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ત્વાંગ્રેસ્ટોંગ્રેસ 14તે પંચ સંપેશાસ દિવાસ, તપ નામયળ ત્યામ વિઝ્લવિદ્યાલય, નામપુર

म्नेकी क्षेत्र के वक में आसम देवे बेकों से है जिसका स्वामित्व सिजी अंशवाहिस्तें डे करने होत्य हैं। ये सरकार के नियचण में नहीं होते हैं। परंतु इनका नियमन भी सरकार हार दलाव गए जननूनों के ठावतर पर ही ठीता है तथा रामय नर गरकार हाम दिए रूष दिष्ठा मनदेशा का जलान में। करना दोता है। भारत में वैकों के संप्रीयकरण के पूर्व जेली संत्र क ही देक करोरस थे। राष्ट्रीमकरण के बाद भारत में मिजी देव के देकों की स्वादना में उहराच सा आ भाग तथा सरकार न भी निजी क्षेत्र में बैंक स्थापित करने पर व्रतिबंध लगा दिया। यहां 1993 में सरकार ने नरसिंहमन समिति (1991) की रिपोर्ट के अधार पर निजी क्षेत्र में येक पथापित करने की अनुमति प्रदान कर दी।

निजी होत्र के देवित्म कार्य प्रणाली की शुरुआत प्रारम्भ में वर्ष 1921 में वैंक ऑफ बयाल देक ऑफ वोम्चे तथा तेक ऑफ मदाम री ईई थी। बाद में इन तेका का विद्धार्णि का इंडोरियल वेक ऑफ इंडिया में कर दिया गया। कातिका के निष्टा तका का विद्धार्णि का कि इवेरियल बैंक अपि इंडिया में कर दिया गया। व्यक्तियों की वैकिय जरूरतों को पुरा करन के लिए निजी बेका की रखापना की गई। निजी क्षेत्र के बैकों के विस्तार से बैंकों की संख्या बढने के कारण चैंकिंग क्षेत्र में चैंकिंग संचाओं का रतर तुलनात्मक रूप से बेहतर हुझा। बंकिंग क्षेत्र में निजी बैंकों के आने से वितीय भागीदारी बढ़ने के कारण देश के आर्थिक विकास में बढोत्तरी संभव हुई है।

क्षेत्रीय संसाधनों का विदोहन करके क्षेत्र विशेष की साख सम्बन्धी आवश्यकताओं को पुरा करने के लिए सरकार में मिजी क्षेत्र में स्थानीय क्षेत्र बैंक स्थापित करने की अनुमति द दी है। मिनी प्रवर्शको द्वारा एसे वेक कम्पनी अधिनियम, 1956 के तहल् स्थापिट किए जा सकते हे तथा इगकी न्युगगम चुकता पूंजी (यक न्व व्यंपजर) 5 करोड़ ब्पये हैं। प्रवर्तको की शयरधारिता कम-रो-कम 2 करोड़ रुपए हैं। यह वैक एक-दूसरे ने लगे हुए तीन जिल्हों में ही अपनी शाखाएँ स्थापित कर राकते हैं। इनका नियमन रिजर्म बैंक इण्डिया एक्ट, 1934, बैंकिंग रेमुलेशन एक्ट, 1949 तथा क्षेत्रीय ग्रामीण बैंक अधिनियम् 1976 के तहत होता हैं। इन नेकों को कार्य प्रारम्भ करने के साथ ही 8 प्रतिशत का पुंजी पर्याप्तता मानक चनाए रखना धाता है।

बर्ष 1991 क बाद भारतीय बीकम में उदाशकरण तथा आशिक सुधारों का दौर प्रारम्भ हुआ। परिणामरचरूप निजी चैको की सरव्या चढने के कारण चैको की शेयर पूँजी मे

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ल्लल को भागीक्षरी का तथा बैंकिम त्यवरणा को अधिक स अधिक लामानित फरने क्व लनता की भागावार के पता करने की बिमा जा रहा है। निजी मेकत के विम्तार में मैंकिन की विम्तार में मैंकिन ्रहि से कमयुद्धकरण के मामीण तथा शहरी क्षेत्रों में मैकिंम युक्तिशाओं का विकास शहरकओं का विस्तार होने से मामीण तथा महीत्राओं को विस्तार में प्राव्हित की विमास शारवाओं का विरुगर के विक्रम के राषा जहण सुविधाओं के विस्तार से प्राथमिक एवं उपेक्षित समय होने से निक्षेपों में वृद्धि तथा जहण सुविधाओं के विस्तार से प्राथमिक एवं उपेक्षित समय होने से गिवान ने मुख्य होई हैं। आधुनिक येक अर्थव्यावरखा में निजी वैकी के क्षेत्र को अरण सुविधार के बागे प्रशरत करते हैं तथा अर्थ व्यवस्था के साहत अनेक काय आविक मानवर समालन में सहयोग देते हैं। निजी वैक साख पत्नों के चलन तथ निर्ममन को संगठित एव रामलन में सहयान के जिस तथा अग्रिमों के रूप में मेंक साख की स्वीकृति का नियमन करते है । यह बैंक उधार देय पूँजी तिनियोग को सुविधाजनक गनाते हैं तथा उसका सबस करते है । यह बैंक उधार देय पूँजी तिनियोग को सुविधाजनक गनाते हैं तथा उसका सबस करत हो पह पर पर स्थितरण राभव बनाते हैं। इस प्रकार आधुनिक निजी वैक अर्थव्यवस्था लाभदायक प्रयोग में वितरण राभव बनाते हैं। इस प्रकार आधुनिक निजी वैक अर्थव्यवस्था लागपापण प्रमान गर्म एव नियंत्रक को रूप में कार्य करके आर्थिक विकास में अपना क कर गया गयु, जनार हैं। इससे ग्रामीण उद्योगों, कृषि क्षेत्र तथा लघु उद्योगों में ऋण सुविधाओं का विस्तार होने से देश में रोजगार में बढ़ोत्तरी तथा आधिक प्रति संभव ह

अार.बी.आई. के नए दिशा-निर्देश भारतीय रिजर्व वैंक (आर.वी.आई.) ने 29 अगस्त, 2011 क्रांआ हुआ भारताय के लाईसेंस से संबंधित बहुप्रतीक्षित दिशा-निर्देशों का प्राह्म्य धार्स किंग्र किंग्र किंग्र किंग्र किंग्र किंग्र पहले पांच साल तक विदेशी हिस्सोदारी 49 प्रतिशता से आधित के ही सकंगी। नर दिशा–निर्देशों के मुताबिक, नया निजी वैंक स्थापित करने के लिए अब कम्पनियों को कन रो कम 500 करोड़ रुपए का निवेश करना होगा। वर्तमान में नए निजी वैंक स्थापित करने के लिए न्यूनतम 300 करोड़ रुपए की पूँजी की अनिवार्यता है।

निजी बैंक खोलने की इच्छुक कम्पनियों में टाटा संस, रिलायंस कैपिटल, महिन्द्रा एंड महिन्द्रा फाइनेशियल सर्विरोस, इंडिया युल्स, रेलिगेयर, आई.एल.एंड एफ एस., आई.डी.एफ.सी., श्रीराम कॅपिटल, एल.आई.सी. हाऊसिंग फाईनेंस, बजाज फिन सर्व

आर.वी.आई. द्वारा जारी किए नए वैंक के लिए मसौदे के दिशा-निर्देशों में निम्न वाते शामिल हैं :-

- नए वैकों वही एजेंसी या समूह प्रमोट कर सकेंगे जिनका खामित्व एवं नियंत्रण किसी भारतीय के हाथों में होगा। उनका कम रो कम 10 वर्ष का व्यवसाय बलाने का सफल अनुभव हो। जिस एजेंसी या रामूह का प्रमुख व्यवसाय रियल स्टेट या कंपिटल गार्केट से जुडा हैं, वह वैंकिंग लाईरोंस के योग्य नहीं होगा।
- नए वैकों की रथापना केवल पूर्ण स्वामित्व वाली गेर परिचालित होल्डिंग कम्पनी (नॉन ऑपरेटिंग होस्डिंग कम्पनी अथवा एन.ओ.एच.सी.) के जरिए हो सकेगी जो रिजवं वेक के पास एनवीएफसी के रूप में पंजीकृत होगी।

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U

नए वेक के लिए शुरुआती न्यूनतम चुकता पूँजी 500 करोड़ रुपए होगी। अभी यह 300 करोड़ रुपए हैं। एन ओ एव.सी के पास कम से कम 40 प्रतिशत चुकता पूँजी भारत में जिनी जैनते का बनेमान भविद्रत्य तथा नामपुर किन में इन देखें का संक्रिय भावतेग्रन ७ 173

की होटिडम होगी। इसकी लाक उन अवनि लाईरास की तांध्रेय से भाव सब क लिए होगी। 10 वर्ष के भीतर एन वा एव ती की मोटिडम बुक्ता पुंजी के 20 फीवर्स और 12 साल में 16 प्रतिशत पर लावी तोगी। एन प्रेम एव सी के अलावा क्रिक्त जन्म एजेन्सी अध्यत्र स्वचित एजेन्सी के संपूर को पत्यहा या अपत्यक्ष रूप से 16 प्रतिशत से ज्यादा शेयर होटिडम की अनुमाने की होगी।

- एन और एव सी के कम से कम आहो ।नेवेशक स्वतंत्र होने चाहिए। कॉमोरिट ढांचा ऐसा हो साकि रिकर्स वेक नए वेको पर अमानार सही ढम स युष्टि रस सके।
- किसी मैर बैंकिंग वितीय कल्पनी (एन बी एफ ही) के प्रमोटर / प्रमोटर समूह को यहि इक लाइसेस के योग्य पाया जाता है वी तसके लिए से विकला होगे– पहला व नमा ढेक खोल सकमें लोकेन एन.वी एम.वी. की सभी गतिगिवियां जो बेंकिंग के उन्धेन आती है जन्हें बैंक को इस्तान्तरित करना होगा। दूसरे एन.वी.एफ.सी. का बेंक म बदलने की अनुगति दी जा सकती है। योनों ही विकल्पों में प्रमोटरों को पहले एन.औ. एच.सी. का गठन करना होगा।
- बैंक को शुरू से ही कोर वैकिंग सॉल्यूशन (सी वी एस) का पालन करना होगा।
- बेक को काम शुरू करने के कम से कम तीन साल तक 12 प्रतिशत पूँजी पर्याप्तता अनुपाल का पालन करना होगा।
- बैंक को प्राथमिकता क्षेत्र, उपक्षेत्र को कर्ज देने संबंधी सभी नियमों का पालन करना होगा।
- वैंक को कम से कम 25 प्रतिशत शाखाएं वैंक-रहित ग्रामीण क्षेत्रों में खोलनी क्षेत्रील Business Fin इसके लिए 2001 की जनगणना के आधार पर 9,999 लोगों की उ**ठावर्श्व**यात्र्यालय (Comm. 8 आधार माना जाएगा।

वर्तमान में 27 सामंजनिक क्षेत्र की येंक, 7 निजी क्षेत्र के नए येंक, 15 निजी क्षेत्र के पुराने चैंक, 34 विदेशी येंक, 86 क्षेत्रीय प्रामीण येंक व 04 स्थानीय क्षेत्रीय चैंक देश में कार्यरत हैं तथा रिजर्व वैंक का मानना है कि वैंकों की संख्या में वृद्धि से इस क्षेत्र में प्रतिस्पद्धां बढेगी और रोवाओं में सुधार तथा लागत में कमी आयेगी। परिवर्चा पत्र के जरिए रिजर्व येंक ने जानना चाहा है कि ओद्योगिक और व्यावसायिक घरानों को क्या बैंक खोलने की अनुमति दी जानी चाहिए और मेर-वेकिंग वित्तीय कम्पनियों (छठथ्थे) को बैंक में परिवर्तित करने की अनुमति किन वशाओं के तहत मिलनी चाहिए, इन लगाम मुद्दों पर विभिन्न वर्यों की राय जानने के परचात ही नए वैंकों को लाईसेस देने के लिए शते रिजर्व येंक द्वारा 31 मार्च, 2011 तक निर्धारित करने की संभावना हैं। निजी क्षेत्र के बैंक ऑफ राजस्थान का आई.सी.आई.सी.आई. बैंक में विलय 13 अगरत, 2010 में विलय हो गया। रिजर्व बैंक की अनुमति प्राप्त होने के पश्चात् 13 अगरत, 2010 में विलय हो गया। रिजर्व बैंक की अनुमति प्राप्त होने के पश्चात् 13 अगरत, 2010 से वैंक ऑफ राजस्थान की सभी 463 शाखाएँ आई सी.आई. रोज की शाखाओं की अब 2500 से अधिक हो गई है। मिलय के प्ररत्ताव को दोनों बैंकों के प्रवत्तन मण्डलों व शेयस्वारकों की अनुमति के मिलय के प्रस्ताव को दोनों बैंकों के प्रवत्तन मण्डलों व शेयस्वारकों की अनुमति के

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भारी 2012 के अस तक भारत न र साथन के साथ प्राण का कुल 13452 शाखाएँ कार्यरत थी। जिसमें 1581 शाखाएँ गामीण क्षेत्रों में, 4687 आआवे अन्ने 13452 जन्म के लग्भी जन्म में तथा 3615 शाखाएँ पहानमत्म व इव्यक्ति कर शाखाएँ कायरत था। एपरान 1507 जाना है। सालाएँ महानगजा व उपलाप अन्द्र क्षेत्रों में, 3561 शाखाएँ शहरी क्षेत्र में तथा 3615 शाखाएँ महानगजा व उपलिय थी।

3561 शाखाए राज्य जन्म अन्य 2012 अन् में भारत में स्थापित समस्त निजी मैंको की जमामें २०२४ - १९ नाम जन्म विनियन रुखी। विद्यित्तर रु तथा अगिमों की राशि 966न विलियन रु थी।

प्रिंगोर जिले में रथापित निजी, राष्ट्रीयकृत, एंतम् सहकारी बेको की जिल्लान कि रिधति

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भारत में निजी ચેલતે पत लनेपान પરિવृत्रय तथा जाधपुत्र जिले में इन नेको एत संशिध्य अपलेखन ७ १७४ तालिक के लिग्नम से जोपपुर जिले में स्थापित कि में की विक्रों कि किये क्षर वर्षी में लिएन प्रकार रही है।

जीवपुर जिलों में 1न ही नेवने की नम 2008 . 09 में कुल आगवओं की 91:2410 हरुया 13 थी को ति- तथे 2011 12 में तदकर 38 हो पई 1 जी ति वर्ष 2009-09 ही हुल्या में 65 89 प्रतिसंत अभिवेत हैं । लेकिन मामीण ये 1 में इनकी शाखाओं का बहुत का गुल्मा इडाहि नहीं के बरावर लिकास हुआ है। जब आभीण तिकास हेतु विकी बैंको को अपनी जनसङ्गी का विस्तार जनसे आपनी मुमितन निमानी तातिए।

कुल जम्मई - वर्ष 2008-09 में जानपुर जिले में स्थापित समस्त बैंकों की कुल जनहरे 587839 लाख रु. भी जिसमें निजी नेनते की जमाएं 83945 लाख रु. थी जो कुल लगाओं का मात्र 14 28 पतिशत था। वर्ष 2011-12 में जोधपुर जिले में स्थापित राभी इस की कुल लमाएँ 1154911 लाख रु थी जिसमें निजी येंकों की जमाएँ 167175 लाख ह दी जो कि कुल जमाओं का लगभग 14 00 प्रतिशत था। अतः निष्कर्ष के रूप में यह इंहा जा सरकता है कि जोधपुर जिले की बैंकों में जमा की गई कुल राशि के संदर्भ में केली देकों की जमाएँ अपेक्षाकृत बहुत कम रही हैं।

क्ल अग्रिम :- वर्ष 2008-09 में जोधपुर जिले में स्थापित समरत वैकों की कुल इग्रिम राहि 425797 लाख रु. थी जिसमें निजी वैकों की अग्रिमों का हिस्सा 81327 लाख रू जा जो कुल अग्रिमों का 19.10 प्रतिशत था। वर्ष 2011–12 में जोधपुर जिले में स्थापित करी देखों की कुल आग्रेग 839257 लाख रु. थी जिसमें निजी वैंकों की अग्रिम 186476 लंख रू थी जो कि कुल जमाओं का 22.22 प्रतिशत थी जो कि वर्ष 2008–09 की बुद्धि दर से कुछ प्रतिशत बढी हैं। लेकिन इसे पर्याप्त नहीं कहा जा सकता है। अतः जोधपुर जिले की वैको द्वारा प्रदर्श ऋण एवग् अग्रिमों के संवर्भ में निजी वैकों की भूमिका राष्ट्रीयकृत वैकों की तुलना में बहुत कम रही हैं।

कुल व्यवसाय -- वर्ग 2008-09 में जोधपुर जिले में निजी बैंकों का⁰⁸र्थुल. व्यवसाय 185272 लाख थी जो कि नर्ष 2011-12 में बढ़कर 353651 लाख रु. हो गया, जे कि दर्ष 2011–12 की तुलना में 53.26 प्रतिशत अधिक है। लेकिन ग्रामीण क्षेत्रों मे अपेमकृत व्यवसाय बहुत कम रहा है |

ऋण जमा अनुपात :- वर्ष 2008-09 में ऋण जमा अनुपात 96.88 जो कि वर्ष 2009-10 में 100.04 हो गया तथा वर्ष 2010-11 में घटकर 85.72 रह गया। 2011-12 में पुनः वदकर 111 54 हो गया। जोघपुर जिले में निजी वैंकों का ऋण जमा अनुपात अधिक होने का मुख्य कारण इन चैंकों द्वारा प्रदत्त जमाओं की तुलना में जरणों पर अधिक घ्यान दिया जाता है।

निष्कर्य के रूप में कहा जा राकता है कि निजी क्षेत्र के बैंकों ने सार्वजनिक क्षेत्र के बैंकों के समान देश के आर्थिक विकास में आपने महत्वपूर्ण भूमिका निभाई हैं। अपने वैतिय र्षेक आर्थिक विकास में महत्त्वपूर्ण भूमिका निभा रहे है। सरकार के निर्धनता उन्मूलन 176 w. RU's International Journal of Humanitics & Social Science

कार्यक्रम, जिला ऋण योजना, प्राथमिक क्षेत्र की अग्रिम, रोया क्षेत्र दृष्टिकोण खरोजगार योजना, कमजोर वर्गों को ऋण आदि योजनाओं में ये वैक अपनी सक्रिय भूमिका निमा रहे है और सरकार एवं विभिन्न एजेन्सियों के साथ इनका अच्छा समन्वय हैं। लेकिन जोवपुर जिले में स्थापित निजी मैंकों का योगवान राष्ट्रीयकृत यैंकों की तुलना में कम दिखाई देता है। इन येंकों की नीतियां साटीयकृत वैकों से मिन्न हैं। अर्थात् इन नैकों में स्वाटवादिता कम देखने को मिलती है क्योंकि यह बैंक समय-समय पर अपनी नीतियां में बबलाव कर वेती है। तरण देते सगय प्राय: यह वैंक अपने उधार शर्ती के तहत प्राहकों को अपनी ओर आकृषित करती हैं लेकिन ऋण प्रदान करने के पश्चात् अपनी नीतियों में यदलाव लाकर तथा व्याज दरों में बढ़ोत्तरी करके ग्राहकों का शोषण प्रारम्भ कर देती हैं। जिससे ग्राहकों का झुकाव इन बैंकों की तरफ कम रहा हैं तथा मजवूर होकर ग्राहक अपने ऋण खाते को अधियुंहण शुल्क (Take Over Charges) देकर राष्ट्रीयकृत वैक में स्थानान्तरित करवा रहे है। अतः निजी बैंकों में अपनी नीतियों में बदलाव लाकर ग्राहको की सेवा करनी चाहिए।

संदर्भ

- मुदा बैंकिंन एवं राजस्व
- र्वंकिंग विधि एवं व्यवहार
- इण्डियन चैंकिंग
- गुद्रा एवंग् वित्त प्रणाली
- Banking Theory & Practice
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- वी. एल. ओझा
- डॉ. मालीराम, जी.एन. शर्मा, वी के, वशिष्ट
- ए. वी.मुप्ता
- त्रिवेद्वी, दशोरा, जेन, नागर
- Shekhar & Shekhar
- P. N. Reddy
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ग्रामीण औद्योगिकरण की समस्याएँ एवम समा

Burger ...

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डॉ. महेन्द्र कुमारु, सह जावार्य ब्यायरगथिक बित्त एवं अर्थशाख विभाग, जय नारायण ख्याख विज्यष्टि पालय,

भारत गांचों का देश हैं। भारत की कुल जनसंख्या का लगभग 75 गांवों में निवास करता हैं। भारतीय ग्रामीण जनता का मुख्य व्यवसाय कृति कृषि मानसून पर निर्भर हैं। विगत कई वर्षों से मानसून के समय पर न अ पड़ने के कारण ग्रामीण जनता का जीवनव्यापन दूर्भर हो गया हैं। ग्रामीण ज की तलाश में शहरों की ओर पलायन कर रही हैं। प्रकृति ने देश के विनि विशेषकर ग्रामीण आँचल में विपूल प्राकृतिक सम्पदा दी हैं। अतः आद्ये उपलब्ध प्राकृतिक सम्पदा का उपयोग कर ग्रामीण जनता के जीवन स्तर परिवर्तन किया जा सकता हैं। भारतीय परिवेश में एक ओर पूँजी की पर्या ला व ही दूसरी ओर जनशकित का बाहुल्य हैं अतः ग्रामीण ओद्योगीकरण की कुटीर एवंग् ग्रामीण उद्योगों का महत्व व अनिवार्यता स्वतः सिद्ध हैं। ल उँद्योग ग्रामीण अर्थव्यवस्था के अनुकूल होते हैं। तथा इनका स्वामित्व लाग हाथ में होता हैं। परिणाम स्वरूप देश में आय के समान वितरण में सहायता Head ग्रामीण क्षेत्रों में स्थापित उद्योग बड़े उद्योगों के लिये सहायक के रूप में सहाय Head sudies of the रथापित लघु एवं कुटीर उद्योग व्यक्तित्व एवं कला का विकास करते हैं। ¹⁰ (Com¹⁰ (Rai)) ³⁴²⁰⁰¹ पुरानी प्रौद्योगिकी, अपर्याप्त बाजार, ऋण प्राप्ति के लिये करते हैं। ¹⁰ भूरी¹⁰⁰ (Rai) पुरानी प्रौद्योगिकी, अपर्याप्त बाजार, ऋण प्राप्ति के लिये भारी भएकः को विद्युत संकट व कच्चे माल की कमी के कारण ग्रामीण क्षेत्रों में स्थापित ला उद्योगों की स्थिति दयनीय हैं।

ग्रामीण औद्योगीकरण से आशय – कुछ विद्वान मानते है कि गांतों तंबू एवम्ं लघरतरीय उद्योगों की स्थापना ही ग्रामीण औद्योगीकरण है जब। क मानते है कि गांवों में सहायक उद्योगों की स्थापना करना ही ग्रामीण ज गांधीवादी सिद्धान्त के पक्षधर सामाजिक कार्यकर्ता इस सम्बन्ध में अप रखते हैं। वे कहते है कि गांवों में आत्मनिर्भरता लाने वाले पारम्परिक ग्रा विकास ही औद्योगीकरण हैं।

राष्ट्रीय कृषि और ग्रामीण विकास बैंक (नाबार्ड) ने ग्रामीण अत्य में परिभाषित करते हुए लिखा है कि – ग्रामीण औद्योगीकरण का अर्थ साध स्थापना से लगाया जा सकता हैं। जिसके अन्तर्गत न तो ऊँची स्तर की च

united approximation and some same solution as the s जरिल तत्पादन प्रकृत्या की जरूरत होती है।

भी गार्श्वामेल से यम्भीण औरतेन्त्रतन को परित्रानित करने हुए के के क विग्न रतर तक फैलेमा और इसमें अधिक लोगों को राजमार विजेशा।

इस प्रकार जिल्ला के रूस में मह कहा जी सकता है कि प्रवीण जीलोगीकरण ग्रामीण आधिक विकास की एक ऐसी न्यापक प्रक्रिय है जिसम दिवस्थ झातायाका . इसोगों की रथापना एनम् विकास के साथ-साथ राज्यातन जिल्लाओं में होने कल इस्तान के परिवर्तनों और - संजीवन्त्रण, कृति का विकास, त्यापार एक्स, परिवरन के

भारतीय मामीण परिवेश में जहां एक ओर पूंजी की पर्यापतन संगतन है कहा दूसरी और जनशक्ति का बाहुल्य है अतः लघु उलोगों का महत्व एवम अभिवार्यता खत दूर्स कर के लघु एवंग कुटीर उद्योग सामीण अर्थन्यवरथा के अनुकृत हाते है तथा उनका सब को प्यावितयों के पास होता है परिणामस्वरूप देश में आय के समान वितरण में रवागाय मिलती है। लघु उद्योगों को अर्द्धनिर्मित माल की पूर्ति करना इत्यादि। विधन्न कुछ वर्षों में लघु एवं कुटीर उद्योगों द्वारा निर्मित वस्तुओं का निर्यात कर रहा है जी दल को बहुमूल्य विदेश मुद्रा अर्जित करने में राहायता थे रहा है। वर्तमान में कुल निर्यात म लघु उद्योगों का लगभग 35 प्रतिशत योगदान हैं। अतः अनुकूल पशिस्थतिमां के अनुसार राजस्थान में उद्योग धन्धे खुलने आवश्यक है आज राजस्थान के मामीण क्षेत्रा में वहाँ की अनुकूल स्थिति के अनुसार खनिज आधारित उद्योग, पशुधन पर आधारित जवांग. हस्तशिल्प उद्योग आदि खोले जाने की पर्याप्त संभावनाएँ विद्यमान है। राज्य क विभिन्न हेन्रों में विभिन्न उद्योगों के लिए कुशल श्रमिक परमारागत रूप से उपलब्ध है। गदि इन अनिकों का, उपलब्ध कच्चे माल का क्षेत्र की अनुकूल रिधति का फायदा उठाते हुए यदि ग्रामीण क्षेत्रों में औद्योगीकरण का जाल बिछाया जाये तो राजस्थान की रिधति कुछ और ही होगी।

आज अनेक ऐसे उद्योग धन्धे जो ग्रामीण क्षेत्रों में सुममता से स्थापित किये जा सकते हैं। ऐसे कुछ उद्योग धन्धों के उदाहरण इस प्रकार है :--

फल एवं सब्जियों का संरक्षण 16 रसगुल्ला उद्योग

- डिब्बा बंद दूध उद्योग
- डेंगरी उद्योग 3

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4

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- तेल घाणी उद्योग
- पिसाई उद्योग
- हथकरघा उद्योग
- लोहे एवम् लकड़ी के कार्य 22 ईटों का भट्टा

17 मिटटी के बर्तन खिलौने इत्यादि

18 दाल बनाने का उद्योग

- 19 पीतल एवम् तांबे के बर्तन का उद्योग
- 20 हार्थी दाँत का कार्य
- 21 ग्वार गम उद्योग

माचिस एवंम् अगरवती उद्योग 23 कॉच उद्योग

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9 चमड़ा उद्योग

10

11

- ग्रेग 24 स्वर्ण एवम् चाँदी के बर्तन एवं आभूषण बनाना उद्योग 25 चित्रकारी बनाना
- ऊनी वस्त्र उद्योग
- मधुमक्खी पालन उद्योग 26 गोटा एवं किनार का कार्य
- 12 पापड़ उद्योग
- 27 सीमेन्ट पाइप बनाने का उद्योग
- 13 भुजिया एवम् नमकीन उद्योग 28 कत्था तथा गोंद उद्योग
- 14 हस्तशिल्प उद्योग 29 दरी व निवार उद्योग
- 15 रंगाई छपाई उद्योग 30 बीड़ी उद्योग इत्यादि

राजस्थान में कुछ प्रसिद्ध हस्तशिलप जो विश्वविख्यात है, का यदि ग्रामीण स्तर पर विकास व विस्तार किया जाएं तो ग्रामीण औद्योगीकरण को बढ़ावा मिलेगा ऐसे हस्तशिल्प में कुछ प्रमुख इस प्रकार हैं :—

- हाथी दाँत का काम :- हाथी दाँत के खिलौने, शतरंज की मोहरे, मूर्तियाँ महिलाओं के चूड़े, मणियाँ, अंगूठियाँ इत्यादि।
- वस्त्रों पर रंगाई छपाई का कार्य :- सांगानेरी छपाई, जयपुर, बीकानेर, सीकर नागौर, जोधपुर, पाली एवम् बालोतरा का बंधेज व रंगाई का कार्य।
- दरी एवं कालीन -- बीकानेर, मालपुरा, बाड़मेर, जयपुर आदि के प्रसिद्ध कालीन।
- चमड़े का कार्य :- जयपुरी एवं जोधपुरी जूतियाँ (मोजड़ी) बीकानेर में ऊंट की खाल से बनाई हुई कुपियाँ, सुराहियाँ जिन पर कलात्मक कार्य होता हैं।
- संगमरमर की मूर्तियाँ
- खिलौने व कठपुतलियाँ :-- लकड़ी एवम् मिटटी से बने खिलौने एवम् कठपुतलियाँ ।
- कशीदाकारी कोटा की मसूरिया, मलमल व डोरिया की साड़ियाँ ।
- लाख व काँच का कार्य
- पीतल की कलात्मक वस्तुएँ।

ग्रामीण क्षेत्रों में उद्योग धन्धों को खोलने से निम्न लाभ प्राप्त होगें :--

- बेरोजगारी की समस्या का समाधान।
- औद्योगिक विकेन्द्रीकरण।
- ग्रामीण एवम् शहरी अर्थव्यवस्था में संतुलन ।
- स्थानीय संसाधनों व कुशलता का उपयोग।
- कृर्षि जनसंख्या का भार कम करना।
- आपातकाल में सहायक जैसे युद्धकालीन परिस्थिति में सहायक।

Department of Business Finance & Economics Department of Comm. & Mgr Studies Faculty of Comm. Vyas University Jai Narain Vyas University Jodhpur (Rai.) 342001 માપીખ ઊચીર્થભરખ જો મઘરવાવું ખુલા આઉપાસ 3365

- शहरों में जनसंख्या का चनान कम होगा।
- देश की राज्यता एवं संस्कृति के अनुरूप ।
- 9. आखिक विषम्ता की कभी। छ. किञ्चे क्षेत्रों की प्रति व्यक्ति आय में वृद्धि ।
- म अर्थवायरथा का रामग्र विकास इत्यादि ।
- ग्रामीण औद्योगीकरण के लिए प्रयासरत कुछ संस्थाएँ ग्रामीण औद्योगीकरण हेतु ख्यापित विभिन्न संख्याओं को दो भागों में बांटा जा
- लकता है :-
- अ- राष्ट्रीय संरथाएँ -
- लघु उद्योग तथा कृषि एवम् ग्रामीण उद्योग विभाग 2 राष्ट्रीय उद्यम विकास बोर्ड और राष्ट्रीय उद्यमशीलता व लघु व्यापार विकास संस्थान
- उ त्तद्रीय उद्यम विकास संगठन
- 1 राष्ट्रीय लघु उद्योग निगम
- 5 भारतीय लघु उद्योग विकास बैंक
- 5 अखिल भारतीय हाथकरघा मण्डल
- अखिल भारतीय दातकारी मण्डल
- केन्द्रीय रेशम मण्डल
- १ जटा मण्डल
- 10 भारतीय खनिज एवं धातु व्यापार निगम
- 11 राज्य व्यापार निगम
- 12 नियति साख गारण्टी निगम
- 13 भारतीय काजू निगम
- 14 भारतीय मानक संरथान रवर बोर्ड इत्यादि ।
- द-राज्यस्तरीय संरथाएँ -
- 1. उद्योग निदेशालिय
- 2. जिला उद्योग केन्द्र
- 3. लघु उद्योग सेवा संस्थान
- राजस्थान लघु उद्योग निगम लिमिटेड
 - राजस्थान राज्य हथकरघा विकास निगम

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's International Journal of Humanities & Social Science

રાजસ્થાન તિત નિમમ

राजरण्यन रक्षदी एवम मामोलोग कोर्ड

राजस्थान कन्सल्टेन्सी संगठन

राजस्थान राज्य औद्योगिक विकास एवं विनियोम निमम लिमिटेड इल्यादि । 9

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् नर्थ	उत्पादन मूल्य करोड़ में (वालू मूल्गों पर)	रोजगार लाख में	नियांत करोट क			
1973-74	7200	39.7	1			
1980-81	28060	71.0	393			
1985-86	61228		1643			
1990-91		96.0	2769			
	155340	125.3	9100			
2000-01	261289	239.09				
2002-03	311993		66797			
2003-04		260.13	86013			
2004-05	357733	271.36	97644			
	418263	282.91	1			
2005-06	476201		124417			
2008-09		294.91	160000			
2011-12	650000	380	180000			
11-12	800000	400				
		100	200000			

लघु एवं कुटीर तथोगों में तत्पादन, रोजमार एवं निर्याती की प्रार्थ

रत्रोत :- आर्थिक समीक्षा 2013-2014 भारत सरकार

उपरोक्त तालिका के अध्ययन से ज्ञात होता है कि योजनावद्ध विकास में लघु एवम् ग्रामीण उद्योगों का तेजी से विकास हुआ हैं। फिर भी विकास की काफी गुंजाईश हैं इनकी कठिनाईयों को दूर करने. उनके तीव्र विकास का मार्ग प्रशरत करने की जरूरत

इन सबके होते हुए भी देश में आमीण औद्योमीकरण पूर्ण रूप से विकसित नहीं हो पाया। इसके अनेक कारण है जिनमें कुछ प्रमुख कारण इस प्रकार है :--7

कच्च गाल का समय पर उमित कीमत पर न मिल पाना।

विषणन सुविधा का अभाव | 2

4. आधारभूत सुविधाओं का अमान जैसे :- रेल एवं सड़क का अमान हो प्राय Studies उपलब्ध न हो पाना, पानी का समस्या इत्यादि। उपलब्ध न हो पाना, पानी का समस्या इत्यादि। Jodpav सिंग के साहन

માર્ગાંગ્ય સૌચાર્ગિન-આ તો સમયતાથું બનાદ સંભાગાનું » 167

- तहनीकी जन्म एव प्रशिक्षण की कमी।
- हलकीकिक हरराक्षेण (
- इडे तलोगो से प्रतिरणतो ।
- श्रवित के समानों की कमी।
- ्रत्वचीय क्षमता नन मभाव ।
- 11 तोपहुले कर प्रणाली (
 - स्वनाओं एवम् परामशे का जामान ।

Department of Butters's Finance & Econom Department of Comm. & Mar Studies Faculty of Comm. & University Jal Natrain Vyas University Jal Natrain (Rail) 342001 ice & Eco

ु की विकास कार्यकमी के अन्तर्गत लघु जुलोगों की उपेक्षा।

ग्रामेन औद्योगीकरण के विकास हेतु कुछ सुझाव :--

- अन्वे गाल सम्बन्धी :--
- तरकार द्वारा अधिक भण्डारगृह खापित कर कच्चे माल की नियमित आपूर्ति सनिषिचत करे।
- ग्राचीन क्षेत्र में स्थापित उद्योगों को कच्चा माल उचित मूल्य एव उच्च कोटि का नग्य-समय पर बरावर उपलब्ध होता रहे इसके लिए सरकारी क्रय समितियों बनाई जन्म लघु उद्योगों की सामूहिक क्रय शकित को बढ़ाया जाये।
- जहाँ कच्चे माल आयातित हो वहाँ इन उद्योगों के सम्बन्ध में सरकार को आयातित गल का कोटा कुछ जदारतापूर्वक नियत करना चाहिए।
- ल्कार द्वारा प्रत्यक्ष रूप से आर्थिक सहायता देकर कच्चे माल के खरीदने में सुविधा
- । नवन तळनीक व उपकरण सम्बन्धी : --

न्तेन व वैज्ञानिक यंत्रों के अभाव को दूर किया जाना चाहिए। इसके लिए नवीन व अर्था गशीने राष्ट्रीय व राज्य के लघु उद्योग निगमों द्वारा किराया किश्त पर जोव्यादिक मात्रा में लघु उद्योगों को प्रदान करना चाहिए।

ग्रमाण क्षेत्रों में स्थापित उद्योगों के आधुनिकीकरण व तकनीकी सुधारों हेतु सरकार के एक नियोजित व सोपानवार कार्यक्रम तैयार करना चाहिए। वितीय सहायता सम्यन्धी -

^{देत निगम} व बैंकों के ऋण प्रदान करने की प्रक्रिया का सरलीकरण होना चाहिए। ेखारी स्तर पर लघु उद्योगों के बिलों का त्वरित भुगतान संभव हो सके इसके ाखार को एक मार्गदर्शिता तथ करनी चाहिए।

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• यामीण होत्रों में स्थापित उसोमां को चनीन पर्धानों व उपकरणों के कंछ करने हेनु यहभरांमव अधिकतम संयसिडीज, सॉफ्टलान च नितीय सडायताएँ मुहेक करानी चाहिए।

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- द विद्यापन व निक्रम सम्बन्धी —
- भागीण क्षेत्रों में स्थापित उसोगों के उत्पादन के विजापन व विक्रम अन् असि व्यवस्था की जानी बाहिए। उत्पादित वरतुओं की प्रदर्शनी, क्लेड्र न मेली क प्रवार-प्रसार करना वाहिए एवं जगह-जगह विझावन वादनों की कर्दस्था करनी चाहिए।
- प्रभावी विज्ञापन व बिक्रय के वैझानिक तरीकों के साथ-साथ यह भी आवश्यक है लघु उद्योग अच्छी मशीनों व उपकरणों व शेष्ट कच्चे माल का प्रयोग कर अपने उत्पादन की किरम को उच्चकोटि का बनाये व उत्पादन परिव्ययों में कमी करें।
- राज्य व जनता को चाहिए कि इन्ही से माल खरीवें व लघु उद्यागों का संरक्षण प्रदु करे।
- य प्रशिक्षण सम्बन्धी :--
- तकनीकी व प्रशिक्षित व्यक्ति अधिक मात्रा में उपलब्ध हो सके इस हेत अनुरक्षिक Finance & Economics शिक्षा का प्रसार होना चाहिए।
 कटीर कला प्रशिक्षण के प्रवर्ण के स्थान के स्थान के प्रति Comm. & Mgr Studies Faculty of Comm. & University Faculty of Comm. & Marship (1998)
- कुटीर कला प्रशिक्षण व प्रदर्शन केन्द्रों की स्थापना की जाये ताकि यहां Faculty of Comm. & University Faculty of Comm. & University त्यां यो को नई– नई डिजायनों व कलात्मक चीजों की तकनीक बताई जादे।
- प्रशिक्षण कार्यक्रमों का विरतार होना चाहिए।
- ग्रामीण क्षेत्रों में स्थापित उद्योगों में कार्यरत सुपरवाईजरी व प्रबन्धकीय स्तर के कर्मचारियों को जनके कार्यक्षेत्र से सम्बन्धित वैज्ञानिक जानकारी प्रदान की जाये लाकि उनकी कार्य कुशलता वढ़ सके।
- र अन्य सुझान :~-
- ग्रामीण उद्योग हेतु विभिन्न करों में रियायतें सरकार द्वारा दी जानी वाहिए।
- ग्रामीण उद्योगों को बिजली की सुविधाएँ कम दर पर उपलबध करानी चाहिए।
- ग्रामीण उद्योगों की रथापना हेतु रारकारी अड्वनें दूर करनी चाहिए।
- ग्रामीण उद्योग हेतु विभिन्न करों में रियायते सरकार द्वारा दी जानी चाहिए।
- ग्रामीण क्षेत्र में स्थापित उद्योगों की किस्म नियंत्रण एवं मानक तय किये जाने चाहिए ताकि उत्पादित वस्तुएँ प्रमावित किस्म की हो सके।
- ग्रामीण क्षेत्र में रथापित उद्योगों को आरम्भिक अवरथा में रथानीय कर चूँगी,

સામાળ ગોલોઇઝહરળ કરી સામરુતાલું હતમ્ સામાજાનિ ≫ 669

Jodhpi

रहर्मन को जानी चाहिए। तर होत्र वे स्थापित जलाको के बाजार अनुराधान सर्वक्षण आदि तिशेषझों को सं^{त्रीक} क्षेत्र वे स्थापित जलाको को जानकत्त्री माहा को जानक रावेत संस्थानस स्थानस स्थान वालार क्षेत्रों की जानकारी प्राप्त की जानी चाहिए। इस्टन हे इस्तरे जाकर नजीन वालार क्षेत्रों की जानकारी प्राप्त की जानी चाहिए।

र्श्वन क्षेत्र में लग एवंग कुदीर उसोगों द्वारा निर्मित माल का बाजार बनाने के लिये इन्द्र हो देश है के तो एक प्रदर्शनियों का आयोजन करना चाहिए | दुस विदेश में केती एक प्रदर्शनियों का आयोजन करना चाहिए | र होत्रों में उत्पादित समी लघु औशोगिक ईकाईयों को अन्तर्राष्ट्रीय मानक कई एम ओ – anni प्रमाण पुत्र पाल करने ने कि इतित हुन्दा न प्रस्थापत राज राष्ट्र जात्या तथ रागरणा पत जन्तरप्रप्रदान नानक हुन्दान (आई एस. ओ. – 9000) प्रमाण प्रत्र प्राप्त करने के लिये प्रोत्साहित करना

लाजन (भार) जोर | जिससे वे आपनी उत्पादित वरतु की गुणवत्ता में सुधार कर सकें |

स्वहत को ग्रामीण क्षेत्र में खापित औद्योगिक ईकाईयों को चढावा देने के लिये र्वे के अधिकाधिक प्रयोग के लिये प्रेरित करना चाहिए । • त्यु ज्यांन मंत्रालय द्वारा ग्रामीण क्षेत्रों में रथापित लघु एतम कुटीर उद्दोगों के बु ज्या के लिये 'तकनीकी जन्नयन कोष' ख्यापित करना चाहिए। जिससे इन

इग्रामे को सन्सिडी प्राप्त हो सके ।

, ल्येन क्षेत्रों में खापित लघु एवंम् कुटीर उद्योगों के लिये एक मास्टर वेबसाईट कांसत को जानी बाहिए। जिससे इन उद्योगों की नीतियाँ, प्रक्रिया, तकनीक ओर इन्ह आदि का समस्त व्योरा रह सके। इसके लिये इन्हें राज्यों एवं अन्य देशों की व्रतहंट से जोड़ना चाहिए ।

उन्नत सुआव न केवल विद्यमान ग्रामीण क्षेत्रों में स्थापित उद्योगों का हल दुष्टिम_{aculty of Cc} इहे। बल्कि संभावित उद्योगों के समक्ष आने तानी उपयोगकों का हल दुष्टिम_{aculty of Cc} इस्ट है। बल्कि संभावित उद्योगों के समक्ष आने वाली समस्थाओं का निराकरण भी र्तन्ल हैं। ग्रामीण क्षेत्रों में स्थापित उद्योगों की उपादेयता को देखते हुए सरकार, खाइ उद्यमियाँ सभी को यथासंभव इनके विस्तार व विकास हेतु मिलजुल कर प्रयास अन्द्र बहिए।

खर है कि ग्रामीण व लघु उद्योग जो कि ग्रामीण औद्योगीकरण के आधार स्तम्भ हिंद में यय की गई राशि में उतरोतर वृद्धि हुई हैं। अतः देशभर में ग्रामीण के काफी संभावनाएँ हैं। हमारी दृष्टि में ग्रामीण औद्योगीकरण का एक अ इत्य है जिनमें वर्तमान में देश जवलंत समस्याओं को आसानी से निराकरण एवम् ल बारे में सहायक होगी।

था ग्रामीण, कुटीर एवं लघु उद्योगों की विभिन्न समस्याओं का समाधान करके ²² जियम ते ग्रामीण आँद्योगीकरण को वढ़ावा दिया जाना चाहिए ताकि इस शुष्क क्षेत्र किंद करने बाले लोगों को रोजगार प्राप्त हो सके व उनकी कृषि पर निर्भरता कम की होते साथ है। इन क्षेत्रों में प्राप्त स्थानीय कच्चे माल से संबंधित उद्योगों को ही बढ़ावा के बन बाहर ताकि प्राकृतिक संसाधनों का पूर्ण उपयोग हो सके व आय में वृद्धि की बाह्ये। श्ववि इन उद्योगों के विकास हेतु सरकार ने अनेक प्रयास किये है जिनमें

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औरोगिक बरितमां की रणापना, जिला उद्योग केन्द्रों की रथावना, रिमायती दर्श पर भाषानिक महत्व किंतली कनेक्शन में प्राथमिकता, उचित मुह्य पर कथ्वे माल की पूर्वि, करों में छूट, आधारभूत संरचना का विकास प्रमुख हैं। साथ ही वित्तीय राखाओं जेसे पूरि, करी न दूद जगा हू राजस्थान वित्त निगग, लगपारिक मैंक, राग्वन्धी चेंक, राहकारी मेंक व भारतीय लघु उद्योग विकास बैंक ने इन तत्तोंगों को वित्तीय समायता देकर तित सम्बन्धी महत्वपूर्ण गमस्य का समधान किया हैं। सिडवी ने कुटीर, प्रामीण व अव्यन्त लघु उन्नोमों के लिये विमेष सहायता योजनाएँ प्रारम्भ की हैं। इन योजनाओं ने सम्मिश्रण ऋण योजना, राष्ट्रीय इविवटी निधि योजना, एकल स्त्रोत योजना, चलरी फिरती बिकी वेन खरीदने के लिये योजना, प्रमुख है। इन योजनाओं के द्वारा वैंक प्रत्यक्ष वित सहायता व पुनर्वित्त सहायता द्वारा इन उद्योगों को वित्तीय सहायता प्रदान कर रहा हैं। लेकिन फिर भी युष्क क्षेत्र में तीव औद्योगीकरण नहीं हो पाया हैं। अतः इन दिशा में सकिय प्रयासों की आवश्यकता है। महात्मा गांधी के शब्दों में भारत का कल्याण आमीण क्षेत्रों में ख्यापित लघु एवंम कटीर उद्योगों में निहित हैं। भारत के लगभग 65 प्रतिशत कार्रशील जनसंख्या कृषि पर लिर्भर करती हैं। जबकि ग्राभीण कृपकों को पूरे वर्ष कार्य नहीं मिल पाता हैं। अतः लघु एवंम कुटीर उद्योग ग्राभीण अर्थव्यवरथा के अनुकूल हैं तथा खाली समय में इस प्रकार के उद्योग धन्धे चलाकर अपनी आय में वृद्धि कर सकते हैं और देश की राष्ट्रीय आय में अपना महत्वपूर्ण योगदान दे सकते हैं।

सदम गंथ

भारत की अर्थवातरथा भारतीय अर्थशास्त्र भारत में आशिक पर्यातरण आधुनिक राजस्थान का इतिहास औद्योगिक अर्थशास्त्र राहकारी चिंतन एवं प्रामीण विकास आर्थिक प्रमुचिरण साधका पुस्तकों :--आशिक समीक्षा (आर्थिक एव सांख्यिकी निद्रेशालय, जयपुर)

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एस. एस. जैन आर. एस. कुलश्रेष्ठ डॉ. ची. पी. गुप्ता गुप्ता, रनाभी

रिजर्न बैक ऑफ इण्डिया बुलेटिन राजस्थान वार्षिकी

इण्डिया वार्षिकी

रामातार पत्रिकाएँ -

राजस्थान पत्रिका, वैनिक भारकर, योजना, प्रतियोगिता दर्भण, कुरूक्षेत्र

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Electronic Banking Services in India

Abstract

In the present car banking services is today an integral part of our everyday life. At home, at university, at college, at school, at business, on travel everywhere we counter some aspect of banking. The significance of banking in our day to day life is being felt increasingly. Money plays a important role in our today's life. Forms of money have evolved from coin to paper currency notes to debit card and credit card. Increased use of mobile services and use of internet as a new distribution channel for banking transaction and international trading requires more attention towards e-banking security against fraudulent activity, it has been in the form of online banking has a lot of benefits which add value to customers' satisfaction in terms of better quality of banking service offerings and at the same time enable the banking industries.

Keywords: E-Banking, Information, Technology, Functions, Advantage, Limitation.

Introduction

The concept of e-banking relates to selling goods and services over the Internet. Electronic payment system is a convenient way of making a purchase or paying for a services without holding cash or having to got through the process of completing a cheque and producing some from of acceptable identification.

Electronic banking means any user with a personal computer and a browser can get connected to his bank's website to perform any of the virtual banking functions. In electronic banking system the bank has a centralized database that is web –enabled. All the services that the bank has permitted on the Internet are displayed in menu. Once the branch offices of bank are interconnected through terrestrial or satellite links, there would be no physical identity for any branch. It would be a borderless entity permitting anytime anywhere and anyhow banking.

Another innovation in Indian banking system has been the use stream technologyin banking mechanism Majority of Indian banks, have provided Electronic Accounting Machines and Advance ledger Posting Machines in their Branches. Banks have taken up the project of total computerization of their branches for enhance of e- banking services. About thousand offices of banks have been hooked through BANKNET, a data communication network for the Reserve Bank and public sector banks at Mumbai, New Delbi, Chennal, Kolkata, and Nagpur, Hyderabad and Bangalore.

Objectives of the Study

The study has the following objectives

- 1. To know the concept of e-banking
- 2. To identify the various electronic banking services provided by banks.
- 3. To study the impact on client and bank.

Research Methodology

The Research paper is based on the exploratory research, keeping in view the objectives of research as e-banking is still emerging in India because there are frequent changes in e-banking through the technology.

E-banking is implemented recently in India; hence there are no accurate data available for the same. Hence the study focuses on extensive study of secondary data collected from various articles, books, National and International Journals, Magazines, Government reports, publication from various website which focused on various aspects of e-banking in India.

Electronic Banking in India

In India e-banking is of fairly recent origin. The traditional model for banking has been through branch banking. Only in the early 1990s there has been start of non-branch banking services. The good old manual

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systems on which Indian Banking dopended upon for centuries seem to have no place today. The credit of launching internet banking in India goes to ICICI Bank. Citibank and HDFC Bank followed with internet banking services in 1997. Several initiatives have been taken by the Government of India as well as the Reserve Bank to facilitate the development of ebanking in India. The Government of India enacted the IT Act, 2000 with effect from October 17, 2000 which provided legal recognition to electronic transactions and other means of electronic commerce. The Reserve Bank is monitoring and reviewing the legal and other requirements of ebanking on a continuous basis to ensure that ebanking would develop on sound lines and e-banking related challenges would not pose a threat to financial stability.

E-Banking Services Offered in India

- 1. ATM
- 2 DABIT CARD
- 3. CREDIT CARD
- 4. INTERNET BANKING
- 5. MOBILE BANKING

Bank that offer e-banking are open for business transaction anywhere a client might be as there is internet connection, Services are available 24 hr. a day and 365 days round the year.

Efficient Cash management

E-banking services speed up cash cycle and increases of business processes as large variety of cash management instruments are available on Internet sites of Estonian banks. Reduced cost

This is in terms of the cost of availing and using the various banking products and services. Ebanking helps in reducing the cost of delivering the services to the customer.

Friendlier Rates

Lack of substantial support and overhead costs results to direct banks offering higher interest rates on savings and charge lower rates on mortgages and loans

Save paper

It reduces the use of paper money that helps the central bank in printing less paper notes. **Reduces work pressure**

FAQ's upload over the banks website will reduce the workload and work pressure on employees.

Single click

E-banking, customer can check account balance, can get statement, apply for loans, check the process of investment, stop cheque, Instant fund transfer, NPS Account, and other relevant information.

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Fund Mangement

Customer can download their history of different accounts and do analysis on their own pc before affecting any transaction on the web. This will lead to better fund management.

Disadvantages of E- Banking

Personal Relationship

E-banking services reduce in personal touch between a bank and its client. Whereas customary banking services allow creation of a personal touch between client and bank.

Limitations of Deposits

Electronic Deposit limit of fund is fixed daily or monthly may make it difficult for individuals.

Depended on Technology

E banking services depended on internet service if you don't have decent connection or there are virus in the software, website are bound to crash and you will undoubtedly face a lot of technological issues. E-banking isn't for everyone non well educated and the elderly cannot use online banking. **Difficult To New User**

E-banking services difficult for new user

9. N.E.F.T. 10. M.I.C.R. 11. E. C. S. Advantage of Electronic Banking Faculty of Conum. & Mgt Studies options available on the bank website and bank Convenience

computer resource or network or communication device. Some of the cybercrime in banking industries are phishing, hacking, skimming, pharming and some many type of crime faced by client.

Limilted Services

E-banking services you can do quite a bit with an online bank account, such as make deposits, check balance, and pay utility bills, there are limitations to the kinds of services you can access. But in most of cases you will need to visit a branch to sign forms and show identity documentation.

Grievance Redressal

E-banking services regarding transaction problems not proper solution without face to face meeting is better in handling complex transaction and problems. Bank may call for meeting and seek expert advice to solve grievances.

Conclusion

The banking industry has been a leader in the e-business world in recent years. The e-banking revolution has fundamentally changed the business of banking by scaling borders and bringing about new opportunities. In India also it has it has strongly impacted the strategic business considerations for banks by significantly cutting down cost of delivery and transactions. It must be noted, however, that while e-banking provides many benefits to customers and banks, it also aggravates traditional banking risks. Compared to developed countries, developing countries face many impediments that affect the successful implementation of e-banking initiatives. One of the benefits that banks experience when using e-banking is increased customer satisfaction. This

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due to that customers may access their accounts whenever, from anywhere, and they get involved more, this creating relationships with convenience, meaning offering service through several distribution channels (ATM, Internet . physical branches) and have more functions available online. Lake of customer and services provider confidence in the security and integrity of these systems have been key agents in the slow offering and take up of these services.

Suggetions

- Banks should be awareness program for ebanking product and services.
- Bank should be ensurefull security of customers money.
- Bank should be an organized seminars and workshop for healthy uses of e-banking products and services for clients.
- E-banking services should be personalize on education, gender, profession etc. so that need and requirement of client are met accordingly.
- Government and RBI should be make giant investment in banking sector for build infrastructure.
- Employees of banks and financial institutions should be given techno friendly training for use of r-banking services.

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Department of Business Finance & Economics Head Head arment of Business Finance & Economic Arment of Business Finance Max Studies Comm. & Max Studies Faculty of Comm. & University Faculty of Comm. & प्रभावों का एक संक्षिप्त अध्ययन

चटी

डॉ. राजेन्द्र प्रसाद मीणा, सहायक प्रोफेसर व्यावसायिक वित्त एवम् अर्थशास्त्र विभाग, जय नारायण व्यास विश्वविद्यालय, जोधपुर

3.4.5

भारतीय दर्शन में भी भूमण्डलीकरण के समकक्ष 'वसुधैव कुटुम्बकम' के विचार को अत्यधिक महत्व दिया गया है तथा इसमे समूचे विश्व के विकास एंव उन्नति की कामना की गई है। ब्रिटिश शासन काल मे भी भारतीय अर्थव्यवस्था विदेशी व्यापार की दृष्टि से परिचमी राष्ट्रों से जुडी रही है तथा पश्चिमी देशों के विकास मे भारत की अहम् भूमिका है।

उदारीकरण, निजीकरण,वैश्वीकरण,नई आर्थिक नीति 1991 के मूल मंत्र है जिसके माध्यम से स्थिरीकरण कार्यक्रमों तथा ढांचागत या सरंचनात्मक सुधारों को अपनाते हुए भारतीय अर्थव्यवस्था में व्याप्त सामाजिक –आर्थिक समस्याओं गरीबी,बेरोजगारी,असमानता आदि का दीर्घकालीन हल प्राप्त किये जाने के प्रयास जुलाई 1991 में भारतीय अर्थव्यवस्था गहरे संकट के दौर से गुजर रही थी। उस समय भारत का विदेशी मुद्रा भण्डार अपने न्यूनतम स्तर पर था जो कि लगभग 1 अरब डालर अथवा 200 करोड रूपये रह गये थे, जो कि केवल दो सप्ताह के आयात कर पाने के लिए भी पर्याप्त नहीं थे। अन्तर्राष्ट्रीय वित्तीय संस्थाओं का भारतीय अर्थव्यवस्था में विश्वास डगमगानें लगा था। 1991–92 का आम बजट समय पर पेश न करपाने के कारण विश्वास ओर कमजोर हो रहा था। मुद्रास्फीति की दर अपने चरम पर थी। प्रवासी भारतीय अपनी जमा पूंजी निकालने लगे थे, इसके साथ ही विश्व में उदारीकरण निजीकरण व वैश्वीकरण की पेरोकारीत भी अपने चरम पर थी इन सभी तात्कालिक कारणों व भविष्य मे सुधार की उम्मीद ने वित्तमंत्री डॉ. मनमोहन सिंह को देश के विकास व वृद्धि के लिए भारतीय अर्थव्यरथा में आमूल—चूल परिवर्तन करके एक मुक्त बाजार के रूप मे आर्थिक सुधारो को लागु किया क्योकि इसी दोर मे सोवियत संघ का विघटन हो चुका था तथा पूर्वी यूरोप की समाजवादी अर्थव्यवस्थाए भी बाजारोंन्मुख होने को बेताब थी। इस प्रकार भारत को अपनी घरेलू परिस्थितियों और वैश्वीक दबाव जिनमे अन्तर्राष्ट्रीय मुद्राकोष व विश्वबैंक ने भी उस जटिल आर्थिक परिस्थिति के दौर में नई आर्थिक नीति अपनाने के लिए प्रेरित किया और उसी शर्त पर वित्तीय सहायता देने का वायदा किया कि वह देश में आर्थिक सुधारों को लागू करके अपनी समस्यायों को निकट भविष्य में हल करने का प्रयास

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भारतीय अर्थव्यवस्था को वैश्वीकरण हेतु प्रेरित करने वाले कारण:--

- 1. तकनीकी परिवर्तन
- 2. तीव्र वैश्वीक प्रतिस्पर्दा
- 3. उदारवादी नीतिया
- अमेरिका का महाशक्ति के रूप में उदय 4.
- 5.
- 6.

Department of Business Finance & Economics

- विकासशील अर्थव्यवस्था के अनुभव अन्य कारण तकनीकी परिवर्तन :-- भारत एक विकासशील देश होने तथा कृषि क्षेत्र पर निर्भरता के साथ पंजी गहन तकनीको के आपन के नगर का का कृषि क्षेत्र पर निर्भरता 1. के साथ पूंजी गहन तकनीको के अभाव के कारण श्रम व उत्पाद की लागत व गुणवत्ता में तकनीक की वजह से वैश्वीक बाजार में पीछे हुआ। इनका समाधान नवीन तकनीकी परिवर्तनों की अंगीकार करके ही संभव बनाया जा सकता था।
- 2. तीव्र वैश्वीक प्रतिस्पर्दा :- पूंजीवादी अर्थव्यवस्था का एक प्रमुख अंग प्रतिस्पर्दा है। प्रतिस्पर्दा के कारण ही बहुराष्ट्रीय कम्पपियों को विदेशो में नए बाजार ढूढने की आवश्यकता हुई और भारत एक बडे बाजार के रूप में देखा जाने लगा फलस्वरूप ही उत्पादन तथा विक्रय की नई विधियों का विकास हुआ है।
- 3. उदारवादी नीतियाँ :- विश्वव्यापीकरण के विकास का प्रमुख कारण विभिन्न देशो द्वारा अपनायी नीतियाँ है | इनके फलस्वरूप अन्तर्राष्ट्रीय आर्थिक लेन—देन पर लगी रोक को हटा दिया गया है। विश्व अर्थव्यवस्था में कई तरह की रूकावटें दूर होने से वैश्वीकरण की प्रकिया के लिए रास्ता साफ हो गया।
- अमेरिका का महाशक्ति के रूप में उदय :- विश्वव्यापीकरण की प्रकिया के लिए 4 किसी एक देश का महाशक्ति का होना आवश्यक है, क्योकि जिससे उस देश की करेंसी को अन्तर्राष्ट्रीय मुद्रा के रूप में लेन–देन हेत् अपनाया जाए। सोवियत संघ के विघटन व पुंजीवादी आर्थिक प्रणाली की जीत ने अमेरिका को विश्व की महाशक्ति बना दिया । इससे भी वैश्वीकरण को बल मिला।
- 5. विकासशील अर्थव्यवस्था के अनुभव :- वैश्वीकरण की प्रकिया को अपनाने वाली अर्थव्यवस्थाए जैसेः– कोरिया,थाईलैण्ड,ताईवान,हाँगकाँग,सिंगापुर आदि आर्थिक दुष्टि से बहुत सफल रही। चीन भी वैश्वीकरण की प्रकिया को अपनाकर आर्थिक विकास की ऊची दर प्राप्त करने में सफल रहा।
- 6. अन्य कारणः-
 - विभिन्न देशों में उपलब्ध आर्थिक ढांचा वितरण की प्रणाली एंव विपणक (i) दृष्टिकोण एक समाप रूप वाले होते जाते है।
 - पूंजी बाजारों का सार्वभौमीकरण होता जा रहा है। पूंजी बाजार में धन के (ii) प्रवाह में तीव्र वृद्धि ने वैश्वीकरण को प्रभावित किया है।

भारतीय अर्थाव्यवस्था पर बेश्वीकरण के प्रभावों का एक संक्षिप्त अध्ययन 33 189

भारतीय अर्थव्यवस्था में वैश्वीकरण हेतु निम्नलिखित लपाय किए गए है:--

- 1. दोहरे कराधार को यथासंभव समाप्त किया गया है।
- 2. विदेशी इंक्विटी के अंतर्प्रवाह को अत्यधिक सुगम तथा उदार बनाया गया।
- रूपये को चातू खाते पर तथा पूंजी खाते को भी पूर्ण परिवर्तनीय बना दिया गया है।
- ऊपये को चालू खात पर तथा पूजा खात का पूर्ण के मात्रात्मक प्रतिबंध
 आयातों को उदार बनाया गया और आयातों पर से सभी प्रकार के मात्रात्मक प्रतिबंध हटा दिए गए है।
- विश्व व्यापार संगठन के प्रति वचबद्वताओं को पूरा करते हुए सीमा शुल्कों को 300 प्रतिशत, 400 प्रतिशत की उच्चतम दर को घटाते हुए 0–25 प्रतिशत तक के स्तर पर ले आया गया है।

वैश्वीकरण के भारतीय अर्थव्यवस्था पर अनुकूल प्रभाव :--

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- वैश्वीक निर्यात में भागीदारी :- भारत का वस्तुओं एव सेवाओं के विश्व निर्यात में भाग 1990 में 0.54 प्रतिशत था जो कि वर्तमान 2014 में 19 वॉ स्थान तथा 1.7 प्रतिशत हो गया है।
- भारतीय अर्थव्यवस्था विश्व की क्रम शक्तिक्षमता के आधार पर तीसरी बडी अर्धव्यवस्था बन गई है।
- स्कल घरेलु उत्पाद के आधार पर भारतीय अर्थव्यवस्था विश्व में आई.एम.एफ व विश्व बैंक के अनुसार सातवें स्थान पर है।
- बहुराष्ट्रीय कंपनियों के आने से ये कम्पनिया न सिर्फ उपभोक्ता वस्तुओं बल्कि अन्य आघारभूत परियोजनाओं में भी अपनी पूंजी लगा रही है जिससे वस्तुओं की गुणवत्ता में भी सुधार आया है।
- विदेशी मुद्राकोष में वृद्धिः जून 1992 में जहाँ भारत के विदेशी विनिमय भण्डार नाममान्न के थे जो 4 सितम्बर, 2015 को 325.650 अरब डॉलर हो गया हैं।

प्रत्यक्ष विदेशी विनियोग में वृद्धि— 2014—15 में अन्तिम 44.291 अरब डॉलरद्ध है जो

IT Studies

Faz Ja .

- प्रत्यक्ष विदेशा विभियां पर्युख 2014 स्वका है।
 कि वैश्वीकरण के परिणाम स्वरूप ही हो सका है।
- भारत की आज स्थिर व मजबुत विनिमय दर भी वैश्वीकरण का परिणाम है।
- औद्योंगिकी के स्तर का उन्नयन हुआ है और यह आशंका निराधार साबित हुई कि बहुराष्ट्रीय कंपनिया भारतीय अर्थव्यवस्था पर अपना प्रभुत्त्व स्थापित कर लेगी।
- सितम्बर 2009 में आई वैश्वीकमंदी के बावजूद चीन को छोडकर अन्य विकासशील देशों की तुलना में हमारी सकल घरेलु उत्पाद की विकास दर अधिक है।

बहुराष्ट्रीय कंपनिया उपभोक्ता वस्तुओं के उत्पादन में ज्यादा लगी है क्योकि इनका उद्देश्य तो कम से कम समय में अधिकतम लाभ कमाना है।

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प्रतिकूल प्रभाव :--

 भारतीय उद्यमो पर प्रभाव :- वैश्वीकरण ने जहाँ एक ओर सकल प्रतियोगिता को जन्म दिया है वही खदेशी उद्योग विशेषकर लघु व कुटिर उद्योग प्रतियोगिता का सामना नहीं कर पाने के कारण गम्भिर आर्थिक संकट का सामना कर रहे कुछ के लिए तो अस्तित्व का भी खतरा मंडरा रहा है। एक ऐसा अनुमान है कि अब तक लगभग पांच लाख लघु उद्योग इकाईया बंद हो गई है।

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- निर्यात की तुलना में देश के वस्तुगत निर्यात 310.53 अरब तथा आयात 447.55 अरब 2. ,डॉलरद्ध रहे है जो की अनुकूल नही है।
- आयात अधिक 2014–15 में आयात में हिस्सेदारी व निर्यात में हिस्सेदारी में बढती 3. हुई असमानताए : वैश्वीकरण से गरीबी का अनुपात तो कुछ कम अवश्य हुआ है लेकिन गरीब व अमीर की खाई घटने की बजाय बढी है।
- लाभ का निर्यात : बहुराष्ट्रीय कंपनिया सुपर प्राफिट को अपने मूलदेश को निर्यात करती है जिससे धन का निष्कासन हो रहा है।
- कार्य संस्कृति पर कुठारघात : ये बहुराष्ट्रीय कंपनिया अपने कर्मचारियों को अधिक 5. वेतन तथा सुविधांए देकर न केवल आर्थिक असमानता बढा रही है बल्कि कार्य संस्कृति पर कुठारधात है।
- विदेशी कंपनिया तकनीक का हस्तानातरण न के बराबर करती है जिसे भारतीय 6. अपने देश के विकास में अपना सके तथा कालान्तर में हम स्वय उस तकनीक में दक्ष tof Business Finance & Economics हो सके।

निष्कर्षः –

देश में जिन परिस्थितियों में आर्थिक सुधारों को अपनाया गया॰ सभावता कि Comm. & Mai Studieg. त समस्याओ जैसे गरीबी,बेरोजगारों,आर्थिक असमानता के कि प्राया प्रदेश के कि आधारमूत समस्याओ जैसे गरीबी,बेरोजगारों,आर्थिक असमानता असतुंलन,ढांचागत विकास जैसी गम्भीर समस्याओं के समाधान के हल उदारीकरण,निजीकरण, भूंमडलीकरण की विचारधारा के तहत् खोजने के प्रयास किये जिनमें से अधिकांशतः लाभ केवल कॉरपारेट क्षेत्र बहुराष्ट्रीय कंपनियों और सरकारी उद्यमों के दायरे पर ही केंद्रित है। आज जरूरत आर्थिक सुधारों के विकृत विरोध की नहीं, बल्कि उनके ट्रायरे को गरीबों तक विस्तृत करने की आवश्यकता है।

अतः भारत ने भूमण्डलीकरण को अपनाने का जो निर्णय लिया वह लाभदायक व दीर्घकालीन दृष्टिकोण से महत्वपूर्ण है। इसे और अधिक व्यवहारिक धरातल पर लागू किया जाना चाहिए जिससे भारत में विकास के लिए आवश्यक पूंजी की वृद्विहो तथा हमारी मूलभूत समस्याओं गरीबी ,बेरोजगारी,क्षेत्रिय असतुंलन आदि का हल हो सके। भारतीय वस्तुओं ओर सेवाओं की विश्व व्यापार में जो भागीदारी लगभग 2 प्रतिशत है उसे दो गुने से अधिक करने का लक्ष्य नई आयात निर्यात नीति में निर्धारित किया गया है जिससे भारत को निर्यातोन्मुख देश के रूप स्थापित किया जा सके। भारत को विशेष रूप में साफ्टवेयर तथा कपडा जैसी नाशवान वस्तुओं का निर्यात करना चाहिए ओर सोने का

भारतीय अर्थव्यवस्था पर वेश्वीपारण के प्रभावों का एक संक्षिप्त अध्ययन भ 191

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सुझाव		
	मर्थिक सुधारों की प्रकिया का नए सिर से में	
1. 3	भार्थिक सुधारों की प्राक्रया की नर रह होगा। धरेलु अर्थव्यवस्था में प्रगति के लिए उपयुक्त नीतियाँ सुनिश्चित करने तथा आर्थिक धरेलु अर्थव्यवस्था में प्रगति की जरूरत है।	
	रोन अर्थतयर्था में प्रगति के लिए उपयुवत गाता " 3	
2. 8	धरेलु अर्थव्यवस्था म प्रगात के गलरत है। मुद्दो पर खुलापन रखने की जरूरत है। मुद्दो पर खुलापन रखने की जरूरत है।	
3.	भारतीय अवान चाहिए।	
	भारतीय उद्योग के सम्मुख पारास छवि को निर्मित करना चाहिए। भारत को विनिमय दर प्रबंधन पर विशेष ध्यान देना चाहिए क्योकि भारतीय रूपया भारत को विनिमय दर प्रबंधन पर विशेष ध्यान देना चाहिए क्योकि भारतीय रूपया	
4.	भारत को विनिमय दर प्रबंधन पर पियान डालर के मुकाबले निरंतर कमजोर हो रहा है। आरत को तीव्र व समावेशी तथा टिकाऊ विकास से ही देश की आर्थिक समस्याओं भारत को तीव्र व समावेशी तथा टिकाऊ विकास से ही देश की आर्थिक समस्याओं	
5.	भारत को तीव्र व समावेशी तथा। टिप्राठा गणहुए। का स्थायी व समुचित समाधान तलाशना चाहिए। का स्थायी व समुचित समाधान तलाशना चाहिए।	
	का स्थाय व अपना हेणों को संरक्षणवाद की नाति ये।	
6.	वैश्वीक बाजार में विभिन्न देशों को संरक्षणवाद पत्र माने वैश्वीक बाजार में विभिन्न देशों को सरक्षणवाद पत्र माने सहयोग से ज्ज्ज्ज के डथ्छै अवधारणा को अमल में लाना होगा। सहयोग से ज्ज्ज्ज के डथ्छै अवधारणा को जमल में लाना होगा।	162.4 17
	सहयोग स ७७०० मा विदेशी पूंजी निवेश का स्थाया पारस गा	
7.	वैश्वीक बाजार में विमिन्न पर्सा को अमल में लाना होगा। सहयोग से ज्ज़्य्य के डथ्छे अवधारणा को अमल में लाना होगा। वैश्वीकरण के परिणामस्वरूप विदेशी पूंजी निवेश को स्थायी परिसम्पतियों में निवेश करने हेतु प्रोत्साहित करना होगा। भारतीय उत्पादकों की प्रतिस्पर्द्धा क्षमता में सुधार के लिए पेशेवर प्रंबधन के द्वारा भारतीय उत्पादकों की प्रतिस्पर्द्धा क्षमता में सुधार के लिए पेशेवर प्रंबधन के द्वारा	
	करने हत प्रार्ताणिय ने के मधार के लिए परापर अवने हिंदी हैं।	
8.	भारतीय उत्पादकों की प्रतिस्पद्धा क्षमता भ छुन कार्यकुशलता बढाकर व लागत को कम करना चाहिए। कार्यकुशलता बढाकर व लागत को कम पर पूंजी प्रदान की जानी चाहिए जिससे ये	
	कार्यकुशलता बढाकर पर पंजी प्रदान की जाना याहर जिला	
9	भारतीय उत्पादको को आसरको कम करना चाहिए। कार्यकुशलता बढाकर व लागत को कम करना चाहिए। लघु व कुटिर उद्योगों को सस्ती दर पर पूंजी प्रदान की जानी चाहिए जिससे ये उद्योग आवश्यक संरचनात्मक परिवर्तन करके अपने आप को प्रतिर्स्पद्धा के अनुरूप	
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	जनारे रख भीका	
	10. भारतीय अर्थव्यवस्था पर्म पदान करके तब तक हमारा आर्थिय रागरा म	ead Studi
	उद्योगों को संरक्षण गठा में के सारे समाधान संभव नही है। 11. वैधानिक रोकः बौद्धिक संपति अधिकारों एंव डम्पिंग के विरुद्ध आदि मामलों के बारे Deputment of Busin OCC Deputment of Co Deputment of Co Deputment of Co Deputment of Co Jai Nata	an Entresit
	समाधनि सनय गण दा मंपति अधिकारों एंव डम्पिंग के विरुद्ध आप भा भा	ead Econe & Econe ess Finance & Econe ess Finance & Mgr Studir mm. & Mgr Studir Mgr St
	11. वैद्यानिक राकः बाद्धिप राजात्ते होगे।	Silver
	में कानून शाय हा पा गा विकास :-विश्वव्यापीकरण के प्रसार प	
	 वैधानिक एक. बाख प्रयोग का मिंगे। में कानून शीघ्र ही बनाने होगें। संवैधानिक प्रणाली का विकास :विश्वव्यापीकरण के प्रसार के साथ ही ¹⁰ Job/1 संवैधानिक प्रणाली का विकास :विश्वव्यापीकरण के प्रसार के साथ ही ¹⁰ Job/1 संवैधानिक प्रणाली का विकास :विश्वव्यापीकरण के प्रसार के साथ ही ¹⁰ Job/1 संवैधानिक प्रणाली का विकास :विश्वव्यापीकरण के प्रसार के साथ ही ¹⁰ Job/1 संवैधानिक प्रणाली का विकास :विश्वव्यापीकरण के प्रसार के साथ ही ¹⁰ Job/1 संवैधानिक प्रणाली का विकास :विश्वव्यापीकरण के प्रसार के साथ ही ¹⁰ Job/1 संवैधानिक प्रणाली का विकास :विश्वव्यापीकरण के प्रसार के साथ ही ¹⁰ Job/1 	
	कापरिश्ट, जिन्द्र समाधन आपसी सहयागे से तलारान हो तर की वस्तओं	And the second se
	कॉपोराइट, पटट, व्यानार में आपसी सहयोग से तलाशन होगा। जाते है जिनका समाधन आपसी सहयोग से तलाशन होगा। 13. मानव पूंजी का विकास : नई अर्थव्यवस्था में ज्ञान पर आधारित श्रमिक ही वस्तुओं की गुणवत्तों को जन्नत कर सकते हैं ओर इस प्रकार आयात की प्रतिस्पर्द्धा का की गुणवत्तों को जन्नत कर सकते हैं ।	
	13. मानव पूर्णा का जन्तत कर सकते हैं ओर इस प्रकार जायाय	a state of the sta
	की गुणवत्तों की उन्गर पर सकते हैं। सामना करने में सहायता कर सकते हैं।	Ladour Contract
	की गुणवता का उन्सा कर सकते हैं। सामना करने में सहायता कर सकते हैं। 14. तकनीक में आत्मनिर्भरताः विश्वव्यापीकरण का लाभ भारत को तब ही मिलेगा जब	ALC: A MARK
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हम नयीन तकनीको को आत्मसातः ही नहीं करेगें बल्कि देश में नवप्रवर्तनों के अनुकूल वातावरण बनायेगें।

- 15. हमें अधांध्रंध विश्वव्यापीकरण की अपेक्षा चयनात्मक वैश्वीकरण की नीति अपनानी चाहिए। भारत में किया जाने वाला विदेशी निवेश की अनुमती आधारभूत तथा जिस क्षेत्र में भारत की तकनीकी पहुंच नही है वह 20–25 वर्षी से कम समय के लिए अनुमती प्रदान नही की जानी चाहिए।
- 16. विदेशी निवेशकों के द्वारा पूंजी निवेश करने पर अनुकूल वातावरण उपलब्ध कराना चाहिए जिससे भारत की निवेश हेतु अनुकूल छवी बन सके।

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A Refereed Monthly International Journal of Management

Revealed Comparative Advantage of India's Rice Export with Selected Countries (A case study)

AUTHORS

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Mr. Abdul Vajid²

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Abstract

India is one of the largest producers of Rice. Huge demand of Rice in global market gave India a good environment to export the surplus production. Today India is the leading exporter of rice to global market and enjoys the comparative advantage in rice export. Rice plays an important role in export earnings of the India.

In this paper an attempt is made to highlight rice export performance of India during 2010-11 to 2014-15. It also focuses on future prospects of rice export and suggestions to improve the performance. This paper also analyzes Trend, Direction and growth of export from India. To find out export competitiveness among major global rice exporter, RCA (Revealed Comparative Advantage) Index is applied which was propounded by Balassa and known as Balassa's Index.

JEL Classification : F13, F14

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Key words: Revealed Comparative Advantage, Rice Export, International Trade, Balassa's Index, Export performance

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Introduction

Indian economy is heavily dependent on agriculture. Rice exports account for a fifth of India's total food and agriculture exports. In recent years India has emerged as a biggest rice exporter and enjoys comparative advantage in rice export. Rice is the staple diet for almost half of the global population. Over 90% of the global rice output and consumption is centered in Asia. China and India both are the world's largest producers and biggest consumers. India accounts for over 70% of the World's basmati rice output, which is small portion of the total rice produced in India.

Objectives of Research Paper

To analyze the India's rice export performance. To examine India's rice export competitiveness with the major competitors by the help of RCA Index.

Review of Literature

Saiful Islam & Parag Jafar Siddique (2014), in their study "Revealed Comparative Advantage of Bangladeshi Leather Industry with Selected Asian Economies", analyzed the comparative advantage of Bangladeshi leather industry with India, Pakistan and China with the help of Balassa's RCA index. The author reported that Bangladesh has a potentiality to expand his leather industry.

Amita Batra & Zeba Khan (2005), "Revealed Comparative Advantage: An analysis for India and China" analyzed the pattern of comparative advantage for India and China In the world market. The researchers provided the detailed information regarding the india and China's top performing sectors and commodities. Study revealed that both India and China enjoy comparative advantage for labor and resource intensive sectors in the world market.

Gurpreet Kaur & Jasdeep Kaur Dhami (2013), "Export Performance of Agro Based Industries In Punjab : A Special Reference to Rice Industry" highlighted Punjab's role in India's rice export and provides the evidence through comparative analysis. The study emphasized on Punjab's contribution in rice export of India. Authors also evaluated government's schemes to boost the rice production in state of Punjab.

Bushra Yasmin & Saba Altaf (2014), "Revealed Comparative Advantage of Carpets and Textile Floor Covering Industry in Pakistan, India and China" compared the competitiveness of Pakistan's textile floor covering industry with other selected countries. The finding of the study implies that a favorable potential exists for higher growth of the carpet industry. Authors analyze the comparative advantage of the carpet industry in Pakistan and compare it with India and China. The result suggested that Pakistan enjoys a comparative advantage at 2 digit level of classification during the period of study except 2002. The study also suggests policy implications to improve the competitiveness of carpet Industry In Pakistan.

Balassa (1965) used an index "RCA (Revealed Comparative Advantage)" to measure the trade competitiveness among various countries. Since then, It has changed several times (Balassa 1977, 1979 and 1986). He used trade data to compute the RCA index. The Balassa index can easily identify a country has revealed comparative advantage or not. The formula he defined as a commodity share in total national export divided by its share in total world export. The RCA value of a commodity that greater than unity indicates that a particular commodity has comparative advantage in exporting it to the world. If the value is less than unity, it indicates comparative disadvantage in exporting that commodity to the world. RCA has been widely used to analyze the changes in trading patterns.

Methodology

RCA Originally RCA index was developed by Balassa in 1965. Measures of revealed comparative advantage (RCA) help to assess a country's export potential. It indicates particular country's comparative advantage or comparative disadvantage in different commodities and sectors. It can also give information about potential trade prospects with new countries. Countries with similar RCA profiles are unlikely to have high bilateral trade intensities unless intraindustry trade is involved. The RCA Index is calculated as follows:-

RCAij = (Xij / Xit) / (Xwj / Xwt)

Xij- values of country i's exports of product j,

Xwj-world exports of product j,

Xit- country i's total exports,

Xwt-world total exports.

If RCA value is less than unity (RCA<1), it indicates that country has a revealed comparative disadvantage in that commodity or sector. Similarly, if RCA value is more than unity (RCA>1), that means country has revealed comparative advantage in that commodity or sector.

Rice Production in India

India is largely self-sufficient in rice production. India is the second largest producer of rice in the world. The Indian government implemented several policies to boost rice production. Numerous subsidies, ranging from fertilizer to irrigation, electricity, seeds, machinery, and food, are available. The government subsidizes agricultural inputs to keep farm costs low and increase production. Irrigation and electricity are supplied directly to farmers at below production costs due to these efforts the country's rice production has increased to 105.48 MT in 2014-15 from 95.8 MT in 2010-11. The major rice-growing states are West Bengal, Uttar Pradesh, Andhra Pradesh, Punjab, Tamil Nadu, Orissa, Bihar, and Chhattisgarh, which together contribute about 72% of the total rice area and 75% of total rice production in the country.

Table 1

Rice Production in India		
Year	Million tones	Head The Protocial
2010-11	95.8	net man have a comm. & Mar on the set
2011-12	105.3	Departinen for Business Finance Reception Music Departinen for Business Finance Mai Studies Faculty of Comm. & Mai Studies Faculty of Comm. & Mai Studies Jai Narain Vyas University Jai Narain Vyas University Jodhpur (Rai.) 342001
2012-13	105.24	
2013-14	106.65	nder en
2014-15	105.48	
Source : Agriculture Statistics Division		Part and the State of the Alter and the State of the Stat

www.pbr.co.in/2017/marchFifth.aspx

Department of Agriculture, Cooperation and Farmers welfare

Based on India's agriculture statistics, the three largest rice-producing states are West Bengal, Andhra Pradesh, and Uttar Pradesh. These states contributes over one third of the country's total rice production.

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India's Share in global Rice Export Table 2

India's share in global rice export (in KGs)

Years	Rice Export of India	World's Total Rice Export	India's Share
2010-11	4,966,160	40,559,807	12.24
2011-12	10,569,565	·· OP	**mics
2012-13	11,387,082	40,719,237	ance & Econolies
2013-14	11,162,015	44,102,083	SUniversity SUNIVERSITY SUNIVE SUNIVERSITY SUNIVERSITY SUNIVERSITY SUNIVERSITY SUNIVERSITY SUNIVERSITY
2014-15	11,025,080	40,719,237 44,102,083 37,398,855 Uepartment of Business Fin Department of Business Fin Department of Comm. Faculty of Comm. Jai Narain Vya Jodhpur (R.	29.48

Sources: ITC calculations based onUN COMTRADE (http://comtrade.un.org/)statistics. ** N.A.

As we can see that India's share in global export of rice Is Increasing year by year. In 2014-15 India's share in global rice export was nearly 30%. Today India is the top in the list of world rice exporter. India's share has sharply increased with 12% to 30% in last five years. Although little bit decline has been reported in 2014-15 in auantity exported but overall growth rate has also been raised. The above table clearly shows that India's share is very high in global rice export; total rice exported 1025080 kg by India in 2014-15 that is nearly one third of world's total rice export.

RCA in Export of Rice

Table 3

India's RCA in Rice Export

Years	Rice Export of India	Total Export of India	Rice Export of World	Total Export of World	India Rice Export RCA
2010-11	4073331	301483250	24037958	18223780065	10.2430
2011-12	6127952	289564769	23930810	18461735539	16.3262
2012-13	8169519	336611389	25400355	18925086844	18.0828
2013-14	7905650	317544642	25992814	18986152033	18.1851
2014-15	6380082	264381004	20048339	16329281326	19.6555

Sources: ITC calculations based on UN COMTRADE (http://comtrade.un.org/)statistics.

India enjoys revealed comparative advantage in rice export and its increasing constantly. In the year 2010-11 India's RCA index was measured 10.24 and now in 2014-15 its jumps to 19.65 which clearly show the India's comparative advantage in rice export.

India's rice export competitiveness with selected countries:-

Table 4

Main Rice Exporter's RCA Index

Years	India Rice Export RCA	Thailand Rice Export RCA	US Rice Export RCA	Vietnam Rice Export RCA
2010-11	10.2430	21.5601	1.08097	28.6272
2011-12	16.3262	15.5683	1.02291	24.7744
2012-13	18.0828	14.4118	1.03128	16.5131
2013-14	18.1851	17.4569	0.89844	14.281
2014-15	19.6555	17.5504	1.11888	6.3364z

Sources: ITC calculations based onUN COMTRADE (http://comtrade.un.org/)statistics.

If we see the above table that clearly shows that structure of global rice trade is very competitive. Main rice exporters are India, Thailand, US and Vietnam. Currently India is the leading exporter of rice with very high RCA i.e. 19.65 calculated on the basis of global rice trade data obtained in 2014-15. RCA Index of the India remained more than 10 during the last five years. All other competitor are now behind from India in rice export, earlier Thailand and Vietnam were ahead but now India has surpassed the both. In the year 2010-11 Thailand's RCA in global rice export was 21.56 but now it's declined to 17.55 and India's RCA Index has raised that

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As 10.24 earlier in 2010-11, that is now 19.65. Vietnam is also losing its share in global rice export tremendously. Vietnam's RCA Index was calculated 28.62 in 2010-11 which has sharply declined and now it's just 6.33. The other competitor in global rice export is United States. The United States has not much perform well and its comparative advantage in last five years has not been very significant, the data reveals that only in the year 2013-14 it was showing comparative disadvantage in United State's global rice export competitiveness. The analysis reveals that the India has revealed comparative advantage in rice export. The RCA index ratio for Indian rice is extremely high, revealing export competitiveness its obvious that india have comparative advantage in rice due to its strategicposition and its peoples living in importing countries.

India's Export of Rice to Major Markets

Basmati Rice: - India is the leading exporter of the Basmati Rice to the global market. Basmati rice fetches good export price in the international market for its three distinct qualities i.e., pleasant aroma, super fine grains and extreme grain elongation. Basmati rice is a high foreign exchange earner compared to Non-Basmati rice as it has always fetched higher export prices. Its export prices are about 3 times higher than that of Non-Basmati. The overall trend growth rate of Basmati export has shown in below table with top importing countries.

Table 5

Basmati Rice Export from India

Product: Basmati Rice

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- need at	2010-11		2011-12	1994 (19))))))))))))))))))))))))))))))))))))	2012-13		2013-14		2014-15	
Importing Countries	Qty	US\$ Mill	Qty	US\$ Mill	Qty	US\$ Mill	Qty	US\$ Mill	Qty	US\$ Mill
Saudi Arab	623666	688.56	721245	704.82	681193	672.64	826119	1108.9	966931	1188.23
Iran	452542	445.2	614645	594.94	1082219	1187.23	1440454	1834.55	935568	1108.5
U Arab Emts	625582	623.56	726901	720.31	234640	240.42	147903	196.51	278601	314.76
Iraq	36981	36.36	151964	137.55	204266	196.73	219605	271.14	235448	259.13
Kuwait	170068	239.85	199869	283.59	163317	194.73	175537	247.95	166469	250.53
Top 5 Total	1908839	2034.53	2414624	2441.21	2365635	2491.75	2809618	3659.05	2583017	3121.15
Other Countries	421411	459.36	754822	775.78	1094194	1072.29	944484	1205.84	1119267	1397.1
Total	2330250	2493.89	3169446	3216.99	3459829	3564.04	3754102	4864.89	3702284	4518.25
% Share of Top 5 Countries	81.92	81.6	76.18	75.88	68.37	69.92	74.84	75.21	69.77	69.08
			- Linner and	1 contraction of the	- 40		- E		A	

Source: DGCIS

India is exporting Basmati Rice to various countries in the world. A total quantity of 37.02 lakh mts basmati rice was exported to different nations from India during 2014-15. In the recent years Saudi Arabia, UAE, Kuwait, Iran and Iraq received about 70-80 per cent of India's Basmati exports. In the Middle-East, export to Saudi Arabia has been the highest (26 per cent) in 2014-15. Saudi Arabia, Kuwait, Iran, Iraq and UAE are the countries, which have been among the top five major Basmati rice importing countries. Incidentally all these countries also have a high Indian population which forms one of the basic demand factors for Basmati rice, the other factor being consumer preference for this particular rice variety.

The above table shows that decline in export by a marginal 1.5 per cent in volume terms to 3.7 million tonnes in 2014-15, as compared to 3.76 mt the previous year registered. In value terms, however, the fall was 7.5 per cent, showing a five per cent fall in average realization. The main reason behind this fall was that Iran bought lesser quantity in 2014-15 due to political reasons. The Saudi Arabia and UAE markets did reasonably well. Saudi Arabia took over from Iran as India's largest destination for basmati rice export in 2014-15. It imported 966,931 M.T. worth \$1,188 million, as compared to 826,289 M.T. valued at \$1,109 million in 2013-14.

Shipment to Iran declined 39 per cent in value terms, to \$1,108 mn (935,568 tonnes) in 2014-15 versus \$1,835 mn (14,40,654 tonnes) the previous year.

Qty In MT; Value in US\$ Mill

Product: Non-Basmati Rice

Table 6

Non Basmati Rice Export from India

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Importing Countries	Qty	US\$ Mill	Qty	US\$ Mill Qty	US\$ Mill Qty	US\$ Mill Qt	y US\$ Mill
2010-11	1.10	2011-12	1. 3 d'ar	2012-13	2013-14	2014-15	

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Bangladesh Pr	5499	2.4	144704	54.37	31334	15.4	662834	250.62	1227665	437.09
Sri Lanka Dsr	8498	3.54	15612	7.21	4109	2.46	5891	3.44	666795	292.58
Benin	1957	0.69	213720	89.72	576546	239.73	1166847	485.17	598569	247.12
Senegal	o	0	333929	116.88	854560	267.9	651984	195.74	765019	226.03
Nepal	27159	9.27	140862	42.29	396586	106.18	406163	119.8	621887	214.31
fop 5 Total	43113	15.9	848827	310.47	1863135	631.67	2893719	1054.77	3879935	1417.13
Other Countries	57568	34.96	3142941	1412.91	4824716	2020.3	4254753	1870.39	4345629	1902.68
otal	100681	50.86	3991768	1723.38	6687851	2651.97	7148472	2925.16	8225564	3319.81
6 Share of Top 5 Countries	42.82	31.37	21.26	17.99	27.86	23.83	40.48	36.07	47.17	42.68

Source: DGCIS

Non Basmati Rice: - Any rice other than basmati rice is named as non- basmati rice. Major export destinations for non-basmati rice include Bangladesh and Nepal. African countries like Senegal and Benin are also emerging as the new markets for the India's non-basmati rice. Sri Lanka is also started to import the bulk quantity of non basmati rice from India in 2014-15. It imported 666795 MT of non basmati rice from India in the year 2014-15 and its share accounted for more than 8% of dia's total non basmati rice exported which was earlier in the year 2013-14 was just 0.082%. If we analyze the table no. 6 that clearly indicate that except Benin, other top importer's share is increasing year by year. The top in the list, Bangladesh imported 15% of India's total non basmati rice valued \$ 437.09 million in the year 2014-15. Nepal's share is also increasing year by year. Nepal was importing just 27159 MT of non basmati rice from India in 2010-11 and now its imported MT 621887 in 2014-15. Benin's share has declined in 2014-15. Benin imported just MT 598569 of non basmati rice from India in comparison with last year in 2013-14 it imported MT 1166847 of non basmati rice which accounted for the 16% of India's total non basmati rice exported.

Conclusion & Suggestions The Study concludes that the rice export performance achieved in recent years by India is significant and it has proved by facts and figures that India has the potential to become a biggest rice exporter in global market in years to come. India is giving tough competition to other major rice exporters. As far as global rice export competitiveness is concerned, India is enjoying comparative advantage and India's RCA is higher than other competitors like Thailand, US and Vietnam. However, scope for the rice export is wide and India can improve its current export performance by implementing new steps and initiatives. Indian rice is showing strong export performance during the past years.

Some hurdles have been also reported which are affecting India's Rice Export Performance and some studies have also revealed that the expansion of rice production in the last few years are not sufficient, if India want to perform well in global rice export with internal demand fulfilled then it has to emphasize on production increase. There is need for India to diversify its rice exports across more regions beside Middle East. This export expansion can help India to change its economic structure and export incentive for the country. There is a higher demand anticipated from African countries for rice and India can tap that opportunities to its fullest potential, Government should also take all steps to explore more markets.

One more thing that is affecting India's rice export performance is the use of pesticides over the admissible limits. It is also adversely affecting India's rice export to various markets as it failed to meet with their quality standards. Production, procurement and processing of rice should be well organized for maintaining its quality for export purposes. Export facilities available to the exporters at Sea Port also need review. If the above measures adopts by the government of India and rice export policy changes according to the situation of the global market then we can expect that present trend of growth in the rice export of India will be continue for long eriod.

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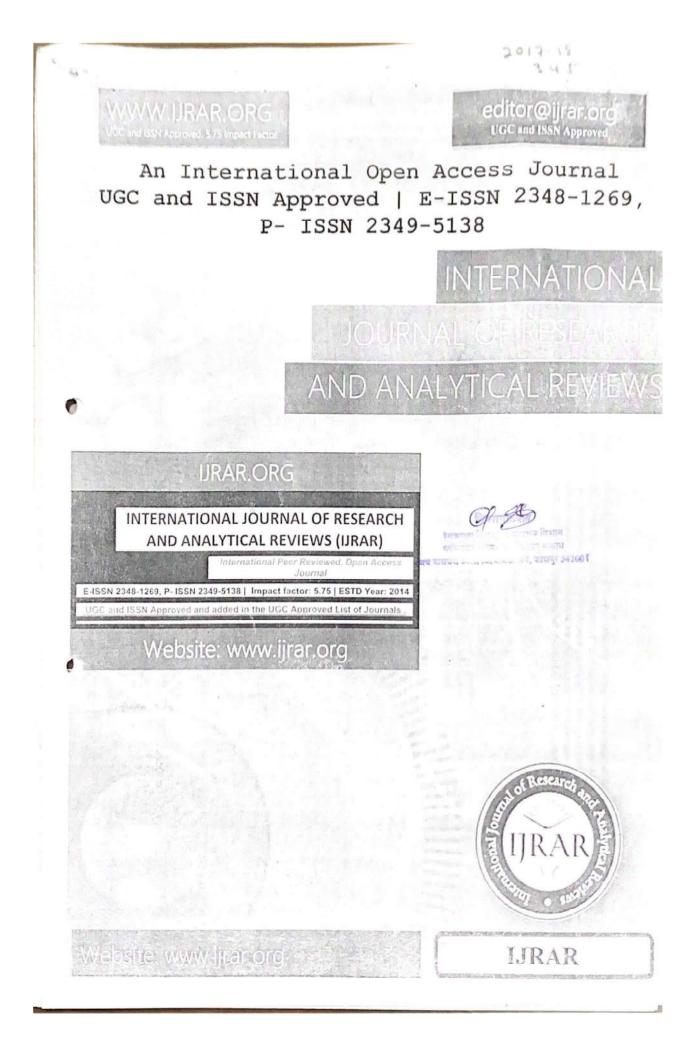
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CONSUMER'S ATTITUDE TOWARDS ONLINE SHOPPING IN JODHPUR

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Abstract

Now a day's people are becoming more interested in online shopping because of the various advantages of online shopping like heavy discount, delivery at home, variety etc. Especially new generation is very excited about it and, they like it. The study "Consumers attitude towards online shopping in Jodhpur" was undertaken to find out how frequently the respondents access the internet for shopping and the factors influencing online shopping on consumer behavior of selected young respondents. The study concluded that the respondents using the internet on a daily basis to support their work but accessing the internet for online shopping occasionally. Saves time, comfortable, relaxed shopping, detailed product information and easy price comparison are the main factors influencing online shopping.

Key Words: Consumer Behaviour, Consumer Attitude, E-Shopping, Digital India, E-Commerce

Introduction we are living in a digital age and E-shopping behaviour becomes a popular way for customers. This new style of buying not only brings a great number and wide range of products and services to consumers; it also offers a vast market and several business opportunities. E-shopping behaviour is defined as the purchasing process of a consumer over the internet for the service or product. In other words, a consumer may at his or her leisure buy from the comfort of their own home products from an estore. This concept was demonstrated before the World Wide Web (WWW) and in use with real time transaction processed from a domestic television. In 1979 Videotext technology was first demonstrated by Aldrick and also designed and installed systems

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n the United Kingdom. The first WWW server and browser were created by Berners Lee and by 1995 online shopping expanded by Amazon. With the ever-increasing penetration of internet and social media, the buying behaviour of Indian consumers has changed dramatically. In India Urbanization is taking place at a dramatic pace and this influencing the life style and buying behaviour of the consumers. E-shopping has grown in popularity over the years, mainly because people find it convenient and easy to bargain shop from the comfort of their home or work place and time saving. One of the important factor about online shopping, during a festival time, is it alleviates the need to wait in long lines or seek from store to store for a particular product .An array of products and services are available on the internet, and more are being added every day. Books comes at first in the category of products offered in online shopping, An online bookstore Amzon has also recently started selling brick and mortar too, in order to cash on their online popularity. Now, it has diversified into providing gadgets, software, music CDs and computer peripherals etc. E-shops also started selling high involvement products like cars, furniture, home accessories and so on. Moreover perishable goods such as groceries and personalized products like clothes can also be ordered online.

Objectives of the Study

- To enquire about consumers attitude towards online shopping in Jodhpur
- · To study about the factors influencing E-Shopping in Jodhpur.

Literature Review

Aminul Islam (2011) in his study in Malaysia on consumers satisfaction on online shopping, the factors that are affecting consumers intention and satisfaction to shop online. Consumers believes that online shopping is more comfortable than conventional shopping due to the many factors of conventional shopping like crowded, traffic jam, non availability of many items, anxious, parking space, limited time, and etc.

Pallavi kumari (2012) in her article found that Indian market are celebrity influence, online shopping, freebies and popularity of eco friendly products. Retailer need to keep up with

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understanding our citizens as they are more proactive and have better access of information and they were new norms are created overtime.

Shalini.S and Kamalaveni.D (2013) in their articles stated that online shoppers are young, highly educated active, intensive and expert users of the internet. They have a strong positive perception towards online shopping and generally spend a very low amount online shopping.

Jadhav and Khanna (2016) conducted the study in Mumbai, 25 college students and qualitative content analysis was used for analysing the textual content of the depth interview data. It was found in the study that main influencing factors for online shopping were identified as

Research Methodology

Descriptive research design used in study to explore new insights in online shopping. 105 peoples responded out of them 55 were female. Percentage method used in study.

Limitations of Study

- · The Study is limited to Jodhpur only.
- 105 respondents taken only.

Result, Analysis and Discussion

		Fe	male	Male		
Particulars	Details	Frequency	Percentage (%)	Frequency	Percentage (%)	
Internet	Yes	5.5	100	50	100	
Access	No	0	0	0	0	
Places of accessing	Home	47	85.4	46	92	
internet	Work Place	3	5.4	2	-4	
	Public places	5	9,0	2	4	
Mobile or	Mobile	43	78.1	35	63.63	
computer	Computer	12	21.9	20	36.36	

Table 1- The Places of Accessing Internet

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The above Table no.1 shows that 100 per cent of respondents are accessing the internet. And majority of the respondents i.e. about 85% female and 92% male respondents accessed the internet at home which logically suggests that they accessed the internet during the post working hour.

Purpose of online	Very Often		Often		Occasionally		Never	
shopping	F	M	F	М	F	М	F	M
Search product information	10	15	20	18	20	17	1	4
Surfing	14	26	23	20	11	9	0	2
Chatting	19	26	24	22	5	6	2	1
Research a topic	15	21	19	18	16	14	0	2
Looking for a job	6	13	10	15	20	17	13	11
Online shopping	9	11	19	17	23	26	0	0

Table 2- The respondents accessing internet sites for varying purposes

F=Female M=Male

Table 2, Shows that chatting is the most frequently visited websites as around 19 females and 26 males respondents reported very often visit of the website while 24 female and 22 male reported they visited this websites frequently. Most of the respondents around 23 females and 26 males' respondents visited online websites occasionally.

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Purchased	Female	(N=55)	Male (N=50)			
from Online	Frequency	Percentage	Frequency	Percentage		
Books*	36	65.4	28	56		
CD/video*	17	31	4	8		
Software *	23	42	11	22		
Toys & gift*	20	36	17	34		
Tickets/Hotel/Travel bookings*	36	65.4	30	60		
Consumer electronics*	29	53	13	26		
Apparels & accessories*	32	58	41	82		
House ware *	9	16.3	3	6		

Table 3 - Types of Purchases Made from Online Market.

*= multi responses

From the above table no.3, from the wide variety of goods and services on offer on the internet, the survey shows that Apparel/ Accessories formed the major portion of online purchases for male respondents as 82 per cent of the male respondents reported making online purchases of this item. In the case of female respondents, books emerged as the first choice for online purchases as around 65 percent of the female respondents reported making online purchases of this item. Tickets/ Hotels/Travel bookings emerged second in the preferences of both the female (65.4 percent) and male (60 percent) respondents.

Mode of payment when	Fem	ale	M	ale
shopping online	Frequency	Percentage	Frequency	Percentage
Credit card	7	13	6	12
Third party	3	6	1	2
Net Banking	3	5	2	4
Personal Cheque	2	4	0	0
Cash on delivery	40	73	41	82

Table 4 Mode of payments used when shopping online

Among the options available for payments it is seen from the table no.4 that 73 percent of

female and 82 percent of male respondents preferred to pay on delivery by cash.

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Table 5 Factors influencing online shopping

CAR ARCON STORY	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
Influential Factors	F	М	F	М	F	М	F	М	F	М
Saves time	24	26	25	19	6	5	0	0	0	0
Saves money	8	6	21	24	26	18	0	2	0	0
More relaxing shopping	10	13	33	30	10	7	2	0	0	0
Much easier shopping	11	17	35	28	9	3	0	2	0	0
Detail product information	12	9	31	31	8	9	3	2	0	0
Broader selection of product	13	12	25	26	16	12	0	2	0	0
Facility of easy price comparison	17	9	28	25	10	13	0	3	0	0

F=female (N=55), M=Male (N=50)

As shown above the maximum of 24 females and 26 males are strongly agreed that online shopping saves time, 25 females and 19 males just agreed with saves time. 10 females and 13

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males admit strong agreement that internet shopping is comfortable and relaxing while 33 females and 30 males just agreed with it.12 females and 9 males strongly agreed that online shopping provided the facility of detailed product information while 31 each from both females and males agreed with it. Around 17 females and 9 males reported strong agreement that online shopping facilitates easy price comparison while 28 females and 25 males simply agreed with it. As a result from the above that the main factors influencing online shopping are comfortable, saving time, detailed product information, relaxed shopping, and facility of easy price comparison.

Findings

- Majority of the respondents (Female-85% & Male-92%) are accessing internet at Home.
- Most of the respondents reported that they are using internet on daily basis to support their work.
- The analysis showed that the shoppers use internet for online shopping occasionally.
- Apparel/Accessories and books are the most purchased goods from online.
- 100% of both female and male consumers looked for the product information before making online purchases and majority of respondents used google for searching.
- Among the various option of payment available online cash on delivery is the most common method used for payment.
- The most important factors which influences online shopping are time saving & Price comparison.

Suggestions

Attractive discount offers should be introduce to attract to more customers for online shopping. In mode of payment other technologies like encryption technology trusted third party certificates, digital ID system and pre paid cards should be used. Innovative services should be provided to consumers for comparing the various products easily and to take buying decisions.

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Conclusion

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The study concluded that online shopping is best one when compared to other diopping. The main factor seen during the research was the save time, price comparison and product milurnation which drives the people to online shopping. Due to changing lifestyle and shopping habits a huge buyers are buying airline, bus and railway tickets, books, home appliances, electronic items, movie tickets, foods etc....

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Scope for further Research

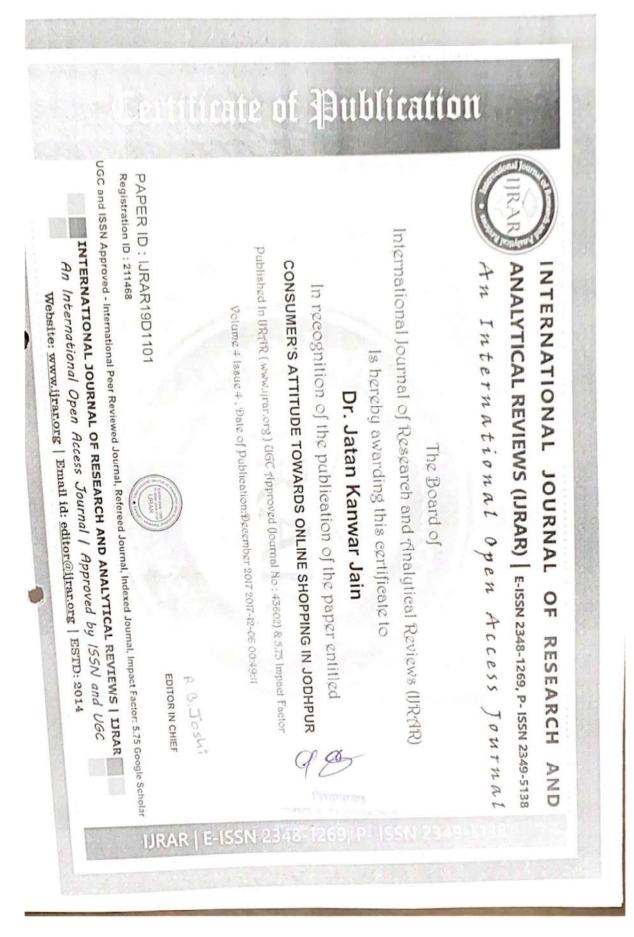
The study is limited to Jodhpur city only. The scope of research can be made wider by covering more places with more respondents to get more accurate results. Moreover a comparative study can also be conducted between unline shops.

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Pacific Business Review International Volume 10 Issue 1, July 2017

The Role of Diaspora in Strengthening Relations between Host and Home Country.(A Case Study of Indian Diaspora in UAE)

Dr. K.A. Goyal, Associate Professor, Dept of Business Finance and Economics, Jai Narain Vyas Univeristy, Jodhpur, Rajasthan

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Abstract

Migration is the human face of globalization, and Diasporas are the human links between countries. According to United Nation Report the global stock of migrants as of 2015 is 244 million persons which have more than doubled within the last three decades. The Survey conducted by UN department of economic and social affairs reveals that India has the largest Diaspora population in the world. There are large numbers of Indians living and working outside India and playing important role in India's Economic Development as well as host country. The Indian Diaspora covers practically every region of the world.

This paper explores the role of UAE's Indian Diaspora in economic development of both India and UAE and how it is acting like a bridge between both countries flourishing relations. UAE and India are one of each other's largest trading partners. The large Indian Community members from a tea vendor to Business Tycoon, Indians have registered their presence in every sector in the UAE. This paper also highlights the current welfare schemes of Indian Government for Indian Diaspora, major problems facing by Indians in UAE and suggestive measures to overcome these problems.

Keywords: Indian Diaspora, Diaspora & Development, India UAE Relations, Migration, Remittance

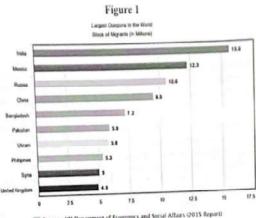
JEL Classification: F22, F24, J6, O15

Introduction

"Diaspora" is derived from the Greek that means "scattering" and refers to the dispersion of members of an ethnic group from their country of origin. The dispersion or spread of any people from their country of origin.

The Indian Diaspora is one of the largest Diaspora in the world. More than 15 million Indians are living and working outside the Indian Territory. The Indian Diaspora covers NRIs (Indian Citizen not residing in India) and PIOs (Person of Indian Origin)

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offe UN Depa Source.

Indian Diaspora has spread across all continents of the world. Many Indian have attained high ranks and positions in host countries some of them got positions in host countries administration and ministries such as governors, mayors, chief ministers, prime ministers and president.

The Indian Diaspora is representing India and in each and every field and in every part of the world. Its economic impact can be seen in enhancing investment, foreign money reserves, industrial development and international trade.

Migration from poorer to wealthier nations has been an old practice since long, after the globalization and development of ICT (Information and Communication Technology) this practice has been increased. Migration not only beneficial for countries of origin and destination, as well as to migrants and their families. It can hugely beneficial multiplier effects for both host and home countries business, investment, diplomatic relations and cultural exchange. India is widely known as a knowledge economy and from a migration point of view; India has advantages of being an open society, democratic, secular, English speaking and with a strong pool of skilled and trained human resources. India's vast Diaspora remits billions of dollars every year.

There is long history of Indians in UAE but Indian Migration to UAE increased after oil boom in 1970. The Indian Community in UAE is increasing year by year. According to Ministry of Overseas Indian Affairs in 2016 there are 2.8Millions Indians are living in UAE. More than 30% of the population of UAE comprises of Indian's mainly from South Indian States like Kerala, Karnatka, Andhra Pradesh and Tamilnadu etc. Apart from the Indian Professionals and Blue Collar Workers, Many Indians have established their own enterprises in UAE. Some UAE based Indian Business Tycoons includes Mickey Jagtiani of Landmark Group, Yousuf Ali of EMKE Group, Chhabria Family of Jumbo Group, Ravi Pillai of Ravi Pillai Group, Sunny Varkey of GEMS Education, Tony Jashnmal of the Jashnmal Group

and Joy Alukas of Joyalukas Jewellery. Under such scenario this study on Indian Diaspora's role in economic development of host and home country and their contribution in strengthening Indo-UAE relations is an attempt to trace the hard realities regarding Indians who resides in UAE.

Review of Literature

Some of the relevant literature has been reviewed to get some evidence and ideas regarding the study.

Ranjit Gupta (2013) in his article" India and the Gulf: Looking beyond Energy, Islam and the Diaspora" indicated towards Close interaction between the peoples of India and of the Gulf region. Factors such as bilateral trade, gas and oil interdependency, remittances and the huge Indian passport holding Diaspora living and working in these countries, makes GCC countries India's leading socio-economic partner in the world. The political and diplomatic relationship is becoming stronger by the day. Overall, it is a relationship of increasing mutual symbiotic advantage and synergy and increasingly significant strategically for both sides.

Kathleen Newland and Sonia Plaza (2013), highlighted the role of diaspora in their study "What We Know about Diaspras and Economic Development" and affirms that diaspora play an important role in the economic development of their host and home countries. Authors provided the evidences of diaspora's contribution in trade, investment and technology transfer between host and home countries. They also recommended that sound methodologies for mapping the diaspora and preparing "diaspora profile" in order to understand the socioeconomic and demographic characteristics of diaspora, their attitude, and possible areas of interest for collaboration.

Neha Vora (2013) the purpose of this study "Impossible Citizens: Dubai's Indian Diaspora" to analyze the role of

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Indian migrant worker in Dubai and focus on reason behind migration, kafala system, remittance and investment made by them. Also tells that India Diaspora do not have political influence in Dubai

Neha Vora examines how Indians living in Dubai, where they are formally excluded from citizenship, create other forms of belonging through relationships with various communities - including Indians of other classes, other South Asians, and Emiratis - as well as particular spaces within the city-state. This book makes a strong argument with both theoretical and empirical significance that Indians are integral to the legitimacy of the Emirati state.

Karayil, Sajitha Beevi (2007) this article "Does Migration Matter in Trade? A Study of India's Exports to the GCC Countries" examines India's exports to the Gulf Cooperation Council (GCC) countries with a special focus on the influence of migration.

In order to explain the growing orientation of India's exports towards the Gulf countries, here analyze the demand pattern of GCC as represented by its import structure. The GCC countries' import structure reveals the influence of the Indian Diaspora and the possible migration-trade link. The hypothesis of migration-trade nexus is further verified using a longitudinal gravity-type model. The econometric evidence also illustrates the strong immigrant preference effect for their home-country products. Thus, the preference similarity mechanism is seen to work in the India-GCC context despite the violation of its crucial assumption of income similarity. Overall, the study brings out the importance of migrant population as a unique source of advantage for India's exports to the region.

Human Watch Reports (2006) the study conducted by Human Rights Watch reported that the migrant construction workers in UAE are facing abusive conditions and exploitation by employers. The report highlighted the scene behind the UAE's luxury life style, glittering skyline of high rise buildings. Report draws the attention of world towards exploitation of migrant workers in UAE especially from South Asia. Extremely low wages, worst living and working conditions, illegal retention of workers passport, health care etc. are the main problems of migrant workers in UAE. Report explored that UAE's labor law provides penalties for such violation of labor law but unfortunately Govt. has not

Countries

UAE United States

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taken serious steps to stop these kinds of activities in emirate. Report recommended some solutions to the Govt. of UAE as well as Governments of South Asian Countries. Report urged UAE's Ministry of Labor to fully implement its labor laws and to hold violators fully accountable under its laws. Report appealed south Asian countries like India, Pakistan, Bangladesh and Sri Lanka to interfere in their worker's matter whenever necessary. They should provide their nationals with guidance, translators and legal assistance to pursue their complaints with UAE authorities.

The Main Objectives of This Study are:-

- 1. To identify the role of UAE's Indian Diaspora in economic development of India.
- 2. To indentify the role of UAE's Indian Diaspora in economic development of UAE.
- 3. To examine the contribution of UAE's Indian Diaspora in enhancing Indo-UAE relations.
- To study the current welfare schemes of Indian 4 Government for Indian Diaspora.
- To identify the problems of Indian Diaspora in UAE and 5.

Role of UAE's Indian Diaspora in India's Economic Development

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Indians in UAE are taking part in India's growth both directly and indirectly. By sending remittance to India and doing investment in India and also by creating demand for Indian goods in UAE.

Remittance

India is the world's leading receiver of remittances, claiming more than 12% of the world's remittances. Remittances to India stood at \$68.91 billion in 2015, accounts for over 4% of the country's GDP. India received USD 13745 million from UAE's Indian Diaspora, 19% of total remittance received approximately. Table No. 1 clearly shows that India is receiving big part of its remittance from UAE's Indian Diaspora. Remittance to India from UAE, not only beneficial for the sender's family but also it has proven a great tool in correcting India's CAD (Current Account Deficit) and increasing foreign exchange reserves of India. Top 5 Remittance Inflows for India (USD Million)

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Trade

Although Indians that lives in UAE are away from their home country, but they love Indian made goods and prefer to consume Indian Goods. Evidence of strong correlation between presence of Diaspora residing in a country and trade ties to the country of that Diaspora's origin have slowly accumulated. One study of Canada's trade with 136 partner countries in the 1980-92 period showed that a 10 percent growth in immigration from a particular country was associated with a 1 percent growth in export to that country, and a 3 percent growth in imports from it. There is strong links between the presence of diaspora and increased trade. Diaspora populations consume the products of their countries of origin and introduce such products to their country of settlement. With every Indian enters in UAE,

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generates new demand for the Indian goods. India's Jewellery, Textiles and Foodstuff Items are heavily consumed by the Indians itself in UAE. Demand of the Indian products is very high in UAE that gives the good opportunity for the Indian Exporter. Not only the merchandise trade but the service trade is also increasing between India and UAE and the factor behind this growth is also Indians. Services like software export, Travel & Tourism and Movies demand is very high in UAE.

Investment

The UAE, which used to be the tenth largest investor in India, is now the seventh largest investor. The investment from the UAE has reached about one billion dollars in the

Table 2

Top Investing Countries in India FDI Equity Inflow (In USD Million) 2015-16 Rank Country 2014-15 Singapore 13692 Singapore 6742 Mauritius 8355 1 3 Mauritius 9030 USA 4192 5 USA 4 1824 Netherland 2643 3 Netherland 3436 5 Japan 2614 4 Japan 2084 6 Germany 986 7 Germany 7 1125 UAE 985 10 UAE 367 8 UK 898 6 UK 0 1447 France 598 8 France 10 635 Cyprus 508 9 Cyprus 598

Source: Department of Industrial Policy & Promotion, Govt. of India

The significant part of UAE's Investment comes from Indians itself in UAE. Property consultancy Square Yards, in its latest report, said more than 20 percent of non-resident Indian (NRI) investment in India's real estate market came from the UAE in 2016. Diaspora plays an important role when it comes to investment; they not only invest directly in their countries of origin but encourage non-diasporas investors to do the same.

Philanthropy

The Indian Community in UAE is also providing financial assistance and help in form of philanthropy to the needy in India. Many NGO's have been established by the Indians living in UAE for the social welfare in India.

Role of Indian Diaspora in UAE's Economic Development

Trade and social links between Indians and Emiratis date back to more than two centuries. The strong bonds of relationship between the India and UAE are poised to diversify further and strengthen in the years to come. Indian Community in UAE has achieved successes in various fields and at all levels in UAE. Indian Community's contribution to UAE is significant. The UAE is heavily dependent on Indians to develop and sustain its economic activities. There are so many areas in which Indians contribution is very big. Some of them are:-

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1) Investment: - Thousands of Indian Companies are operating in UAE that accelerating Growth of UAE. Huge Investment has been made by the Indians in such Companies. Data released by the Dubai Land Department put the Indian investment in Dubai's real estate at over \$3.27bn in 2016. Indian community in UAE is the biggest international investor fraternity in the Dubai real estate industry. Indians are shaping UAE's Economy from long time. In last few decades UAE's Trade and Commerce flourished at very high growth rate and now UAE is considered as a business hub of Middle East. Behind this success story of UAE, Indians contribution cannot be neglected.

2) Cheap and Skilled Human Resource for the Economic Development :- After the UAE got Independence in 1971. There were demands of both skilled and non skilled workers for the country's infrastructure development, from that time Indian workers are engaging in various business in UAE. The Indian construction workers have helped in building UAE brick-by-brick. The high number of Indian schools, hospitals, restaurants and other shops are all examples of how deep and strong the contribution of Indians have been in developing the UAE. From construction workers to professional engineers and executives, Indians are found in every corner of the UAE. Doctors, Teachers, IT Experts, Chartered Accountants,

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Supervisors and blue collar workers, Indians are engaged in supervisors and once contait workers, mutans are engaged in almost every profession and providing their services for the 3) Revenue Generation:- Although UAE does not have any enforced federal taxation except oil companies and

any enforced reactal taxation except on comparises and foreign banks, however it generate huge revenue from expatriates (and also from locals in some cases) in form of expansions (and also from locals in some cases) in form of various services, Fines, Municipal Taxes and from Issuing and Renewing Business Licenses, Visa etc. And it's clear that Indians are ahead from any other residents in UAE, paying such Fee. The big part of the Fee comes from Business License Issuance and Renewal. UAE generate significant part of its total revenue from such Fee and Fines

which helps in building the infrastructure of the country. Role of Indian Diaspora in enhancing Indo-UAE

The Indian diaspora is an important factor for Indo-UAE relations. India diaspora in UAE is acting as facilitators, middle persons and cost savers for both. The role of Indian Community in the UAE is appreciated in both nations. After knowing the India Diaspora's contribution to India and UAE. It can be concluded that Indian Diaspora is like a bridge between India and UAE that is enhancing bilateral relations between both countries. In UAE they are playing important role in UAE's Economy through Investment, Trade and as a Human Capital. On the other hand by sending Remittance to India, bringing new ideas & skills and investing in India, It's taking part in India's Economic Development also. There are so many organization and economic forums is also actively involved in UAE by the

Indians to promote Indo-UAE ties. Various Schemes of Indian Government for Indian

Recognizing the value of Indians abroad, Indian Government has started many welfare schemes for the Indian Diaspora. Some of them are:-

1) Indian Community Welfare Fund for Indians Abroad

Government has established the Indian Community Welfare Fund (ICWF) for welfare of Overseas Indians. The Indian Community Welfare Fund (ICWF) provides the following services on a means tested basis in the most deserving cases:

- Boarding and lodging for distressed Overseas Indian workers in household/ domestic sectors and unskilled labourers:
- Extending emergency medical care to the Overseas Indians in need:
- Providing air passage to stranded Overseas Indians in need:
- Providing initial legal assistance to the Overseas ٠ Indians in deserving cases;

Expenditure on incidentals and for airlifting the mortal Expenditure on incluences and for an influing the mortal remains to India or local cremation/burial of the

remains to more a line of the deceased Overseas Indians in such cases where the sponsor is unable or unwilling to do so as per the contract and the family is unable to meet the cost;

Providing the payment of small fines/ penalties for the

release of Indian nationals in jail/detention centre. Mahatma Gandhi Pravasi Suraksha Yojana

It is a Pension and Life Insurance fund scheme called as Mahatma Gandhi Pravasi Suraksha Yojana (MGPSY) for the Overseas Indian workers having Emigration Check Required (ECR) passports. The objective of MGPSY is to encourage and enable the overseas Indian workers by giving

government contribution to: Save for their Return and Resettlement (R&R)

- .
- Obtain a Life Insurance cover against natural death
- during the period of coverage.

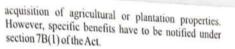
Pravasi Bhartiya Bima Yojana (PBBY): The Pravasi Bharatiya Bima Yojana is a compulsory insurance scheme for overseas Indian workers having Emigration Check Required (ECR) passport going to ECR

- An insurance cover of a minimum sum of Rs. 10.00 countries. lakhs payable to the nominee/legal heir in the event of death or permanent disability of any Indian emigrant who goes abroad for employment purpose obtaining emigration clearance from the concerned Protector of Emigrants (POE).
- In the case of death, besides the cost of transporting the dead body, the cost incurred on the one way airfare of one Attendant shall also be reimbursed by the Insurance Company.

4) Overseas Citizen of India (OCI) Card Scheme:

The Scheme was introduced by an amendment of the Citizenship Act, 1955 in August 2005 and was made operational from January, 2006.

- Registered OCIs are issued an OCI registration certificate and a life-long multiple entry, multipurpose for visiting India.
- Registered OCIs are exempted from registration with Foreigners Regional Registration Office for any length of stay in India
- Registered OCIs are granted conceptual parity with Non-Resident Indians in respect of all facilities available to them in economic, financial and educational fields except in matters relating to the



- OCl is not to be construed as 'dual citizenship'.
- Entitlement to appear for the All India Pre-Medical Test or such other tests

5) Know India Programme (KIP):

The objective of Know India Programme is to help familiarize Indian Diaspora youth, in the age group of 18-26 years, with developments and achievements made by the country and bringing them closer to the land of their ancestors. KIP provides a unique forum for students and young professionals of Indian origin to visit India, share their views, expectations and experiences and to bond closely with contemporary India.

6) Study India Programme (SIP):

The SIP enables Overseas Indian youth to undergo short term course in an Indian University to familiarize them with the history, heritage, art, culture, socio-political, economic developments etc. of India.

The focus of the programme is on academic orientation and research. Cost of boarding, lodging, local transportation, course fee during the programme and 90% of the cost of airticket by economy class is borne by Govt. of India.

7) Tracing the Roots:

It has been launched by MOIA in October 2008. Scheme is to facilitate PIOs in tracing their roots in India.

8) Scheme for Legal/Financial Assistance to Indian Women Deserted / Divorced By Their NRI Husbands:

The scheme is for providing legal/financial assistance to the Indian woman who have been deserted by their overseas Indian / foreigner husbands or are facing divorce proceedings in a foreign country.

Assistance is provided to meet the legal and other costs, by the Heads of Indian Missions/Posts overseas directly to the applicant's legal counsel empanelled with the concerned Indian Mission/Post, or through the Indian Community Associations / Women's organizations / NGOs acting on the woman's behalf in an overseas legal institution.

9) Pravasi Bharatiya Samman Awards (PBSA):

The is conferred on to a Non-Resident Indian (NRI), Person of Indian Origin (PIO) or an organization or institution established and run by Non-Resident Indians or Persons of Indian Origin, who has made significant contribution in any one of the following fields:

- (a) Better understanding abroad of India;
- (b) Support to India's causes and concerns in a tangible way;

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- (c) Building closer links between India, the overseas Indian community and their country of residence.
- (d) Social and humanitarian causes in India or abroad;
- (e) Welfare of the local Indian community;
- (f) Philanthropic and charitable work;
- (g) Eminence in one's field or outstanding work, which has enhanced India's prestige in the country of residence; or
- (h) Eminence in skills which has enhanced India's prestige in that country (for non-professional workers).

It is conferred by the President of India as a part of the Pravasi BharatiyaDivas (PBD) Convention. PBSA is the highest honour conferred on overseas Indians.

Problems of Indian Diaspora in UAE

Indian Diaspora residing in UAE is considered as a bridge between both India and UAE that is engaged directly and indirectly in economic development of both its home and host countries. Indian Migrants have become the essential part of the UAE's economy and society. However, the Indian migrants have to undergo some problems and difficulties especially the blue collar workers. Based on the some studies and human rights watch reports, it has been found that Indians are facing some serious problems in UAE which needs to be resolved.

- After spending years in UAE they couldn't get citizenship
- 2. High Cost of Living
- 3. Cheating by Recruitment Agencies
- 4. Illegal possession of Passport by the employers
- Exploitation by Employers in forms of low wage, bad working and living conditions
- 6. Human trafficking and human right violations

Conclusion & Suggestions

The Indian migrants long sojourn in the UAE has helped build the foundation of a strong bilateral relationship between India and UAE. The Indian Community in UAE has significant impact on both India and UAE's economic development. The recent visit of Shaikh Mohmmad bin zayed al nahyan, crown prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces on India's republic day in which so many new agreements and MoUs have been signed by both India and UAE to boost relationship. In a joint statement issued by India's Prime Minister Narendra Modi and Shaikh Mohammad both side highlighted the role of India's Diaspora in this growing bilateral relationship which is like a strong bridge between both countries. To deepen this old friendship both countries are taking serious steps and many new areas have been identified for the cooperation. Both countries are mutually





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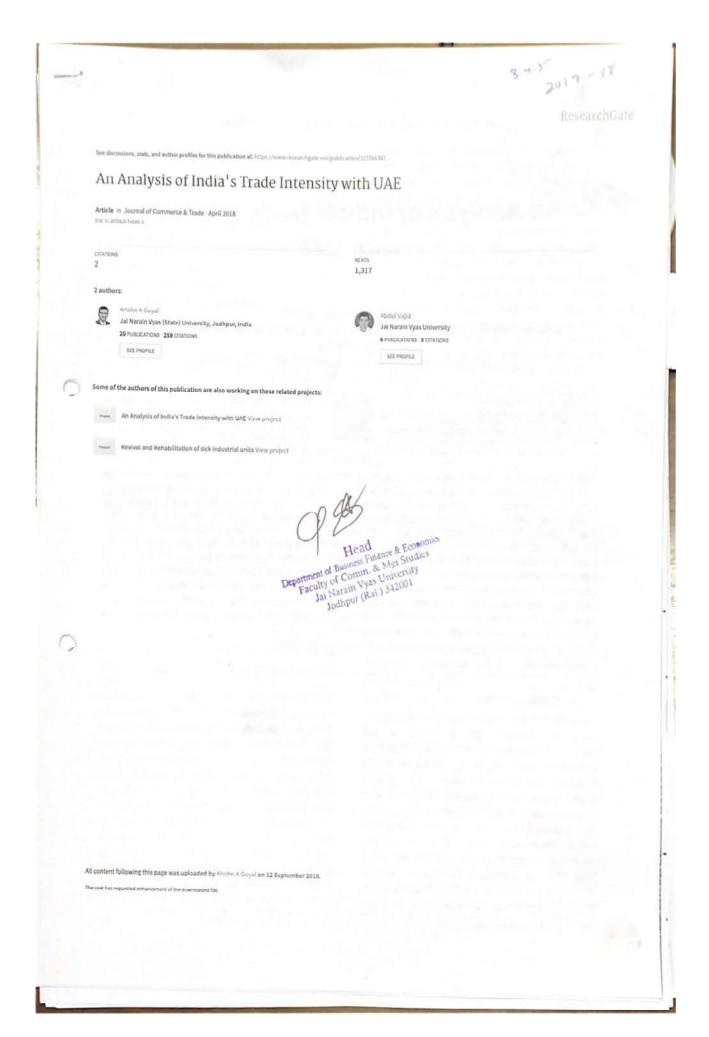
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An Analysis of India's Trade Intensity with UAE

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Abstract

Today no nation in the world is fully self-reliant on its own resources. All the nations of the world are somehow interdependent on others, because every nation has its own natural resources, climate, geographical conditions and sources of energy. International interdependence is the main feature of today's global economy. Trading links between India and UAE have existed since ancient times. Indo-UAE trade has grown enormously in recent years. Many statistical trade indices are available to measure trade between two countries. One of them is the trade intensity index. The trade intensity index appears in two forms, the export intensity index and import intensity index. A few studies have done to explore intricacies of the trade relationship between the two countries. Under such scenario this paper investigates the major trends of bilateral trade and explores issues associated with trade intensity. An attempt is made here to examine the India's Trade Intensity with UAE for the period from 2006 to 2016. The paper also suggests measures to enhance trade intensity between India and UAE. Time series data have been used to measure Trade Intensity Index (TII). The findings of the study reveal that India's trade with UAE is more intense in comparison with its other trading partners.

Keywords : Trade Intensity, Import-Export, India UAE Trade, Foreign Trade Classification-JEL : F13, F15, N15, N55

1. INTRODUCTION

In the era of globalization international trade has become the backbone of any economy. India and United Arab Emirates both economies have significant places in global economy. The Indian economy is the seventh largest in the world by nominal GDP and third largest by purchasing power parity. The United Arab Emirates has an open economy with a high per capita income. The UAE is one of the wealthiest countries in the Middle East. The India and UAE have old civilization, cultural, Commerce and trade ties with each other which have now turned in to a comprehensive strategic partnership. India and UAE are constantly working hard to improve this relationship stronger than before. Trade between India and UAE started when these two nations used to deal some of the traditional items with each other. In recent years India-UAE bilateral trade has grown enormously. The items which are exported to UAE mainly are Gems and Jewelry, engineering goods, meat, tea, fruits, vegetables, chemicals, spices, textiles and rice. The items which are imported to India mainly are crude & petroleum products, precious and semi precious stones, transport equipments, gold & silver, pearls, electronics goods, metal ores and metal

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scrap. With respect to bilateral investments, total Foreign Direct Investment (FDI) from UAE to India is estimated to be US\$3.01billion (January. 2015) and ranked as tenth biggest investor in India. At the first meeting of India-United Arab Emirates High Level Task Force on Investment (HLTFI) held on February 18, 2013 in Abu Dhabi, Abu Dhabi Investment Authority (ADIA) announced its plans of investing US\$ 2 billion in Indian Infrastructure sector.

2. **REVIEW OF LITERATURE**

Some relevant reviews of literature are as follows:-

K.A. Goyal & A. Vajid (2016) analyzed the bilateral trade between India and UAE in their study "An Analysis of Bilateral Trade between India and UAE". The authors examined the Indo-UAE trade data between 2011 to 2015. The study revealed that India and UAE are good trade partners of each other and having deep trade relations. India's major export items to UAE are minerals fuels, precious and semi precious stones, gems & jewelry, clothes, cereals and mechanical appliances etc. While UAE's main export items to India are petroleum products and oil. The authors briefly highlighted the diplomatic relations, bilateral agreements and MoUs signed by both countries to further enhance the bilateral trade.

Pouria Mohajeri (2015) analyzed the Trends of Trade between India and PGC (Persian Gulf Countries) in his paper "Trends of India Trade with Persian Gulf Countries". The analysis based upon the growth evaluation of Indian trade with PGCs. Persian Gulf Countries (Iraq, Iran, UAE, Saudi Arabia, Kuwait, Bahrain, Qatar and Oman) are the big suppliers of Energy in the world market. Author used the Trade Intensity Index to measure the trade intensity with PGCs and observed that the highest volume of Indian Trade among PGCs is with United Arab Emirates. Author also discussed the share of PGCs in International Trade of India and explored that the UAE's share is the highest among all other PGCs Countries after UAE in PGC Group, the

second place is occupied by Saudi Arabia. Author found from the analysis that the maximum Indian Import from PGCs falls under product category of HS-27 (mineral fuels, mineral oil, bituminous substances etc).

Das and Pradhan (2014) discussed India's trade relationship with Gulf countries in their study "India-Gulf Trade Relations". According to authors despite the outstanding growth in trade volume, the structure and pattern of India-Gulf trade depicts a very contrasting picture. To understand trade intensity between both regions they applied Trade Intensity Index and found that India's export intensity is above one for UAE, Saudi Arabia, Iran, Kuwait, and Oman. For other Gulf countries (Bahrain and Qatar) the export intensity is fluctuating. Moreover, India is importing smaller volumes from countries such as Bahrain and Qatar which is reflected in the low Import intensity Index.

Sundar & Ambrose (2014) examined the Indo-Japan trade in their study "A Brief Analysis of India-Japan Bilateral Trade: A Trade Intensity Approach". The authors analyzed the trade intensity between India and Japan with the help of Kojima's trade intensity index. The study revealed that India has not diversified its export basket over the years to Japan. During the study (2001-2011) period it has been found that Japan's imports from India have declined much more than its exports to India. The authors concluded that the overall trade intensity whether its export of import, has declined over the period of study.

Sayeeda Bano (2010), in her study "India-New Zealand Trade And Trade Potential: Recent Experience And Future Opportunities" explores the evolution of trade relation and trade potential between India and New Zealand. The author analyzed the trade with the Kojima indices of trade intensities, revealed comparative advantages, intra industry trade and trade potential indices. Author concluded that bilateral trade between India and New Zealand is at very low level compared to the global trade profiles of both countries. At last

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author suggested priority areas for realizing untapped, trade and investment potential between both countries.

3. OBJECTIVES

Objectives of this research paper are:

- To analyze the extent of intensity of trade between India and United Arab Emirates
- To suggest measures to enhance trade intensity between the two countries.

4. INDO-UAE TRADE

Bilateral trade between India and UAE for 2016 reached US\$50 billion. Trade between the two countries, excluding oil, stood at \$36bn. India accounts for about 10 per cent of the UAE's foreign trade. The country, which has been among the top three UAE trading partners in the past few years - is currently the largest partner. According to UAE's Ministry of Economy about 9 per cent of the UAE's total exports go to India, while 8 per cent of the UAE's imports come from India. According to Table 1 it's clearly revealing that in past 10 years from 2007 to 2016 India's Export to UAE has reached USD 30290.01 Million from USD 12021.77 Million which is more than 60%. Although it has witnessed some incline and decline in growth rates.

TABLE 1

India's Export to UAE

Year	Export	Growth
2007	12021.77	
2008	15636.91	30.07
2009	24477.48	56.54
2010	23970.40	-2.07
2011	33822.39	41.10
2012	35925.52	6.22
2013	36316.65	1.09
2014	30520.42	-15.96
2015	33028.08	8.22
2016	30290.01	-8.29

Source: Compiled from Director General of Commerce Intelligence and Statistics The below table 2 shows the India's imports from UAE. India's Import has also increased in past 10 years. It was USD 8655.28 Million in 2007 which reached to USD 19445.68 Million in 2016 reporting more than 55% increase in India's import from UAE in last 10 years.

	TABLE 2
India's	Import to UAE

Year	Export	Growth
2007	8655.28	
2008	13482.61	55.77
2009	23791.25	76.46
2010	19499.10	-18.04
2011	32753.16	67.97
2012	36756.32	12.22
2013	39138.36	6.48
2014	29019.82	-25.85
2015	26139.91	-9.92
2016	19445.68	-25.61

Source: Compiled from Director General of Commerce Intelligence and Statistics

5. TRADE INTENSITY BETWEEN INDIA AND UAE

With the help of trend analysis of growth rates one cannot get the full idea about intensity of trade between the two countries. In order to know the trade intensity between two countries and to see the trajectory of trade over the years, Kojima's (1964) Trade Intensity Index can be used. It helps to measure bilateral trade intensity between two countries and can identify how intensively the countries are trading with each other. Trade intensity index is defined as the share of one country's trade with another country, divided by the other country's share of global trade. The value of index can be 0 to 100. If the value comes 0, it implies no trade relationship between partner countries. On the other hand, if the value of import intensity index is more (or less) than 100, it indicates that country 'I' is importing more (or less) from country 'j' than might be expected from that country's share in total world trade. In export

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too, if the value is 0 or nearer to 0, it implies export link between these two countries is negligible and if the value is nearer to 100 that indicates that performance is significant and if it exceeds 100 it indicates that country i is exporting more to country j than might be expected from that country's share in world

MI = Total Import of India

XG = Total Export of the UAE

XW = Total World Export

XI = Total Export of India.

The Table 4 investigates the intensity of trade between India and UAE. The values of

TABL	E 3 (a)
Indo-UAE Bilatera	l Trade 2007 - 2011

Description	2007	2008	2009	2010	2011
India's Export to UAE	14447008	19096532	25415975	27412253	37369375
Total Exports of India	145898053	181860898	176765036	220480496	301483250
Total Import of the UAE	127001505	175485699	164251000	187001000	210945000
Total Import of the World	14097221790	16345271437	12609807746	152316407041	18313272111
Total Import of India	218645294	315712106	266401553	350029387	462402791
Total Exports of the World	13777495680	15972677606	12317210483	15065283815	18072982655
India's Import from UAE	11702839	19419289	19735385	30907472	35471580
Total Export of UAE	156634000	210000000	174725000	198362000	252556000

Source : Compiled from UN Comtrade

TABLE 3 (b) Indo-LIAF Bilateral Trade 2012-2016

	muo-o	AL Dilateral frac		and the second se	2010
Description	2012	2013	2014	2015	2016
India's Export to UAE	35781394	33980431	32919602	29989560	30041758
Total Exports of India	2895647659	336611389	317544642	264381004	260326912
an sea e de anno anti-	261022920	2949669128	298611277	287024848	270882074
Total Import of the UAE	18504364372	1889462491	18901028897	16561697875	16045698257
Total Import of the World	T T T T T T T T T T T T T T T T T T T	466045567	459369464	390744731	356704792
Total Import of India	188976378		18841472314	164069919752	15912143458
Total Exports of the World	18346873446	18851591759	27287867	20283244	19240912
India's Import from UAE	37799115	32964585		33362350	28965094
Total Export of UAE	350123000	379488768	380339616	55502550	20505054

Source : Compiled from UN Comtrade

Export intensity Index (EII) of India with UAE = (XIG / XI) / ((MG / (Mw - MI))

Where, XIG = India's Export to the UAE

- XI = India's total Export
- MG = Total Import of the UAE
- Mw = Total World imports
- MI = Total Imports of India.

Import intensity Index (III) of India with UAE = (MIG / MI) / ((XG / (Xw - XI))

Where, MIG = Import of India from UAE

TABLE 4 India's Trade Intensity with UAE

Year	Export Intensity Index	Export Intensity Index
2007	10.82	10.82
2008	9.59	9.59
2009	10.81	10.81
2010	8.96	8.96
2011	10.49	10.49
2012	8.53	8.53
2013	6.31	6.31
2014	6.4	6.4
2015	6.4	6.4
2016	6.68	6.68

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Export Intensity Index (EII) and Import Intensity Index (III) were calculated for the time period 2007 to 2016 which shows that in recent years India's trade export and import intensity with UAE has been declined slightly, however it's still above unity which indicates the higher trade intensity between India and UAE. It can be analyzed from Table that India's Export Intensity with UAE is higher than its import intensity with UAE. India's Export intensity with UAE was 10.82 in 2007 which is now in 2016 calculated at 6.68. On the other hand India's Import Intensity with UAE was 4.65 in 2007 which is now 2.83 in 2016.

CONCLUSION

After analysis of trade intensity between India and UAE it can be concluded that India's trade with UAE is in good flow. In the study period from 2007 to 2016 India's trade intensity both export and import never went below unity that implies the both countries have good trade partnership in comparison with global trade. However it's matter of concern that in recent years, both India's export and import intensity with UAE has been declined. This decline is due to recession in global trade and some policy measures at both sides to improve their trade deficit.

7. SUGGESTIONS

Suggestions to enhance trade intensity between India and UAE are :

- There are still some underdeveloped areas in Indo-UAE trade that needs to be focus like knowledge based industries, tourism, telecom etc.
- Many bilateral agreements and MoUs have been signed between India and UAE in various sectors like Double tax avoidance, BIPA, Agriculture, banking etc. but for removing the trade barriers and other hurdles new policy initiative and agreement are required.
- Trade fairs and trade exhibition can also enhance the trade between India and UAE. So government should organize and arrange more trade fairs and exhibitions in both the countries to give good platform to both countries traders where they can meet and explore their commodities to each other.
- Good understanding of languages and culture of each other is very necessary to promote trade and investment between both India and UAE. English is the universal and common language for both the nations. It is necessary for the traders of both nation's to have good command over the other's local language. Government should establish training and teaching centre at both sides to promote language and culture. It can help to understand business environment easily at both sides.

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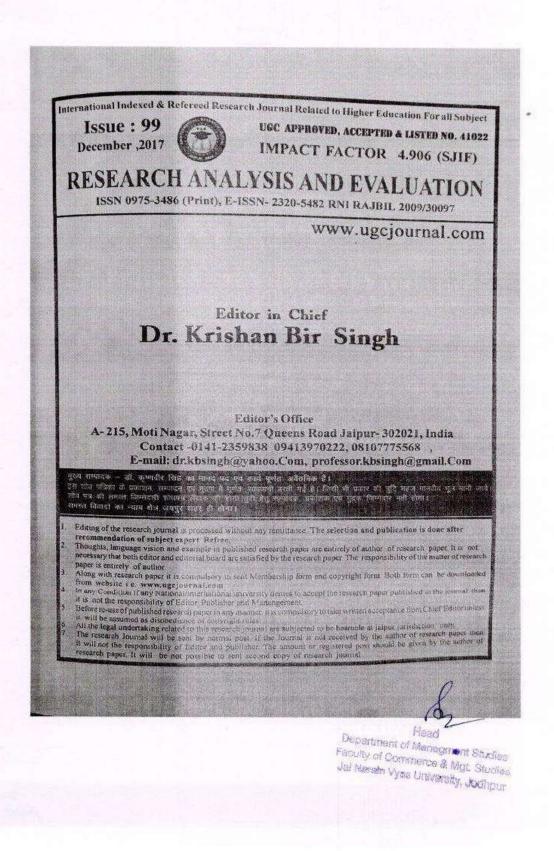
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Research Paper - Management

Challenges of Multigenerational Workforce In Tourism Industry Special Reference To Jodhpur

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ABSTRACT

Irmodern workplace working today means working with a team with a large of ages. Each person comes with a different life experiences, perspective, values, approached etc. to create and manage a cohesive team of all a different into a challenge for all manages. This study is to analyse whether generations gaps exist and to provide ideas and techniques to overcome them.

Introduction:

Tourism is the world's largest and fasiest growing industry in generating employment & carning foreign exchange. It provides opportunities for economic growth and employment generation which leads to alleviation of poverty. The neglected segments like artisans, handerafters and service providers of backward areas are exposed and appreciated by tourist from all over the world. It provides a platform to other industries through different linkages and generates huge revenue earning. The industry account for 10.7% of the work force all over the world and contributes to about 10% of the GDP (Globalized).

Jodhpur, popularly referred to as the 'Sun City' of India due to the sunny weather the city enjoys for most of the year, is one of emerging hospitality destinations within India. Geographically, Jodhpur is located at the centre of Rajasthan and is well connected by rail, road and air. Jodhpur also serves as the base for tourists who travel to various destinations in Rajasthan. Handicrafts are manufactured and exported to various parts of the world, especially Eastern Europe, thus the city has become a trading centre for resulting in many foreign nationals travelling to Jodhpur to source handicrafts from here.

Jodhpur's attraction include Mehrangarh Fort, Umaid Bhawan Palace, Jaswant Thada, Ghanta Ghar (Clock Tower) and Flying Fox (Mehrangarh Fort). fourists can make excursions to Mandore, Kaylana Lake and Garden, Balsamand Lake, Sardar Samand lake and palace, Massoria Hill, Veer Durgadas Smarak nument, Park and Museum). Those artractions have turned out to be quite hefty crowd pullers.

This city has witnessed significant demand for on destination wedding segments. Many small palaces and Haveli's have been converted into Hotels and Guest Houses to provide accommodation to the

tourist. MICE is a growing segment of the city and during the off peak season, this segment keeps the occupancy rates for few months.

Tourism is a labour intensive industry and provides employment to skilled, semi skilled & unskilled workers. The progressive labour force with dynamic management and responsive government and responsible society are the pillars of the tourism industry. The service provides in Tourism Industry range from 20 years of age to 75 years of age. This leads to a multigenerational work force, where 4 generations of employees are working under one roof and one size does not fit all each group has to own individuality.

The multigenerational work force includes the Pre-Boomers (Born 1925-1945), also known as the Silent Generation and Traditionalists, the Baby Boomers (Born 1946 - 1964), Generation X (Born 1965-1976), and Generation Y, also known as the millennial (Born 1977-1994). The idea was to include members of Baby Boomers (born between 1946-1964), Generation Xers (1965-1980), Generation Vers (1980-1995) and Generation Z members. (1995-present) to the research in order to get a complete picture of the needs and wants of different generations. "A generation is defined by what it thinks, feets, and experiences and not just by dates of birth." (Zemke, Raines & Filpczak 2000, 64.)

McCrindle and Wolfinger (2009) define a generation as a group of people, who were born in the same era, shaped and influenced by the same times. They usually go through the same events, trends and developments of that particular time. Those historical and cultural events, which person will experience during his/her formative years, no doubt will have an effect on individual's values, personality and world views. (McCrindle & Wolfinger 2009, 2; The multigenerational workforce: Opportunity for Competitive Success 2009, 1.) in this study the focus is on the values and working

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International Indexed & Refereed Research Journal, ISSN-0975-3485 (Print), ISSN-2320-5482, Dec. 2017, ISSU 9-99 International Indexed & Referent Research Journal, ISSN 97 manpower supply in Indian hospitality industry has to methods of four different generations, which are now in manpower supply in Indian hospitality industry has to methods of four different generations. present in the workforce: Baby Boomers, Generation X, Y and Z. The generation of Traditionalists (born before 1945) was purposely left out, since they are no longer as big part of the workforce as other generations. That being said, also many Baby Boomers are currently retiring, but decided to keep them as part of the research, since the trend shows that retirement age is rising, thus Boomers might be staying in the work force longer. Gen Z on the other hand is increasing by number by each year, meaning that even though they are not a huge segment of labour force yet, they will be.

One of the most challenging aspects of managing multiple generations in the workplace is getting each group to respect the unique talents of the other. As per Dr. James Johnson, Professor of Entrepreneurship and national speaker with WeSpeakWorldwide.com - "Managers and employee have to understand that great ideas, creativity and innovation come in all shapes, sizes and ages. We have to have a greater respect across generations to understand that everyone comes to the workplace with a set of skills and contributions.

As more boomers work past retirement age and as tech-savvy millennials continue to graduate and enter the workforce, the stark differences in the values, priorities, expectations, approaches, communication styles and work habits of each generation are becoming increasingly pronounced.

To manage and create a cohesive team of all generations creates the biggest challenges for the modern tourism industry. Managers will have to rethink hiring practices managing styles rewards training and retention of their employees.

Literature Review :

These paragraphs present a comprehensive review of literature on this subject. Khan Nafees A (2008) -Surveyed on the HR developments and analyzed the HRD initiatives to enhance & develop the competence of employees. This study is limited to aviation industry P. Sriniwas Subbaras in his study on issues & constrains in manpower supply in Indian hospitality industry discussed the need of skilled & trained manpower.

He stressed on the fact that to ensure efficient & good quality services to tourist skilled & trained workforce is an necessity. The study is limited to demand & supply of man power but how to fill the gap is lacking.

The study of P.K. Srivastawa relates to gap between demand & supply as manjor challenge faced by the industry but it restricts itself only to the travel and trade industry does not include the hospitality

discussed the need of skilled and trained manpower as a crucial element in the successful long-terms development and sustainability of a tourist destination but there is no suggestion to fill this gap and regarding higher level programmes for management development The study of Annastiina Romo "MANAGING MULTL" GENERATIONAL WORKFORCE" examines generational differences in values, expectations and working methods. Another aim was to find out if Salating belongs to generationally savvy companies. The idea was to include representatives of Baby Boomers (born in 1946to 1964), Generation Xers (1965-1980), Generation Yers (1980-1995) and Generation Zmembers (1995. in the research in order to get a complete picture of the needs and wants of different generations.

The results indicated the generations to have some differences between them. The findings also implied the employees acknowledging the differences' and being able to adapt to them. The final part of thequestionnaire revealed that the staff was satisfied with the current management in terms of age management Thus, the author can assume restaurant Salitintti to be up-to-date with the issues regarding age management This study was limited to restaurant Salitintti.

The Challenges of Managing Multigenerational Workforce Contributed by: DeVan C. Brown President & CEO and Melody E. Barnett Director of HR Administration & Support and Edited by Martha M. Adams quotes that as the landscape of the workplace continues to change, one of the most prevalent issues facing employers today is staff composition, which could range from 18 to 80. This rich mix of generations in the workforce can be attributed primarily to labor shortages experienced in many industries and the rising average age of retirement. The multigenerational staff is alive and real, creating a set of challenges-and opportunities-for employers that can be difficult to recognize and address.

Objective of The Study

The objective of the study is that since there is a need of four generation working together, we need to analyse their differences in values, needs, behaviours, work styles and expectations etc. of all generations. To provide ideas and techniques for how to meet the needs of every employee and bridge the possible generation gaps

Data Analysis

Since the aim of this particular research was to collect information on the attitudes and perceptions of the respondents, we decided to use questionnaire as & method to collect the results. The enquiry was quantisector P Sriniwas Subbarao in his study on Issue and constrains tative in nature, which would give qualitative data to be

* UGC Approved & Accepted No. 41022 : Research Analysis And Evaluation

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nternational Indexed & Refereed Research Journal, ISSN-0975-3485 (Print), ISSN-2320-5482, Dec. 2017, ISSUE- 99

malysed. This was the best way to get honest answers well, since the respondents would stay anonymous. Data was collected through a structured questionnaire survey was conducted on various stake holders of he industry. There were 60 respondents, with equal representation from each generation group. The uestions were framed keeping in view the characterisic features of the different generations.

After collecting the completed forms, the reponses were grouped as per the age of the responents. The results were registered and analysed, which elped to create illustrative tables and diagrams in order to support the analysis.

General Characteristics: -

I respect the authority and hierarchy of the work place.

om comfortable in using technology at my work. I am loyal to the company I work.

The working hours needs to be flexible enough for

my personal life.

- Important rewards for me in work: -
- Compensation and monetary benefits
- Promotions

Personal growth and learning

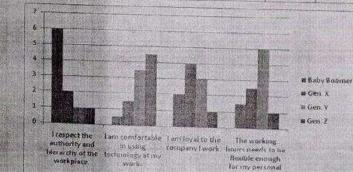
3 More challenging work tasks/more responsibilities An appealing job for me: -

- Strict work ethic/clear rules on how things are done Freedom / possibility to do the work according to my wish
- Security
- Variety of works
- Meaningful works
- Getting continuous feedback and recognition
- Fun and innovative workplace.

Supportive coworkers and management

Questions	Baby Boomers	X	V	7
I respect the authority and hierarchy of the workplace.	5	2	1	1
I am comfortable in using technology at my work.	0.5	1.5	3.5	4.5
I am loyal to the company I work				
The working hours needs to be flexible enough for my personal life.	1.5	2.5	5	1

Result and Findings



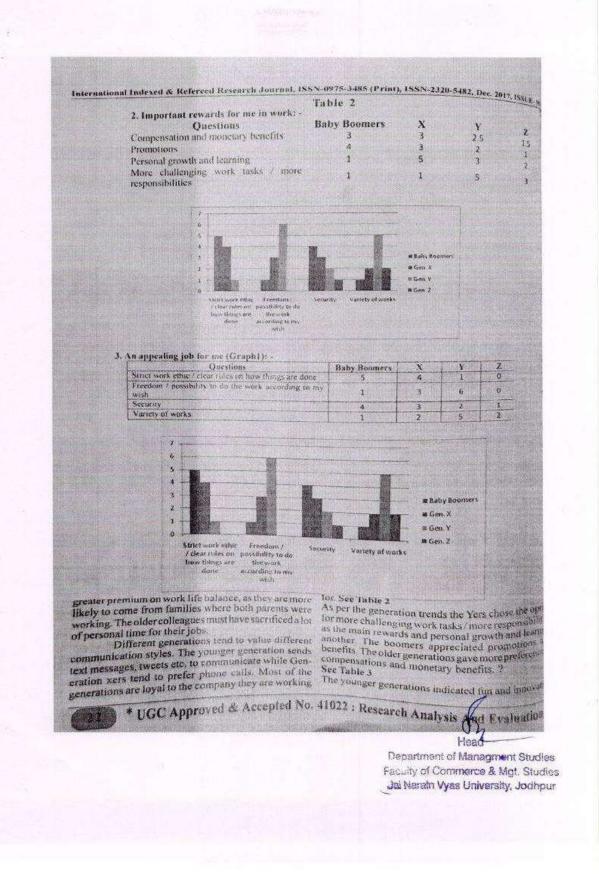
is the typical workplace evolves to keep up with the number of hours spent at their desks. On the other end anging technologies a consequent shift in cultural spectations has also occurred. It is observed that the

members of Generation Y value and expect a healthy Ider workers respect the authority of the workplace favorable where more work can be done at home avoid-and are used to having performance measured by the ing rush hour commutes. Younger workers place a

for my personal life.

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An appealing job for me (Graph	(2): -				
Onestions		Baby Boomers	x	Y I	-
Meaningful works		5	3	2	2 0
Comme continuous leedback and recogni	non	1	3	4	7
Fan and unnovative workplace		1	X	3.5	3.5
Supportive coworkers and management		- 2	4	1	1
			# Baday day		

work place as most appealing factor whereas boomers fiked security or strict work ethic and meaningful work. The generations Xers were more interested for supportive co-workers and management Conclusion And Suggestions

The results of few questions supported the enerational theory very well while few of them were not learly in support. Therefore we can say that generaional gaps do exist and these to are problems relating o age gaps. Thus managers must acknowledge the differences between the generational and create an invironment where each generation respect the other and work in a cohesive firm.

To develop a team of multigenerational employees the managers must help each generation to under stand each other to work together effectively.

By creatively identifying each persons skill in the group for example "Ram Singh Ji has 40 years of

experience in service industry which will benefit your groups services".

- Develop clear goals & expectations for each team.
- Hold every member accountable for their individual group participation - "What role did Mr. Shyam play in this project."
- Offer ongoing formal feedback to modify behavior & performance. Meet each group individual to monitor their success & challenges.
- Hosting company events and happy hours and celebrating Joyful occasions is a great way for ev eryone to grow together.
- Leaders can help a dys-functioning situation cost by negative stereotypes of by actively looking for misunderstanding and intervening wherever re quired.
- Best practice is to conduct regular training sessions for all employees & to require supervisors to attend multigenerational management training.

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A STUDY OF CHANGING SCENARIO OF ENTREPRENEURIAL OPPORTUNITIES FOR WOMEN ENTREPRENEURS

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Abstract:

Pandit Jawaharlal Lal Nehru has said "When women move forward, the family moves, the village movies and then ultimately the Nation moves forward". In the recent times women entrepreneus has grown significantly all over India. They are not only contributes to economic growth and development of country but also to the economic well-being of their family members and communities. There's no denying the point that Indian women have come a long way, but they still have a long path to go when it comes to comparing the figures with their male colleagues. According to the recent reports only 14 percent of business establishments in the India are being run by female entrepreneurs. Regardless of number of actions and incentives taken by the government, the women entrepreneurs are not growing at a faster rate. This shows that the government has to make many more efforts to boost the present scenario of women entrepreneurs in India. In this paper we will cover the review of several researches and experts on women entrepreneurship in India and ways to take care of the present condition of women entrepreneurs. This paper is an attempt to know the recent trends and changing paradigm shifts of entrepreneurial opportunities in country, what are the various motivating factors for women to become entrepreneur, various opportunities available in front of women & challenges faced by women entrepreneurs and to know the future prospects for the development of women entrepreneurs in India.

Keywords: Women entrepreneurs, Changing Paradigms of entrepreneurship, Women Leaders, Opportunities and Challenges.

Introduction:

"The Glass ceiling that once limited a woman's career path has paved a new road towards business ownership, where women can utilize their sharp business acumen while building strong family ties."-Erica Nicole (Owner of YFS Magazine). The contemporary Scenario of India is witnessing a transformational journey of women entrepreneurs and brimming with their success stories all over the world. Today the world is daunted by influential women's positions, but knows little about their journey, sacrifices, and hurdles and about the battles she fought. While women are either on a platform or off it, women still reside a largely patriarchal workplace where gender discrimination exists. Women make up around half of our country's population and if we can unclog their imagination and handed them with the needful resources, this can definitely create a major leap in our economy. Some of the Women Entrepreneurs like Nita Ambani, IndraNoorf, Head

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FalguniNayar, Richakar, Ekta Kapoor, Shuchi Mukherjee, Nita lulla, Ritu Kumar, Shahnaz Hussain, JyotiNaik, Indu Jainand many more are well known faces in India.

Women entrepreneurs are simply those women how are confident, persuasive and willing to take risks, generates employment opportunities for others through initiating establishing and running an organization. There are many reasons for women to start their own ventures in this growing and developing society, it could be the personality of women, family needs for money, inherent family business sometimes creativity or a strong desire to be your own boss rather than employed. In this era of Globalization along with ongoing Information Technology trends, the women-owned firms have the potential to make their important contributions in job creation and economic growth of self and the country. These days women are making their mark equally everywhere in comparison to men. They are flourishing as fashion designers, interior decorators, beauticians, film direction, exporters, novelists, publishers, and still discovering new ways of economic contribution. The important motivating factors for choosing entrepreneurship as a occupation by women are self-determination, independence, expectation for recognition, selfrespect and higher career goal (Moore & Buttner, 1997). In India, traditionally women entrepreneurship was viewed as extension of their kitchen activities 3 Ks- Kitchen, Kids, Knitting to 3 Ps, viz. Pickles, Powder and Pappad. But in the recent time women have started shifting from 3 Ps to 3 modern Es, viz, Engineering, Electronics and Energy, Indian women had endured a long way and are becoming progressively visible and successful in all spheres they are working, According to the Shashtri and Sinha, (2010) women Entrepreneurs need help and support of the families, social groups and most importantly help of the government. Government requires taking initiations to provide financial help and supports to women entrepreneurs for their development in our country. While accomplishing all their dreams they are also facing many problems and challenges in their way of success, challenges like capital issues, socio- cultural barriers, lack of training and skill barriers, awareness about the financial assistance, motivational factors etc.

Recent Trends of women entrepreneurs in India:

Female entrepreneurship has been gradually climbing in recent years, but all these new opportunities and growth are not without a unique set of challenges. The present scenario is witnessing how women's are putting their gigantic efforts to meet the expectation of global competition. According to the survey Commissioned by Dell, the Gender-GEDI is the world's only diagnostic tool that comprehensively measures high potential female entrepreneurship by analyzing entrepreneurial ecosystems, business environments and individual aspirations across 30 developed and developing economies found that among the 17 countries included in both the 2013 and 2014 Gender-GEDI reports, four increased their rankings (Japan, Brazil, India, and United Kingdom), four showed a decline (Malaysia, Egypt, Mexico and Morocco), and the others ranked comparatively both years. Facts revealed by the Sixth Economic Census by the National Sample Survey Organisation (NSSO), only 14 percent of business establishments in the country are being run by female entrepreneurs. This means, out of the 58.5 million functional businesses, only 8.05 million of them have a female as a boss. The data collected by the survey also revealed that most of these women run companies are small-scale and about 79 percent of them are selffinanced. The survey also talks about the reason behind this massive gender gap in the Indian Entrepreneurship sector.

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REASONS FOR SLOW GROWTH OF WOMEN ENTREPRENEURS IN INDIA:

- Availability of the proper information about the market, raw material and financial support are effecting growth of women entrepreneurs.
- Lesser of self-confidence, will-power, mental attitude and optimistic outlook amongst women in India creates a fear of failure, this directly affect the growth of women entrepreneurs.
- Lack of proper support, cooperation and back-up for women by their own family members.
- Male oriented or male dominated society of India affecting entrepreneurial growth of women in India.
- Ineffective entrepreneurial development programme by the government.
- Improper infrastructural facilities, high cost of production, lack of management experience and improver marketing assistance etc.
- Lack of financial support and assistance. Finance is the main problem and challenge for women entrepreneurs.
- Women's family obligations and personal problems are occasionally one of the main barriers for succeeding.

Review of Literature:

Cohoon, Wadhwa & Mitchell (2010) their study were based on the primary data to collect the details about men & women entrepreneur's background and experiences and to know top factors inspiring women to become entrepreneurs. They founded some reasons that inspiring women and they were wish to build the wealth, to capitalize own venture ideas and to move forward in their life's. Rizvi and Gupta (2009) studied that government funded entrepreneurial development activities have helped but only limited numbers of women, specifically the urban middle class. This is all due to their level of education, access to information in different areas and support of their family members. Tambunan (2009) conducted a study on current entrepreneurial changes that have occurred in developing Asian countries in the area of women entrepreneurs. Their study primarily dedicated to women entrepreneurs in small and medium enterprises and based on data analysis. They found that women entrepreneurship is gaining prodigious significance in all sectors. They also had shown the various details about women entrepreneurs in this area and it is comparatively low due to factors like low level of education, deficiency of capital and cultural or religious restrictions. Starcher (1996)stressed on factors like primary responsibility for children, home and older dependent family members are the few reasons women can't devote all their time and energies to their business, this limits them from becoming successful entrepreneurs in both developed and developing nations.

Singh (2008) recognized in his research the reasons & issues that affect the entry of women in entrepreneurship and also the difficulties in the progress of women entrepreneurship. The factors recognized were lack of communication with successful entrepreneurs, social un-acceptance of women entrepreneurs, family obligation, and gender discrimination, absence of social networking, low family and economical support. Greeneet.ai. (2003) compared and eventated various research studies in the area of women entrepreneurship. The study identific dependent of acceptance of women entrepreneurship. The study identific dependent of the study identif

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parameters concerned with women entrepreneurship problem and challenges and they are gender discrimination, personal attributes, financing challenges, business unit, context and feminist perspectives. Kevaneand Wydick(2001)founded that the reason for the growth of interest in female entrepreneurship in developing countries is due to the rapid growth in the number and proportion of female entrepreneurs in the developed countries of world.

Lall&Sahai (2008) conduct a comparative study of multi-dimensional issues & challenges of women entrepreneurship, & family business. They identified Psychographic variables like, degree of commitment, entrepreneurial challenges & future plan for expansion, based on demographic variables and also recognized business owner's traits such as self-perception self-esteem, Entrepreneurial intensity & operational problem for future plans for growth & expansion. Data have been collected from women entrepreneurs working in urban area of Lucknow and suggested that though, there has been significant growth in no of women choosing to work in family owned business but they still have lower status and face different operational challenges in running business. Das (2000) conducted a study on women entrepreneurs of SMEs in two states of India, viz, Tamil Nadu and Kerala and founded that the primary glitches faced by women entrepreneurs are almost alike to those faced by women in western countries. However, Indian women entrepreneurs handled lower level of work-family conflict as compare to western countries. Similar trends are also found in other Asian countries such as Indonesia and Singapore. Founded that statistics showed the percentage of business setup of women and ran by women entrepreneurs is much lower than the numbers found in western countries. So from the above talk about literature it is cleared becoming successful entrepreneurs is a challenging jobs for women due to the various reasons as mentioned above but can be conquered with proper information, support and assistance by the government, family and by the society.

Research Methodology:

The research is empirical in nature and both the primary and secondary data is used for the paper. The primary data is collected through questionnaire and informal interactions with the respondents were conducted in order to gain better understanding of their operations. The secondary data is collected through the review of existing literature related with the topic by using books, magazines, newspapers, journals and research thesis.

Objectives of the Study:

- To know the various influencing factors that encourages women to become Entrepreneurs.
- To investigate various opportunities available for women entrepreneurs.
- To investigate and examine the support given by the government and other agencies to women entrepreneurs.
- > To discuss the problems and challenges faced by women entrepreneurs,

Area of the Study: The area of study has been taken as Jodhpur district of Rajasthan. Jodhpur is the second big city of Rajasthan and is considered as establishing hub for bisiness ventures in the near future.

Data Analysis & Discussion:

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Demographic Profile of the women entrepreneurs:

Out of the 63 respondents taken for the survey 63% belong to the age -group of 33-40 years. Regarding the marital status 59% are married and 41% are not married, 53% have children, 61% have completed their educations up to graduation and only 36% have some kind of the work experience. About the family type 60% are from nuclear families& 40% are from joint family system. 44% are engaged in fashion designing and tailoring and 31% run beauty parlor and re-4 are from Grocery, general stores. 74% have utilized their own funds& capital to start the business while only 26% have borrowed from various sources of which 60% have borrowed from their relatives and only 32% from friends. For 79% percent of the respondents, their business is not the only source of income. The demographic profile of the respondents is given below in Table 1.

Particulars	Classification	Number	Percentage
Age Group	Below 25 years	0	0%
Children and Children	25-32 years	18	29%
	33-40 years	40	63%
	40-55 years	5	7%
L	Above 55 years	0	0%
Marital Status	Married	37	59%
- 0	Unmarried	26	41%
	Widowed	0	0%
	Divorced	0	0%
Children	Yes	34	53%
and the second sec	No	29	47%
Educational Qualification	illiterate	0	0%
Television in the second conversion	Primary school	0	0%
	Secondary School	0 0 8	0%
	High school	8	13%
	Graduate	39	61%
	Post Graduate	16	25%
Work Experience	Yes	23	36%
	No	40	63%
Family Type	Nuclear family	38	36%
	Joint family	.25	63%
Enterprise Type	Fashion Designing & Tailoring interior Designing	28	44%
	Confectionary & Bakery	91	1.5%
	Beauty Parlour	00	0%
	Grocery Shop	20	31%
	Medical & General Stores	7	11%
	Other activities	7	11%
	the second s	0	0%
Sources of Funds	Own Funds only	47	74%
	Own funds & borrowed Funds	16	26%
Sources of Borrowings	NA	5	8%
	Relatives	38	50%
	Friends	20	32%
	Commercial banks	Ö	0%
	Co-operative banks	0	0%
	Financial institutions	0	0%
usiness as Main source of	Yes	13	21%
income	No	50	79%

From the above collected data this has been cleared about the women entrepreneur that both married and unmarried women are pursuing entrepreneurship as their careers, mostly of them are engaged in fashion designing & tailoring and in beauty parlour business. They are using own money or capital as the main source of funds in their venture as compared to other borrowed funds.

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Results and Discussion:

Factors motivating women to become entrepreneurs:

In order to know the factors encouraging the women to become entrepreneurs 15 attributes were identified to analyse for the purpose that can affect their decision to become entrepreneur for women's. The respondents were then requested to express their opinion and views on the influence of those factors on a 5 point Likert-scale. The output of t-test performed to identify the significant factors encouraging women entrepreneurs to start their own business is shown in Table 2.

Motivating Factors			Test Value=	ilue=	
	T	Df	Sig. (2-tailed)	Mean Difference	
Unemployment	-1.728	45	0.000	0.745	
Economic Independence	4.348	50	0.000	0.660	
Market potential	4.245	65	0.000	0.459	
Accessibility of Infrastructural facilities	1,278	45	0.125	0.378	
No other income sources available	1.643	53	0.254	0.854	
To make more income	4.761	34	0.022	0.327	
Gaining control on my life	4.447	37	0.000	0.568	
For self-esteem	5.986	41	0.542	0.287	
Being entrepreneur was a life goal	5.315	52	0.000	0.186	
Freedom from supervision	2.046	54	0.246	0.450	
To spend spare time	2.713	54	0.421	0.247	
Family business passed on to me	0.851	58	0.245	0.774	
Support from family	5.520	60	0.324	0.701	
financial Responsibility	4.293	49	0.124	0.375	
To run business due to death of member	~2.863	61	0.000	0.724	

Table 2: Motivating Factors

The above table shows the factors which are significant for motivating women entrepreneurs. The conclusion rule used to find out the significant factor is t value > o and sigma < .05 from the 15 factors, Accessibility of infrastructure facilities, no other income source available, support from family, to make more income, gaining self-respect from others for skill and talent, freedom from supervision, to spend spare time and financial responsibility are the factors proved to be significant and motivating factors. Hence, the left behind 6 factors namely unemployment, economic Independence, market potential, gaining control on my life, being entrepreneur was a life goal, Responsibility to run business due to death of family member, family business passed on to me proved to be insignificant.

Problems/challenges faced by women Entrepreneurs:

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In direction to know what problems/challenges women entrepreneurs have faced if their journey as entrepreneur are mentioned in Table 3, the respondents were then requested in their opinion and views on the influence of those factors on a 5 point Likert-scale. Department of Managment Studies

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Table 3:F	problems/(Thallenge	25	and outper outpe		
Problems/Challenges	Test Value=					
	T	Df	Sig. (2-tailed)	Mean Difference		
Maintaining work life balance	3.061	44	0.322	0.927		
Non-awareness of Government scheme	23.733	56	0.040	-1.589		
Lack of motivation and confidence	9.653	60	0.014	-0.214		
Lack of leadership qualities	21.503	44	0.056	0.076		
Orthodox family background	10.245	61	0.030	0.359		
Lack of finance	23.733	56	0.040	-1.589		
Fear of failure and criticism	20.002	38	0.624	0.836		
Low risk bearing ability	12.643	50	0.054	1.854		
Lack of proper training	3.012	50	0.633	1.074		
Marketing challenges	-1.028	40	0.500	1.745		

The above table shows the factors which act as a problems and challenges for women entrepreneurs, which they are facing during the journey. The conclusion rule used to find out the significant factor is t value > o and sigma < .05, 6 factors i.e. maintaining work life balance, lack of leadership qualities, fear of failure and criticism, low risk bearing ability, lack of proper training, marketing challenges proved to be significant factors and making it more difficult to be an women entrepreneur. Hence, the other remaining 4 factors namely non-awareness of government scheme, lack of motivation and confidence, orthodox family background and lack of finance were proved to be insignificant factors in the study.

Suggestions and Recommendation:

From the above data it is clear that various factors like market potential, accessibility of infrastructure facilities, no other income source, support from family, to earn more income, gaining self-respect from others for skill and talent, freedom from supervision, to spend spare time and financial responsibility are motivating factors but still most of the women entrepreneurs are of the view that because of lack of training, lack of risk bearing ability and non-awareness of government schemes are the reason for women entrepreneurs to excel more in this field. These hurdles in the way of development of women entrepreneurship can be overcome by making serious efforts.

Some recommendation for these Problems of Women Entrepreneurs in India:

- Training facilities: Government should conduct regular training programmes with regard to new production techniques, sales techniques, etc.
- Financial aid: Finance is the main problem and challenge for women entrepreneurs. Hence, the government can offer interest free loans to encourage and motivate women entrepreneurs in our country. To attract more women entrepreneurs, the subsidy for loans should be increased.

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- Marketing assistance: Marketing co-operatives can be established to inspire and assist to women entrepreneurs. Government should give preference to women entrepreneurs and help them to sell their products on remunerative price in the market.
- 4. Better raw-materials accessibility: The essential, scare and imported raw-materials should be made accessible to women entrepreneurs at priority basis at concessional rate
- Vocational training and Skill development: Vocational training and Skill development programmes by government can enables women's to recognise the production processes, raw material facilities, technical aspects and management etc.
- Proper family support: Due to lack of family support, personal problem and family
 obligation restrict the growth of women entrepreneurs in India and this problem can on y
 be solved by the proper family support to the women.
- Awareness programs: Different institutes and Ngo's can help in the growth of women entrepreneurs in India by giving proper education, knowledge and awareness program about the entrepreneurial opportunities available in the market.

Conclusion:

The changing paradigm for women entrepreneurs is an important part of a changing world today. We cannot ignore the fact that women are making their marks equally in every sphere of business today; women like IndraNoori, FalguniNayar, Richakar, Ekta Kapoor, Shuchi Mukherjee, Nita Iulla, Ritu Kumar,Shahnaz Hussain, JyotiNaik, andIndu Jain have proved it very well by becoming successful women entrepreneurs in different field. Due to the rapid globalization and use of information technology the world is shrinking day by day and the changing domestic atmosphere of families have contributed in the direction of the growth and development of women entrepreneurship in India. From the different studies and review of literature about the women entrepreneurs reveals that aspects such as motivation, available family support system, finance, and market information are the main problems faced by women entrepreneurs in our country. To imp ove the situation of the women entrepreneur an attempts to motivate, inspire and assist women entrepreneurs should be made at all possible levels by the government, by family member and by the society also. Proper training can enhance their level of work-knowledge, market understanding, risk-taking abilities, enhancing their capabilities etc. So we can say that by the proper schemes and efforts by the government we can improve the present condition of the women entrepreneurs in our country.

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AN EMPIRICAL STUDY ON IMPLEMENTATIONS OF PERFORMANCE MANAGEMENT SYSTEM IN PUBLIC AND **PRIVATE BANKS OF JODHPUR**

Ms. Pragati Bhati Research Scholar, Department of Management Studies Jai Narain Vyas University Jodhpur

ABSTRACT: This study emphasizes on Performance management system of banking industries both public (BOB & PNB) and private (Axis and ICICI) banks which explored the performance management of employees by their banks and its relative advantages or benefits for employees and banks both. As Performance management is to promote and improve employee effectiveness. It is a continuous process where managers and employees work together to plan, monitor and review an employee's work objectives or goals and his or her overall contribution to the Banks. This study also focuses on the factors for implementation of the performance management system in Banks for the employees.

The present study both exploratory and conclusive research methods used. The conclusive research method here is descriptive in nature and the research design is single cross sectional. In this study primary data has been collected through the structured questionnaire method. The research was conducted with the help of a questionnaire measuring the perceptions and acceptability by Banks for the employees. The chosen research design mainly emphasizes on the discovery of ideas and development of insight into th subjects under study.

1.1 INTRODUCTION

In the existing globalised era the ever increasing banks pressure has made it compulsory for business to work effectively, effectively and wisely and employ the best business strategies possible. To maintain in the existing day aggressive world they have to draw in, develop and maintain the most skilled and efficient employees.

This improving stress in banks has designed an impounding stress on employees too for their optimal performance. To distinguish themselves from their opponents the organizations are spending improving attention towards the efficiency of their employees that are their "Human Resources".

Typically, Performance Appraisals decided the best and the most severe executing employees through ranking and rating program that formed the behavior of banks towards the staff member for the next ranking period. But over a length the focus has moved away from measuring the output of individuals to their contribution in achieving the overall objectives of the banks with their right skill initiatives and abilities to Head make an amazing impact on bank performance.

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And this has happened with the introduction of Performance Management System. This has enhanced the significance of HR features that earlier concentrated only on recruitment, selection, employment performance appraisals, promotions, compensations, training & development, special offers, settlements and growth. The role of HR has progressed numerous from merely an evaluator to a company to an enabler. Now HR develops a favorable environment for enhancing the performance of employees and provides them the opportunity of taking part in business planning and making decisions. Today all the major act vities of HR are impelled towards growth of high executing management and promoting employees inspiration and motivation.

According to Armstrong and Baron 1998 "A performance management system is a useful framework for companies to use to communicate important messages to their employees. It can be used to accomplish number of different functions; as a method of communicating business goals; determining growth specifications, enhancing individual and group leadership, planning for future years and the measurement of results and outcomes.

Beardwell et al (2004) also recommend that individuals who know exactly what is expected of them will perform better than those who are unclear about their goals and objectives.

1.1 CONCEPTUAL FRAMEWORK

Performance Management is basically an evaluative tool for performance measurement of empk yees for accomplishment of strategic organizational goals and objectives. This helps employees to know and understand the expectations from them and evaluate whether they possess those skills and abilities to meet those expectations or not.

The goals of an organization should stream down from top to bottom describing what the organization is eager to achieve and the role of its employees in achieving those goals. This develops an understanding amongst the employees that how their actions and behavior help in accomplishment of strategic organizational goals and the importance of it. Performance Management is not just another word to replace Performance Appraisal; it is much more than that. Performance Management is a wide term that combines purpose setting, regular reviews and feedback, performance evaluation to assess individual performance and evaluating the need for further development. It also leaves an opportunity for career planning and talen: management.

According to a survey mentioned in CIPD paper (2009) performance Management is seen as a vehicle for developing employee engagement and focuses on developing a positive relationship between individuals and their managers. If individuals have clarity of their roles and how to contribute a organizational objectives they are more likely to be committed to what they are doing.

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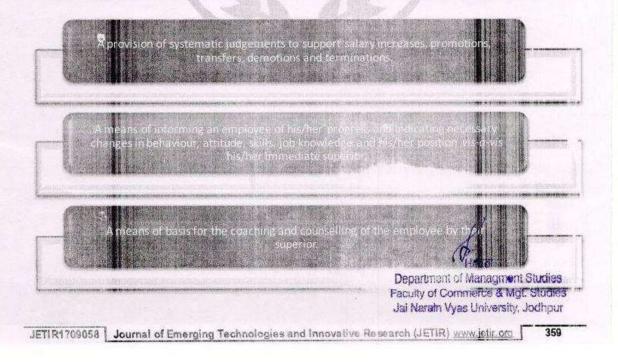
According to **Oracle white paper June 2012** in today's do-more-with-less economy it is more significant and important than ever to develop high-performance teams. The key is to maximize team impact through effective utilization and of each person's unique talents to achieve strategic business goals. PMS is the hear⁴ and soul of managing people and it involves goal planning and tracking, performance assessment, ongoing coaching and reward and recognition activities.

As said in CIPD Factsheet "Overall, performance management is about establishing a culture in which individuals and groups be responsible for the ongoing enhancement of business procedures and of their own skills, behavior and contributions. It is about sharing expectations. Managers can clarify what they expect individuals and teams to do; furthermore people and categories can connect their objectives of how they should be handled and what support and sources they need to do their tasks".

Thus, "Performance management is about maintaining and improving the quality of relationships – between managers and employees, between managers and teams, between members of teams and so on – and is therefore a joint process. It is also about planning, through defining expectations expressed as objectives and in business plans, and about measurement; in the words of the old dictum, 'If you can't measure it, you can't manage it'. It should apply to all employees, not just managers, and to teams as much as individuals. It is continuous and holistic process".

Performance depends on association as well as the individual. If there is ambiguity in performance, the organization's mission, goals, objectives and policies and the individual's goals, skills and efforts and knowledge are to be responsible jointly. It creates accountability on individuals of their actions.

Douglas McGregor sets out functions of an organization's performance Management System as



1.2 DEFINITION OF PERFORMANCE MANAGEMENT

The institute of **Personnel Management (1992)** given a definition. "A technique which associates to every activity of the organization set in the context of its human research on style, and interaction and communication systems. The nature of the technique relies on the pective and tan vary from organization to organization".

Performance Management mainly focuses on the following

Improvement in organizational performance by focussing on the desired and reducing the gap between actual and desired goals, that is only possible with the feed forward process.

A constructive feedback so as to identify the training and development needs and supporting their professional development

Motivating the employees to improve their engagement and efficiency incentives to retain the top performers

Improving employee accountability for the work assigned to their

Dealing with the weak performers proactively through reinforcem behaviour.

Performance Management is not only concerned with achiever strategic goals but it also focuses on employee development. dialogue between the team and its managers. Performance Moremployees do, how they do it and what are the outcomes. tion's objective and building a culture of

sses as to what the

1.3 REVIEW OF LITERATURE

1.3.1 Performance Appraisal

Eichel ard Bender (1984) stated that performance evaluation can heel of management. Although management of many public o employee centered or employee based, a lack of focus is given to member in achieving both personal and organizational goals.

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Cascio (1998) described performance appraisal is a procedure efficiency by assisting them recognize and use their full

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ake an effort to be ant to assist the staff

employee's perform

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organization's tasks and to provide information to employee perform related decisions. He goes on to determine performance observation and judgment, a feedback process and an organizational

1.3.2 Performance Appraisal in Indian Banks

Choudhary (2008), banking services is one sector where a 2 Performance Appraisal Systems. Several of the public sector banks (the procedure for modifying and changing them.

Zhang (2009) suggested that in banking industry, employees' prelationship to their overall contentment and satisfaction with both results and its outcomes. However, statistically significant different whether employees had received training in performance appraisal or

According to Bhatia (2010) The performance appraisal or evaluatio the person and those focused on their efficiency in the lender, mos get together to participate in a discussion about the individual's needed from the administrator. It should not be a top down procedur ask concerns and the other to react. It should be a free streaming opinions are exchanged.

According to Shrivastava & Rai (2012) "Banking sector is a fas quick development in the variety of divisions and the new features as a new stress on their organizational capabilities i.e. the procedures promotion and appraisal, in order to ensure that the employment, p evaluation, to make sure that the right variety of employees with the right time and for the right places. They also suggested that appr business ability which is also the main concentrate of this surperformance appraisal is an analysis of employee's recent act strengths and weaknesses, and suitability for promotion or further to

1.4 RESEARCH GAP

Above review of literature showing that many authors have been management system, performance appraisal in various public and prino one has done their study on IMPLEMENTATIONS OF PEI SYSTEM IN PUBLIC AND PRIVATE BANKS OF JODHPUR

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s for use in making om as an exercise i

test is being paid to diffed their PAS or in

ustice has a positive bee appraisal process, and in next of kin to

ally the possibility for line administrator - 1 th and the assistance dity for one person to 1 which a variety of

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tudy on performance ven in banks too. Bu E MADAGEMENT Head

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So this study will try to cover the gap of performance management with their comparative study, on specifically banks of Jodhpur in Raj.

1.5 OBJECTIVES OF STUDY

Performance management can be used as a powerful tool to achiev PMS is rarely understood well in organizations, let alone its imple especially when the measures have to be percolated to the lower level

The objectives of this study are:

- To determine whether the employees and managers share implementation of PMS in Banks.
- 2. To get the obstructions, if any, and recommend remedial action

1.6 RESEARCH DESIGN

This study emphasizes on Performance management system of private banks which explored the performance management of relative advantages or benefits for employees and banks both, promote and improve employee effectiveness. It is a continemployees work together to plan, monitor and review an emplohis or her overall contribution to the Banks. This study also focus the performance management system by the adoption of Banks 1-

The present study both exploratory and conclusive research me method here is descriptive in nature and the research design is primary data has been collected through the structured questic conducted with the help of a questionnaire measuring the percepthe employees. The chosen research design mainly emphasizdevelopment of insight into the subjects under study.

1.7 SOURCES OF DATA COLLECTION

Data has been collected from the tow public and two private banks given below.

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lic and private banks

employee motivation. high faces challenges

understanding about

stries both public and y their banks and its ice management is to where managers and ojectives or goals and ors implementation c⁻⁹ cs.

e conclusive research ectional. In this study id. The research was ptability by Banks foicovery of ideas and

List of the banks has

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Table 1: Names of Banks Chosen for the Study Purpose

1.	Bank Of Baroda (BOB)
2.	Punjab National Bank (PNB)
3.	AXIS
4.	Industrial Credit And Investment Corporation
	Iadia Bank (ICICI)

Source: Author's Compilation

For collecting data from respondents' convenience sampling procedur it is taken care of that responses are collected from only those responnecessity of the research, and can interpret that any of the fruitful out. by more supervised advertisement content without misleading dissemination. One of the major issues was under consideration while the respondents should be aware about the services offered by perforbanks.

For the purpose to analyze the perception of respondents about the pethe factor influences them to measure by their banks of total of 10? the respondents in Jodhpur Rajasthan state of India. Out of total 1' were distributed in public sector banks (BOB and PNB) and remain and ICICI). This sample size is good enough by which the cicc respondents and even will be very helpful for analyzing the relation demographic factors of respondents.

1.8 RESEARCH HYPOTHESIS

For the purpose of analysis various hypothesis have been formulated to a types of banks and factors of PMS (Performance Management System) m

Hypothesis between types of banks and Performance management sy

- Ho1: The Axis and ICICI banks do not implement performance ma and PNB banks.
- H11: The Axis and ICICI banks implement performance manager PNB banks. De

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Under this procedure able to understand the initely benefited then type of information respondents was that ment system and their

inagement system and es were distributed to ires 50 questionnaires ite sector banks (Axis out the perception of een the adoption and

lationship between the

stern/better than BOIs

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H ₀₂ :	The Axis and ICICI bank's performance management system (BOB and PNB banks.	more successful than
H ₁₂ :	The Axis and ICICI bank's performance management system (P and PNB banks.	successful than BOB
H ₀₃ :	The Axis and ICICI bank's performance management system BOB and PNB banks.	t more effective than
H ₁₃ :	The Asis and ICICI bank's performance management system () and PNB banks.	e effective than BOB
H ₀₄ :	The Axis and ICICI bank's bonus system is not more effective t	1 PNB banks.
H14:	The Axis and ICICI bank's bonus system is more effective than	™B banks.
H ₀₅ :	The Axis and ICICI bank's performance management follow-up PNB banks.	t good than EOB an d
H ₁₅ :	The Axis and ICICI bank's performance management follow- PNB banks.	is good than BOB and

1.9 ANALYSIS AND INTERPRETATIONS:

	The second se	and the main		- Internet	
		N	Mean	Std. Dev	i. Error
Implement PMS	Public	50	2.375	0.218	.0265
	Private	50	2.375	0.249	0.0135
	Total	100	2.375	0.244	012
PMS Succeed	Public	50	2.205	0.248	13
	Private	50	2.16	0.2635)145
	Total	100	2.165	0.261	0.013
Effectiveness PMS	Public	50	2.13	0.2385	0.029
	Private	50	2.095	0.2535	0.014
	Total	100	2.1	0.251	0.0125 Hear studies
Bonuses	Public	50	2.215	0.2635	0.0125 Head 0.032 Head Department of Managment Studies Department of Managment Studies Faculty of Commerce & MgL Studies Faculty of Commerce & MgL Studies
	Private	50	2.19	0.272	0.032 no Martagn Department of Martagn Paculty of Commerce & Mgt. Sudie Faculty of Commerce & Mgt. Jodhpu Jai Narath Vyas University, Jodhpu
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Table 1:- Descriptive table of type of banks with factors of PMS

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	Total	100	2.195	0.2705	0.0135
PMS Follow-up	Public	50	2.005	0.183	0.022
	Private	50	1.985	0.1775	0.0095
	Total	100	1,99	0.1785	0.009

Source: - Primary Data

Table 1 is showing the descriptive analysis of five parameter of Performance management system in public and private sector banks, higher mean values represents wider scope of performance management system in banks.

Table 2:- Test of Homogeneity of Variances

de estado en la construcción de la constru	Levene Statistic	dfl	df2	Sig
Implement PMS	0.011	1	48	0.441
PMS Succeed	0.5565	1	48	0.0145
Effectiveness PMS	0,61	1	48	0.135
Bonuses	0.2455	1	48	0.024
PMS Follow-up	0.19	1	48	0.269
and the second sec	and the second second second second		the surface of the second	

Source: - Primary Data

Table 3:- ANOVA table for types of banks and factors of PMS

		Sum of Squares	df	Mean Square	F	Sig.
Implement	Between Groups	1.023	NI CONTRACTOR	0.2	1.626	0.012
PMS	Within Groups	45	48	0.123		
	Total	46.023	49		1	
PMS	Between Groups	0.515	1	0.2575	1.893	0.014
Succeed	Within Groups	108.263	48	0.136		
	Total	108,777	49		1	
Effectiveness	Between Groups	0.317	1	0.1585	1.258	0.023
PMS	Within Groups	100.28	48	0.126		0
	Total	100.598	49	1	1	En
Bonuses	Between Groups	0.141	1	0.141	0.481	0.043 _{ead}
	Within Groups	116,569	48	0.293		n' ci Managment Si
	Total	116.71	49			Commerce & Mgt. 5 Vyas University, Jo

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PMS	Between Groups	0.113	1	• 0.113	0.89	0.004
Follow-up	Within Groups	50.684	48	0.127	in Paragooni	
	Total	50,798	49		-	

Source: - Primary Data

Levene's Test for Equality of Variance is performed to test condition that the variances of both samples are equal or not. A high value results normally in a significant difference, but in Table 1 result significant, which could be interpreted as no equal variance.

In the Table 2 the variation (Sum of Squares), the degrees of freedom (df), and the variance (Mean Square) are given for the inter and intra groups, as well as the F value (F) and the significance of the F (Sig.). Sig. indicates whether the null hypothesis – the population means are all equal – has to be rejected or not.

Table 3 shows reasons for PMS implementation in banks significant value is 0.012, which is less than p value (0.05) so reject the null hypothesis and accepts the alternative hypothesis which shows that the Axis and ICICI banks implement performance management system better than BOB and PNB banks.

PMS success have a significant value is less than p value $(0.014 \le 0.05)$ so accept the alternative hypothesis which shows that the Axis and ICICI bank's performance management system (PMS) is more successfithan BOB and PNB banks.

Effectiveness of PMS have a significant value which is less than equal p value (0.023 < 0.05) so reject the null hypothesis and accept the alternative hypothesis which shows that The Axis and ICICI bank's performance management system (PMS) is more effective than BOB and PNB banks.

Parameter Banks pay bonus to the employees, have a significant value which is less than p value (0.043 < 0.05) so accept the alternative hypothesis The Axis and ICICI bank's bonus system is more effective than BOB and PNB banks.

Parameter PMS follow-up system, have a significant value greater than p value (0.004 < 0.05) so accept the alternative hypothesis which shows that The Axis and ICICI bank's performance management follow-up system (PMS) is good than BOB and PNB banks.

CONCLUSION

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Banks are one of the most consequential part of any nation. In this comemporary time money and its indispensability is very vital. Designed Developed Banls/financial systems of the country make sure achievement of monetary development. Today's bank provides useful solutions to a country. To obtain economical as well as other development there should be a nicely developed financial system to make sure not only the financial development but also the overall development of the community. Banking services ar:

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one of the areas where a great level of attention is being paid on Performance Management Systems. Several public sector banks have transmuted their PMS or are in the process of modifying them.

As of now it banks have completely accepted and embraced the fact that PMS is one of the most crucial responsibilities of their HR Managers, if implemented correctly; performance management can result in numerous important outcomes for their banks, its managers and employees.

PMS can support remunerations decisions, promotions & transfers, employee development & training etc. Effective PMS have well defined process for evaluation of employee productivity, with predefined roles for both the managers and employees. In the banks where Performance Management is used as a basic tool for compensation and other important HR decisions it is critical to ensure that all employees are treated in a fau and equitable manner.

By the analysis it was identified that today's employees are very conscious about the evaluation pattern of PMS so they wants to know each and everything related to the process, nature and implementation of PMS. These entire variables are very significant in term of persuasion.

SUGGESTIONS

Administrative capabilities acts as a strategic tool for improving the service quality of banks in ærms of employee's satisfaction, reduction in complexities to understand their PMS, accessibility of PMS plays a significant role. So that administration of banks should focus on following issues:

- Administration and Top Control should organize proper two way interaction regularly, the overall training, training to employees, not only to understand the means of applying Performanc Management System but also to build up believe in about the effectiveness and credibility of the plan.
- 2. An evaluation procedure, which focuses on actual accomplishment rather than on style or personality, it may be described based upon the evaluation on decided goals, by making the employs interview itself as an open, two-way procedure and appealing employees to play a role in self appraisal.
- The performance is also required to be assessed based on the pre-agreed objectives. Personal biasness while evaluation, may greatly affect the employees objectivity.
- Managers should evaluate the performance of employee very fairly and should not have any fear in mind, of loosing valued subordinates.

5. Managers must appreciate the good performance of employees, in order to boost his/her morale and maintain the same for next years.

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- Managers must possess positive and constructive attitude, which allows him to perform the Performance Appraisal activity seriously.
- Approach of managers should also be very objective, transparent, and open to change and task based.
- The basic aim of Managers or Administrators should be to develop an overview of the functions under him and identify employees and areas for improvement, with the help of Performance Management System.

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IMC AS A STRONG MARKETING TOOL FOR TELECOM COMPANIES

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ABSTRACT

This study emphasizes on the customer perception for the integrated marketing communication practices by telecom companies, services which they are using for themselves for their own benefits and requirement. The purposes of integrated marketing communication should be to maximize customer delivered value and it should be in such a way that it completes or fulfill every individual in one or the other way. Integrated marketing communication plays a very important role to develop the ability and capacity of firm to innovate and in successfully delivering competitive response through value added offering to their customers so that they are attracted more in numbers.

For the present study both exploratory and conclusive research methods were used so to get the perfect result to be come out from this research. The conclusive research method here is descriptive in nature which clearly describes the individual customer requirement and how to satisfy their need of the time and the research design is single cross sectional. In this study primary data has been collected through questionnaire method, in which the individual are the general people who has filled the questionnaire. The research was conducted with the help of a questionnaire measuring the perceptions and acceptability of integrated marketing communication of telecom companies according to the customer who will be the user of the future and are the user of today. The chosen research design mainly emphasizes on the discovery of ideas and development of insight into the subjects under study for the overall benefit of the entire customer individual to meet their requirement of the today's need. Hence can be said it could be beneficial for the individual on one side and can be beneficial for the company and can raise the economy of the country and can lead to the development of the nation as a whole.

Key words: - IMC, Customer Perception, Integrated Marketing Communication Aretices, Telecon Companies, Services, Digital/Interactive Media etc.

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INTRODUCTION

Integrated Marketing Communication (IMC)

The American Marketing Association (2014) defines Integrated Marketing Communications (IMC) as "A planning process which is designed to assure that all brand contacts received by a customer or prospect for a product, service, or organization are relevant for that person and consistent over time and it will be productive in future."

The IMC planning process has been compared with composing a musical score. In a piece of music, while every instrument has a specific task, the goal is to have them come together in a way which produces a melodious music. It's the same in IMC, where advertising might be your violin, social media your plane public relations your trumpet and so on and hence the result could be effective and desirable.

• Why IMC?

Five major shifts or changes in the worlds of advertising, marketing and media have caused an increased interest in (and need for) IMC. These include:

A shift From	To
Traditional Advertising	Digital/Interactive Media
Mass Media	Specialized Media
Low Agency Accountability	High Agency Accountability
Traditional Compensation	Performance-Based Compensation
Limited Internet Access	Widespread Internet Availability

Source: - http://imc.wvu.edu/about/what_is_imc

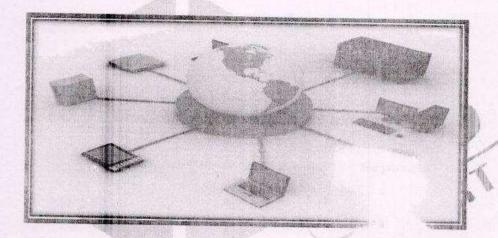
According to encyclopedia IMC, The first definition for integrated marketing communication was coined from the American Association of Advertising Agencies(also 4A's) in 1989, defining IMC as "an approach for achieving the objectives and goals of a marketing campaign through a well-coordinated and wellorganized use of different promotional methods that are intended to reinforce each other (Business Dictionary Online, 2014). "The 4A's definition of IMC recognizes the strategic roles of various communication disciplines (advertising, public relations, sales promotions, etc.) to previde clarity, consistency, and increased impact for the result to be delivered when combined within a comprehensive communications plan. Basically, it is the application of consistent brand messaging across both various traditional and non-traditional marketing channels.

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OVERVIEW OF TELECOM SECTOR

Globalization, liberalization and privatization are the three most spoken words in today's world. These initiatives paved way for all-round reforms and changes being made, especially in developing econom. country, like India. All these countries who are still developing realized that development of effective and efficient means of communications and information technology is important to push them onto the path of development and can make them stand among the developed one. The growth of the telecom sector in India during post-liberalization has been phenomenal which can be visibly seen. This study aims to throw light or the factors that contributed to growth and development in this segment and presents an insight on the present status of the telecom industry in today's scenario as its playing a big role in marketing.



As by the report of Department of Telecommunication M Technology Government of India New Delhi (Report 2012-20) one of the basic amenities of infrastructure like electricity, roads, we the critical components towards the economic growth required f the country and for the betterment of the citizen. The Indian expressive growth during the last few years and has become after China. A series of reform has been measured by the Goveparticipation of private sector has played an important role in the the country for the overall development. National Telecom Policy the current financial year with the primary objective Head

ion and Information ations has evolved as iso emerged as one of comic development of stered a phenomenal aetwork in the work schoology and active of telecom sector in was announced during

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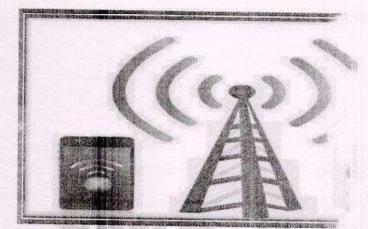
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ure across the entire

telecommunication and broadband services available, affordab country by which these citizens are mostly benefitted.

Present Status:-

In the last decade, the Indian telecom sector in general and mophenomenal growth as compared to previous decades and people 2014, out of the 938 million connections in the country,910 n use of the cell phone and wireless communication devices has across the whole country to prevent any disruption to communication



ec.europa.eu

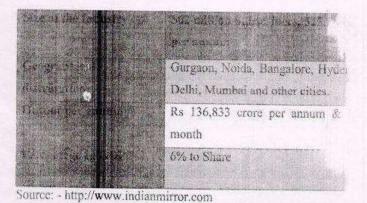


Table 1.1:- Status of INDIAN TELECOM INDUSTRY

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ticular has witnessed if of these. As on May popularity and proper tration of cell towers people.





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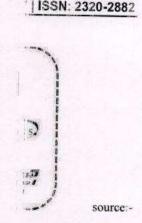
http://www.indianmirror.com

According to the Current report of Indian Mirror 2014 the . and 5th largest industry in the world with 110.01 million con a 40% in 2005 and has reached the expectations of 250 million in 20 two out of every three new telephone connections are wireless. C accounts for 54.6% of the total telephone subscriber base, ar subscriber has grown to 2.5 million new subscribers every in to use and more comfortable with.

The wireless subscriber base skyrocketed from 33.69 million in 2 be seen. The wireless technologies currently which are used System for Mobile Communications (GSM) and Code Divi presently has 9 GSM and 5 CDMA operators providing mobile se 4 metro citie: covering more than 2000 towns across the countr growing for Indian Telecom Industry day by day. Telecom Indu Regulatory Authority of India (TRAI). It has been able to ear competence by their own efforts and they will prove this Industry community has three types of players (Blog- Indian viat

REVIEW OF LITERATURE

Venkatram (2012) "The Telecommunications industry toda economies and societies of the world. The Telecom indu towards the economic activities of countries, but also towards the overall growth of individual. In recent times, developing in transformation within this sector due to the impact it has le



is the fastest growing er base has grown by it was found out that 7's time wireless now 1% in 2003. Wirelet mer feel it to be easy

in 2005 and even can in Industry is Globa DMA). The industry nunication circles and ity numbers are still lated by the **Telecom** its transparency and it than this. Telecom

F productivity across gnificant contributor lustrics along with the nesset a significant esH3ac booming and Department of Managment Studies Faculty of Commerce & Mgt. Studies Jai Naratn Vyas University, Jodhpur

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emerging economies of China and India have been impacted the me industry in the past decade comparatively than the past and enorm

According to **Pritish and Saxena** (2015)"The Telecommuniand leading industries among the other companies of the w parts of the people of the country through various modes like tele internet and made their communication an easy one. The Teleco this industry by providing a regulatory framework and favorable even sees to it that it is beneficial for every individual. The 'largest in the world due to its rapid advancement and has made cut-throat competition with the telecom industries of the other of a will be above all in the world. The telecommunication service accessible at affordable prices to the customers of urban and rura more and more to fulfill their requirement. India's telecom ne unique technology in the world so far it is concern".

Schultz (1993) defined IMC as a concept of marketing comevaluate strategic role of different communication discipline to greater impact for individual and try to find out that it should be in eve

According to **Percy et al.(2001)** planning and execution of all in a same way to meet the objective of telecommunication for die individual of rural or urban. Process of producing and applying the dif all individual development and the probability to have its impact in futuprocess starts with the customer and aims to fulfill their requirements the methods and forms to develop the influential communications belonging from rural or urban (Schultz, 1993).

Each strategy of telecommunication has its own importance which can be strong impact of such strategy which are made for people. IMC is supadvantages for many organizations (Kitchen and Schultz, 2001; because sales and profit can be increased while saving the time, pl and hence so much of time of individual is saved and it's a saying that the saving time(Smith, 2002). nowth of the Telecom

a is one of the vast connecting different evision, satellite and rity of India governs ifficient operation and stands as the secondiore simpler and is in es and in coming time industry are easily ience people are using highly developed an d

ng that combine and rity, consistency and

inications are require lepting in mind every nication programs for ig time, overall IMC fetermine and definivery individual either

om the resulte and has as a key competitive 2001, Smith, 2002) css by applying IMC we can save money by Head

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Naeem, Bilal and Naz (2013) "Integrated marketing communication (IN very large scale as it is very much in demand. This paper is reviewed to is IMC, its impact and the difference betweenIMC and traditional ma could prove out to be more beneficial. Integrated marketing communica rather than organizational oriented which focuses on organizational need for the welfare of customers. IMC is performed in a manner of synergy for all.IMC is associated with some positive results like brand aware loyalty, positive brand image, unique brand association, greater protsavings and hence more number of customer are avail its benefit. IMC 1 performance and brand equity and for the individual. There are some bar of IMC program which need to be identified and overthrown out".

According to Valeecha& Reza (2013) "Advancement in technology the purpose of communication which was the connection between emergence of new communication channels based on interne communication is same although the method requirement is new due to have fashioned bold new approaches in the management of the concept more popularize among all and make it spread to every corner c i.e. "social media" has come to the front line of media that allow comj on a level never before thought possible which is made possible now . explore and analyze how social media is helping Telecom brands i and how consumers perceive or respond to it and how much they ar about it , whether the response by them is positive or negative. Conseque those factors which are critical for its success. The results confirm the be at the heart of any social media strategy and to successfully exploit i need hard to design experiences which deliver tangible value in retained endorsement and data".

RESEARCH METHODOLOGY

This study emphasizes completely on the customer perception and the marketing communication practices by telecom companies the services w The purposes of integrated marketing communication should be to maxiit should be in such a way to satisfy the customer's need. Integrated mar important role in the ability and capacity of the firm to innovate and Bepartment of Managment Studies

cacticed worldwide at inderstanding of what unication and which ner oriented approach ver customer oriented n isolation, beneficial er satisfaction, brand eased sales ind cost oact on organizational essful implementation

ears has transforme nd encouraged the gy but the concept of nent of the era, that nix to make the nev "new" phenomenon inect with customers c of this study is to ster communication after coming to know us is on identifying elevant content should " r capacity; companies mers' time, attention

out for the integrated using for themselves delivered value and Quication plays a very Headvering competitive Faculty of Commerce & Mgt. Studies Jai Narah Vyas University, Jodhpur

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omers and can attract

for achieving proper

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mability of integrated

ily emphasize on the

response through value added offering for their customers, hence can satis more number of customers by doing so.

For the present study both exploratory and conclusive research method result. The conclusive research method here is descriptive in nature and a sectional. In this study primary data has been collected through questions conducted with the help of a questionnaire, measuring the perceptions marketing communication of telecom companies. The chosen research discovery of ideas and development of insight into the subjects under stud

SAMPLING PROCEDURE

Name of the telecom companies which was used for the data collection ab marketing communication are given below.

Table 2: Names of telecom companies Chosen for the Study Purpose

S. No	Name of the Private Telecom companies	
1	Airtel	
2	Vodafone	
3	Reliance	
4	BSNL	

Source: Author's Compilation

For collecting data from respondents' convenience sampling procedur

OBJECTIVES

 To study the impact of the perception of various demographic factor. Communication and whether they are satisfied with the services give required to fulfill their satisfaction need.

Integrated Marketing nem and what all are Head

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lowed.

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owledge of integrated



arch.

RELIABILITY FOR DATA COLLECTED

Reliability coefficient test was done by using Cronbach's alpha (α) analysis. In order to measure the reliability for a set of two or more constructs, Cronbach's alpha is a commonly used method where alpha coefficient values are ranged between 0 and 1 with higher values indicating higher reliability among the indicators.

Table 4: Reliability Statistics for the responses of customer of Telecom Industries

N. CT.
N of Items
20

Source: Author's Compilation

From the above **Table 4** it could be interpreted that Cronbach value for the responses of the 100 customer respondents study was found to be 0.921, which is an excellent demonstration of the quality of data and confirms approx 87.4% reliability of the collected data.

Cronbach's α (alpha) is an important psychometric instrument to measure the reliability of the data. The reliability coefficient indicates that the scale for measuring trust and commitment is reliable. So, various statistical tools can be applied and tested.

ANALYSIS OF RELATIONSHIP BETWEEN DEMOGRAPHIC VARIABLES AND IMC RELATED VARIABLES

This part of analysis gives the level of agreement of respondents with integrated marketing communication

H₀₁ :- There is no significant difference between the opinion of male and female towards the IMC as a strong marketing tool for telecom companies.

 H_{11} :- There is significant difference between the opinion of male and female towards the IMC as a strong marketing tool for telecom companies.

Table 5

Gender	Mean	N	Std. Deviation
Male	2.35	66	1.23 1.23 1.23 1.23 1.23 1.23 1.23 1.23
Female	3.24	34	1.23 4 4 4 C
Total	5.59	100	1.955

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 Table 5 shows that mean value for male is 2.35 and for female is 3.24 among 66 respondents as male and

 34 as female out of total 100 respondents. The std. deviation for male is 1.23 and for female is 0.725.

			Sum of Squares	df	Mean Square	F	Sig.
Cagg * Gender	Between Groups	(Combined)	2.542	1	2.542	2.6702	0.082
	Within Gro	oups	182.56	98	0.952		
	Total		185.102	99			

Table 6:- ANOVA Table

In the Table 6 the variation (Sum of Squares), the degrees of freedom (df), and the variance (Mean Square) are given for the within and between the groups, as well as the F value (F) and the significance of the F (Sig.). Sig. indicates whether its null hypothesis or not- the population means are all equal or not- has to brejected or not. As you can see, there is a significant difference between the two Mean Squares (2.542 and 0.952), resulting in a non significant difference (F = 2.6702; Sig. = 0.082). The Sig. value is higher than the Sig. level of 0.05. This means that H_{01} must be accepted which states that there is no significant difference between the opinion of male and female towards the IMC as a strong marketing tool for telecom companies. Means that the table is signifying acceptance of IMC as a useful marketing tool.

 H_{02} :- There is no significant difference between opinions of various age groups of respondents towards the 'MC as a strong marketing tool for telecom companies.

H₁₂:- There is significant difference between opinion of various age group of respondents towards the IMC as a strong marketing tool for telecom companies.

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Age * agg	100	100.0%	0	0.0%	100	100.0%

Table 7:- Case Processing Summary

 Table 7 shows the case processing summary of various age groups and that the total number of observation was 100.
 IMC related variables that the total number of observation was 100.
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Table 8:- Cross tabulation

Age *	agg Cross t	abulation					
Count		the second second	16162559	******			
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Age	15-25	6	9	23	10	3	51
	26-40	2	12	18	7	2	1 11
	41-55	0	0	4	2	1-	0
Total		8	21	45	19	7	100

Above Table 8 illustrates that out of 100 respondents 8 respondents are those who strongly agreed and in this 6 fall under the age group of 15-25 and 2 fall under age group of 26-40, while 21 respondents agreed in which 9 were of age group between 15-25 and 12 were of age group between 26-40, while 45 respondents were neutral for this ,do not showed any deviation in which 23 fal under age group between 15-25, 18 respondents fall under age group between 26-40 and 4 fall under the age group between 41-55, while 19 respondents were disagreed in which 10 were from the age group between 15-25, 7 were from age group between 26-40 and 2 were from age group between 41-55, while 7 respondents were strongly disagree for this in which 3 were from the age group between 15-25, 2 were from age group between 26-40 and 2 were from the age group between 15-25, 2 were from age group between 26-40 and 2 were from the age group between 15-25, 2 were from age group between 26-40 and 2 were from the age group between 15-25, 2 were from age group between 26-40 and 2 were from the age group between 15-25, 2 were from age group between 26-40 and 2 were from the age group between 15-25, 2 were from age group between 26-40 and 2 were from age group between 41-55 and hence can be concluded that the major portion of the customers respondents are neutral between the relationship of IMC and age. Maximum respondents are between 15-25 age groups out of 100 respondents.

Table 9:- Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23.822ª	10	0
Likelihood Ratio	24,526	10	0
Linear-by-I inear Association	7.021	1	0
N of Valid Cases	100		

From the above **Table 9** it could be interpreted that Asymp. Sig. (2- Sided) column values are less than .05 which shows that the relationship between the different age groups and IMC related variables average score of customers respondents is statistically significant. So it could be understood that there is significant difference between age and IMC as a strong tool of marketing.
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Table 10:- Symmetric Measures

		Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig
Interval by Interval	Pearson's R	0.132	0.068	3.214	.002°
Ordinal by Ordinal	Spearman Correlation	0.125	0.072	2.135	.019 ^c
N of Valid Ca		200			
a. Not assumin	g the null hypothe	sis.	••••••••••••••••••••••••••••••••••••••	han an a	1
b. Using the as	ymptotic standard	error assumin	ng the null hypot	herie	
c. Based on no	rmal approximatio	with about in	ig the null hypo-	nesis.	

From the above **Table 10**it could be interpreted that the value of Approx Sig. columns shows the relationship between the average score of customer's response and IMC variables are positively significan. Observation was performed by Pearson's and Ordinal by Ordinal analysis which was performed by Spearman Correlation at different intervals. Correlation was found positively significant by observed values, like for Pearson's it was (0.068) and for Spearman it was (0.072). Their Approx Sig. value for Pearson's R was 0.002 and for Spearman Correlation was found 0.019.

CONCLUSION

From the research and statistical analysis done on the data collected through questionnaire we can easily conclude that there are significant differences between the gender and IMC practices adopted by the selected telecom companies and there is significant difference between various age groups of respondents and IMC practices adopted by the selected telecom companies.

Thus the awareness about the IMC term and related practices among the respondents is not same as for the respondents of different categories like gender wise as male and female wise. Means these demographic variables or gender discrimination significantly affect the IMC related practices by telecom companies and it's really an important thought. It also implies that maximum respondents are satisfied that IMC is leaving good impact on marketing and advertising and hence general people are not facing so much of problem regarding telecom companies.

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SUGGESTIONS FOR CUSTOMERS USING TELECOM SERVICES

Following issues should be administered or taken care by the customers for successful implementation of Integrated Marketing communication development of methods implementation in telecom activities for better results.

- 1. Customer must be curious to make himself literate to avail the new trends of telecom services.
- 2. Customer should ask for help as and whenever they feel or they face any type problem in any kind of telecom activities or services.
- 3. Customer should follow the guidelines which are supervised for them to avail any telecome companies' service, the services which they are using or any other services if required feel free to suggest.
- 4. Positive participation in development of IMC related practices in telecom companies and feel free to give feedback for further positive changes if required.

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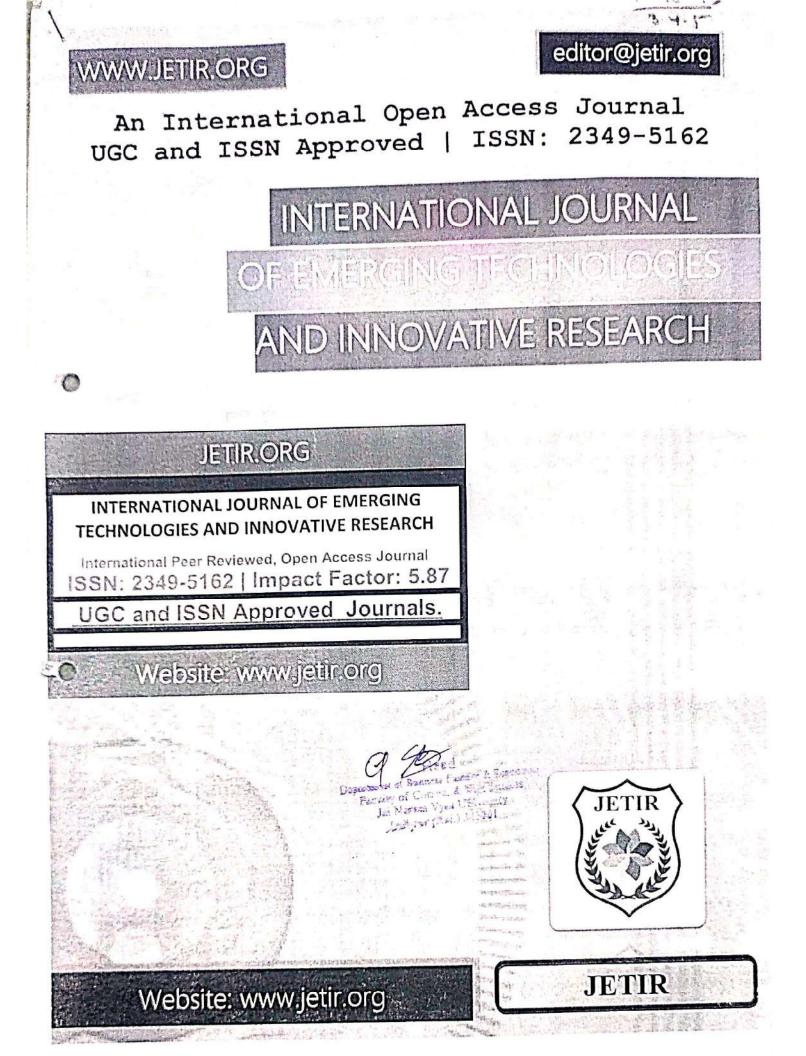
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AN ANALYSIS OF COMMERCE EDUCATION IN INDIA

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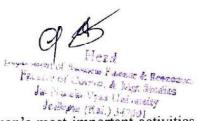
Abstract

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Indian education system is one of the most significant factors contributing to the economic development of India and Commerce education is considered as one of the popular career options for youths in India. It is the backbone of Economy, trade and industry. This type of education focuses on developing people to make optimum utilization of available resources. The present paper is an attempt to highlight the issues and challenges before commerce education in India. Since last two decades a numbers of changes and developments have taken place in the social and political arena and as a consequence, India being a developing country is facing new challenges to cope with, which put high demand on the educational system of the country.

Key words: Commerce Education, Higher Education, Business Education, Indian Education System, Education System.

Introduction



Throughout history, education has been one of man's most important activities. In fact, man cannot carry on government, family life, religion, or earn a living without some sort of education. Education includes all the ways in which one person deliberately tries to influence the behaviour of another person. Informal education involves learning from people such as family and other agencies in the social and physical surroundings. This type of education is incidental and not deliberately planned. Formal education is consciously planned. It is

important through the process of formal instruction given by teachers in such institutions as schools and colleges. The fate of Commerce Education in India has changed in the last one and a half decades. In fact, Commerce Education started with a view to prepare the manpower requirements of the industrial world at large. As a field of study, Commerce Education is almost a century old. It was first started in India in the year 1889. In the pre-independence era, it was treated as a centre for attraction with limited objectives of providing clerical and accounting personnel with an emphasis on training in typewriting, shorthand, letter writing and business methods which ultimately widen due to the growth in trade, commerce and industrialization and then became a part of the main stream of higher education in India. But in the context of rapid expansion and innovation of the business system coupled with competition in higher education, the importance of commerce education as a field of knowledge is degrading day by day

At present India is in a juncture of evolution involving social, cultural and economic changes etc. On one hand, the number of employment opportunities is declining, whereas on the other hand Industry doesn't find commerce graduates up to the marks in terms of skills and knowledge. Thus, Commerce education need to be holistic, targeted and customized with aim to remove the gap that exist between industry requirements and academic curriculum focusing on attitude, corporate awareness, grooming and developing managerial skills. Therefore, it is the need of hour to re-orient and redesigning the commerce education in such a way that it will be relevant for society. Therefore, the government should try to establish the new drifts to improve the educational system of the country.

Review of Literature

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Sumanta Rudra (2004) - In her book 'Effective Communication' covers various aspects of communication and gives an in depth understanding of the various elements of communication verbal and non verbal, with case studies and assignments to provide a practical perspective. Sumanta Rao has referred to a number of theories belonging to various schools of thought in the field of personality and communication skill development and has

made an effort to inculcate in readers, not only conscious understanding but also a subconscious awareness about the various interpersonal skills.

K. Venkateshwara, Sk. Johni Basha Digumarti B. Rao (2004) - in their book 'Methods of Teaching Commerce' have emphasized the need of good quality teacher- education, and good curriculum. According to them the methods of teaching each subject play a pivotal role in enhancing the efficiency of their profession.

J. C. Aggarwal (1999) - 'Teaching of Commerce, a practical Approach' serves as a reliable handbook for in-service Commerce Teachers. The book is written keeping in view the actual teaching learning situations in the classroom. The book fully covers the B.Ed. Syllabi in the Teaching of Commerce and is essentially student-centered and examination oriented.

Objectives of the Study

- · To Study about the issues and challenges to Commerce Education in India
- · To Study about the Scope for Commerce Education in India

Commerce Education in India

The Sydenham College of commerce and economics was established in 1913 as the first institution for higher education in commerce. Since then it has experienced tremendous growth. Commerce faculties are established in many universities. The main objectives of education are to develop human resources to face any challenges of the life. The role of commerce education is to develop human resources to overcome the challenges in the field of commerce and business. To archive this goal the commerce education must be focus on linkage with business and industries. It should be more practical and as like on hob training and hands on experience.

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Specialization wise number of colleges UGC Report 2017-18

Specilization	No. of Colleges	Specialization	No. of Colleges	
Agriculture	281	Commerce	267	
Architecture	169	Medical and Dental	212	
Arts	855	Engg	2228	

The above table clearly shows that in comparison between the other streams/area commerce colleges are less in numbers. New Engineering and Arts colleges are opening day by day, but the numbers of commerce colleges are few in comparison with Engineering and Arts Colleges.

Major Disciplinc wise Ph.D/M.Phil Enrolment

Discipline	Students E	nrollment	1, de 18			
	Ph.D.				M.Phil	
	Male	Female	Total	Male	Female	Tota
Agriculture	3306	2306	5612	28	25	53
Commerce	2096	2397	4493	910	1894	2804
Education	3759	3543	7302	544	943	1487
Science	22759	19085	41844	2311	5949 1	8260

Source : UGC Report 2017-18

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Similarly Students who are doing Ph.D. and M.Phil in Commerce, also less in numbers in comparison with other areas like science, arts etc. So from above analysis we can conclude that more focus should be given to commerce education in India. Because it's the need of the industry and economy.

Challenges to Commerce Education in India

- Craze for Medicine, Engineering, Management and IT courses.
- Unpopularity of commerce at competitive examinations:- the syllabus of commerce at competitive examinations is not attracting even the meritorious commerce students.
- Commerce graduates are not eligible for teacher training courses, such as B.Ed. in many States.
- □ Lack of knowledge about commerce at school level as commerce education is not introduced at school level in many States.
- □ No preference or reservation for commerce graduate either in employment or in admissions to professional courses like C.A, CWA, CS, M.B.A. etc.
- Poor teaching in many colleges forcing many students to go for tuitions, which means additional cost and effort.
- □ High student low teacher ratio.
- □ Lack of proper infrastructure: it is sometimes remarked that many colleges are virtually academic slums.
- Instruction in regional media and inadequate or non availability of reading material in regional media.
- □ Inadequate teaching aids like commerce lab, CTV-Video films.
- □ Untrained and ill-equipped teachers.
- It is more content oriented rather than skill and practice oriented

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Job Opportunities in Commerce Education

The job prospects of commerce graduates are many. They have the ability to serve in walks of the society when taking into account the role played by Finance and accounts in day to day life of every person and company. Successful business often depends on strong employee skills and specialized staff who can help the management to run things effectively by analyzing problems and recommending solutions.

The various areas of job possibilities for a commerce graduate are

- Banking Institutions
- Financial companies and offices
- □ Firms providing financial outsourcing
- Companies engaged in the Insurance sector
- Private and public Audit firms
- Industrial Accountancy firms
- Offices in multipurpose companies
- Various Government undertakings
- Planning and Budget departments
- □ Ministerial affairs offices
- Schools and Colleges
- Hospitals (Accounting Staff)
- □ Hotels (Accounting Staff)
- □ Factories (Accounting Staff)
- □ Financial Teaching institutes

In fact students of commerce stream have job roles in any sector where finance plays a part which in today's world covers almost everything. Salary will never be a constraint for the right candidate provided he or she has chosen a credible company or work provider. Getting into an Audit firm and then slowly becoming an established Auditor is perhaps the best option for many. The job demands a high degree of skill initially but after experience the task can be a joy.

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Suggestions

To make commerce education more effective & job oriented following are the suggestions.

- 1. The syllabus of commerce education must contain knowledge component skill component of practice component.
- 2. Build close relationship with trade commerce and industry or establish university Industry Hub.
- 3. Use of computer in commerce education should be compulsory as per the needs & requirement of Industry.
- 4. University-Industry/profession interaction for making the course relevant.
- 5. Training is essential for the teachers. Faculty members should update their knowledge.
- 6. Placement is the ultimate goal of any business education. To place the students in industries, colleges can arrange campus recruitment & placement.

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Conclusion

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The new challenges before the country at the beginning of the twenty first century is to become a developed society by the year 2020, which requires that not only a vibrant economy driven by knowledge has to be ushered in soon, but also a new society where justice and human values prevail has to be created. Moreover challenges in higher education are no longer only nation centric. With growing emphasis on information technology, higher education was viewed as increasingly essential for the world population. Information technology and mobile technology is now forcing education sector to change according to the need of the time the most emerging dimension of the business and commerce education in the 21st century is the need for business school to use technology and make it integral part of curse contents. The present study indicates that government should pay attention towards this serious matter that day by day students are not attracting towards commerce education and admissions in commerce stream are decreasing. If we want to boost economic development then we should train the people in business, and this can be happen through commerce education.

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SCENARIO OF INDUSTRIAL DEVELOPMENT IN RAJASTHAN

SONAL SONI (RESEARCH SCHOLAR)* Dr.(Mrs.)NAVNEETA SINGH (ASSOCIATE PROFESSOR)"

Rajasthan being the largest state of India covers an area of 10.4% of total geographical area of India with a wide range of natural resources which is attracting the investors and increasing the scope of industrialization. Industrialization is an important component for economic development of the agricultural based economy state like Rajasthan which is agricultural oriented. There is a scope of abundant employment, income generation and better living standard with the development of industrialization in Rajasthan. The main occupation of the people of Rajasthan is agriculture but due to increasing population agriculture alone cannot generate the employment fully, so observing the importance of the role of industrialization in the state, government is trying its best to attract the investment, sustainable utilization of the natural resources is being done for the development of this sector. Government has formulated various policies and programmes for the development of this sector, and efforts are showing positive growth of 5.02% in the industrialization which is a good sign towards this sector. This article will discuss the various industrial policies, role and working of RICCO for industrial development and other measures taken by the government for the progress of this sector.

An Overview about Industrial Sector of Rajasthan

Rajasthan is emerging as one of the best destination of investment, growth and industrial development. The state has developed a strong industrial base with the great potential for Agro-based, textile, tourism, ceramics, chemical, drug formulation, engineering, electronics and IT sector. The vast mineral and natural resources, livestock, tourism, rich culture and heritage, manpower potential coupled with a commitment of the government to offer a tremendous potential to the upcoming industries. Rajasthan offers the most favored destination for investment and establishment of industries. Rajasthan is the leading producer of rapeseed, bajra, guar seed and spices such as fenugreek, coriander, cumin, fennel and mustard; it has become largest cement producing state of India contributing 15% of the India's production and world's largest producer of zinc, lead and silver. Rajasthan is the 2nd largest producer of Polyester fiber and contributes about 21.96% of India's production, it has 2rd highest number of mines (557) in the country, it is the 2nd largest producer of oilseeds and spices, it is 3rd largest producer of salt which accounts one-tenth of the country's salt production, 3rd largest producer of soyabean and coarse cereals in India, 4th largest producer of spun yarn. Bhilwara has emerged as India's largest manufacturer of suitings, fabric and yarn, Jaipur is well known centre for manufacturing exportable garments, largest IT park of North India is situated in Jaipur which is named as Mahindra World City. Today Rajasthan is not left with any field whether it is art, education, public welfare, business, sports, politics, science, medicine, literature, textile or engineering where it has not achieved remarkable and

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 To determine the performance of various government agencies working for the industry

development in Rajasthan.

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Review Of Literature Dr.Neel Kamal Purohit, Assistant Professor, department of Commerce, SS Jain Subodia Dr.Neel Kamal Purohit, Assistant Professor, department of infrastructure in Rejease Dr.Neel Kamal Purohit, Assistant i forestructure of infrastructure in Rajasthan subodific College reviewed in his article entitled, 'Development of infrastructure in Rajasthan say College reviewed in his article entries tructural development, as there is 80% of increases that," Rajasthan is showing a fast infrastructural development, there has have been concluded in energy sector, there has have that." Rajasthan is showing a fast influence of in energy sector, there has been a significant from 5683 kms to 5911 kms

growth in the length in railways in Rajasthan from 5683 kms to 5911 kms. growth in the length in tarry dy or there is a significant growth of industrial sector in Rajasta According to www.ibef.org, "There is a significant growth of industrial sector in Rajasta due to its natural resources, policy incentives, strategic location and infrastructure in the saare favorably suited for investments in sectors such as cement, tourism, agriculture and ally industries. Between 2011-12 and 2017-18 GSDP expanded at a compound annual goes rate of 11.60% (in rupees terms) where as NSDP expanded at compound annual growing

According to www.business standard.com,"Rajasthan is emerging as India's preme industrial hub. Rajasthan is the only state in India to have an act on Single Winder Clearance, it is the only state in India to have 3 international investment zones, Japane Manufacturing Zone at Neemrana, an exclusive Korean Industrial Zone and one more come up in the region of Alwar district in Rajasthan.

Shodhganga, Inflibnet.ac.in revealed in their research a positive growth rate of indiana development in Rajasthan which was based on the survey which was conducted of experts from different field like industry, government academic and non-put organizations. Data collected about different districts and identical suggestions were not in the study revealed that no district exhibited negative growth, only positive rate of good was witnessed.

Key Industries Of Rajasthan

- 1. Agro-based industries.
- 2. Textile industries.
- 3. Tourism industries.
- 4. Cement industries.
- 5. IT and ITeS
- 6. Ceramic industries.
- 7. Mining.



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g. Gens and Jewellery.

o Marble Industry.

10. Steel.

11. Handierafts.

12. Chemical.

13. Salt production

Limitations And Challenges In Industrial Sector In Rajasthan

1. Lack of infrastructure.

2. Overpopulation.

3. Improper use of natural resources.

4. Insufficient water availability and poor rainfalls.

5. Lack of training facilities for efficient manpower working.

6. Gender inequality.

7. Sick industries due to huge financial liabilities and fiscal deficits.

8. Dry and arid climate

9. To develop proper infrastructure facilities.

10. Revival of sick industrial units.

11. Development of Rural sector.

12. Water conservation.

13. Fiscal management.

14. Drought and agriculture.

STRENGTHS-

I. Largest state with the largest land area.

2. Abundance of natural resources.

3. Rich heritage and culture.

4. Abundance of skilled manpower.

5. Internationally known for gems and jewellery.

6. Inherent art and craft.

7. Huge livestock.

8. Widespread mineral, gas and oil refinery. (Barmer Oil Refinery).

9. Thar desert.

10. Natural beauty.

11. Population.

SCOPE

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1. TOURISM SECTOR.

2. ESTABLISHMENT OF SOLAR UNITS.

3. TEXTILE SECTOR.

4. EDUCATION SECTOR.

5. MINING AND MINERALS SECTOR.

Need For The Industrial Development In Rajasthan

Rajasthan is one of the least developed states of India known for its underdeveloped conomy. Its location, climatic conditions, physical charms and demographic distribution make it distinct from other states of the country. However, like other states it is basically dependent on agriculture which is an allied field for the livelihood of its people and exhibits all characteristics features of an underdeveloped economy. This state has been suffering from deficiency of food grains, which is made by imports from other states of India and rationed

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of people. Various Agencies Working For The Development Of Industrialization In Rajasthan 1) RICCO (Rajasthan State Industrial Development and Investment Corporation). 1) RICCO (Rajastnan State Industrial which is working for the industrial development at the infrastructural facilities and c RICCO is man organization of trapaction all the infrastructural facilities and financial ad in Rajasthan with the objective of provide stabilishment of new industrial units and provide to the working industries. It works for the established units for their development. In the all the basic facilities to already established units for their development. In the year 2017, all the basic facilities to an early a cres of land was developed by RICCO and 196 plots were 18, till December 2017, 1,671.09 acres of land was developed by RICCO and 196 plots were allotted for industrial development, Rs.503.05 crore were getting as a revenue against allotted for industrial development of micro, small scale and medium scale by providing tax rebates and other duties, by providing all the technical Special parks developed by RICCO

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Agro-food parks-4Agro-food parks have been established by the RICCO in Boranada(Jodhpur), Kota, Alwar, and Shri Ganganagar with costing 4,965.17 lakh rupes with the aim of developing agricultural products and to ensure maximum jobs and

Japanese Industrial Zone- RICCO and JETRO (Japan External Trade Organization) on a international level have signed a memorandum of understanding in 2013 to facilitate be JETRO to set up their Japanese industrial units in the Neemrana city of Alwar district Rajasthan is the only state in the country to have a special Japanese Investment Zone spread in 1,167 acres. Currently more than 50 companies are operating in this zone. Already lands allotted to Japanese multinational companies like-Nissin, Mitsui, Daikin, Dainichi color, etc to establish their industrial units. This project has been proving successful and observing is success another South Korean Industrial zone has been established in Ghilot city of Alva district which is spread in 500 Acres land.

RIICO has established 2 special economical zones in Sitapura and Jaipur based on gens and jewellery to promote coloured gemstone industry of Jaipur, and it will enable the industry flourish in an organized way. The gems bourse will come up on a 40,000- square meter pla of the RICCO. The bourse will be the trade hub and it will facilitate exports from Japa. which will boost the foreign trade and generate additional employment in the state. With the establishment of Sitapura Special Economic Zone exports from India is increasing day by day. In 2017-18, till December 2017, export of rupees 922.54 crore has been done which created the employment for 11,091 people.

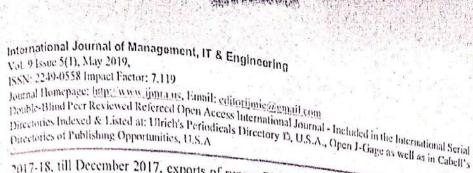
RICCO with the collaboration with Mahindra Group has created Special Economical Zor (SEZ) in the Mahindra World City (Jaipur) with the investment of rupees 3,305.40 erore by this zone sub-reasonable with the investment of rupees 3,305.40 erore a special this zone sub zones will be established for the industrial units of different sectors 3 special economic zones have a low and the stablished for the industrial units of different sectors a special sector. economic zones have been established for the industrial units of different sectors, and Handicalls,

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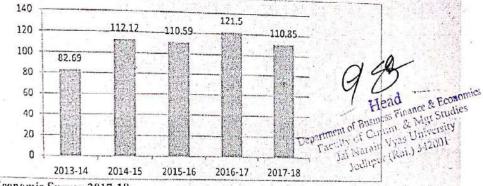


2017-18, till December 2017, exports of rupees 737.70 erore have been done in Mahindra World City (Jaipur) which created around 30,959 jobs for the people. The fair has been organized by RICCO in collaboration with FICCI in Jaipur from 21-24.

The fair has been engineering and promote textile business and industries RICCO has December 2017. To develop and promote textile business and industries RICCO has established an exhibition venue in Sitapura Industrial Area, Jaipur, which is committed to promote this sector which is highly employment oriented sector and inherent strength of promote this sector will provide the platform to the participants and exhibitors for forming Regarding to boost their exports, international relations, partnerships, which will result in projecting India as a prominent sourcing hub and investment destination. 2) RAJSICO (Rajasthan small Industries Corporation Ltd.) Rajasthan stands among the richest state of the country in terms of art and craft. State is

famous for its handicrafts work like paintings, vibrant colors, stone carvings, wood and sandalwood work, carpet, metal work, gems and jewellery, leather craft, lac work, weaving etc. The creativity and art is not only famous within India but it is flourishing internationally also and known as the treasure trove of India. RAJSICO was formulated on June 1961, to develop and promote micro, small scale and handicrafts industries and their products. Being a business oriented its aim is to maximize its profit, for that timely steps are being

taken for profit maximization like, changes in products with improved quality, new innovative and creative ideas in product designing, use of updated technology, supply of the products according to the demand in the market, to launch programmes for the development of handicraft industries so that those industries can get direct profit to them. To promote handicrafts sector government has organized around 35 exhibitions in last 10 years in different cities of the nation. The following table reveals about the turnover of RAJSICO and HANDICRAFTS ITEMS. TURN OVER OF RAJSICO (In rupees crores)



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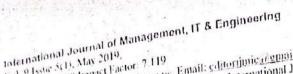
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Source- Economic Survey 2017-18

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Analysis of graph- Bars are briefing the annual turnover of RAJSICO, in 2013-14 there is a turnover of 82.69 crore rupees which has raised in 2014-15 up to 112.12 crore, in 2015-16 a

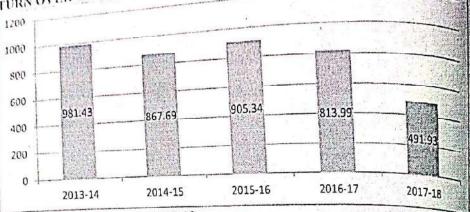
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Directories of Publishing Opportunities, U.S.A Directories of Publishing, 917 slight downfall can be observed which is 110.59 crore, in 2016-17 it is 121.50 crore and to slight downfall can be observed which is 110.85 crore.

2017-18 till December 2017 it is 110.85 erore. TURN OVER OF HANDICRAFT ITEMS (In rupees Lakh)



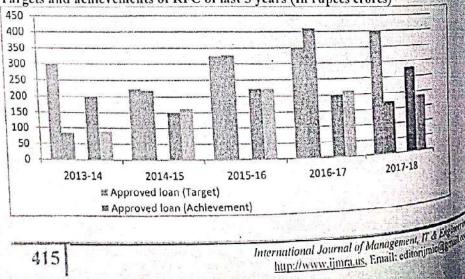
Source- Economic Survey 2017-18

Analysis of graph- We can observe a severe downfall of turnover in the field of handicraft in last 5 years. As it were 981.43 lakh rupees in 2013-14 which went down to 867.69 2014-15, due to government efforts it raised up to 905.34 lakh rupees in 2015-16, but bare 2016-17 is again showing the decrease of turnover upto 813.99, bar of 2017-18 is also showing the decreased turnover which is 110.85 till December 2017.



3) RFC (Rajasthan Financial Corporation)

Rajasthan Financial Corporation was constituted under the SFCs Act, 1951, on 17 January 1955 with the aim of establishing new industrial units, for providing long term financial support to tiny, small and medium scale industries, to promote and develop already established industrial units and to provide financial aid of rupees 20 crore to these units. The Corporation has 37 branches and 5 sub offices in 33 districts of the state with headquartera Jaipur. Many projects are working under this campaign like CRI (Commercial real estat project, single window project for SSIs and tiny industries having worth capital of mpro 200.00 lakh., project for marble processing unit, to provide credit for working capital a non-assisted units, gold card and platinum credit project, etc. To promote Industrialization and to motivate youth entrepreneurs, RFC has extended its credit limit upto rupees 1501ad from rupees 90 lakh under Youth Entrepreneurship Encouragement Project. Targets and achievements of RFC of last 5 years (In rupees crores)



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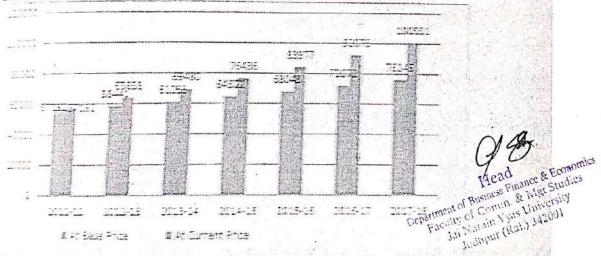
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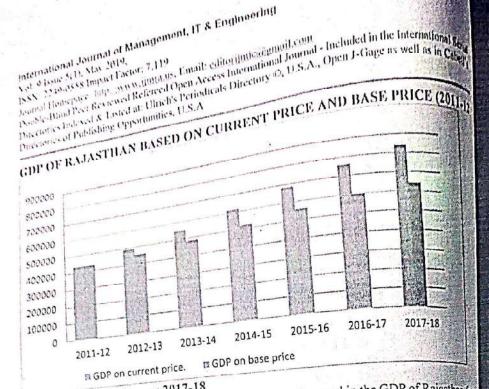


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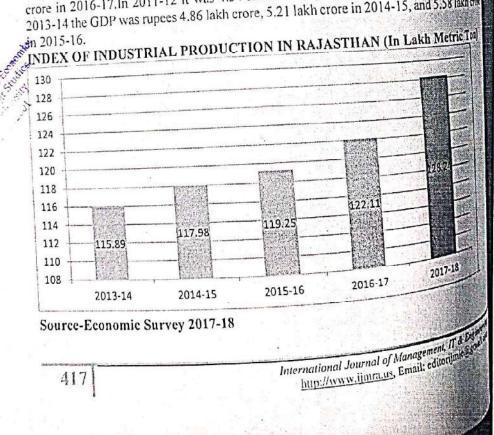
😤 ann manne is the index of welfine and fiving standard of people. Table is showing 2011 de compared cas of per centre income in Referitien as compared from lest 8 pers. Ve to to conners of industrialization per capita income is also doubled in fast \$ years νομή το πανίας τος ροσίανος χαρινούς οξ' Χυβικούκου'ς αυτοριστιγ.

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Source- Economic Garrent price) - Remarkable growth can be observed in the GDP of Rajasthan from GDF (at current price) containing a notable growth it estimated about the production of rupees 8.40 lakh crore in the year 2017-18 which the estimated about the production of the production of the gold was of rupees 4.34 lakh crore to rupces 7.59 much crore in 2012-13. In 2013-14 GDP was rupees 5.51 lathere which rose to rupees 6.15 lakh crore in 2014-15 and rupees 6.83 lakh crore in 2015 16 k can observe constant increase in the GDP (current price) in Rajasthan.

GDP (at base price) - If GDP is calculated on base price then also growth can be sent the GDP of Rajasthan. Production price of the year 2011-12 is taken as the base year list showing the production of rupees 6.41 lakh crore in 2017-18 which was rupees 5.99 in crore in 2016-17.In 2011-12 it was 4.34 lakh crore, in 2012-13 it was 4.54 lakh crore 2013-14 the GDP was rupees 4.86 lakh crore, 5.21 lakh crore in 2014-15, and 5.58 lakhow



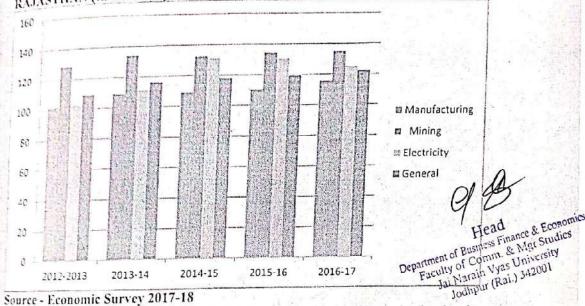
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The table is revealing about the increased Industrial production which is showing growth of 5.02% towards industrialization. We have taken 2011-12=100 as the base year to calculate the growth of industrial production for the given years. From 2013-14 to 2017-18(till December 2017) we can observe a significant growth of Industrial production. In 2013-14 it is showing the production of 115.89 Lakh Ton, which went up to 117.98 lakh ton in 2014is such that it is raising and in 2015-16 the production was 119.25lakh ton, in 2016-17 bar is showing the production of 122.11 lakh ton, and the significant rise in the production can be seen in 2017-18 (till December 2017) which is 128.24 lakh ton.

INDEX OF INDUSTRIAL PRODUCTION IN DIFFERENT SECTOR OF RAJASTHAN (In Rs. crore)



Source - Economic Survey 2017-18

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From the given table it can be analyzed that the graph of industrial production has been increased in recent years which is proving the development in the industrialization sector in Rajasthan. We can observe a consistent growth in the manufacturing sector, as there was the production of rupees 101.48 crore in 2012-13 which reached up to the index of rupees 115.71 erore in 2016-17 showing the growth in manufacturing sector in last 5 years.

Mining sector is also showing growth, as it was rupees 128.17 crore in 2013-14 and went up to rupees 135.04 crore, remarkable growth can be seen the electrical field also, from 102.51 crere in 2012-13 it reached to 125.32 crore, general sector of industrialization is also showing ^{a notable} growth: from 108.92 in 2012-13 it reached to 122.11 in 2016-17.

Conclusion - From the above article and the given graphs it can be concluded that Rajasthan is one of the fastest growing economies; it has been witnessing a significant growth of 5.02% in the industrial production. GDP of 2017-18 in Rajasthan has risen to 7.16% in last 5 years as it was 4.54% in 2012-13. Per capita income is also showing a notable growth up to 5.65% in 2017-18 as it was 2.19% in 2012-13. Growth can be observed in every stream whether it 15 per capita income, GDP, industrial production. Turnover of various agencies working for industrial development has increased as compared to 2013-14 but annual fluctuations are

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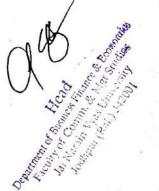
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being observed which is showing decreased turnover. At last it can be concluded that the has been a remarkable growth in the industrial sector of Rajasthan.

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Bankruptcy Code for Corporate Failure in SAARC Countries : A Comparative Study

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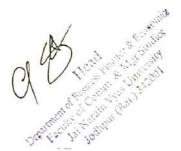
Revival and Rehabilitation of sick industrial units View project

Feature

"Bankruptcy Code for Corporate Failure in SAARC Countries" (A Comparative Study)

KRISHN A. GOYAL AND RAVINDER KUMAR

Corporate failure is one of the hurdles in economic development of the SAARC countries comprising India, Pakistan, Nepal, Bhutan, Afghanistan, Bangladesh, Sri Lanka and Maldives. The main objectives of this study is to explore the existing bankruptcy code, laws, current trends of bankruptcy code and legal framework in contemporary business environment of SAARC countries for dealing with corporate failure. The study has made a comparative study of bankruptcy code for corporate failure in SAARC countries.



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Dr. Ravinder Kumar, Department of Business Finance & Economics, Faculty of Commerce and Management Studies, J. N. V. (State) University, Jodhpur, Rajasthan.

1. Introduction

The South Asian Association for Regional Cooperation (SAARC) was formed in 1985 to reduce regional imbalances, economical barriers and enhance cooperation among the member countries. SAARC countries are multi-cultural, geographical diversified and have a different kind of traditional legal system for dealing with corporate failure. India is the centre point for SAARC countries in terms of transmission of information, trade and other co-operation among the member countries. SAARC countries are facing problems in economic development due to lack of competitive cost effective technology, financial scarcity and lack of country's skill based resources besides quality concern at all levels. Corporate failure is a long standing problem for the economic development of SAARC countries.

Failure of industrial units depends on a number of causes such as micro and macro level of a business unit. Corporate failure is a common phenomenon that can be detected through applying simple tool or by financial analysis at business unit level or micro level. Corporate failure is becoming a serious problem as several industrial units are on the verge of failure in SAARC countries. Corporate failure has a negative impact on society, country's image in international business, financial institution for granting loans, employment and national economical development. Therefore, a systematic treatment of corporate failure in a country has become a necessity. Developing countries in South Asian Region are framing policies, infrastructure and legal framework to combat the situation of corporate failure.

Developed countries have their own sound legal system or bankruptcy code for treatment of corporate

failure through a systematic process. Meanwhile, most of SAARC nations' treatment of corporate failure process has been laid down in their Companies Act, Courts or are informal in nature. India is the most developed country among SAARC nations. The Indian government has recently implemented "Insolvency and Bankruptcy Code 2016" for dealing with the problem of corporate failure or bankruptcy. According to the code, it will bring uniformity and expedite dealing with the corporate failure in the country. In 2017, the country's ranking has improved from 100 to 47 points in 'Ease of Doing Business' report published by the World Bank. But many companies have closed in previous years without providing any genuine information about reasons for their failure to the government. Thus bankruptcy code will be a sound tracker and effective law in the country for dealing with corporate failure.

Appropriate diagnosis of corporate failure will help check similar instances in future. Financial transactions should be verified through financial institutions for transparency and uniformity at national level. Financial expert/s should be very diligent in making timely visit to the company premises to verify corporate healthiness. In modern era, various studies have been conducted on causes of corporate failure in western countries but few studies were conducted for its treatment. Corporate failure is the biggest reason for resulting in unemployment, decreasing exports, investment and foreign exchange reserve of the country besides creating social unrest.

Tracking of sick industrial units must be done at state level or national level for monitoring and analysis. Corporate failure can be effectively dealt with through the efforts of corporate social responsibility (Catherine Janssen, Sankar Sen & CB Bhattacharya (2015)). A company brings innovative product and services that creates a crisis for other companies to survive in the market. The government of India is working for digitization in the nation for flow of information, goods and services in a transparent manner. A report of MSME 2015 has stated a framework for revival and rehabilitation of sick industrial units through corrective action plan and providing more credit facility to sick industrial units in India. The report has emphasized on relaxation in the payment of statutory obligation of sick industrial units in the country.

Treatment of corporate failure is a continual process for making a business unit more profitable. A new industrial unit needs heavy resources at the time of establishment. It would be better to repair an old home rather than making new one. Hence, from the point of view of social cost benefit analysis, it will be a better move to treat a sick but economically viable industrial unit instead of establishing a new one.

Awareness of current procedures of bankruptcy code is a necessity among business managers and investors. A general awareness program on bankruptcy code is valuable for creating awareness among all business stakeholders for timely treatment of corporate failure. Many companies have closed in SAARC countries as they did not take revival grants from the governments due to lack of knowledge.

Failure of industries is a major cost concern in the state and society always pays for it. Production is the mother of necessity. Necessity comes from social needs, taste and preference. If an organization is not able to fulfill the demands according to the society or environment then it fails in the market. In the event of a corporate failure, who is liable to pay all the cost that is directly or indirectly linked to the project or business unit? Commonly, investors lose their hard earned money, financial institutions lose money, employees lose jobs etc. The government has to bear the repercussions of this failure on macro level. Most studies were conducted for prediction of corporate failure in SAARC countries but none were done on forming a bankruptcy code.

The question is: Who is liable for corporate failure in a country? The whole system of governance is responsible for not coping with the situation. If pollution is increasing then we cannot blame it on an individual. It is better to nurture existing companies rather than creating new ones. Demand will increase, fashion will change, taste will change and environment will change. There are greater challenges for the society for the development of policies and uniform code for the country. Unequal groups of society will resist for the change at national and regional level. But development is always based on the change (World Development Report 2017). The main principle of SAARC is based on respect for sovereign equality, territorial integrity, political independence, non-interference in the internal affairs of the member countries and mutual benefits. But it also has an objective to promote welfare, accelerate economic growth, understanding problem of member countries and co-operate in problem solving matters.

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"Bankruptcy Code for Corporate Failure in SAARC Countries" (A Comparative Study)

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2. Objective of the Study:

The study is based on an analysis of the existing system of treating corporate failure in SAARC countries. The main objectives of this paper are as follows:

- 1. Understand the system of treating corporate failures in SAARC countries.
- 2. Explore the existing bankruptcy code, laws and legal framework in contemporary business environment of SAARC countries.
- Analyze the prevailing laws related to corporate 3. failure.
- Do a comparative analysis of prevailing laws in 4. SAARC countries.
- 5. Comparison of SAARC countries for solvency over the years.

3. Review of Literature:

Branch & Khizer (2016) "Bankruptcy Practices in India" argued for prevailing practices of bankruptcy in India. The authors have argued for landmark amendments in the Companies Act according to contemporary business environment. The researchers have recommended a list of the improvement in the existing bankruptcy legal framework of India.

Asian Development Bank (2013) "Bhutan Critical Development Constraints" in its country diagnostic study focused on the key constraints of economical development in the country. Bhutan's economic development policy is based on peace, prosperity and happiness. Bhutan is maintaining its distinct identity in respect of accepting modernization without negativity from the rest of the world. Hydropower is one of the energy sources of the country. Bhutan is exporting 80% of its power to India. Despite development of power sector, Bhutan's economy is more based on tourism industry. About 70% of land of Bhutan is covered by forest and 11% by shrubs. There is only 3% land cultivated and out of the cultivated land only 1% is irrigated. The critical constraints to inclusive growth are (1) Narrow fiscal space (2) Inadequate and poor quality of infrastructure (3) Limited access to quality of education (4) lack of financial resources for MSMEs (5) Presence of market failure.

Shaheen Irum (2013) "South Asian Association for Regional Cooperation (SAARC): Its Role, Hurdles and Prospects", argued for role of SAARC for giving platform

to the associated countries for sharing information, ideas and development of institution for interaction. The author has said that SAARC countries fear threat to their political, economic, and territorial stability (terrorism) from their neighboring countries. She emphasized on peace initiative that can build confidence among the member countries for increased cooperation.

Rashid & Abbas (2011) "Predicting Bankruptcy in Pakistan", authors have taken a sample of financial ratios of non-financial companies from 1996 to 2006. The researchers have selected 24 key financial ratios for the study. The financial ratios were grouped under the leverage, liquidity, profitability and turnover ratios to examine separately for bankrupt and non-bankrupt companies by calculating their means and standard deviations for five years prior to bankruptcy. In addition, T-tests and F tests were employed to get about the similarity and difference of financial variables each year prior to bankruptcy. They selected 52 companies for the research study. The authors have argued in this study for identifying the financial variables that distinguish "healthy" from "financially troubled" companies. To develop a model that could have the predictive ability of financial health and discriminate between bankrupt and non-bankrupt units. The researchers have identified the financial ratios that are most significant in bankruptcy prediction for the non-financial sector of Pakistan using a sample of companies, which became bankrupt during the period between 1996 and 2006. In doing so, 24 financial ratios that measures important financial attributes of a company (i.e., profitability, liquidity, leverage, and turnover ratios) were examined for a fiveyear period prior to bankruptcy. The discriminate analysis produced a model of three variables: sales to total assets, EBIT to current liabilities, and cash flow ratio. Our estimates provide evidence that the firms having 'Z value' below zero fall into the "bankrupt" whereas the firms with 'Z value' above zero fall into the "non-bankrupt" category. The model achieved 76.9% prediction accuracy when it is applied to forecast bankruptcies on the underlying sample.

Batra Sumant (2006) "Insolvency Laws in South Asia: Recent Trends and Developments" has studied insolvency law and recent development. Breakdown in cease fire between government and LTTE at Sri Lanka has boosted its GDP growth rate. A number of recent positive political developments have determinant factors for the development in the legal framework in south Asia.

Productivity • Vol. 59, No. 3, October-December, 2018

Narayanan (1994) "The Law Relating to Industrial Sickness in India: The Role of BIFR" said a number of textile companies became sick in the private sector that were taken over by the National Textile Corporation, however, most of them remained sick. The Reserve Bank of India also issued periodic instructions to banks to monitor weak or sick units more closely. In 1985, the finance minister had said, "We will constitute a board, which will provide a speedy mechanism for amalgamation, mergers and devise such other solutions as may be necessary to deal with problems of sick industrial units in large and medium sectors of India."

4. Research Methodology:

The present study is based on secondary data. All information collected from the published reports, newspapers and various surveys. The authors have analyzed and interpreted the published reports. Past studies on the topic is well reviewed and acknowledged.

This study is based on SAARC countries so the data has been compiled from various sources.

5. Bankruptcy Code for Corporate Failure in SAARC Countries

South Asia is an emerging region in the world map in terms of development related to bankruptcy code and legal framework to tackling the situation of corporate frauds, corporate governance and revival of failed business units. SAARC countries are in the process to develop Insolvency and Bankruptcy Code for better governance. These countries have higher economical growth rate and greater market for products compared to developed countries. Development can be brought through changes in the existing bankruptcy law, which is outdated at present. (Table 1). Now, business is becoming more challenging and complex and there is a need to bring a uniform bankruptcy law for contemporary business environment.

TABLE 1: Bankruptcy Code for Corporate Failure in SAARC Countries

SAARC Countries	Year	Bankruptcy Law / Code	Influenced By	
1. India	2016	Insolvency & Bankruptcy Code	British, USA, Australia	
2. Pakistan		N/A	British & Common Law	
3. Nepal	2005	Insolvency Ordinance	Common, Continental	
4. Bhutan		N/A		
5. Afghanistan		N/A		
6. Bangladesh	1997	Bankruptcy Act	British Common	
7. Sri Lanka		N/A	Roman Dutch	
8. Maldives	_	N/A	_	

Sources: www.worldbank.org www.occd.org, Authors own manually compiled Information, *N/A- Not Available

Entrepreneurs are much more focusing on transparency in the transaction and minimal risk for doing business in a particular country.

Sri Lanka – Sri Lanka is focusing to develop a strong bankruptcy code to meet the issues related to business organizations. The cabinet of Sri Lanka has been given green signal by Prime Minister Ranil Wickremesinghe for introducing the Insolvency Ordinance No.24 of 1884. The Institute of Chartered Accountant of Sri Lanka and Security Exchange Commission of Sri Lanka have jointly developed certain codes based on Cadbury Committee report for corporate governance.

India: - The Indian government has developed its Insolvency and Bankruptcy Code 2016. Formerly it was governed through Sick Industrial Companies (Special Provisions) Act of 1985 by the recommendation of Tiwari Committee.

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"Bankruptcy Code for Corporate Failure in SAARC Countries" (A Comparative Study)

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Provisions of the act were applied on companies that were registered under Companies Act 1956. According to the provision of Sick Industrial Companies Act (SICA), Board for Industrial and Financial Reconstruction (BIFR) was setup for detecting industrial sickness and recommendation for revival or liquidation. Insolvency and Bankruptcy Code 2016:- Provisions of the code shall apply on companies incorporated under the Companies Act 2013, any company governed under Special Act, incorporated under Limited Liability Partnership Act 2008, body corporate, partnership firms and individuals. According to the code, there will be minimum threshold limit of Rs 35000 of debt waiver. This code has brought individual, firms, LLPs, & partnership firms in mainstream. Bankruptcy code is more important In dealing with the number of applications received at national level. A uniform code of bankruptcy can reduce all kind of hurdles for timely solving the problem of sick Industrial units in India. Corporate insolvency resolution process has time limit of 180 days after receipt of the application, which can be extended to another 90 days. Insolvency resolution process is managed by professional agency after receipt of the application. The adjudicating authority has the right to reject resolution plan under the code. The main aim of Insolvency and Bankruptcy Code 2016 is to bring transparency, expedite decision for bankruptcy and matching bankruptcy code of developed countries.

Afghanistan: - Afghanistan is under a transition phase. Political stability was badly affected due to Taliban and its terrorist activities. Hence, corporate culture did not develop in the country. Afghanistan has not adopted any bankruptcy law. The existing Partnership Law, Corporations, and Limited Liability Companies Law have some liquidation provisions that provide some procedural framework for winding up of a business unit. That's why, the country has poor ranking in ease of doing business as per the study report of World Bank.

Bhutan: - Bhutan has a corporate sector and legal framework more influenced by Buddhism. Bhutan is the only country in the world that measures Gross National Happiness (GNH). Bhutan is also ranked high for political stability and ease of doing business by the World Bank. It is also the least corrupt and least developed country in south Asia. The World Bank report has also ranked the country lowest in terms of resolving insolvency due to lack of required legal, bankruptcy code, governance code and regulatory framework. The government of Bhutan is much more focused on balanced and sustainable development in the country. Bhutan's economy is more dependent on tourism, handlcraft and agriculture based industries. There is only some evidence and procedure for corporate governance stated in the Registration of Companies Act 2000.

Nepal: - Corporate sector plays very little role in the economy of Nepal. Private sector has not gained much significance in the Himalayan nation. Insolvency Ordinance was enacted in 2005 with inclusion of corporate insolvency and rehabilitations framework for industries in Nepal. Nepal is the only country in South Asia to give place for rehabilitation of sick industrial unit in its Insolvency Ordinance 2005. Incidentally, it is the only country in South Asia where court has no role in the process of liquidation or winding up of a company.

Pakistan: - Pakistan's economy is based on Islamic religion model. Pakistan has weak political and institutional environment for corporate sector. Security Exchange Commission of Pakistan has recommended for amendment in the bankruptcy stated in company's ordinance and making it corporate rehabilitation act. A number of companies have failed in Pakistan during 2008-09 due to its legal business framework. Contemporary business scenario is changing globally. Several countries have adopted bankruptcy code in its countries for better governance. It has direct influence on FDI and investment in the country. At present bankruptcy cases are governed through civil courts and provincial procedures only. Mr. Iftikhar Ali Malik in his keynote address at a seminar on Bankruptcy Law by Federation of Pakistan Chamber of Commerce and Industry at Karachi on 28 January, 2002 emphasized on the need for improvement in auditing standards and dispute resolution mechanism for governance. Pakistan has no mandatory requirement to keep independent directors in the board of a company. Such loopholes in legal framework are creating business risk in the country and decreasing overall country ranking in ease of doing business as per the World Bank report. Many companies in Pakistan are being run by family business groups. There is strong need for a bankruptcy code in the country to bring uniformity to deal with corporate failure in the country.

Bangladesh: - Bangladesh has an Islamic economic model for corporate governance in the country. Bangladesh has enacted Bankruptcy Act in 1997 for loan defaulters. The Bankruptcy Act 1997 came into existence due to lacunae in the country's Insolvency Act, 1909. The Insolvency Act 1909 was applicable only on natural persons

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and not artificial person like companies and corporations. Meanwhile, there is no inclusion of revival and rehabilitation framework for sick industrial unit/s in the Bankruptcy Act 1997. But Companies' Act of the country has given place for revival in the Act. Bangladesh has 64 districts in the country. Each district court judge has been made Exofficio bankruptcy court for solving bankruptcy cases in the country. Influence of international donor agencies are remarkable in terms of formulating and reformulating of its reforms agenda (Sarker, 2004).

Maldives: Maldives is made of tiny islands and is a great attraction for tourists. The economy is primarily based on tourism and fisheries. The country is one of the least developed in South Asia. Maldives's economy is at present in development stage. Majority of the companies come under small scale industry. Resources are underdeveloped. Treatment of corporate failure is only discussed in the Companies Act. There is need for strong governance code to attract investment in the country. According to the World Bank's Ease of Doing Business report 2017, ranking of Maldives on the ease of resolving insolvency has been determined through benchmark method of distance to frontier scores for resolving insolvency. The scores were the simple average of the distance to frontier scores for the recovery rate and the strength of insolvency framework index. Maldives has been placed 2.0 on the Index of 16 points for the strength of insolvency framework. Maldives ranks 135 among 190 countries on the ease of resolving insolvency as per the report. At

present insolvency and corporate failure in Maldives is dealt by civil court and registrar of companies. Maldives has been placed 2.0 on the Index of 16 points for the strength of insolvency framework. Maldives has a need to develop its law, procedure and governance code to enhance investment in the country.

A matter of effectively monitoring and implementation of bankruptcy code in the country is more desired to bring transparency in the transactions. Political, economical and social stability is prime root for the good governance in the country. Regional level co-operation is more desired for development of business activities in SAARC countries.

6. Comparison of SAARC Countries for Solvency over the Years

Resolving insolvency is an urgent matter for development and maintaining business stability for a country. According to the World Bank for Ease of Doing Business -2018, a list of 190 countries was ranked wherein Nepal at 76th position is one of the most efficient SAARC country for resolving insolvency. Bhutan placed at 168th position is one of the least developed SAARC country for resolving insolvency issue. According to the published report, Maldives is considered very low time consuming country for resolving insolvency among SAARC countries, Whereas, India is considered very high time consuming country for resolving insolvency in the SAARC countries. (Table 2).

S. No,	SAARC Country	Global Ranking in Ease of Doing Business (2018)	Ranking of Resolving Insolvency (2018)	Time for Resolving Insolvency (Years)	
1	Nepal	105 76		2	
2	Pakistan	147	82	2.8	
3	Sri Lanka	111	88	1.7	
4	India	100	103	4.3	
5	Maldives	136	139	1.5	
6	Bangladesh 177 152		152	4	
7	Afghanistan 183 161		161	2	
8	B Bhutan 75		168	Not Available	

TABLE 2: Resolving Insolvency for Corporate Failure In SAARC Countries

Sources: World Bank, Ease of Doing Business Report, Authors own manually compiled Information

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"Bankruptcy Code for Corporate Failure in SAARC Countries" (A Comparative Study)

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According to the data released by World Bank for Ease of Doing Business (2018), Bhutan, India and Nepal have been considered as most preferred country for attracting the business or ease of doing business. India is among top ten most improving countries in the areas measured by doing business report of 2016/17.

7. Conclusion and Recommendation

Bankruptcy coding is a systematic process of bringing uniform legal framework to tackle corporate failure in a country. The situation of bankruptcy or corporate failure can be dealt with through implementing a strong bankruptcy code or bankruptcy law in a country according to its business environment. SAARC countries are considered in the categories of developing and least developing countries. India, Nepal and Bangladesh have strong bankruptcy code or insolvency law to protect all stakeholders of business. It denotes risk minimization in the respective countries. Some SAARC countries like Bhutan, Pakistan, Afghanistan, Sri Lanka and Maldives have no proper bankruptcy code for corporate failure in the countries. Few countries are at the stage of developing their legal framework such as Sri Lanka and Afghanistan. But effective legal system is also important for resolving the insolvency in the country. If bankruptcy code is not properly monitored or effectively implemented then it may affect the corporate sector as well country's ranking in the ease of doing business.

For improving country ranking at global level, there is a need to develop strong bankruptcy code or Insolvency law in SAARC countries to attract foreign investment and improve national productivity. India has strong a presence among SAARC countries due to strong legal framework for dealing with the situation of corporate failure. That's why India has improved its ranking in the Ease of Doing Business report 2017 published by the World Bank. SAARC member countries can co-operate with each other for development of legal advisory services. SAARC member countries may go for mutual transfer of ideas, technology and financial assistance to treat corporate failure in their respective country.

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"The ultimate goal of farming is not the growing of crops, but the cultivation and perfection of human beings."

– Masanobu Fukuoka

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Managing Cross Culture Workforce: A Challenge or an Opportunity for Organizations

Ms. Kirti Jaiswal* Prof. S.P. Singh Bhadu**

JobTTedA

Several phenomena have paved the ways to the prevalence of diversity in the modern workplace like globalization, cross-border mergers & acquisitions, MNC's work style and plant location etc. All these factors have redefined the Indian organization workforce structure and put its impact on different areas of organization likes policies, productivity, performance, the effectiveness of the organization and personal life of the employees. The increased competitive environment made it crucial for all organization to embrace crosscultural challenges of the workforce and also need to take measures to tackle the challenges of workforce diversity in the organization for sustainable business development. The objectives of the paper are to throw light on understanding facts whether the crosscultural issues has a positive or negative influence on organizations and will cover the review of several kinds of researches and experts on managing cultural issues & challenges and strategies for managing regarding the same in the challenging environment.

Megruerdes: Managing Diversity, Cross Cultural Issues, Organizational performance. Diverse Workforce.

1. Introduction

and all these factors puts its impact on several areas of an organization. mostly age, sex, marital status, qualification, social positions, religion, origin and cuture actually that persons vary from one another in many ways, like noticeable or unnoticeable, exactly like everyone else, no diversity exists. Workforce diversity allows us to recognize each other along with one or more significant ways. If everyone in the organization is (2001) found that the diversity exists at the workplace where their employee differs from domestic managers to accomplish and harness the goodness of diversity. Thomas and Ely better understanding of diversity management which helps worldwide managers and Therefore this required to explore the Indian dimension of diversity at the workplace for a different backgrounds, perceptions of diversity and perceived organizational performance. and it aims at indulgent the relationship between the employee working together from cope with this changing environment. Diversity management strategies are one of them are moving towards various efforts and strategies on human resource factor these days to further the increase is expected in near future. This is the primary reason that organizations from the era of liberalization, also with the "MAKE IN INDIA" initiative of ruling party; meet the expectation of global competition. In India there is a progress in no of MNCs The present scenario is witnessing how organizations are putting their gigantic efforts to

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compulsory for every organization to make better managing policies & strategies to exploit organizations. Due to the increase in the diverse workforce at workplace made it corrmon matter not only at the workplace in western countries but also at domestic organization. Nowadays cross-cultural and multicultural employees have become the investment in education and training, along with changes in the working condition of the changing with the increased global competition and stressed on the necessity for national demographics of the US workforce. It concluded that the demographics of the employee is government-commissioned report entitled Workforce 2000 which studied the changing Michaelsen, 1993). It is widely recognized that the main thrust to its development was a organizational researchers (e.g. Riccucci, 1997; Thomas, 1999; Watson, Kumar, & Twenty-First Century. This publication contributed to the popularity of the phrase among not appear in the management literature until Workforce 2000: Work and Workers for the Johnston & Packer (1987) highlights the actual term cultural diversity that is usually, did

the benefits of a cross cultural workforce in organizations sustainable growth.

2. Research Methodology

context and to find out the current cross cultural diversity strategies used at the workplace process of realizing its importance, and impact on organizational performance in the Indian cultural diversity, workplace diversity management and categorizing the literature in a The paper adopts a literature review approach start with specifying significant works on

by the organizations.

WeiveR eview

organization's aims and objectives. together different ideas and viewpoint at workplace leading to the accomplishment of the put emphasizes on the fact that, cultural diversity has a crucial part to play in getting the challenges of this opposing global economy. Schermerhorn, Osborn and Hunt (2005) on cultural diversity and state that it should be treated as a valuable resource in coping with also helps in making a way towards change in an organization. Doka (1996) emphasized cultural diversity at the workplace, it can support in gaining a competitive advantage and from which they can recruit. Additionally, by exploiting the potential consequences of understand and to attend different markets, also offers a better-talented pool of employees believed that diverse employee helps in harmonies an organization better chance to distinctly different group affiliations of cultural significance". Cox and Blake (1991) cultural diversity refers to "the representation, in one social system, of people with uniqueness as well as recognizing individual differences. Cox (1994) defined in particular; Luthans, (2013) defined diversity as the means of understanding the individual's

objectives through full incorporation. Hammer and Martin (1992) studies the expediency critical component in developing the association and in accomplishing its key busides found that a viable and deliberate way to deal with building intercultural capability is one continued and progressive steps to create a diversity-welcoming Organizational culture. He believe firms must acknowledge new chances of development and flourishing through the significance of the successful management of diversity. It has both the sides; some worldorce diversity and organizational performance and there can be no argument about productivity. Cox (2008) stated in his paper that there is a complex association between helps in effective people management at the workplace, which can improve organizational Black Enterprise (2001) found that managing and valuing diversity is a key component

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organizational goals, and decreases anxiety and uncertainty. of cross cultural training in enhancing the exchange of technical information, attaining

the luman resource department of the organization to address these issues seriously. Cultural diversity can impact both positively and negatively to the organization; this wants cultural diversity at the workplace is an important challenge in front of management. challenge across the globe. It is correct to summaries from the above literature that highlighted in this article, addressing cultural and other forms of diversity has been a organizations are making efforts for creating the right balance of workforce. As we have to women employees these days, but it's still has a long way to go. This is showing how Economic Times, (2017) Companies twitch hiring policies and start opening towards more also face barriers like the glass ceiling, therefore need to manage diversity. According to various challenges from biases, gender schemas, stereotypes and overt discrimination and to the se solution of the individuals continue to experience unfair treatment in the workplace as a result of this innovative strategies and on the other hand Gareth and Jones et al, (2008) clarifies practices interrelated with better productivity and market performance for organizations by on earnings, a strategic contingency connection was supported only due to the diversity workplace can decrease turnover. They also found that a crucial outcome of these practices practices and accept the fact that by implementing the formal diversity practices at the Richard and Johnson (1999) investigate the organizational benefits of proper diversity

staff yet for this they need to confront numerous obstacles like various assessment, an reviewed nowadays' organizations are thinking about promoting the abilities of a diverse intrigue gatherings, and the overall population must be considered. Joplin and Daus (1997) administrative structures, legislative offices, legislators, courts, specific associations, to value the complex changing parts of working environment i.e. diversity issues like likewise pay mind towards the elements that empower diversity at work environment and be just regarded as far for making monetary advantages for an organization yet we ought to diminishing gathering execution and gathering cohesiveness. The workforce ought not to decent variety perhaps will bring about some negative angles like developing clashes, in positive influences like inventiveness, critical thinking, and advancement; yet on other Roberge and Dick (2010) identified that on one hand differences of employee's outcomes build efficiency and develop means to meet the necessities of the worldwide business. professionals to look for procedures to use cultural diversity as an effective instrument to workplace. Quappe and Cantatore (2005) according to them, this is a challenge for HR experience that heterogeneous groups have can easily create a conflict situation in the organization. Jehn et al. (1999) recognize the difference in principles, background, and leader to recognize both the challenges and opportunities of cultural diversity in the Due to the rapid changes in today's business environment, it becomes necessary for every 4. Today's Challenges and Opportunities of Cultural Diversity

Jai Narain Vyas University, Jodhpur Faculty of Commerce & Mgt. Studies productivity focal points like innovativeness, critical thinking, and entitied advertiged and entities of broadened workforce, associations should appreciate diversity to enhance organizational integrate every member of the organization. Cox (1991) put stress on with every difficulty?

oreating a diversity-friendly atmosphere through the execution of policies that help to essential for every organization's value system the organizations must incline towards outdated techniques. McKay et al. (2009) witnessed that if the idea of cultural diversity is these difficulties can be taken care of by compelling authority style instead of applying absence of sympathy contrasts in observation, an absence of interest. Assist every one of

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with the gathering individuals. and follow-up activities like additional preparation, dialogs about decent variety matters research, examination and change of culture and human asset administration frameworks deal with every one of these issues by grasping key devices like administration, preparing, change that may prompt upper hand thusly it gives different open doors before directors to

5. Suggestive Framework for Managing Culturally Diverse Workforce

SIC: suggestive diversity management initiatives for organizations to adopt at the workplace strategically to improve its performance. Based on the detailed review of work, some markets and overall rivalry. An organization must focus on the ways to manage diversity derrographic variations in the workforce and buyer populations, united with globalized Nowadays' organizations are managing the diversity issues from different sectors like

approach to culture, its characteristics, and know the crux of cultural difference. cultural impacts on business operations. They are required to have the comprehensive business dealings across cultures. Global leaders must be aware and understand the crossmanagement. Global management leaders must be professional and talented in their Organization, there is the need for the more capable workforce as well as capable I. Global Management Leaders: Along with the demand for cross-cultural competence in

working environment. minorities at the workplace and to assist organizations to handle diversity proportion at the workplace. AAPs contain distinctive measures with the aim of expanding the image of recruiting, hiring and encouraging women, minorities, disabled personnel and veterans at action plans (AAPs) can be defined as a business's typical criteria for proactively nationality, creed, age, disability or genetic background. On the other hand, Affirmative discrimination of special section of employees on the basis of race, color, gender, 2. EEO and AAP's: Equal employment opportunity (EEO) means that the liberty from

HRD in handling cultural advancement is significant of how accomplished the departments decision making processes; and in building relationships inside the organization. The act of activities in the fields of recruitment and retaining employees; executive practice and 3. Role of HRD: Nowadays cultural diversity effects business's through their HRD

at the workplace largely adds to the achievement of any organization. cultures. In the following ways effective cross-cultural communication between individuals both incomparable and distinctive way, and how accurately they follow to know other individuals with different cultural upbringings cooperate and converse among themselves is exceptionally indistinguishable to intercultural communication which detects how distinctive languages and it is an undertaking, not every person is prepared to do. The idea 4. Cross-Cultural Communication: It is problematic to speak with people having are in dealing with issues and difficulties by building up plans and programs.

resistance. DESH practices at the workplace by removing the glass ceilings, gender differendes and eliminate management is very important. All this can assist to overcome unfairless & prejudice selection techniques, promotions and training methods, performance appression and reward differences at workplace. HR activities, like staffing, selection & placement practices, present management diversity practices will support organizations in managing cultural 5. Examining the present HR diversity practices: An effective examination of the

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6. Cross-Cultural Training programs: Because of the growing requirement for a global society, organizations are nowadays investing in the cross-cultural training programs. This also, employees will feel more competent at workplace as cross-cultural cooperation and information about different cultural backgrounds and many appearances of culture at the workplace. These kinds of training programs stresses on handling cultural diversity in the organization.

7. Collaborative atmosphere: Collaborative atmosphere at workplace helps companies to make a working atmosphere that encourages cooperation, involvement and cohesiveness among the employees. This can also help in the professional side and when it arises to whether you stay in that position or stay in the company or believe in performance and progress. Making of cooperative atmosphere at workplace helps in numerous ways in limiting the effects of cultural diversity at workplace.

8. Support Groups and Mentoring: The workplace might be tough for those who embody a demographic that is unique or limited within the organization. Workers who share a similar statistic foundation may have the capacity to offer help to each other on the off chance that they approach a formal care group composed and encouraged by HRD. These gatherings met frequently to share their encounters (both positive and negative) to influence recommendations to each other for prospering and to enhance the social condition of the association.

6. Conclusion

A diverse workforce is a replication of a changing world today, India is full of diverse people, and hence the Indian HR practices deeply rooted in its socio-cultural aspect, the cross-cultural challenges faced by MNCs in India cannot be overlooked. Global companies have started setting up their offices & shops in different countries all these aspect pose a danger for all companies. Therefore this makes it necessary for organizations to employee with a new atmosphere and culture and all this will affect the organizational performance accordingly to the cultural differences by employing different strategies while doing business globally. All these issues made it essential for organizations to tackle all these cross-cultural challenges in a best ways to improve the organizations to tackle all these erross-cultural challenges in a best ways to improve the organizations to tackle all these performance and for its growth in future.

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Student's Perception towards Higher Education in Jodhpur with Special Reference to MBA Program.

1. Dr. Jatan Kanwar Jain

2. Dr. Dhanraj Jain

Abstract

The present study is an empirical analysis designed to measure the perception and satisfaction level of students towards the MBA program in Jodhpur. Study undertaken with sample of 100 students across Jodhpur.

The MBA Program which is the very popular among the students who wants to build their career in Management, many students in Jodhpur revealed their views about it. In recent time the success of business is depend upon the management team. The study is an attempt towards the perception and satisfaction level of students towards such a prestigious degree which can also gives a lucrative career.

Keywords: Higher Education, Management Education, Commerce Education, Chi Square Test, Education in India

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- 2. Dr. Dhanraj Jain, Principal, Shri Lalchand Milapchand Dadha Jain College, Osiyan Jodhpur

Objectives

1. To study about the students perception towards MBA Program in Jodhpur

2. To know the relationship between gender and choosing MBA for commerce graduates in Jodhpur

Research Methodology and Research Design

In this study exploratory research has been undertaken. The purpose of exploratory studies is to achieve new insights into a phenomenon. The major emphasis in those studies is the discovery of new insights or ideas.

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Sampling Design: - In this project convenience sampling research has been undertaken.

Sources of Data:-

Primary data: - Primary data are collected through orderly structured E-questionnaire from the students pursuing Graduation Final Year.

Secondary data: - Secondary data are collected from books and websites.

Tools for Analysis: The collected data was formulated using the statistical tools namely

1. Percentage analysis, 2. Chi square method.

Limitations of the Study

- The study is conducted only in the Jodhpur city so results are applicable to that place only.
- The sample is limited up to 100 respondents for the study.

Review of literature

Enwistle (2003), is that a student's motivation to learn is a key influence on how that student learns overall. The second assumption is that there is a relationship between the type and level of inspiration to learn of a student and their expectations of that learning experience.

DeBacker & Nelson (1999) who suggest that these expectations of learning will have a number of different dimensions. In making the link between motivations and expectations, this paper considers motivation across two dimensions: Intrinsic motivation and extrinsic motivation

.2 Fagan et al (2008) suggest that intrinsic motivation "refers to doing something because it is inherently interesting or enjoyable" (p.3 f) which is a common explanation across much of the literature.3 V.

According to Zeithmal et al. (2009) one of the prime issues of poor performance in service organizations is unawareness about customer's expectations. Further the study suggests that higher learning institutions are bound to fail if they do not have an accurate understanding of customer's expectations.



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Rajab Azizah, Rahman Hamaidah Abdul, (2012), to investigate the perception of students towards teaching, learning and services provided by supporting staff in institution of higher learning identified that private institutions are facing challenges in holding multiple task not only for their identity and sustenance but also to provide high learning and quality services to students to attract applicants either locally or internationally

Gamage, et al, (2008) in Japan and Thailand on 10 university student suggests that in case of academic the students perceptions are influenced by factors like quality of academic staff, quality of programs, and university reputation, whereas in case of non-academic; the factors influencing their perception included financial assistance 406 Fourteenth AIMS International Conference on Management and tuition fees, counseling and support services, job placement services, and grievance procedures. Besides they were also influenced by facilities like, library and computing facilities, physical plants and facilities, and student organizations. The final results of the study suggest that perceived quality has a positive impact on student overall satisfaction and academic is the most important factor which strongly impacts on students' overall satisfaction followed by non-academic and the facilities factors.

Similar, study on factors determining quality in higher education was conducted by Tsinidou et al. (2010) in Greece among Business and Economics students. The important factors of identified were: academic staff, administrative service, library service, curriculum structure, location, facilities, and career prospects.

Oldfield and Baron (2000) have conceptualized three dimensions: requisite elements; acceptable elements; and functional elements of service quality in higher education based on the student perception regarding service quality and further suggest that requisite elements are necessary to fulfill their study obligations and overall satisfaction. These items include duties to be carried out by non-academic staff, Faculty support staff. Further it was observed that student are not interested in university organizational hierarchies, and expect all university staff to work together.

The findings of study conducted by Douglas et al. (2008) in the UK at Liverpool John Moores University suggest that education managers need to focus on responsiveness, communication and

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access. It was observed that the critical sources of dissatisfaction are attitude, responsiveness, tangibles, teamwork, communication, management, access and socialization.

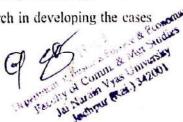
Benoit et al. (1998) conducted a study on the emerging contribution of online resources and tools to classroom learning and teaching trends in higher education and observed seven themes: mixed mode of learning (face to face and on-line learning activities); direct interactive and flexible information access; social interaction; the learning community, supported by networked technologies, computer resources; adaptability of the university to new higher education needs: and finally, the computer linked to other computers constitutes an important element in the modification of academic administrative procedures at both the micro and macro levels. 3

Management Education in India

Management education has taken different shapes in India. In the 90's, due to privatization, and major economic reforms, management education was provided by several institutions and it wa. like a mushroom growth. But after 2010, slowly the government started controlling the management education institutions, mainly by using Information Technology.

Today Management education in India is divided into three categories: (1) Management colleges, (2) Management institutions, where Master's program are offered like MBA/ PGDM exclusively or in addition to UG programs and along with teaching, faculty works on research and (3) Business schools or shortly, '*B-Schools*' offers exclusively the Master's program like MBA/ PGDM exclusively and faculty works on teaching, research, training, academic administration and consultancy. B-Schools, by its nomenelature, should be autonomous and self-sustained.

Initially, MBA programs started in university departments and later in their affiliated colleges with an objective as an additional degree with just knowledge transfer. Later, with the advent of IIMs, PGDMs became popular, which imparted knowledge through practical learning using *Case Studies'*. B-Schools that practicing IIM Model are very successful, and IIMs are conducting training Programs on *Case Study Pedagogy* and facilitating other, management institutions to imitate the IIM Model in training the students to learn practical application of management. The greatness of IIMs is the faculty members do research in developing the cases



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and then they teach those cases in the class, whereas in other management institutions, faculty downloads the cases and use.

B-Schools started working on 'Entrepreneurship', but it took some time to create awareness in the mindsets of Indian students about entrepreneurship. Students joining B-Schools with the only motto of getting jobs and hence placement became the pivotal element. Slowly, B-Schools used 'Placement' as their marketing strategy to attract candidates. Majority of the B-Schools, even though they offer entrepreneurship as a program, very few Institutions like EDI, Ahmedabad able to withstand on this concept. But, with the recent boom in start-ups, B-Schools are focusing on entrepreneur development programs once again. B-Schools are now able to attract budding Entrepreneurs and nurturing their ideas through the 'Incubation Centers'.

B-Schools in India are facing problem in getting qualified and experienced Faculty. In the process of training students to industry requirements, B-Schools are able to support students for good placements. The Ph.D. in management program offered by universities and FPMs offered by B-Schools are giving partial support to '*Education Industry*' to get faculty in management field. On the other hand, all Institutions are going for quality norms like NAAC, NBA etc. where the process includes lot of documentation with data/information from various departments. Some of the Management of B-Schools are able to train their faculty for academic administrative works and offering better positions like Dean or Director in various verticals like admissions, student services, academics, and placements etc.

With the reforms that are taking place at higher education with a focus on technical and management education through clear-cut policies from the government, B-Schools are slowly moving from fixed specializations to *Choice-based Credit System* (CBCS) and this seems to be a good direction for management education as (a) uniformity in curriculum across country (b) freedom to the students to choose their courses without intervention by the Institute (c) easy for any credit transfer with any international institute during any student exchange program (d) student will be getting what direction his career has to forward by selecting his course credits semester wise (e) student gets advantage during placements as recruiting companies are looking all-rounder profiles not just specialization in one vertical.

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Government of India has initiated "Digital India" and slowly all sectors are on digital platform. Education sector has also taken its role in such an initiate and exploring the possibility of technology-based learning in the classrooms. Flipped classrooms are becoming popular compared to the traditional classrooms. This is an instructional strategy where material will be given through online in addition to the lecture sessions. This also includes the home works /assignments/tests /projects which students can do after the lecture sessions through online. Now slowly educational sector started using MOOCs (Massive Open Online Course) in which online education for unlimited participation through web, In MOOCs, in addition to traditional lecture sessions, one can find video lectures, readings, Problem Sets, interactive sessions through forums, quizzes and assignments. One has to register and it is a free of cost for learning, but if you want a certificate for your learning, then only you have to make payment. IIM-B has started giving training to faculty of different Institutions in how to integrate MOOCs in management education. AICTE has indicated that faculty should go for refresher courses on MOOCs in different topics and asking them to register, as the future of education is mainly 'Digita?'.

ANALYSIS AND INTERPRETATION

AGE GROUP OF RESPONDENTS

S.NO.	AGE		NO. OF RESPONDENTS	PERCENTAGE
1	19	\$\$ · (i	6
2	20	nin - 1	3	33
3	21	1	52	32
4	22	•• 1	5	15
5	23	1	4	14
			00	100

UNDERGRADUATION OF THE RESPONDENTS

S.NO.	UNDERGRADUATION	NO. OF RESPONDETS	PERCENTAGE
1	B.com	27	27
2	B.com (Hons)	21	21
3	BBA st	31	31
4	BA	7	7
5	BSC	4	4
6	BCA	6	6
7	BE	4	4

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PLACE OF ORIGIN OF THE RESPONDENTS

S.NO.	PLACE	NO. OF RESPONDENTS	PERCENTAGE
1	RURAL	34	34
2	URBAN	66	66
	x*	100	100

FAMILY INCOME OF THE RESPONDENTS

S.NO.	FAMILY MONTHLY INCOME(in INR)	NO. OF RESPONDETS	PERCENTAGE
1	Below 20000	11	11
2	20000-30000	21	21
3	30000-40000	27	27
4	Above 40000	42	42

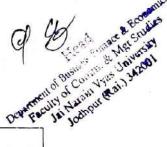
Gender and MBA Program

In order to indicate the relationship between the gender and choosing MBA program chi-square test is used and the result is disclosed.

H0: There is no relationship between gender and choosing MBA after graduation for the commerce graduates in Jodhpur.

H1: There is relationship between gender and choosing MBA after graduation for the commerce graduates in Jodhpur.

	N	o. of Respondents	
GENDER	Interested	Not Interested	TOTAL
MALE	54	• 10	64
FEMALE	30	6	36
TOTAL	84	16	100



Factor	Degree of Freedom	Calculate (x2)	d Value	Table Value	Hypothesis
Gender		1	0.017	3.841	Rejected

3.0

The table discloses that the calculated chi-square value is less than the table value and the result is accepted at 5% level. Hence the null hypothesis is rejected. Therefore there is significant relationship between the gender and doing MBA program.

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Findings

Majority of respondents belongs to Family Income Group (>40000) which indicate that in India MBA Education is still a dream for poor students. Most students want to choose MBA to be more valuable person but the financial difficulties prevent them to do so. When the questions comes to why they want to choose MBA then there are some other common reasons also revealed from respondents that luxury corporate life styles, high salaries in MNCs, other benefits in forms of luxury accommodation, vehicles etc. Highest percentage 33% were from the age 20 who want to choose MBA after graduation. 31% students who wish to choose MBA after graduation, were from BBA; after that B.com students were interested (27%). When it comes to the place of origin then 66% of urban students were interested in MBA and 34% from rural area.

Suggestion and Recommendation

Education could be provided at low cost.

Scholarship could be provided to students who are academically brilliant.

Faculty should be qualified and trained enough to impart knowledge to students.

More focus should be made on skill development in students.

Course should be as per industry need.

Specialization could be increased.

For the exposure of students they could be taken to industrial visit time of

1. 2

Conclusion

This study helped in getting information about the student's satisfaction towards MBA program. The reason for analyzing this study is to know how many of the under graduates are interested to do the higher studies especially MBA and to make the aware about the importance of the higher studies. The respondents have mixed reactions. Some of them have willing to do they higher study (MBA) and some are note due to certain reasons such as financial problems, placement problems etc. It can be concluded that doing higher studies would be good for student has they would get more knowledge and personal development of student which would help them in

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future to get a good job opportunity. The study also concluded that female students are more interested than male students in doing MBA.

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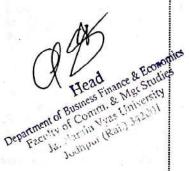
3.4.5

A Flashback of MSME in India: Role in Employment Generation

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Prawal Sharma Research Scholar, Management Dept., JNV UniUniversity, Jodhpur

www.pbr.co.in



Abstract

Micro, Small and Medium Enterprises (MSME) sector has developed as an enthusiastic and energetic division of the Indian economy over the last few decades. MSME is the second biggest sector after agriculture in terms of employment generation. MSME plays an important role in the economic development of the country. It is the spine of the Indian manufacturing segment and are also called as the engine of economic development. In developing nations, like India, most of the space isn't always appropriate for setting up of huge ventures and such type of lacuna can be minimized by a lesser amount of investment. MSME provides 80% of jobs in the industry, with only 20% of the investment.

The significance of proposed research lies in the fact that the Micro, Small and Medium Enterprises (MSMEs) sector plays a crucial role in India's economic development or can say monetary advancement with help of employment creation and this also contributes in the social development of the country as well.

This paper gives in-depth analysis of MSME sector in India. It focuses on the role of MSME in employment generation. It is divided into two parts i.e.(i) A Flashback of MSME in India, and (ii) Role of MSME in Employment Generation.

Keywords: Enterprise, MSME, Investment, Economic, Employment Generation.

Introduction

Micro, Small and Medium Enterprises (MSMEs) plays a key role in development of indigenous and global economy and also proven fact that it strives towards socio economic condition of its people. To remove regional imbalance and stabilizing growth in all sectors of country, the MSME is only sector identified for boosting and making it as a key driver of growth on which Govt. is emphasizing a lot. Like many other countries India is also taking more steps for stabilising this sector which is need of the time. On the other hand, where big entities like wall mart, Amazon and many others are coming in very organised way but at other side our small-scale entities are getting down and forced to close as they are unorganised and unskilled. By taking many more aspects the government of India has concentrated to boost this core sector that has power to create balance in market economy,

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employment creation and creativity in process and making friendly technologically innovative environment.

Objectives of The Study:

To have conceptual analysis of MSME.

To identify the role of MSME in employment generation in India.

Concept of MSME: Indian Perspective:

According to the latest amendment in Micro, Small and Medium Enterprises Development (MSMED) Act, 2006, basis of defining the MSME has been changed from investment in plant & machinery to annual turnover. The current definition is given in Table 1:

Table 1

Definition of MSME in India

(As Per Latest Amendment on 7th Feb'18 in Micro, Small & Medium Enterprises Development (MSMED) Act,2006)

Enterprise – On th	e Basis of Annual Turnover
Description	Turnover (INR)
Micro Enterprise	Up to Rs. 5 Crore
Small Enterprise	Above Rs, 5 Crore & Up to Rs. 75 Crore
Medium Enterprise	Above Rs. 75 Crore & Up to Rs. 250 Crore

Table 1 shows the recent changes done by Union Cabinet in the definition of MSMED Act, 2006. These changes were made by Union Cabinet under the supervision of Finance Minister MR. Arun Jaitley to reform the ease of doing business and to reduce the unnecessary inspections. The main reasons for amendment in the MSME definition are to encourage the MSMEs growth. It will also help in expelling the instabilities related on investment in plant and machinery and equipment. Besides this, the Reserve Bank of India decides to give more extended time period to small businesses who are unable to repay their loan on time. RBI gives them more time before declaring their loans as nonperforming assets (NPAs) or bad loans. The central bank raised the payment period from 90 days to 180 days for MSME loans.

Concept Of MSME: Historical View:

After Independence, the first step was taken by Central Government of India about the Industries Development was to arrange a conference in Dec'47 which was in favour of the advancement of small-scale industries. In this conference, the Central Government divided the SSIs (Small-Scale Industries) into three different categories

Which are as below:

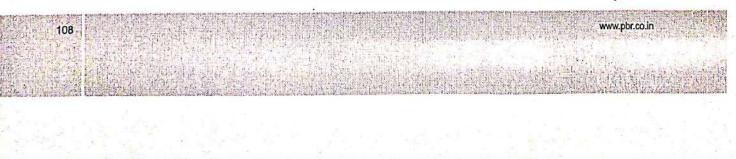
Those units which are auxiliary to large-scale industries.

Those units which are engaged in the supply of repair service.

Those units which involved in the manufacturing of finished products.

In brief, SSIs are playing a crucial role since the beginning for the Indian economy in terms of developing employment and exports. Mr. K.T. Shah Former General Secretary of NPC (National Planning Committee) gave the first definition of SSI, but this was not complete in technical terms. Later on, in 1940, Pt. Jawahar Lal Nehru redefine SSI which was more practical and covered most of the dimensions. He used two categories i.e. electrification of the units and employment generating by the units to define SSI. After the independence, the first official definition of SSI given in 1950, which was divided into two categories. the units. This definition has been revised over time which Finance & Economics is given in below Table 2: Faculty of Comm. & Mgt Studies

Jai Narain Vyas University Jodhpur (Rai.) 342001



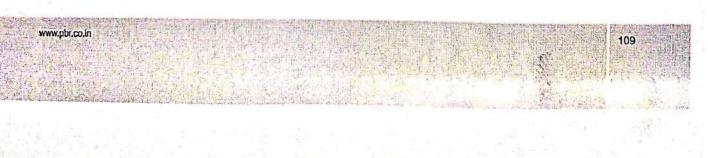
Year	Investment Limit	Other Condition
	investment Ennit	
1951	Up to Rs. 5 lakhs in fixed assets	Appointing < 50 workers if using power and <100 workers if not using power
1960	Up to Rs. 5 lakhs in plant & machinery	NIL
1966	Up to Rs. 7 lakhs in plant & machinery	NIL
1977	Up to Rs. 10 lakhs in plant & machinery	NIL
1980	Up to Rs. 20 lakhs in plant & machinery	NIL
1985	Up to Rs. 35 lakhs in plant & machinery	NIL
1991	Up to Rs. 60 lakhs in plant & machinery	NIL
1997	Up to Rs. 3 crores in plant & machinery	NIL
1999	Up to Rs. 1 crore in plant & machinery	NIL
2006	Up to Rs. 5 crores in plant & machinery	NIL
- th Feb'18 (As per the Latest Amendment in MSMED Act,2006)	No Condition	Annual Turnover up to Rs. 250.00 Crore
		Department c

Table 2 Various Definition of MSME in India in Chronological Order

Source: https://msme.gov.in/know-about-msme

SSIs in India was the mixture of Tiny, Cottage, Traditional, Village and Modern Small Industries, prior to the establishment of Micro, Small and Medium Enterprises Development (MSMED) Act, 2006. This act is commenced with the aim of development, promotion, providing new schemes and concessions. Sectors like handicrafts, khadi, coir, handloom were neglected before the launched of MSMED. So, in order to remove this barrier and negligence, Government of India implemented Micro, Small and Medium Enterprises Development Act which was launched on dated 16th June'06 with effect in operation (Rai.) 342001 from dated 2nd Oct'06.

The MSME Development Act classifies manufacturing units into medium, small and micro-enterprise depending upon the investment made in plant and machinery. Any unit with input up to 1000 lakhs INR in plant and machinery is considered as medium enterprise while those having investment between 25 lakhs INR to 500 lakhs INR is a small enterprise and those units with the investment with up to 25 lakhs INR is considered as micro enterprise. In the



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service sector, any unit with the investment limit up to 10 lakhs INR, between 10-200 lakhs INR and of up to 500 lakhs INR is called as micro, small and medium enterprises respectively. But the Union Cabinet did the latest amendment in (MSMED) Act, 2006 on dated 07th Feb'18 for defining MSMEs on annual turnover criteria which was earlier defined in the terms of investment in plant and machinery criteria.

PROVISION OF MSMEACT, 2006:

The MSME Act,2006, established and came in effect from dated 02nd Oct'06 for regulation and development of micro, small and medium enterprises.

This act is made to encourage, create and expand the competitiveness of micro, small and medium industries of India. In this act, facilities are as below:

1. Access to finance facility from banks without collateral requirements.

2. This act explains medium enterprises to make technology upgradation easier.

Grievance redressal cell for disputed with buyers through arbitration.

4. To file the memorandum is optional for all the medium enterprises those who renders services.

5. Provides benefits regarding the taxes and octroi.

6. Subsidy in electricity bills of micro, small and medium scale industries.

7. It reinforces the lawful arrangements to check deferred payments to micro and small enterprises.

8. Arrangements for guaranteeing convenient and smooth stream of credit to MSMEs.

MSME: FOREIGN PERSPECTIVE:

In most of the countries, industries have divided into three sectors, i.e.

- a. Large-Scale Industrial Units,
- b. Medium-Scale Industrial Units,
- c. Small-Scale Industrial Units.

There is no single definition for MSME which is globally accepted. Different countries have different criteria for MSME. Some of the criteria are, (i) the number of workers, (ii) Based on Capital Investment, (iii) the management and character of Organisation, and (d) Based on of firm's annual turnover.

In Table 3, Definition of MSME in some selected countries is given.

Definitions of SME's in Selected Countries							
Country/Region	Number of Employees	Other Conditions	4				
Australia	Small: less than 100	/					
Canada	Less than 100	/85					
Belgium	Less than 100						
Denmark	More than 5 and less than 500	Department of Business Finance & Mar Department of Comm. & Mar Faculty Narain (Vas) 3420	ECON				
France	10 to 499	Department of Business Finance & Department of Business Finance & Mar Department of Comm. & Mar Facults of Comm. & Univer Facults Narain Vyas Ind Narain Vyas Ind Narain (Rai.) 3420	rsity				
Germany	Less than 500		101				
Greece	Less than 50	Ja hodhpur (Kar					
Ireland	Less than 500						
Italy	Small: 11-50 Artigiano: less than 10	Capital: less than Lire 3 billion					
Netherland	Less than 10						
UK	Mfg.: less than 200 Construction: less than 25	Trade: (Turnover) Retail: less than £50000 Wholesale: less than £200000 Transport: less than 5 vehicles					

Table 3

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EU	Less than 50	Annual turnover: less than 10 million EURO.
Malaysia	Less than 75	Shareholder fund: less than RM 2.5 million
Mexico	15 to 99	Income / Sale: US\$175000
Singapore	Services: less than 100	Manufacturing: less than Singapore \$12 million in fixed assets
Sweden	Less than 200	
Thailand	Labour Intensive Sector: less than 200 Capital Intensive Sector: less than 100	
Brazil	Less than 100	
Argentina	Medium: Up to 300	Annual Sales: Up to US\$18 million Production Assets: Up to US\$10 million
Japan	Medium: Up to 300	Capital: Up to ¥100 million
U.S. A	Up to 500	
Indonesia	Up to 20	
Thailand	Small: Up to 49	Capital: less than \$1.17 million
Vietnam	Small: Up to 29	Capital: less than \$65 thousand De
China	Small: 50-100	

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Source: (i)India: The State Development of Small and Medium Enterprises -2005, Institute of Small Enterprises and Development (ISED) (ii)Soundarapandian.M. (2009), Economic Reforms and Small -Scale Industries, Concept Publishing Company,New Delhi,pp9 -1.

Note: *These countries were using different definitions for SSIs, but since 6 May 2003, the European Union is found to be using the common definition for all EU member countries.

Review of Literature:

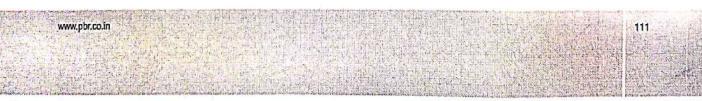
The reason of the literature review is to urge a few information from the existing works that have just been done in a particular area regarding the research. A few studies are discussed below:

Chandraiah & Vani (2014) in their article entitled "The Prospects & Problems of MSMEs Sector in India- An Analytical Study", in their study author, highlight the prospects and problems of the MSME sector. This study is was based on the Indian history and other different segments which will help to improve the rural economy's standard. MSME in India was bound by the government's strict policy regarding export/import of goods. Due to the localisation of their trading location, this is the hurdle of comes between the growth of MSME in India. Indian Government should modify its trade policy for MSME.1

Garg (2014), in his article entitled "Role of MSME in Economic Development", the author highlights all the barriers which are facing by Indian MSME. This study helps to identify the gap between the success of MSME even after various steps has already taken. Even after interference by the government for the growth of MSME, still there has a gap in finance, and operational sector in MSME remain. So, unless this gap will not be covered, these kinds of barriers will not remove which comes between the success of MSME.2

Bouazza, Ardjouman & Abada (2015), in their article entitled "Establishing the Factors Affecting the Growth of Small and Medium-Sized Enterprises in Algeria", in this study, the author highlights all those factors which are affecting the growth of MSME. Both outer and inner factors are included in this study. Outer factors like government policies and procedures, access to credit etc. and internal factors like training deficiency, unskilled labours, lack of promotional techniques used by MSME staff become very crucial which affect the growth of MSME units. This study concludes that for the smooth functioning of MSME units and its continuous growth, both external, as well as internal factors get equal weightage.3

Singh and Kumar (2017), in his article entitled "Working Capital Requirements of Manufacturing SMEs: Evidence from Emerging Economy" in this study, author found that financial leverage, operating cash flow, sales growth, profitability, etc. all such are the main features of working capital needs for SME's in India. Through this study, knew that all these drivers such as cash flow provided from operating activitics, leverage on equity, growth, size and



age of the company would directly affect the working capital need in SME's in India.4

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Upadhyay, Jahanyan and Dan (2011), in their article entitled "Factors influencing ERP implementation in Indian Manufacturing Organisations: A Study of Micro, Small and Medium-Scale Enterprises", this study was conducted on the investigation of Enterprise Resource Planning (ERP) implementation achievement factors in reference to India MSMEs (Micro, Small and Medium Scale Enterprises). According to this study, the author found that four factors are the most important factors which directly influenced the ERP Implementation process in MSME of India. These four factors organisational climate, technical perspective, project execution and product perspective. Proper Controlling over all these factors in every MSME in India may provide smoothness in functioning and growth in MSME in India. 5

Role of Msme In Employment Generation:

The MSME in India are playing an important role in generating and providing huge number of employment eventuality at a relatively low cost of investment than large enterprises.

In the below Table 4, the No. of MSMEs in India and Employment generated through MSMEs from the year 1990-91 to 2015-16 is given. This is clear that the growth percentage of no. of MSME and the Employment generation wise is increasing every year. It is showing that around 11.10 crore jobs have been generated by the MSME sector according to the study conducted in 2015-16. Therefore, employment generated till the latest survey which is up to 2015-16 is 1109 lakhs as reported in the annual report of MSME 2018-19 and according to the projected figures of the year 2010-11 is 965.15 lakhs reported in the annual report 2008-09. The total difference in employment generated through MSME sector in both these reports or in these five years is approx. 144.74 lakhs, i.e. 15.00% growth showing in these five years. And number of MSME in India reported in annual report 2010-11 & in 2018-19 is 428.73 lakhs and 633.88 lakhs (Table 4) respectively. Therefore, total no. of MSME units increased in last five years is approx. 205.15 lakhs enterprises i.e. 47.85% growth rate showing in last 5 years.

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Table 4

Employment (In Lakhs) Total MSMEs (In Lakhs) S. No. Year 158.34 67.87 1990-91 1 165.99 (+4.83%) 70.63 (+4.07%) 1991-92 2 174.84 (+5.33%) 73.51 (+4.07%) 1992-93 3 182.64 (+4.46) 76.49 (+4.07%) 1993-94 4 <u>–30.73 (+20.61%)</u> <u>294.91 (+23.53%) nt of Pusiness Finance & Economic</u> <u>265.15 (+227 Origination of Comm. & Mar Studies</u> <u>265.15 (+227 Origination of Comm. & Mar Studies</u> 191.40 (+4.79%) 79.60 (+4.07) 1994-95 5 82.84 (+4.07%) 1995-96 6 101.10 (+22.04%) 2000-01 7 hpur (Rai.) 342001 123.42 (+22.08%) 2005-06 8 965.15 (+227.27%) 428.73 (+247.37%) 9 2010-11* 10 1109.89 (15.00%) 633.88 (+47.85) 2015-16 10

MSME's Performance: Employment Generation (From 1990-91 to 2015-16)

*The figures showing in bracket is the growth rate as compared to previous year compiled from various annual reports from 2008-09 to 2018-19.

#Projected

Source: Annual Report 2008-09, Ministry of MSME, Government of India, pp 33.

Annual Report 2018-19, Ministry of MSME, Government of India, pp 28-32.

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OUANTUM OF MSME IN INDIA:

As per the NSS (National Sample Survey) 73rd round, conducted by National Sample Survey Office, Ministry of Statistics & Programme Implementation during the period of 2015-16, there were 633.88 lakhs unincorporated nonagricultures MSMEs in the country involved in various economic activities out of which 196.65 lakhs of enterprises are in Manufacturing Sector, 0.03 lakhs in Noncaptive Electricity Generation and Transmission, 230.35 lakhs is in Trade Sector and 206.85 lakhs is in Other Services excluding those MSMEs registered under (a) Section 2m (i) and 2m (ii) of the Factories Act, 1948, (b) Companies Act, 1956 and (c) Construction activities comes under Section F of National Industrial Classification (NIC)

2008.

MSME sector has generated almost 11.10 crore jobs as per the survey conducted during the year 2015-16 by NSS (National Sample Survey) 73rd round. MSMEs generated approx. 360.41 lakhs jobs in the Manufacturing sector, approx. 387.18 lakhs jobs in Trade, approx. 362.22 lakhs in Other Services and 0.07 lakhs in Non-captive Electricity Generation and Transmission. The latest scenario of Number of MSMEs and Estimated Employment Generation in MSME Sector in India (broad activity category wise) during the year 2015-16 has been discussed in detail in Table 5:

Table 5

Number of MSMEs and <u>Estimated Employment Generation in MSME Sector in</u> India (Broad Activity Category Wise 2015-16)

Category		Rural	l	Jrban		Total	Sh	are (%)
	No. of MS	Employ ment Generati	No. of MS	Employ ment Generati	No. of MS	Employ ment Generati	No. of MS	Employ ment Generati
	ME	on	ME	on	ME	on	ME	on
Manufact uring	114. 14	186.56	82.5 0	173.86	196. 65	360.41	31	32.00
Trade	108. 71	160.64	121. 64	226.54	230. 3 5	387.18	36	35.00 Department of T Haculty of 33.00
Other Services	102. 00	150.53	104. 85	211.69	206. 85	362.22	33	33.00,0
Electricity	0.03	0.06	0.01	0.02	0.03	0.07	0	0
Total	324. 88	497.78	309. 00	612.10	633. 88	1109.89	100	100

Source: Annual Report 2018-19, Ministry of MSME, Government of India, pp 28-32.

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Conclusion:

In this paper, the definition of MSMEs across the world have been discussed. There are many definitions of MSMEs have been seen based on different criteria country by country, and it has been redefined over the time. Some countries defined MSME based on capital investment, and some country defines on the ground of the number of employees working in their firm whereas some define on the ground of annual turnover of the firm. In India, the definition of MSME has been changed many times from 1951 to 2006. But in EU member countries, the definition of MSME is same since 2003. We come to conclude, the MSME sector plays an important role in employment generation in India. According to a survey conducting in 2017, MSME contributes around 31% to the nation's GDP, 34% shares of the overall manufacturing sector and 45% shares of the overall export output. It is the backbone of the Indian economy. Looking to its importance, government must try to facilitate MSME to grow at faster rate. The efforts so far done to exaggerate is not sufficient.

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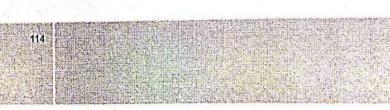
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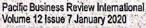
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Demonetisation in India: An Empirical Study on the Opinion of the General Public

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Abstract

The word demonetisation captured the imagination of the people and emerged as the biggest catchword at least in year 2016 in India. The sheer scope and scale of the decision made the experts, economists and policy makers across the globe to take a note of the move. The demonetisation, which impounded around 86% of the currency amounting to more than Rs 15 lakh crore, was indeed an unprecedented decision on the part of the ruling dispensation. The event has got cemented in the collective memory of our nation and will certainly go down in the history as a bold and overwhelming surprising decision.

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The government had mentioned the rationale and goals of the demonetisation, initially and few were added to the list later. A pilot survey was conducted (December 2018) to gauge the opinion of the college students' and based on the lessons learnt, a comprehensive survey was undertaken in the 2019 to gauge the public opinion with varying demographic profile across India in which 1061 respondents participated.

The results of the survey indicate that on the dimension of stated goals of demonetisation, the respondents have opined in favour of the government.

Keywords: Demonetisation, Survey, Opinion, Demographic Profile

Introduction

The decision of the demonetisation, announced on 8th November 2016 by the Prime Minister was indeed come as a bolt from the blue for one and all. The decision led to taking away the legal status from the high value currency notes (Rs 500 & Rs 1,000) and resultantly rendering them worthless for undertaking economic transaction barring few exceptions.

Some of the major stated goals of the demonetisation chiefly included:-

- · Flushing out the black money
- Curbing corruption
- Checking Counterfeit bank notes (FICNs)
- Checking anti-national activities (Stone Pelting, Naxalism, Terrorismetc.)

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· Transforming the economy into Digital and Cashless Economy

- Improvement in the government revenue and tax base
- Gross Domestic Product (GDP) higher growth rate in the long term
- Cleaner economy in the long run

The reactions and point of views start rolling in immediately after the decision. Many experts, economists and researchers supported the decision as a bold and much needed one to streamline our economy by correcting the present state of affairs and underlying economic muddle. The demonetisation move was equated with the bitter yet effective pill to address the diseases infesting our nation in the form of economic improprieties like black money, corruption, terror funding etc.

Moreover, it is expected that the move would catapult the government revenues owing majorly to the digitalisation and formalisation of the economy which would further lead to handsome funds allocation to the desirable areas like welfare schemes, education, health, skill up-gradation and employment generation. This would play an instrument role in achieving a desired society driven on the principles of equity, inclusivity and sustainability

On the contrary, the critics of the decision relegated the move as an outrageous, unnecessary and irrational one subjecting the masses to unimaginable hardships, pain and misery. The move has dented the citizen's trust. No less than the person of stature of former Prime Minister Shri Manmohan Singh has termed it as a case of organised loot, the implementation of which was a monumental management failure in itself. The decision would bring down the GDP by 2%. Amartya Sen, the Nobel laureate, pointed out that the decision led to inconvenience and suffering as innocents being deprived of their own money and only an authoritarian government can cause the misery of such magnitude.

Nonetheless, the decision has certainly caused the inconvenience and hardships to the people but it is expected that in the long run, owing to the major benefits and positive spillovers, the decision would outweigh the short term cost. In the long run, the revenue of the government in terms of tax and non-tax is expected to rise owing to the transformation of the economy from informal to the formal economy. The black economy is expected to scale down resulting into the government revenue heading north and better bargaining power to the labours along with better employment opportunities and social security.

Review of Literature

C. Rammanohar Reddy (2019) "Demonetisation and Black Economy", the author of the book made a sincere effort to gauge the different dimensions of the demonetisation. The formal objectives of the demonetisation remained unfulfilled especially the gross miscalculation of the amount of banknotes not returning to the banking channel. Against the expectation of Rs 4-5 lakh worth currency notes (25-33% of total demonetised currency notes) not returning by virtue of they being black money, only around 0.8% eventually did not came into the banking system which is the indication of the scale of the disappointment.

Moreover, demonetisation had in reality encouraged financial transactions of illicit nature and turn out to be the biggest money laundering operation. The former governor of RBI, RaghuramRajan had not supported the demonetisation and advised against it in early 2016 as the long term benefits would be outweighed by the short term cost. Secondly, as compared to demonetisation, there are other effective and better options available to deal with the black economy. The quantum of counterfeit high value currency notes detected post demonetisation has been around Rs 582.7 million which was insignificant in the light of the sheer scale of the demonetisation.

The demonetisation decision has caused a disproportional deleterious impact on the informal sector. It is still not clear as to how much of that damage to the informal sector is permanent and temporary in nature. The author points out that higher cash prevalence in the economy do not necessarily mean a larger black economy. and higher usage of digital medium of for undertaking economic transaction does not necessarily lead to smaller black economy.

Meera H Sanyal (2018) "The Big Reverse: How Demonetisation Knocked India Out", the author in her book did a ruthless attack on the move. The reports and data on the impacts of the move have not been able to capture the true nature of the colossal misadventure. The extent of inconvenience, hardships and misery the most unfortunates faced owing to the demonetisation failed to get the enough representation in the mainstream media.

The decision has caused unimaginable sufferings to the innocents on account of them being deprived of access to their own money. The most suffered were the small businessmen and farmers due to liquidity shock and invariably found themselves back in the clutches of the money lenders and informal channels due to lack of access to formal channels of borrowing. The move has dented the trust of people.

The RBI has fallen from the grace due to its powerlessness to stand straight and strong to the ruling dispensation on the decision of demonetisation and eventually submitted to the pressure and dictates of the government. In the process the RBI's autonomy and giant standing came under fire.

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Moreover, the series of official notifications, which were at times contradictory in nature, post demonetisation decision have added to the prevailing confusion and inconvenience. However, the author appreciated the role of bankers for the hard work put in and commitment shown post demonetisation in order to ensure the smooth transition. Nonetheless, few black sheep maligned the whole banker's community and damaged the credibility. The author indicated that the owing to its sheer callousness, the move of demonetisation would be rather better to be an unforgettable experience.

Sheenu Jain(2017)"Dimishing the Digital Divide: Cash is not Accepted!", the researcher cautioned that there would be turbulence in the transformation of our economy to digital platform. The appropriate measures and arrangements should be made by providing the enabling environment to ensure that such transformation be people driven based on their choice and not forced upon them.

The government shall come up with the necessary and sufficient policy initiatives in the legislative, technological and infrastructure domain to ensure smooth transition to the digital and cashless economy by addressing the underlying issues of digital divide, education and financial literacy. A digital system rooted on the principles of accountability, trust, security and transparency go in long way in making the general public confident to go digital in place of undertaking economic activities in cash form.

The researcher emphasised, there is utmost need of visionary leadership, robust digital infrastructure, publicprivate partnership and strong cyber laws to achieve smarter and cashless economy in the times to come.

L.N. Nathuramka (2017) "Assessing the Impact of Demonetization", the researcher reflected his concern over the stress on the economy (disproportionally on the poor and informal sector) caused immediately after the demonetisation decision. Nevertheless, the move was based on the good intentions of the government chiefly driven to address the economic problems which were eating into the vital of our nation for quite some time. However, the move fell short of addressing the problem of corruption, black economy and terror funding in a holistic and comprehensive manner.

Nevertheless, the people supported the resolve and astonishing courage reflected by the government to address the economic illegalities prevailing in our economy. The move was flawless in capturing the popular imagination and in turn got the support of the people. The citizens endured the short term inconveniences and hardships owing their trust in the decision and confidence of long term benefits.

The research suggested that the citizens should be appropriately rewarded for their support and sacrifices by the government in terms of restructuring the direct tax system, rationalisation of the tax rates, better welfare schemes, streamlined infrastructure, higher funds allocation to human resource development etc.

Deepa Krishnan (2017) "Survey of the Effects of Demonetisation on 28 Slum Neighbourhoods in Mumbai", interviews were undertaken by the researcher around a month after the demonetisation decision that is in the early December 2016. The survey was administered on 200 households in 28 slums.

The study attempted to gauge the opinion on the various facets of the decision and the impact on their savings, revenue and expenditure along with the appraisal of the decision of the demonetisation. The socio-economic status of the households indicated majority of them being falling to lower-middle class in Indian context as around 66% of the households had monthly median earning in the range of Rs 8-18 thousand. The result of the survey signposted that the household income decreased immediately after demonetisation (November 2016) with variation on the dimension of occupation, organisation; along with decrease in consumption and shift in saving pattern. Nevertheless, majority of the respondents supported the demonetisation as a desired strategy on the part of the government.

The researcher concluded that the time is still not fructify to give afinal judgment on the demonetisation decision and once the more data is available with passage of time, the impact of the decision would be gauged in a comprehensive manner.

Local Circles (2016), piloted a survey in 200 cities of India, a citizen engagement social site. A total number of 9,000 people participated in the survey. The survey results reflected astrongbacking to the decision. The results indicated that only 3% of the respondents were against the decision. However, on the question of implementation, 24% graded it as poor as against the 51% and 25% of respondent marking it as good and average respectively.

What was even more encouraging for the government is fact that a strong majority of the respondents (79%) pointed out that they do not mind the inconveniences caused. Furthermore, 18% of the respondents opined that though the implementation process is causing inconveniences but still they stand by the decision.

The results are indeed music to the ears of the ruling dispensation, which came under a lot of criticisms from various quarters. The government decision has in fact gone down well with the public, based on the results of the

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survey.

Research Methodology

The survey method was applied through a structured questionnaire to assess the general public's opinion on the goals mentioned by the government behind demonetisation. In December 2018, a pilot survey was conducted to capture the college-going students ' view on demonetisation through a structure questionnaire designed for this purpose.

A full-scale comprehensive survey was conducted in the month of May-June 2019 based on the learning from the pilot survey.A total of 1061 participants, with varying demographic profile, presented their opinion on the different dimensions of the demonetisation, administered through a questionnaire.

The respondents were requested to present their opinion on

various dimensions of demonetisation on 6-point Likert scale, where 1 and 6 depicting strongly agree and strongly disagree respectively. The SPSS was applied to analyse the participants' responses.

Research Objectives

Mentioned below are the research objectives:-

i.To gauge the opinion of public about the need of the demonetisation.

ii. To capture the opinion of the public on the goals stated by the government behind the decision of demonetisation.

Data Analysis and Interpretation

Demographic Profile

The demographic profile of the respondents comprises of gender, age, annual income & educational level.

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Particulars	No. of Respondents	Percentage
A. Gender		
Male	538	50.7
Female	523	49.3
Total	1061	100
		n installer and
B. Age (in Years)		
Up to 25	514	48.4
25 to 40	438	41.3
Above 40	109	10.3
Total	1061	100
Zhi Hashiya da ay		10.3 100
C. Educational Level		
Up to Graduation	503	47.4
Above Graduation	558	52.6
Total	1061	100
	and a state in the second	for the state of the particular
D. Annual Income (in Rs)		
Up to Rs. 5 Lakh	548	51.6
Above Rs. 5 Lakh	513	48.4
Total	1061	100

Demographic Profile of the Respondents

Source: Primary Data collected by the Researcher through Questionnaire

The table 1 comprises of the summary of the demographic profile of the respondents. From the table, it can be seen that out of total 1061 respondents, 50.7% are male while female accounts for 49.3%. On the dimension of age, 48.4% are up to the age of 25 years while respondents between 25-40 years and above 40 years are 41.3% and 10.3% respectively. Similarly, in terms of the educational level of the respondents, 47.4% are up to graduation level and 52.6% are above graduation level. Finally, on the

strand of annual income of the respondents, 51.6% fell into the income bracket of up to Rupees 5 lakh and 48.4% in above Rs 5 lakh.

Need of Demonetisation

Once the respondents mentioned their demographic details, they were requested to specify the opinion about need of the demonetisation in 2016.

Table 2

Opinion of the Respondents about the Need of Demonetisation

Response	Number of Respondents (N)	Percentage
Strongly Disagree	165	15.55
Disagree	182	17.15
Slightly Disagree	104	9.80
Slightly Agree	185	17.44
Agree	264	24.88
Strongly Agree	161	15.17
Total	1061	100
Mean Score	3.64	15.17 100 Depa
Level	Agree	

Source: Primary Data collected by the Researcher through Questionnaire

From the table 2, it is apparent that in the opinion of the respondents, demonetisationwas needed in 2016 as the median score (3.5) is less than the mean score (3.59). Out of the total number of respondents, 24.88% and 15.17% had agreed and strongly agreed with the decision of demonetisation. On the other hand, 15.55 and 17.15% of the respondents reflected strong disagreement and disagreement respectively to the demonetisation decision.

This would quite satisfying for the government as the

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people stood by the decision of the demonetisation and reposited their faith in the intent to clean up our economy and achieving a strong and resilient economy in future.

Achievement of the stated goals of the demonetisation

In order to collect the opinion of the respondents on the achievement of the demonetisation goals, the 6 point Likert scale was applied. The 1 reflecting strongly disagree and 6 indicating strongly agree.

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Table 3

Summary- Opinion of the Respondents about Achievement of Goals of Demonetisation

		1	Respon	se of t	he Resp	onden	ts	Total		
S. No	Decisive Role played by Demonetisation in	St. D	D	SI. D	SI.A	A	St.A	1.4	Mean Score	Level of Agreement
1	Removal of the Black Money	167	187	119	196	248	144	1061	3.57	Agree
2	Checking and Curbing Corruption	143	201	129	194	265	129	1061	3.59	Agree
3	Checking prevalence of FICNs	93	137	118	207	283	223	1061	4.05	Agree
4	Checking Anti - national Activities (Naxalism, Terrorism, Insurgency, Stone Pelting etc.)	97	146	118	214	274	212	1061	4.00	Agree
5	Transformation into Cashless and Digital Economy	60	109	100	194	353	245	1061	4.32	Agree
6	Improvement Government Revenue& Higher Tax Base	63	146	128	244	325	155	1061	4.02	Agree
7	Higher Gross Domestic Product (GDP) growth rate in the long term	105	173	118	271	280	114	1061	3.74	Agree
8	Cleaner Economy in the long run	77	169	133	226	308	148	1061	3.91	Agree

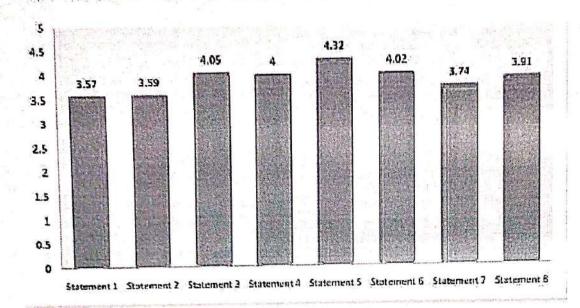
Source: Primary Data collected by the Researcher through Questionnaire

St.D- Strongly Disagree, D- Disagree, Sl.D- Slightly Disagree Sl.A- Slightly Agree, A- Agree, St.A- Strongly Agree

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Figure 1



Summary- Opinion of the Respondents about Achievement of Goals of Demonetisation

Source: Based on the data from Table 3-

The table3 and figure 1 are depicting the respondents' opinion about the achievement of the goals. The responses of the respondents were captured on the 6 point Likert scale as presented in the table. The result varies between 3.57 and 4.32 which are above the median score of 3.5 in all the cases (stated goals of the demonetisation), thereby leads to the agreement of the respondents with the achievement of the goals of demonetisation.

This is certainly a huge encouragement for the government as the respondents agree with the efficacy of demonetisation in achieving the stated goals. What is even the matter of high morale buster for the government is the fact that the mean score is above 4, reflecting strong support, in case of goal of demonetisation namely checking counterfeit currency, checking anti-national activities, transformation into digital economy and improvement in tax base & revenue of the government. Therefore, in nutshell, the stated goals of the demonetisation have been achieved to a larger extent.

Conclusion

Even after around 3 years of demonetisation, the opinion of public seems quite divided. The claims of the government about the demonetisation got both the supporters and critics. Even the recent slump in the GDP growth rate has been blamed on the demonetisation and Goods& Services Tax by some experts and economists. The cost- benefit analysis associated with the move has certainly polarized the opinion of the experts, economists and general public.

However, respondent indicates that the public has supported demonetisation move on the strand of the stated objectives by the government. This would really be an encouraging outcome for the government which was facing scathing attack chiefly owing to the hardships caused in the initial stages of the implementation and the unintended negative consequences of the decision as experienced with the passage of time.

This could possibly be due to the positive perception of the respondents about the intent behind the move due to which they stood with the government in spite of the initial glitches in the implementation that resulted in inconveniences at the end of the masses at large. There is also a line of reasoning, in the German language the word schadenfreude meaning feeling of pleasure due to misfortune of others played itself out in people support to the demonetisation. The feeling that I lost one eye but rich will go blind would have possibly led to the overwhelming

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support for the move. Finally, the government was able to sell its narrative beautiful where any opposition was seen with suspicion (they being corrupt and having black money) and at worst being anti-national. On the other hand the opposition found wanting to take the fight to the government and challenge the narrative in an effective and meaningful way.

It does take a genius to take a position on the demonetisation at this point of time as such unprecedented measure unfold over a long period of time and effects economic, political and socio-cultural realm. The single minded agenda of the government should be to provide an enabling environment to the people to ensure smooth transition in the times to come to the desired state of affair.

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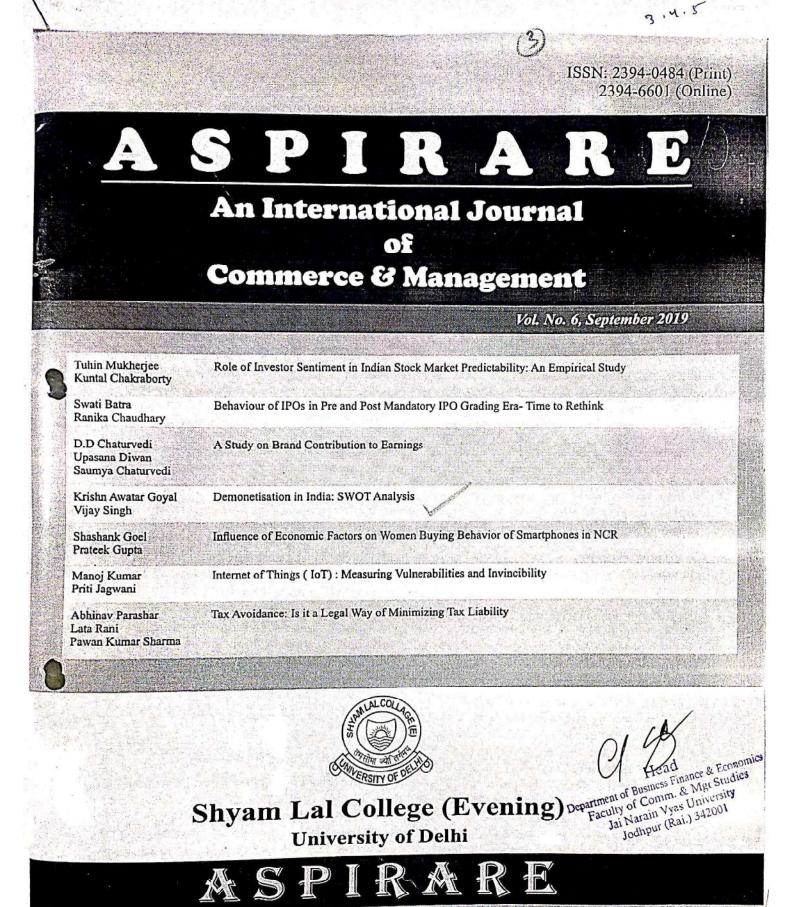
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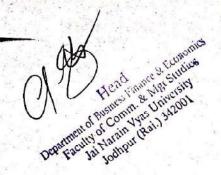
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Demonetisation (2016) in India: SWOT Analysis

Krishn Awatar Goyal* & Vijay Singh**

The decision of demonetisation announced in the evening of 8th November, 2016 has brought about substantial change in the lives of the people of India. The argument posited in favour of the economic move was that it is going to address the daunting problem facing our nation like black money, anti-national activities (terror funding, naxalism, insurgency), counterfeit currency (FICN), informal economy, tax evasion and corruption; which are without a second thought eating into the vitals of our nation. Later on one more dimension of digital and cash less economy added to the list of the goals.

However, the counter argument advanced against demonetisation relegated the move as an unwarranted and unnecessary pain, inconvenience and agony mounted on the general public without any commendable achievement of the stated goals.

In this paper, an attempt is being made to understand the various dimensions of the demonetisation of 2016 through the application of SWOT analysis.

Even after more than 2 years of demonetisation, it is indeed not an easy choice as to whether the decision to demonetize 86% of Indian currency in form of Rs 500 and Rs 1,000 was a wise move or not.

See Sec.

Keywords: Demonetisation, SWOT Analysis, Black Money, Digital Economy.

Introduction

The announcement of demonetisation on 8th November, 2016 has rendered the 86% of Indian currency useless by virtue of they lost their legal tender status. The move was unprecedented in the terms of the sheer scale and scope it has got. Hardly does anyone could avoided himself from the impact of the demonetisation. It touched upon the lives of all the people of India, albeit in varying degree. Same goes true for the various sectors of Indian economy, with the rider that the impact differed in intensity.

As in case of any major policy decision, like New Economic Policy (LPG, 1991), there are people who extend their support to the decision and on the other hand, there are people who present the counter view on account of the futility of the decision. This also applies to the decision of demonetisation taken in 2016.

As more than two years have been elapsed since the demonetisation decision was taken in 2016, it is an opportune time to decipher the enigma through in-depth analysis. The SWOT analysis would not only help in understanding the strengths and weakness of the economic

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event but plays a critical role in gauging the future possibilities and concerns in terms of opportunities and threats in light of the data available from various experts, government and private agencies.

The strengths would concentrate on the positive outcomes on the strand of stated goals and other implied as well as unintended consequences. While the weaknesses would cover the failures in achieving the stated goals and turmoil the decision of demonetisation caused. Finally in the Opportunities and threats section the future possibility and challenges would be discussed.

The moot question whether it was worth the gamble would be attempted to be answered through SWOT analysis.

Review of Literature

Hasina Daya and Philip Mader (2018) "Did Demonetisation Accelerate Financial Inclusion" opined that government has not been able to achieve its stated goals. Likewise the fall back claim that removing cash or cashless economy would result into better financial access does not holds it ground in the light of the evidences. Their findings points out that among the poor, with bank accounts, the uptake of digital transaction has remained minimal and there is negligible changes in the saving behavior. Finally, it was concluded that the demonetisation came at a major social and economic cost especially for lower class people. The government overemphasis on financial services is not desirable for our country where people are not confident to have access to basic necessities of life like food, education, sanitation.

Tulsi Jaykumar (2017) "Behavioural Economics Perspective of Demonetisation" made an attempt to decipher the demonetisation from the perspective of behavioural economics. The core idea was to apply the key principle of behavioural economics in a systematic manner to a decision in the domain of public policy in

order to achieve the superior outcomes. The decision and implementation of demonetisation was explained applying the concept of decision utility and experienced utility which are based on the choices the economic agent makes. The author also touched upon prospect theory to understand the public policy.

The author concluded that demonetisation failed to factor in the various dimensions of utility. The lack of major public discontent in the short run shall not be seen as the acceptance of the policy of the government which points out the inability of the ruling dispensation to differentiate between decision and experienced utility.

Gautam Prateek, Richard Knopf and Bjorn C Peterson (2017) "Demonetisation: Wefts and Warps of the Common Man" presented their analysis on demonetisation based on the content analysis of the articles published in four leading English newspaper namely Indian Express, Hindu, Hindustan Times and Times of India between 8 November and 18 November 2016. The government considered the poor, neo-middle and middle-class citizens as the common man and pointed out that the demonetisation would benefit them in diverse ways.

The authors have finally pointed out that the opposition political parties, in their indulgence of countering the narratives of the ruling dispensation on the point-to-point basis, have failed to present a strong coherent counter-narrative. Nonetheless the common man is considered to be quite gullible by all.

Anand Teltumbde (2017) "India's Marie Antoinette Moment" showed his concern over the government forceful move to the cashless economy. The cashless or less-cash transformation of Indian economy will not be achieved in near future and moreover it is not suitable either. The author noted that in his speech on November 8, 2016 the Prime Minister used the term Black money innumerous time and no mention of cashless economy.

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Deepa Krishnan and Siegel Stephan (2016) "Survey of the Effects of Demonetisation on 28 Slum Neighbourhoods in Mumbai" an effort to capture the immediate effect and response to demonetisation was produced on the basis of a study of approximately 200 households residing in 28 neighborhoods in Mumbai.

The study showed that 82% of participants visited a bank branch or an ATM between 9 November and 18 November, 52% exchanged ancient notes for fresh ones, 49% deposited old notes, and/or 22% withdrew fresh notes from the ATM. During these visits, the majority (63%) encountered average waiting times of one to three hours.

The study results suggest that the policy has led to a fall in revenue, but the effect on revenue differs considerably across distinct organizations, especially between those who receive a periodic wage and those who do not.

Demonetisation (2016): SWOT Analysis

SWOT analysis is an important strategic tool to have in-depth critical evaluation and planning for the possible future possibilities.

Like any other major economic decision, demonetisation do have set of underlying strengths and corresponding weaknesses. It would also throw up the opportunities and threats in future.

Looking at the tremendous impact of demonetisation on people from different walks of life and on different sectors of our economy, it is of prime importance to dissect the phenomena of the demonetisation in a dispassionate and comprehensive manner in order to draw a meaningful conclusion and resultantly present a correct picture to the people.

In this regard an attempt is being made to have comprehensive analysis of the government's move in 2016 to demonetize around 86% of the currency in circulation.

Strengths

In this section, the positive achievements of the demonetisation are taken up for the discussion. The basic framework for this section is based on the intended goals of the government behind the demonetisation and other positive spillover effects of the same.

On the dimension of checking Fake Indian Currency Notes (FICN) or counterfeit currency, the move of demonetisation has definitely removed all fake Rs 500 and Rs 1,000 currency notes in circulation as all of these notes were either deposited in the banks or remained unusable with the people and thereby the elimination of fake notes is inevitable. The hawala networks which runs overwhelming on the back of high denomination notes, owing to the demonetisation the funding of terror activities and separatist agenda have been choked and halted. On the other hand, in the red corridor the naxal activities have reduced owing to a lot of pain and lack of ability to convert the huge stacks of demonetized notes on which they were sitting. Based on the interceptions of the talks among the Maoist leaders, the fear of losing the ill-gotten and dirty money lying with them to go down the drain seems to have materialized.

This is made possible more so with the implementation of Goods & Services Tax (GST) in 2017. This would ensure the formal reporting of all the transaction as well as help in reducing the allegation and instances of corruption and harassments as the physical contacts between general public and tax officials would reduce drastically owing to the shift to the online mode leading to higher degree of accountability on the part of the government officials and transparency in overall economic activities.

The table 1, it is quite apparent that during the financial year ending 2017, the highest growth of 21.51% in personal tax collection is recorded since 2010-11 and an unprecedented growth of 1316.68% in other direct tax collection. At the same time an impressive growth of 14.53% is recorded in overall direct tax collection.

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75.1.5.2				(Rs. in crore)			1	Sec. 200 1
Financial Year	Corporate Tax	% Change	Personal Income Tax	% Change	Other Direct Tax	% Change	Total	% Change
2009-10	244725		132833		505		378063	1.
2010-11	298688	22.05	146258	10.11	1049	107.72	445995	17.97
2011-12	322816	8.08	170181	16.36	990	-5.62	493987	10.76
2012-13	356326	10.38	201840	18.60	823	-16.87	558989	13.16
2013-14	394678	10.76	242888	20.34	1030	25.15	638596	14.24
2014-15	428925	8.68	265772	9.42	1095	6.31	695792	8.96
2015-16	453228	5.67	287637	8.23	1079	-1.46	741945	6.63
2016-17	484924 .	6.99	349503	21.51	15286	1316.68	849713	14.53
2017-18*	571202	17.79	419998	20.17	11541	-24.50	1002741	18.01

Table 1: Direct Tax Collection

Source: Compilation from Income Tax Department, GOI (Union Finance Accounts of respective years and reports of C&AG/ Receipt Budget)

*Provisional/ Unaudited

Table 2: Number of	Returns	Filed	(Including	Revised	Returns)
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Financial Year	Returns Filed	% Change
2013-14	37976554	
2014-15	40433614	6.47
2015-16	46304045	14.52
2016-17	55709086	20.31
2017-18*	68532510	23.02

Source: Compilation from Income Tax Department, GOI

*Provisional

In the table 2, it can be seen that the returns filled have increased by 20.31% and 23.02% in the financial year 2016-17 and 2017-18 respectively. This indicated the positive impact

of demonetisation in term of people coming out and declaring their income thereby helping in checking the tax evasion and black economy.



Table 3: Direct-Tax GDP Ratio

(Rs. in crore)

Financial Year	Net Collection of Direct Taxes	GDP Current Market Price	Direct Tax GDP Ratio	Tax Growth Rate	GDP Growth Rate	Buoyancy Facto
2009-10	378063	6457352	5.85			
2010-11	445995	7674148	5.81	17.97	18.84	0.95
2011-12	493987	9009722	5.48	10.76	17.40	0.62
2012-13	558989	10113281	5.53	13.16	12.25	1.07
2013-14	638596	11355073	5.62	14.24	12.28	1.16
2014-15	695792	12541208	5.55	8.96	10.45	0.86
2015-16	741945	13567192	5.47	6.63	8.18	0.81
2016-17	849713	15253714	5.57	14.53	12.43	1.17
2017-18*	1002741	16773145	5.98	18.01	9.96	1.81

Source: Compilation from Income Tax Department, GOI

Provisional

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The table 3, reflects that post demonetisation, the direct tax GDP ratio has reached to 5.57 and further to the highest of 5.98 (since 2009-10) in the financial year 2016-17 and 2017-18 respectively. Itapparent that the buoyance factor has reached to 1.17 and 1.81, which are highest since 2010-11, in the financial year 2016-17 and 2017-18 respectively. This is a commendable achievement as the tax buoyancy factor indicates the efficiency and revenue mobilization responsiveness in relation to growth in the GDP.

Table 4: Gross Tax Revenue to GDP Ratio

S.No.	Financial Year	N/ C1
1	2010-11	% Change
2	2011-12	10.39
3	2012-13	10.18
4	2013-14	10.42
5	2014-15	10.14
6	2015-16	9.98
7	2016-17	10.58
8	2017-18	11.25
	2017-10	11.59

Source: Compilation from CMIE

In the table 4, we can see that the Gross Tax Revenue to GDP ratio has improved and registered the highest rate of growth of 11.59% in 2017-18 and 11.25% in 2016-17, since the financial year 2010-11 which is again a welcome sign for our economy.

The above figures mentioned in table 1 to 4, owing to better tax compliance, improving tax buoyancy factor and improvement in the number of tax payers and growth in the gross tax revenue to GDP ratio, the government is expected to improve its revenues and thereby meet the fiscal deficit target of 3.3% of Gross Domestic Product (GDP). On the front of digitalization and cash less economy, there is indeed a handsome growth in the electronic transactions.

The table 5, reflects that in total retail electronic clearing, a growth rate of 45.06% and 46.21% is recorded in the financial year 2016-17 and 2017-18 respectively. In case of total card payments, a growth rate of 68.18% and 43.24% is recorded in the financial year 2016-17 and 2017-18 respectively. It can deduced from the above data that the people are accepting the

Table 5: Electronic Transactions

					(in Rup	ces Trillion
	2015-16	2016-17	% Change	2017-18	% Change	
Total Retail Electronic Clearing	91	132	45.06	193	46.21	-
Total Card Payments	4.4	7.4	68.18		0.00000	
Source: RBI (compiled from Bloc	mberg)		00.10	10.6	43.24	

cash less mode of payments and shifting to digital platform.

If we look a little deeper, we can appreciate the fact that the demonetisation was one of the link in the whole chain which is aimed at freeingIndia from the clutches of black money and to formalize our economy. In this regard, many steps are taken since 2014.

All these steps shows us that the government was taking the necessary steps since 2014 to check corruption, to unearth black money and to make the economy more formal and clean.

The demonetisation was indeed one of the part of the same.

Therefore, more than an unwarranted economic adventurism, the demonetisation was part of the large scheme of the things and the government should not the blamed squarely for the inconvenience and pain caused as the intentions of the government does not seems to be malicious and we all need to do introspection is this regard.

Finally, it can be said that the decision of demonetisation led to many positive outcomes



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by registering good progress in term of achieving the defined goals as well as some positive spillover effects of the same.

Weaknesses

In this section, the flaws and negative effects of the demonetisation will be taken up for discussion. The discussion would be based on the lapses and unintended negative consequences.

Many experts have opined that the demonetisation came at a huge socio-economic cost and has got many unexpected negative consequences, which are very difficult to quantify. The demonetisation of 2016 is rated as one of the most perplexing decision of the government as the economic conditions prevailing at that point of time were not that dire to go for such an unprecedented step which created havoc in the lives of innumerable number of people.

The demonetisation was done in a hurry which set up the stage for a lot of pain and inconvenience. In order to make demonetisation successful, the government keep coming up with new rules and regulations especially during first 50 days, which add to further confusion and suffering.

The experts and agencies favouring the demonetisation expected that around 3 lakh crores would never return as it was expected to be black money and therefore no sane person would take the chance to get within the radar of the tax authorities and other government agencies. This turns out to be gross over-estimation, which could be on account of over-estimation of the quantum of black money or the people played smart around the system. In the first case our agencies seems to be completely aloof of the ground realities as only 0.7% that is rupees 16,000 crore of demonetized currency did not find its way back. It is further pointed out that some of that money is lying with NRIs; Nepal and Bhutan. In the second case, it reflects pretty poor on the character of those people who would go to any extent to fail any government initiative which can transform our economy into a formal

and tax complaint one.In both the cases it rather paints an undesirable pictureof our nation.

Table 6: Estimated Loss to Indian Economy till 30th December 2016 (Post Demonetisation)

Rs (in crores)

S.No.	Particulars	Amount
1	Cost to Enterprises	61500
2	Cost to People Queuing Up	15000
3	Cost to Bank	35140
4	Cost to Centre and RBI	16800
en le composition de la compos	Total	128440

Source: Compilation from CMIE

From the table 6, according to Centre for Monitoring Indian Economy (CMIE), the first 50 days (till 30th December, 2016) were very difficult days for the people from different walks of life and enterprises in India which caused a substantial loss to the economy to the tune of Rs 1,28,440 crores.

It is pointed out that the unintended negative consequences of demonetisation would be felt for a long time to come.

Table 7: Labour Participation Rate

Months	Labour Participation Rate
Oct-16	46.4
Nov-16	44.8
Dec-16	45.2
Jan-17	45.2
Feb-17	44.5
Mar-17	44
Apr-17	43.5

Source: Compilation from CMIE

From the above table, it can be seen that the labour participation rate which was 46.4 in October 2016 fell to 43.5% in April, 2017 which indicates the possibility of economic slowdown. Moreover, the CMIE has pointed out that the demonetisation led to the loss of approximately 15 lakh jobs lost during the January-April 2017.

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Dr. Krishni Awatar Goyal & Mr. Vijay Singh The claim of government of digital and cash less economy also came under fire in the light of the fact that the cash still remains the basic medium of undertaking transactions. This is derived from the fact that the currency with public reached to rupees 18.5 trillion in the month of august 2018 in comparison to rupees 17.9 trillion before demonetisation.

Another shortcoming includes the inability of the banking system to show up during the need of the hour.

. Period	% Growth
April- June 2017	7.9
July- September 2017	7.5
October-December 2017	7
January- March 2018	6.1
April- June 2018	5.7

Table 8: GDP Growth

Source: Compilation from CSO, Gol

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From the above table, experts have claimed that the reason for continuous slide in the GDP growth rate from the first quarter of financial year 2017-18 to the first quarter of financial year 2018-19 is chiefly because of the shocks of demonetisation and further aggravation due to GST.

Some experts, especially in political domain, put the allegation that the demonetisation of high value notes was done in order to choke the opposition political parties into submission. As per the reports and findings, we know that the black money plays an important role in elections in India at different levels.

Finally, the critical question is whether the demonetisation would stop the further generation of black money in future or not. There is no point in attempting to dry up the floor if thewater tap is kept open. Therefore, the single minded agenda should be to check the generation of black money itself rather than concentrating on doing the clean-up job afterwards.

Therefore, it can be said that whenever a massive economic exercise is undertaken of the scale

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of latest demonetisation, there will be some unexpected and unintended negative outcomes. However, with a better preparedness and wellcrafted implementation the collateral damage could have been controlled.

Opportunities

In this section, the future possible avenues are discussed based on the positive impacts and strengths of decision of demonetisation and by leveraging upon the same.

A digital economy indeed strikes a balance between keeping the record of all the transaction (checking tax evasion) and ease of financial operations.

It is also expected that the digital and less cash economy would promote the cause of financial inclusion. The scheme of Direct Benefit Transfer (DBT) would result into checking the leakages in the system which would further cut the corruption and other malpractices. The JAM (Jan Dhan Account- Aadhar Card- Mobile Phone) trinity can transform our economy in a clean and formal one.

We know that the corruption eats into the vitals of an economy and puts a lot of strain on the socio-culture fabric of a nation. The step of demonetisation was taken as a part of the series of measures taken to address the same. We have all the capabilities to uproot this malice, provided the government takes all the necessary measureswhich includes promotion of moral education, digital literacy, facilitating infrastructure for digital economy, conformity of punitive action against the wrong doers etc. Subsequently, the government shall make it mandatory for the transaction beyond a given threshold not be done in cash or the aadhar card and PAN card details be disclosed if payment is made in cash. At the same time people need to think beyond their self-centered selves for the larger good of our nation.

The possibility of demonetisation in future would keep moral check on people and thereby promote

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the banking activities in place of keeping the cash and futility of indulging in corrupt activities once the digitalization take its roots.

There are tremendous opportunities which are quite difficult to quantify at this point of timethat shall be leveraged upon in order to achieve the goal of a transparent, prosperous and striving nation in the times to come.

Weaknesses

In this section, the future over reaching adverse possibilities would be discussed based on the concerns raised about demonetisation.

It is already discussed earlier that the people's love for cash is hard to die as the currency with public has rather increased post demonetisation which puts a question mark on whether the people have actually changed the manner in which they use to do the economic transaction and shifted to digital platform or they did so due to lack of alternatives post-demonetisation.

The preference for cash need not necessarily mean that people for inherently corrupt and chose to remain anonymous in their financial domain to evade tax and to avoid any tax related scrutiny. The fact that force-feeding the concept of digital economy could easily be proved counter-productive need to be understood in a holistic and comprehensive manner. The efforts should be taken to understand the economic behavior of the people and subsequent measures and enabling environment need be provided in order to achieve the transformation from cash to digital mode.

The concern has been raised that due to demonetisation there is possibility that people would rather shift their future savings to nonproductive assets like gold, silver, jewellery, precious stones, land etc. The possibility is based on the actual and perceived difficulties faced by people in getting their own money back postdemonetisation especially till the cash crunch normalised. The fear of over-reaching surveillance is perhaps a real one. In digital mode, the advantage of trail of transaction is prone to be used against the people is indeed a possibility. Therefore the issue of privacy of the people need to be ensured as a matter of fundamental right extended to the citizens by our constitution.

The dual question of cybercrime and cost of digital transactions need to be set right before expecting the transformation to cashless economy. The cost attached to using cash are pretty much known and well documented but at the same time it need to be ensured that people should feel safe and secure on digital platform and the fees charged should be appropriate. There have been news from time to time about the economic cyber crimes or frauds and compromising of the bank details of millions of the account holders. Therefore, there are many possible negative consequences and fears that can materialize owing to the loopholes and as the unintended effects of the demonetisation.

Conclusion

As the dust is settling down, opinions are divided about the need, utility and desirability of the demonetisation in the light of the data coming on regular basis pertaining to the outcomes of the demonetisation. Whether we like it or not, the demonetisation is going to be remembered for a long time to come with different set of emotions.

Not all of us are convinced about the need of the demonetisation but we also need to appreciate the fact that in principle there seems to be positive intent on the part of the government to clean up our economy and to infuse desirable economic behavior in the people in form of shift to formal and tax abiding nation.

We need to appreciate the calm and mature behavior of the people in spite of all the hardships and inconvenience they were subjected to. It is the prime responsibility of the government

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to ensure that the sacrifices of the people shall not go waste.

In the words of the present Vice-President, the demonetization is a mahayagya where every Indian need to contribute and sacrifice. However, the question still remains whether every India contributed to the cause and whether the people borne the cost in equal measure.

The jury is still out on the dilemma of as to whether the demonetisation was a poor implementation of a desirable policy or poor implementation of an undesirable policy.

The process of thesis, anti-thesis and synthesis is an ongoing process which does apply to the demonetisation also. Let more data and opinions come in before taking the verdict on the suitability and appropriateness of the timing and intent of demonetisation for our nation.

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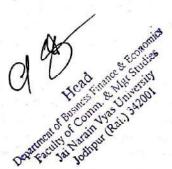
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Exploring the Role of Demonetization in India through Garrett's Ranking Method: An Empirical Study of University Students

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Abstract

In the evening of 8th November 2016, the Government of India decided to demonetize the Rs 500 and Rs 1,000 currency notes which constituted 86% of the total currency in circulation. The decision had many wider ramifications in terms of its effect on the people from different classes and on the different sectors of the Indian economy. There are supportive as well as opposing views. The supporters of the move rated it as of one of the most comprehensive and necessary step to clean up the Indian economy and there would be many positive spill-over effects in the times to come in terms of checking corruption, formalization of the Indian economy, better income realization, cash economy etc. The opponent of the move rated the demonetization as an unwarranted catastrophe inflicted the adverse impact of which is hard to qualify. They declared it an unwarranted and undesirable decision of the government to create sensation and to cover up their governance failure as there was no dire situation in India to undertake the unprecedented step of demonetization of Rs 15.41 lakh crore worth of currency notes. In this research paper, an attempt is being made to gauge the opinion of the university student's about the demonetization decision taken in 2016 through an online questionnaire. A total of 201 responses across India pursuing under-graduate, post-graduate, M. Phil. and Ph.D. courses in different streams were taken into consideration reflecting their opinion on the various dimensions of the demonetization using the 5 point scale and applying Garrett's Ranking Technique to gauge the relative importance of the objectives as stated by the government.

Key Words: Demonetization, Black Money, Students, Opinion, Garrett's Ranking Technique

INTRODUCTION

The demonetization is not an unfamiliar event to India. The demonetization of 2016 was the third one after 1946 and 1978. However, in terms of its scope and impact, 2016 was certainly the biggest of them all. Due to its sheer scale of impact, the demonetization has touched upon people from different walks of life and different sectors of our economy, although the impact varied in terms of intensity. This decision should not be seen as a standalone event taken to address the mess prevailing in the economy. There were a scrics of efforts taken in order to clean up the economy which is apparent in terms of the administrative and legislative steps taken by the government of India prior to the decision

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of demonetization of Indian Currency; Some of the major efforts taken by the incumbent government since 2014 include the formation of Special Investigation Team (SIT), enactment of 'Benami Transaction Act', Income disclosure scheme, Information exchange and tax treaties with various countries (especially with the countries which are supposed to be tax havens), etc.

So far so good, but the implementation was the bone of contention as according to many experts on the subject matter rated the application of the decision as to the one implemented in a reckless manner without factoring in the ground realities which invariably resulted into avoidable pain and agony to the general public.

The capacity of the state to implement the decision of such scale was perhaps either overrated or not taken into consideration in an appropriate manner.

The unintended negative consequences in terms of people losing out on their jobs, deaths especially of the old people, loss of daily wages, drag on the growth of the economy, etc. Moreover, according to RBI, 99.3% of demonetized currency notes getting back into the banking system indicates the ingenuity of the people to play around the system and circumvent the checks & balances in place. This also grossly failed the predictions and claims of various experts and the government which anticipated that a substantial amount (around Rs 3 Lakh crores) of the demonetized currency notes would not find their way back into the banking system by virtue of they being black (money) in nature.

The decision of demonetization has impacted all the sectors of the Indian

economy namely the primary, secondary and tertiary sectors.

The same goes true for the different classes of the people namely lower income group, middle-income group, and high-income group. However, the intensity of the impact of demonetization has certainly been varying in degree.

In light of the facts, figures, and finding coming with each passing day, a survey was done to gauge the opinion of the University students' about the demonetization of 2016.

REVIEW OF THE LITERATURE

A. Aleeswari, W. Lilly Merline, Nivetha Martin (2018) the research paper deals with the problems faced by the industrial units in India. The research work applied the Garrett's ranking technique for the preferential ordering of the industrial problems. This would play a critical role in gauging the responsible factors and their relative importance in the realm of industrial problems and would facilitate better decision making, framing and formulating plans, programmes and policies to the problems faced by industrial units. For conducting the study, geographical locations having major industries were selected across India. The respondents included managerial staff, decision makers and policy framers. The questionnaire method issued for data collection. Using the Garrett's ranking technique, the responses were converted into numerical score for facilitating comparison. The results showed that the out of the ten factors, most important factor behind industrial problem is of Lack of selfreliance, followed by Financial constraint, Human Resource Mismanagement, Industrial illness etc. The factor of Lack of profit in public sector is the least ranked

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(tenth) and therefore the least important as per the finding of the survey.

Jagdeep S Chhokar (2017), "Black Money and Politics in India" discussed the issue of the black money in the Indian political system. The demonetization was aimed at gauging the spread of black money and removing the same from the Indian economy and society. The author pointed out that the issue of black money in politics is multidimensional in terms of the need of black money in politics, its role, its sources or generation, its possible harmful effects, the possibility of its elimination in politics, etc. As per the white paper on black money by the finance ministry in 2012, the black money is the resource or asset that is not reported to the concerned authorities both at the time of its generation and possession. The author reflected his concern in the light of the fact that in spite of all the possible efforts by Association for Democratic Reforms to identify the sources of political funds, nothing substantial has been achieved since 2007. It is concluded that the political parties will go to any length to prevent disclosure of their sources of funds, they undermine that legal and constitutional decisions of the highest statutory body (Chief Information Commission), it is not beyond them to violate the law of land (Foreign Contribution Regulation Act) and it can be inferred that the political parties use black money and dependent on it. The likely way out seems to be the cooperation among civil society, media and judiciary to check the menace of black money in politics in India which in reality is pretty difficult as there is lack of a formal way for them to come together. Therefore the onus rests on us to eliminate the curse of black money.

Ashok K Nag (2016), "Lost Due To Demonetisation" examined the stated objective of demonetization (i) to curb the menace of fake currencies;(ii) to wipe out unaccounted and tax evaded money stored in such high-value notes; and (iii) to prevent use of high denomination notes for terror financing. The author drew the parallel between the demonetization exercise of 1978 and 2016 as on both occasions a new government came to power based on popular anger against corruption. The problem is our perception of Black money. The former governor of RBI, IG Patel, has refuted the people perception that black money is kept in hard cash and therefore such exercise of demonetization hardly produces decisive results. However, there is a major difference between demonetization 1978 and 2016 of what constitutes "high-value notes" chosen to be demonetized. An Rs1,000 note of 1978 vintage would not be less than Rs14,000 in 2016 irrespective of the deflator one uses. Back then the per capita income was 1.49 times the value of the lowest denomination note that was withdrawn. The corresponding figure in2016 is 186.5 which reflects that an Rs500 note is well within the reach of an ordinary middle-class person and its discontinuation impacted the transactional demand for cash, resulting into the disruption of life at a larger scale.

The author has shown his concern over the regeneration of black money and therefore the demonetization should be followed with other necessary measures. It is suggested that in order to curb corruption the government spending at transactional level shall be released under Open Data license.

Prime Minister Narendra Modi App (2016), a survey was conducted in which more than five lakh people took part. The

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result reflected the acceptance of the demonetization. More than 93% of the participants have supported demonetization. 98% of the participant thinks that Black money exists in India, while 99% think that the evil of corruption and black money needs to be fought and eliminated. A heartening outcome for the government is that 92% of the respondent thinks that the demonetization will have an impact on curbing black money, corruption, and terrorism. But CPI leader D. Raja questioned the survey results, saying, "Rural India has no access to apps. This is not a reflection of the real picture."

Dr .Uma H.R., Madhu G.R., Mahammad Habeeb (2013), conducted the survey in which 100 respondents participate which were selected from different construction fields located at Mysore, Karnataka, A questionnaire was designed and administered in order to collect the primary from the respondents. The pull factors responsible for the internal regional migration were analyzed using the Garrett's ranking technique in order to rank the various factors in term of their influence on the migration. The unemployment factor got the first rank, followed by low wages, loan, drought, low productivity and the last rank was bagged by drinking water problem. Therefore the most influential factor responsible for the migration turn out to be Unemployment while the least influential factor happens to be drinking water problem based on Garrett's ranking technique.

OBJECTIVES OF THE STUDY

The main objectives of the research study were:-

 To capture the opinion of the University students' about the demonetization and its impact on people and sectors of the economy.

 To gauge the relative importance of the various factors stated behind the decision of demonetization applying Garrett's Ranking Technique.

RESEARCH METHODOLOGY:

In order to capture the opinion of the University students, an online questionnaire was designed and sent to the students across India for which the random sampling method was used. The respondent includes the students pursuing various courses at Undergraduate, Postgraduate, M. Phil and Ph.D. in different streams.

The questionnaire was floated in the month of December 2018. The response on the questions was captured applying the fivepoint scale.

The responses were received across India and finally, 201 responses were taken into consideration for the final analysis after removing the incomplete and repeated responses from the same respondent.

Finally the Garrett's Ranking Technique was used in order to ascertain the most significant factor that influenced the decision.

In this technique the respondent ranked all the factor from I to V, where I being the most significant and V being the least important according to the responses, as given in the form of the rank, were finally converted into the score value, applying the formula as mentioned below:-

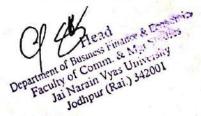
100 (Rij- 0.5)

Percent Position= -----

Nj

Where, Rij = Rank given for the ith variable by jth respondents

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Nj = Number of variable ranked by jth respondents

DATA ANALYSIS:

The online questionnaire was designed having questions on various dimensions, stated goals and achievement of the demonetization. For the purpose of capturing the response, five-point scale was used. The random sampling method was used to select the respondent across India pursuing various courses at different levels of specialization. The questionnaire was floated in the month of December 2018. Finally, 201 responses were considered for the analysis.

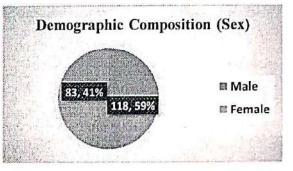
Table 1

Demographic	Composition	of the	Particinants	(in	terms of the Se	x)
Demographie	Composition	OI SHO	T SET FICT DELLED		LOTINO ON THE OW	

S.No.	Sex	No. of Respondents	Percentage
1	Male	118	58.71
2	Female	83	41.29
1.6		201	100.00

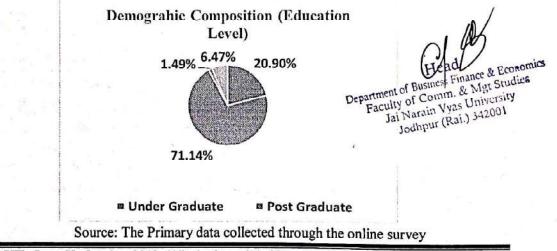
Source: The Primary data collected through the online survey

Demographic Composition of the Participants (in terms of the Sex)



Source: The Primary data collected through the online survey Figure 2

Demographic Composition of the Participants (Education Level)



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Figure 1

In order to ascertain the importance of each factor behind the decision of the government to demonetize the currency, the Garrett's Ranking Technique is used.

Accordingly the five factors were ranked in order of their importance from I to V based on the response of the students:-

- 1. Checking Corruption
- 2. Controlling Anti-national Activities
- 3. Reducing Counterfeit Currency
- 4. Curbing Black Money and Black Economy

5. Transformation into Digital and Cashless Economy

There were four major sections in the questionnaire having a total of eleven questions pertaining to the demonetization.

In the first section, the questions of the need of demonetization were asked. In the second section, the questions were asked on the effectiveness and efficiency in the implementation of the demonetization.

In the penultimate section, the set of questions were related to the five major stated goals by the government of India behind the decision of the demonetization.

Finally, in the last section, the questions were asked on the participant's verdict on different dimensions of demonstization.

The response from the students are then rated using the Garrett's ranking technique in order to find out the preferential ranking of the factors, as declared by the government behind the decision of demonization.

S.No.	Role of Demonetization	Respons	e (No. of R	espondent)	2 - 2 - 2	Total (No. of
		Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Respondent)
1	In Checking Corruption	22	58	49	43	29	201
2	Controlling Anti-national Activities (Naxalism, Stone Pelting, Insurgency etc.)	30	58	42	39	32	201
3	Reducing Fake Indian Currency Notes (Counterfeit Currency)	38	61	42	31	29	201
4	Curbing Black Money and Black Economy	24	51	40	44	42	201
5	Encouraging India to transform into Digital and Cashless Economy		49	40	28	25	201

Table 2

Summary of the re	sponses of the students
-------------------	-------------------------

Source: The Primary data collected through the online survey

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In the above Table 2, the summary of the responses received from the University students are indicated. In the given table, the respondents have rated the five stated goals of the demonetization, as mentioned by the government. Based on the responses received the rating is done applying the Garrett's rating technique. On the basis of above formulae and the garrets conversion table the garrets weight will be 75,60,50,40 and 25 for 1st 2nd 3rd 4th and 5th Ranks respectively.

Table 3

The second	1 7. St. 11-1.	Respon	se			1.4.2	1.2.2.2	1.1		
	Asia Alient	Garret	t's Weigl	ht –Tab	le value			5 a 4 a		82.1
	di di	75	60	50	40 ·	25			1.000	
A CALCULATE AND A STREET	Role of Demonetizat ion	monetizat Rank Rank Rank Rank Rank		Rank 5	Total	%	Average Score	Rank		
1	Checking Corruption	1650	3480	2450	1720	725	10025	19.44	49.88	IV
2	Controlling Anti-national Activities	2250	3480	2100	1560	800	10190	19.76	50.70	ш
3	Reducing Counterfeit Currency	2850	3660	2100	1240	725	10575	20.51	52.61	п
4	Curbing Black Money and Black Economy	1800	3060	2000	1760	1050	9670	18.75	48.11	v
	Transformati on into Digital and Cashless							а., 		
5	Economy	4425	2940	2000	1120	625	11110	21.54	55.27	I
Tot	al						51570	100 %		

Ranking of the factors applying Garrett's Ranking Technique

Source: The Primary data collected through the online survey

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Faculty of

The above table represents the ranking of the five stated objectives of the demonetization. These ranking are based on the response of the students after applying the Garrett's Ranking Technique.

The objective of transformation into digital and cashless economy bagged the first rank (with 21.54%) and therefore the most important factor behind the move of demonetization according the students. The reason for the same are not hard to find.

The government put its weight behind to ensure the transition of Indian economy into digital economy through various initiatives like no commission on digital transaction, declaration of various schemes/ awards/ concessions for people effecting transactions through digital means, various awareness programmes (dedicated TV channels) etc. Resultantly, the results also showed a handsome growth in digital and cash less transaction especially during the initial months.

The carrot and stick approach worked in favor of the government in terms of its push for digital economy. However the critics have pointed out the general public was not left with much option in light of the paucity of the cash and therefore the transition to cash less economy was forced one and on desirable in our context as over reliance on the technological means to solve the socioeconomic problem is wrong medicine for the underlying ailments and short comings.

The objective of reducing the counterfeit currency or Fake Indian Currency Notes (FICNs) rated as the second most important factor and got the second rank (with 20.51%). This was indeed a surprise as accordingly to many experts and organizations, the quantum of FICN was not substantial enough to go for the extreme measure of demonetization of such scale. According to the report of Indian Statistical Institute (Kolkata)the quantum of FICN in circulation was around Rs 400 crores (estimated at 250 pieces per million) which is far lesser in comparison to many developed countries and was indeed not strong enough a reason to lose sleep over and taking such drastic step.

The next important factor is controlling antinational activities (terrorism, insurgency, naxalism, stone pelting etc.) and got the third rank (with 19.76%). Many experts opined that the government played pretty smart in giving the economic decision (demonetization) a national color by stating the imperativeness of the decision to free India of anti-national activities and to achieve a peaceful, prosperous and stable nation. The ruling dispensation has certainly gauged pulse of the nation and also, in principle, the intent of the government seemed to be honest. The acceptance of the narrative of the government is reflected in the third rank the factor has bagged.

According to various reports and statements by the ministers, the stone pelting activities have nosedived especially the months immediately after the demonetization. Moreover, the activities of the naxalities were badly hit as the money accumulated through various illegal activities (smuggling, extortion, robbery, loot etc.) were rendered useless and the new currency was not easily forth coming for them to carry out their antinational activities for the want of cash. According to the claims of the government,

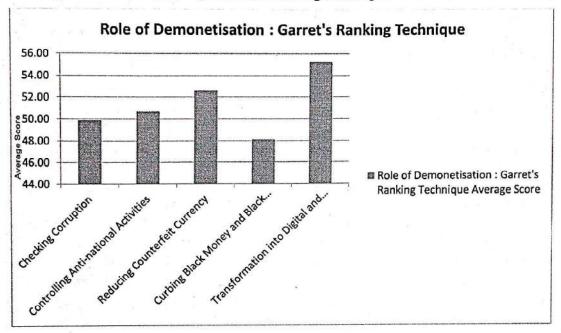
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the whole anti-national machinery was brought to a standstill and got halted in the

red corridor zone of India and many Naxalites surrendered in the process.

Figure 3



Ranking of the factors applying Garrett's Ranking Technique

Source: The Primary data collected through the online survey

One of the most important factors stated by the objective behind the unprecedented decision of demonetization was to get rid of the malice of corruption. It is also the decisive reason because of which the decision got a huge acceptance and support in spite of a lot of inconvenience and pain experienced by the general public. But to the surprise of many, the factor got the penultimate rank (with 19.44 %). The possible reason behind such low ranking could be on account of doubts among general public about the intention of the government and seriousness towards making India corruption free especially in the light of the launch on Rs 2,000 currency note. This move has, to a considerable extent,

spoiled the party for the government as it is believed that Rs 2,000 currency note is logistically far suited and easier to effect the corrupt transaction.

The last rank was bagged by the factor pertaining to curbing the black money and black economy (with 18.75%). It does not take a genius to appreciate the fact that the people who gets the money from illegal sources or which is not declared to the officials for the purpose of tax payment (black money and dirt money) do not remain in cash form for a long time. According to various studies, the black money in cash form ranged between 4% to 6% only. The most to such ill gotten money of the past has

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already been converted into black wealth through the means of real estate, salted away as foreign investments, gold, jewellery, foreign currency etc.

AFTER THOUGHT

Many experts have tried to decipher the reasons, which majorly falls in behavioral domain, behind lack of notable protests despite the unwarranted and avoidable pain and agony. The implementation problems and resultant inconvenience and nuisance were heavily skewed against the poor people. The reason for the unprecedented poor (and the calmness among argumentative Indians) was the belief and confidence among the poor and less fortunate that we might lose one eye but the rich will get blind. The fight was indeed become class based.

Secondly, the poor had unquestioned belief that demonetization would lead to redistribution of wealth as the government will take away the ill-gotten or unaccounted money from the rich and distribute among the poor through various ways and means. The "Robin Hood Syndrome", if we may say that, worked beautifully in favor of the government of the day.

Thirdly, the ruling dispensation was far more superior in terms of putting forward the immaculate narrative and giving it a nationalist favor. Therefore, let alone the protest, anyone who dared to criticize or raised his voice against demonetization was rated as anti- national.

Finally, it was also the gross failure on the part of the opposition political parties to put up a cohered protest and mount the decisive attack on the government. Arguably, the ruling dispensation won the battle of the perception by giving a nationalist flavor to the economic move of demonetization. However, it will unfair to blame the government squarely for the implementation glitches as the people of India also put in their best possible efforts to con the system by finding innovative ways and means to play around the system and find their ways to exchange or deposit their unaccounted money. This also resulted in government coming up with rules and regulation every other day in order to remain ahead of the curve and to control the measures resorted to by anti-social elements to fail the move of demonetization. The fact certainly speaks a lot about our value system and moral density where parochial interest of few undermined the larger national interest.

CONCLUSION RECOMMENDATION

AND

The online survey did satisfactory job in capturing the opinion of the University students across India about their take on the various dimensions of demonetization by the mean of the questionnaire designed for the purpose.

By applying the Garrett's ranking technique the responses were rated and results were analyzed. There are few surprises while eye balling the results.

Firstly, the first rank bagged by the factor pertaining the encouraging Indian economy to transform into digital and cashless economy. This was quite surprising as this objective was not initially mentioned as the core objective behind the decision of the

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demonetization and was added later to the vowed objectives of demonetization.

Secondly, the objective of Curbing Black Money and Black Economy got the last rank and rated as least important by the respondent. It was again pretty surprising as the core objective behind the move of demonetization was to free India of the malice of black money which is certainly eating into the vitals of our economy. The aim was to formalize the Indian economy. Moreover, the demonetization was in line with the series of the steps taken by the government to get rid of black money and black economy (which is pegged in the range of 25% to 40% according to different estimates). Still, the factor lies at bottom has certainly came is the bolt from the blue.

Finally, there is a gap of just 2.79%(21.54%- 18.75%) between the Ist and the Vth ranked factor. This reflects the relative importance of all the stated objectives of the demonetization and the miniscule gap between the factors reflects the criticality of each factor. Indeed a tough choice to decide the most important factor.

However, we need to appreciate few facts before taking the verdict of the responses of the students that there are many factors that impact the objectivity on the part of the respondent whereby the decision is not seen only from the economic rationale rather political, socio-cultural aspects, etc. does come into play. Moreover, the time is still not ripe to be sure of the outcomes of the decision of demonetization. Lastly the unprecedented moves like demonetization have quite a substantial amount of gestation period owing to which the impact is not seen immediately rather it takes a long time to decisively reflect its impact on the ground.

Nevertheless, the single-minded goal of the Government to up the antc in order the clean up the economy overwhelmed the much need efforts to ensure the appropriate and desirous level of implementation. But in order to keep the secrecy intact such glitches are not something totally unacceptable.

It is recommended to have more such survey to capture the opinion of the people in order to comprehensively gauge the pulse of the nation in a more decisive and holistic manner on the question of demonetization and its different dimensions/ impacts.

One thing is for certain, whenever the economic history of our nation be looked back upon, event of demonetization will be remembered with the set of mixed emotions.

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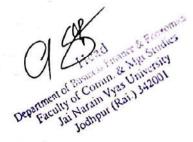
Feature

Demonetization In India- The Journey So Far

KRISHN AWATAR GOYAL AND VIJAY SINGH

With each passing day, in the light of various reports and data, the consequences of demonetization are becoming far clearer and comprehensible. The jury is still to give its verdict on the demonetization, which is certainly a watershed event in the political and economic history of our nation. However, it is not that easy to choose between the pro and anti-demonetization divide. There is little doubt about the stated objectives and intentions behind the decision of demonetization, which primarily includes checking the menace of black money, black economy, corruption, FICN, antistate activities and to enhance cashless & digital economy. The Bharatiya Janata Party (BJP) led NDA government at the Centre shall be praised for taking such a huge political risk to cleanse the economy of our nation. However, there was clear cut indication of lack of proper and adequate planning on the part of the government, which led to unintended adverse consequences like loss of employment and daily wages, deaths, suicides etc.

Even after more than two years of the demonetization, it is indeed very difficult to clearly mention that it is good or bad for the Indian economy as the whole picture is still to be unfolded.



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Introduction

The decision of demonetization taken on the evening of 8th November 2016, was one of the major economic reform, which touched upon so many lives across India and elsewhere. The ripples of the breakthrough economic event is felt to this day. In the history of our nation, especially in the economic history, the event of demonetization of 2016 will be remembered for varied reasons.

The demonetization of 2016 is considered to be unparalleled in terms of the sheer volume which led to around 86% of the currency rendered worthless (Rs 500 and Rs 1,000 currency notes lost their legal status as the accepted currency). There would hardly be any resident of our nation who has not felt the effect of demonetization.

The experts who are watching the unfolding of the effects of demonetization from close quarters have differing opinion on the question of its efficacy. The opinion varies diagonally from the much necessary and awaited economic cleansing of the whole economy to one of the largest economic disaster of unimaginable proportions.

2. Historical Background

India has resorted to the demonetization for the first time In 1946 with the aim to curb black marketing owing to the Second World War. Back then Rs 500, Rs 1,000 and Rs 10,000 notes lost their legal status as the official currency.

Again in 1978, Rs 1,000, Rs 5,000 and Rs 10,000 notes were rendered worthless with the chief aims to check black economy.

In 2016, on the evening of 8th November, the government decided to demonetize Rs 500 and Rs 1,000 notes, which constituted around 86% in value term of the total money in circulation. What was striking about the

demonetization of 2016 is the sheer volume and value of the demonetized currency, which brought down the entire economic activities on its knees, at least temporarily.

India is not the first country that has taken the route of demonetization to address the underlying economic issues and better future economic outcomes. In the past many countries like Nigeria, Ghana, Zimbabwe, North Korea, Soviet Union, Australia and Myanmar have resorted to demonetization to address their economic problems which majorly includes; check on black money, controlling inflation, combating corruption, transformation to digital economy. The experience of these countries reflects mixed response in terms of achieving the underlying goals of the demonetization.

However, the event of demonetization of 2016 was quite gigantic in terms of the people affected and the sheer quantum of the currency that lost it legal status.

This time the government presented following reasons behind the decision to demonetize around 86% of our currency.

- A. To gauge the black money and black economy
- B. To check corruption
- C. To control anti-state activities like terror funding, insurgencies, stone pelting in Jammu and Kashmir, extremism etc.
- D. To check the circulation and misuse of counterfeit currency (FICN)
- E. To move towards a cashless and digital economy

3. Review of Literature

Arun Kumar, (2017) "Economic Consequences of Demonetization Money Supply and Economic Structure", pointed out the impact of demonetization is difficult to ascertain due to the uncertainty caused by demonetization. However, according to RBI, the economy is expected to slow down by 0.5%. The researcher has concluded that a tiny proportion of the black wealth is expected to be destroyed owing to demonetization but it would not be able to check the generation of black wealth in future.

J Dennis Raja Kumar and S L Shetty, (2016) "Demonetization 1978, the Present and the Aftermath", compared the demonetization exercise undertaken in 1978 and 2016 on the basis of the stated goals and their strands. They opined that the step of demonetization should be

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resorted to in a demanding and precarious economic situation like hyper-inflation, financial crisis; which was not the case in 2016. In 1978, when the President of India promulgated the High Denomination Bank Notes (Demonetization) Ordinance to demonetizing the 1,000, 5,000 and `10,000 currency notes, the main objective was to eliminate "the possible use of such notes for financing illegal transactions" (RBI 1977-78:77).

The current situation is different, the demonetized Rs 500 and Rs 1,000 notes constitute over 85% of total notes in circulation by value. In the first week of November 2016, when the current demonetization took place, about 95% of such currencies were with the public. Another fundamental difference between the 1978 and 2016 demonetization is of the motivation behind the actions taken. The reason this time, according to the RBI, is that there is increasing quantum of FICN which are used for terror funding and by black money hoarders. However, the claim is debatable as the counterfeit notes have generally constituted around 0.002% of the notes in circulation. It is expected that the demonetization would improve the fiscal heath of government's finances as the exercise of demonetization is likely to result into addition to RBI's accrued income as part of "other liabilities and provisions" on the liabilities side.

Ashok K Lahiri, (2016) "Demonetization and Cash Shortage", asserted that the demonetization of 2016 is similar to the demonetization done in 1946 and 1978 for that the main goals are to address the critical issue of Black money and to gauge the problem of counterfeit currency (FICN). The researcher makes an endeavor to analyze the possible impact of cash shortage on growth of the economy and when the cash shortage is likely to get over based on various scenarios.

Sumanta Banerjee, (2016) "Narendra Modi, Bob Dylan and Demonetization", has questioned the intent behind the demonetization as to whether it was one man decision by the Prime Minister to compensate for his failure to make good his promises in the realm of bringing back black money that is stashed abroad, thereby boosting his image as an anti-corruption crusader. Some conspiracy theories have pointed out the possible political mileage that the government tried to get out of the exercise in the light of forthcoming election in 5 states by 'drying up' the opposition of the cash funds while the BJP itself secured its position by enough stacked cash as in the case of West Bengal.

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Prerana Priyadarshi, (2016) "Demonetization: Potential Benefits for the Indian Economy" called the demonetization as an unprecedented move which in the short-term would cause inconvenience but there are larger economic gains ahead. The parallel economy casts a long shadow on the real economy. The cash recoveries made by law enforcement agencies from time to time indicate the use of Rs 500 and Rs 1000 notes for storage of unaccounted wealth. The Finance Ministry's 2012 White Paper on Black Money acknowledged the application of cash in generation and use of black money. It is concluded that the demonetization will encourage electronic transactions. Much of black money is expected to be mainstreamed because of the demonetization.

4. Impact Analysis of Demonetization-

Based on the claims made and counter-arguments put forward regarding the appropriateness and timely demonetization, critical analysis is presented in order to measure the efficacy of the move in achieving the stated goals.

A. Black Money and Black Economy

The term black money can be defined as the money on which the taxes are not paid. In other words, it is the money which is not accounted for in the official records. While the Black economy is unrecorded and unaccounted in the books of account, resultantly it is beyond the coverage of the official statistics.

According to various estimates the size of Black economy is in the range of 20% to 70% of the Gross Domestic Product (GDP) of India. The disturbing fact is that the size of the Black economy is already on the higher side which is increasing with each passing day primarily due to the forces of globalization and liberalization which have opened up the world economy.

This leads to locking up of billions of dollars in unproductive assets, further aggravating the problem of economic inequality across the globe and having disproportional opportunity cost to an economy. The report of the National Institute of Public Finance and Policy (NIPFP) submitted to the finance minister in December 2013, black economy could constitute 75% of India's gross domestic product (GDP)

One of main reason behind demonetization was that the government was expecting that a huge quantum of black money was stored in Rs 500 and Rs 1,000 notes and therefore a major proportion of the notes would not come back to the RBI.

However, according to RBI, 99.3% of the demonetized currency notes has returned to it. Out of the total amount of Rs 15.41 lakh crore in the denomination Rs 500 and Rs 1,000 in circulation at the time of announcement of demonetization, notes worth Rs 15.31 lakh crore have reached back to RBI. In other words, the notes worth Rs 10,720 crore failed to return to RBI.

This indicates that the black money holders found the ways and means to settle and adjust their ill-gotten money through various channels like depositing the money in the account of their knows, relatives, servants etc. The government has also gauged the fact and categorically pointed out that the Rs 2.89 lakh crore is under consideration for not being legitimate.

The Income Tax department of Government of India launched the "Operation Clean Money" in July, 2017. According to the Ministry of Finance, the number of Tax returns filed are 2,82,92,955 (August 05, 2017) which were 2,26,97,843 during the corresponding period (2016-2017). This reflects a handsome increase of 24.7 % in comparison to the increase of just 9.9 % in the previous year. The Advance Tax collections of Personal Income Tax (other than Corporate Tax) and Personal Income Tax under Self Assessment Tax (SAT) registered an appreciable growth of 41.79 % and 34.25 % (August 05, 2017) respectively as compared to the corresponding period (2016-2017).

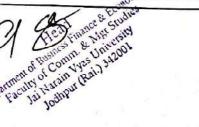
It is a welcome development and points out that increasing number of people are filling the returns which would reduce the quantum of black money and ensure better tax compliance.

The move of demonetization has delivered a bodily blow to the black proportion of the real estate sector which is considered as a substantial reservoir of black money. It is an open secret that builders prefer a proportion of the sale to be paid in cash which is being affected due to cash crunch and shift to digital economy owing to the demonetization.

This is an encouraging development as the money which was laying ideal can now be productively be pumped into potential entrepreneurial projects thereby giving boost to employment opportunities and to our economic growth.

In addition, the government has introduced and implemented the Goods and Services Tax (GST) from July

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1, 2017 which is expected to further check the tax evasion and black economy by widening the tax net and brining transparency in the economic activities.

On the other side the critics have pointed out that one of the reason why Indian Economy was able to come out of the Global Financial Crisis of 2008 relatively less harmed as compared to major economies of the world, perhaps the black money was fueling of the economic activities primarily in unorganized sector. Now, the money which was used to fuel the economic activities is channeled into formal banking sector where the banks will be required to pay interest on the same.

The phenomena of double whammy of sorts is in operation as on the one hand many small units and entrepreneur would suffer due to absence of funding from informal channels and secondly the banks would be obliged to pay interest on the money deposited with them.

The critics have also pointed out the credit off take is not just purely the function of credit availability but also the economic opportunities, economic ecosystem, expectations about the future, animal spirit etc. The over simplified assumption that the availability of the money with banking system will automatically lead to credit off take, which would further lead to vibrant economic ecosystem and better economic growth is actually need not stand firm in the light of economic realities. Moreover the ever increasing problem of Non-Performing Assets (NPA) and Asset Liability Mismatch that is infesting out Banking system especially Public Sector Banks with further complicated the process of credit off take itself.

In fact, according to the economist, Swaminathan S Anklesaria Aiyar (2016), less than 2% of black money is held in cash and the remaining has already been converted into other assets like precious metals, real estate, financial investment at home and much abroad.

B. Corruption

In simple term the phenomena of corruption can be understood as private gain at public cost. It is observed that the Rs 500 and Rs 1,000 notes are main instrument of effecting corrupt transaction as they are logistically easy to transact, move and store.

The black money plays a critical part in fueling the prices of goods and services especially the prices of real estate properties. This further aggravates the problem of economic inequality and eats into the vitals of socioeconomic fiber of a nation. The fact of the matter is that in digital economy, the transaction leaves a trail which makes it very easy to trace a transaction and in case of suspicion the question can be raised about the authenticity of such exchange. The government has emphasized on cashless economy and shift towards digital economy to check the corruption.

It is strongly felt that the demonetization would lead to reduce the corruption as the cost-benefit analysis would be high stacked against the people indulge into taking bribes. No person in his senses would take the risk of accepting the bribe in e-transaction format as that would ultimately lead to being caught by the law enforcement agencies.

On the other hand the critics have questioned the introduction of Rs 2,000 currency notes. They pointed out that undertaking corrupt transaction will become far easier using Rs 2,000 notes. According to them it is not a wise move and questioned the very premises of checking corruption through demonetization owing to the introduction of Rs 2,000 currency note.

Some people with political leaning have pointed out that one of the reasons for demonetization in 2016 was the upcoming elections in five major states. They alleged that the central ruling part intended to make other political parties cash starved as the political parties resorts to money power in buying votes using cash, liquor etc. However, the proofs for same are yet to be found.

It is also asserted that had government been serious on the matter of corrupt practices in political funding, it would have brought the political parties under the umbrella of Right to Information (RTI) Act, 2005 and should have promoted the state funding of elections.

It is expected that the demonetization would transform our economy into a digital economy where the people prefer the e-transaction and the usage of currency notes will decline substantially. The bone of contention is whether the people's romance with cash will ever end in the future or not which would have its bearing of corruption to a greater extent.

C. Checking Anti-State Activities

One the major stated goal of demonetization was to check the anti-state activities like terror funding, stone pelting in the Jammu & Kashmir and Naxalites activities.

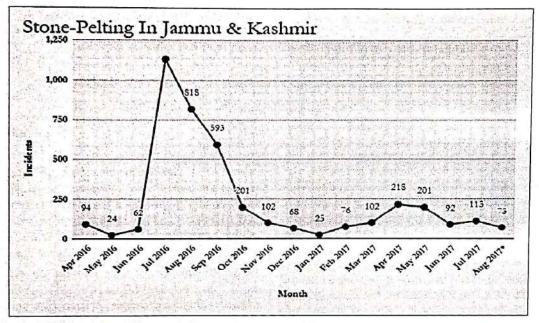
The Financial Action Task Force (2013) stated that high-quality counterfeit Indian notes were "printed in

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Pakistan and then smuggled into India through transit points at Dhaka, Sri Lanka, United Arab Emirates and Bangkok." According to Intelligence Bureau report, every year almost INR 100 crore is being funneled from Pakistan to Kashmir through 'Hawala' channels.

The image shown reflects that immediately after the demonetization the incidents of stone pelting have decreased from the high of 1132 in July, 2016 to the low of 25 in January, 2017.



(Source: Jammu & Kashmir police *As of August 19, 2017) Image 1: Courtesy Factchecker.in

Table 1: Incidents of Stone Pelting	j in Jammu & Kashmir
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Particulars		Year	
	2015	2016	2017
No. of Stone Petting Incidents	730	2808	1661

Source: Incidents of Stone Pelting in Jammu & Kashmir, Courtesy Ministry of Home Affairs

The above table 1 reflects that the incidents of stone pelting registered growth rate of 284.66% in 2016 as compared to 2015. Interestingly, post demonetization, in 2017 there is a decline of 40.84% in comparison to 2016.

The whole supply chain of illegal activities of Naxalites is overwhelmingly driven on the back cash which involves illegal activities like extortion, back-mailing which is used to fuel their acts of violence against security forces. Post demonetization the Naxalites groups are left with hordes of cash having no value.

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The then Finance Minister Shri Arun Jaitely has pointed out that due to the demonetization, the anti- state actors ran out of cash, which is one of the reasons behind the drastic decrease in the incidents of stone pelting in Jammu & Kashmir and Naxalites activities.

D. Fake Indian Currency Notes (FICN)

The term Fake Indian Currency Note (FICN) used to indicate the counterfeit currency which is being pumped into our economy. This is illegal in nature as eats into the vitals of

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our economy and suspected to be used for anti-state activities (Table 2).

In 2012, the Indian Statistical Institute (ISI), Kolkata was directed by the Government of India to undertake the study on FICN. Accordingly, in 2015 Government informed

Table 2 : The Percentage of FICN (Courtesy RBI)

that the quantum of FICN in value terms is Rs 400 crores which has remained constant for the last four years. The study of ISI has shown its confidence in the existing system of examination, detection and capture to get rid of the FICN.

The Percentage of Fake Indian Currency Notes (FICN)												
Particulars	Rs	500 Currency N	otes	Rs	otes							
	2013-14	2014-15	2015-16	2013-14	2014-15	2015-16						
Percentage of FICN	0.000022	0.00002	0.000016	0.000021	0.00002	0.00002						

According to Government's answer in Lok Sabha, 9254 currency notes of Rs 2,000 and 14175 currency notes of Rs 500 has been seized from the 17 bordering states of India amounting Rs 2,55,95,500 up to July 2017. This reflects a drastic fall in the quantum of FICN in value and volume terms.

The government has pointed out that post demonetization the FICN seized are of low quality which indicates that the security features of currency notes are sophisticated and it is quite an onerous task to copy the new notes.

While the critics have tried to drive home the point that the quantum of FICN is within the tolerable limits. The cost benefit analysis is loaded against the demonetization on the dimension of FICN as the economic cost alone of demonetization runs in thousands of crore in terms of printing the new notes, moderation of ATM machines etc apart from unimaginable cost in terms of emotional and mental agony, avoidable deaths, suicides, opportunity cost of the number of productive man hours lost in exchanging the old notes. On the other hand the guantum of FICN is not at the alarming level to merit the demonetization. Moreover the new Rs 2000 note would

	Electron	ic fund trans (Growth in	•	l electronic i de of Payme		fer.		
Month/Year	EFT/NEFT		Immediate Payment Service (IMPS)		Credit/Debit Cards (Usage at ATMs and POS)		Prepaid Payment Instrument (M-wallet, PPI card, paper vouchers)	
Strates The	Volume	Value	Volume	Value	Volume	Value	Volume	Value
2 (1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 19	(Million)	(Rs. billion)	(Million)	(Rs. billion)	(Million)	(Rs. billion)	(Million)	(Rs. billion)
Nov-16	123	8807.9	36.2	324.8	896.1	1823.2	169.3	50.7
Mar-17	186.7	16294.5	67.4	564.7	1089.4	2952.6	342.1	106.8
Aug-17	151.6	12500.4	75.7	651.5	1097.8	3072.1	261.1	102.9
Growth rate (%)							6 8	
Mar-2017 over Nov-2016	51.7	85	86.4	73.9	21.6	61.9	102	110.4
Aug-2017 over Nov-2016	23.2	41.9	109.2	100.6	22.5	68.5	54.2	102.7

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Table 3: Growth in Digital Mode of Payments

EFT/NEFT: Electronic fund transfer/national electronic funds transfer.

Source: Reserve Bank of India.

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provide higher motivation to the anti-national forces to duplicate the same.

E. Digital and Cashless Economy

A digital or a cashless economy is defined as an economy in which the transactions are routed through digital means between the parties like UPI, USSD, prepaid instruments, debit cards, credit cards and internet banking. In such economies the prevalence of undertaking the transaction through cash takes a back seat. It is also observed, in most of the cases, that as an economy develops and transforms into developed economy, the romance with cash dwindles and more number of transactions are affected using the digital means (Table 3).

The above table shows a commendable increase in terms of the volume and value of the transactions routed through digital platform between November 2016 and August 2017. As compared to November 2016, the highest growth is registered in Prepaid Instruments in terms of volume and value in March 2017 which stands at 102% and 110.4 % respectively. During the given period, the lowest growth of 21.6 % (volume term) is registered in Debit and credit card usage which stands at 21.6% and 61.9% in volume and value terms respectively, which is again a no mean achievement.

When comparison is done between November 2016 and August 2017, the growth rate registered on various digital platforms merited appreciation with highest being achieved by IMPS (109.2%) in terms of volume and Prepaid Payment Instruments (102.7%) in terms of value.

According to RBI, the total number of digital transactions have reached to 1.11 billion in January 2018, registering a growth of 4.73% over the 1.06 billion transactions in December.

This indicates a strong move towards the acceptability of digital platform to undertake financial transactions by the masses and acceptance of digital mode to effect the economic transactions. Mihir Sharma, a writer and business columnist: "What started as a 'surgical strike' on black money is now called the dawn of a cashless society." This opportunity, if milked in the right way, will go a long way in ensuring that cash finds minimal use in the future.

However, based on the RBI findings, the critics have pointed out that, prior to demonetization, the amount of currency with public was Rs 17.01 lakh crore which reached to the low of Rs 7.81 lakh crore in December 2016 but it has bounced back substantially to Rs 15.33 lakh crore.

This reflects two things. Firstly the measures taken by government to transform our economy into digital economy were rather forced upon the masses and have little acceptability among the masses. The people resorted to digital mode due to paucity of cash in the economy and lack of alternate means to undertake economic transaction. Secondly the romance with cash has not declined. In our nation where a substantial majority of economy lies in unorganized sector, the cash is still the king and preferred mode of effecting the transaction. The reason for same are primarily due to overwhelming presence of unorganized sector, lack of banking facilities, lack of financial literacy; to name the few.

The critics have strongly opined that there is no guarantee of reduction in the size of black economy but it can certainly undermine the freedom and privacy of the people owing to the new avenues of surveillance in a digitalized economy where government and its agencies has eye on each and every transaction they wish to. The JAM (Jan Dhan-Aadhaar-Mobile) trinity, is matter of great concern in the realm of freedoms of people.

On the other hand as per the Deutsche Bank's (2016), indicated that high share of cash in total payments does not always indicate a large shadow sector citing the cash-intensive economies of Germany and Austria which in fact have small shadow economies. Also, Sweden has mid- sized shadow economy in spite their payment systems being highly less cash intensive.

The critics have pointed out the transformation to digital economy is a gradual process and should be done in a calibrated mode rather than forcing it down the throat of the masses. In developing economies like India, which is infested with poor literacy and learning outcomes, poverty, digital divide, glaring inequalities etc. the shift towards digital economy in a hastily manner is not an intelligent choice. The problem of cyber fraud, banking frauds, identity theft etc. have the potential to kill the dream of achieving the digital economy before it takes the wing.

There are important facilitators that should be put into place before eyeing for the digital economy which includes digital literacy, financial education, ensuring economic viability of the modes of digital transaction, the transaction cost on digital platform, cyber security measures, strong legal and regulatory framework, reliable digital infrastructure, unhindered power supply and internet

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connection etc. The digital eco-system should be developed to optimal level to motivate and inspire confidence in the masses to go digital way else we would keep falling back to old habits. It is quite safe to say that our romance with cash is quite prominent and deep rooted, the reason for which has been discussed at length.

5. Food for Thought

In spite of all the measures on the part of government and enforcement authorities, people still find the ways to play around and con the system, laws, policies, reforms, welfare programs etc. Likewise, in spite of necessary measures taken by government and changing rules on regular basis in order to achieve the underlying goals of the demonetization, people still got their black money deposited in the banks or get them turn into white.

Some of the ways resorted to include:-

- Making the advance payments to their employees in demonetized currency notes
- Booking most expensive long route railway tickets and getting it cancelled to the refund in legal currency
- Donation to religious organizations
- Purchasing jewellery in back dated bills
- Advance Payment of Loans

Since Independence our colonial hangover has made the ruling dispensation to come up with the variety of never ending and sometimes contradictory rules with bureaucratic red-tapism, which has in fact made us expert in finding way out of any situation with the help of 'jugaad.' which itself has got a strong negative connotation attached to it. Sad enough but we have got tremendous ingenuity to fail the best of intended plans which in turns reflects a lot about our socio-culture value system and economic behavior.

6. Conclusion

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The pro and anti-camp of demonetization has presented their views where both sides have hard hitting facts to prove their version to be correct. The anti-demonetization camp has rated it as unnecessary economic adventurism at the cost of millions of people. All the set objectives behind demonetization could be achieved through much better and less painful measures. It is argued that the extreme step like demonetization is resorted to only in response to situations of hyperinflation or some form of

financial crisis and India was not facing such dire situation in 2016. It is further pointed out that there is huge discrepancy between what government claimed and what the ground realities actually were. Our former Prime Minister Manmohan Singh labelled it as "Making of a Mammoth Tragedy", which is going to bring down our GDP growth by 2%.

On the other side of the divide, the prodemonetization camp has asserted that the decision of demonetization as a necessary bitter pill that was inevitable for our economy to rejuvenate itself and to add vitality in terms of better economic coverage, revenue generation and better economic opportunities.

A CRISIL report (2016) states that in the long run, owing to demonetization, the significant structural benefits will accrue as the direct tax collection are expected to rise and government fiscal position will strengthen. However, in the short run the GDP growth may be negatively impacted due to cash crunch as millions of small enterprises in the unorganized sector that use cash to transact will be inconvenienced.

Perhaps it would be fair to give the benefit of the doubt to the ruling dispensation in spite of the innumerous hard comings the people were subjected to owing to demonetization, the intentions seemed good in principle and there was correct diagnosis of the economic problems. However the implementing found wanting on various accounts. This roughly indicates the situation of recommending improper medication to address the economic illness where medicine was bitter than the disease itself.

In spite of all the adversities people were subjected to due to demonetization, a strong majority still stands firmly by the government on the move of note-bandi as the people are highly keen to have a secure, prosperous, developed and corruption free nation.

To conclude, the decision to demonetize has got mixed blessings due to good intent and post demonetization positives but at the same time there are far reaching unintended negative consequences owing majorly to implementation glitches. At the fag end of the event, it is still not wise to conclude safely as to which side of the cost- benefit the move of demonetization is tilted. Let the question be settled in future in the light of more conclusive and substantial information to gauge the bigger picture and decipher the enigma called demonetization.

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"The only real voyage of discovery consists not in seeking new landscapes but in having new eyes."

Marcel Proust

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An Empirical Study on Implementations of Performance Management System in Public and Private Banks of Jodhpur

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Abstract: The banking sector is very important for the economic development of any country and hence it is regarded as the lifeline of any modern economy and also as an important financial pillar of the economy. Banking industry plays a crucial role in the functioning of an economy. Performance management in any organization is a method that includes developing and improving anemployee's efficiency and effectiveness. It is a continuous process of evaluation. Thus this study focuses on the factors for implementation of the performance management system in Banks for the employees. Also the study emphasizes on the present Performance management system (PMS) of banking industries. For this purpose both public (BOB & PNB) and private (Axis and ICICI) banks which were selected and explored. The performance management of employees is evaluated and its relative advantages or benefits for employees and banks both are also found out.

The present study adoptsexploratory and conclusive research methods. Data collection is done through both primary and secondary methods. Primary data has been collected through the structured questionnaire comprises of both open ended and close ended questions. Questionnaire is framed here to measure the perceptions and acceptibility of PMS by Banks from the point of view of the employees. The study reveals that banks have completely accepted and embraced the fact that PMS result in numerous important outcomes for the banks, its managers and employees.

1.1 INTRODUCTION

In the existing globalized era the ever-increasing bank's pressure has made it compulsory for business to work effectively, effectively and wisely and employ the best business strategies possible. To maintain in the existing day aggressive world they have to draw in, develop and maintain the most skilled and efficientemployees.

This improving stress in banks has designed impounding stress on employees too for their optimal performance. To distinguish themselves from their opponents the organizations are spending improving attention towards the efficiency of their employees that are their "Human Resources".

Typically, Performance Appraisals decided the best and the most severe executing employees through ranking and rating program that formed the behavior of banks towards the staff member for the next ranking



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period. But over a length, the focus has moved away from measuring the output of individuals to their contribution in achieving the overall objectives of the banks with their right skills, initiatives, and abilities to make an amazing impact on bank performance.

And this has happened with the introduction of the Performance Management System. This has enhanced the significance of HR features that earlier concentrated only on recruitment, selection, employment, performance appraisals, promotions, compensations, training & development, special offers, settlements, and growth. The role of HR has progressed numerous from merely an evaluator to a company to an enabler. Now HR develops a favorable environment for enhancing the performance of employees and provides them the opportunity of taking part in business planning and making decisions. Today all the major activities of HR are impelled towards growth of high executing management and promoting employees inspiration and motivation.

As perArmstrong and Baron 1998"A performance management system is a valuable system fo. organizations to use to convey significant messages to their employees. It tends to be utilized to achieve various functions; as a technique for conveying business objectives; deciding development details, improving individual and group leadership, planning for future years and the measurement of results."

Beardwell et al (2004) likewise prescribe that people who know precisely what is expected from them will perform superior as compared to the individuals who are confused about their objectives and goals.

CONCEPTUAL FRAMEWORK

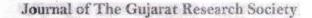
Performance Management is basically an evaluative tool for performance measurement of employees for accomplishment of strategic organizational goals and objectives. This helps employees to know and understand the expectations from them and evaluate whether they possess those skills and abilities to meet those expectations or not.

The goals of an organization should stream down from top to bottom describing what the organization is eager to achieve and the role of its employees in achieving those goals. This develops an understanding amongst the employees that how their actions and behavior help in the accomplishment of strategic organizational goals and the importance of it. Performance Management is not just another word to replace Performance Appraisal; it is much more than that. Performance Management is a wide term that combines purpose setting, regular reviews, and feedback, performance evaluation to assess individual performance and evaluating the need for further development. It also leaves an opportunity for career planning and talent management.

According to a survey mentioned in CIPD paper (2009), performance management is seen as a vehicle for developing employee engagement and focuses on developing a positive relationship between individuals and their managers. If individuals have clarity of their roles and how to contribute to organizational objectives they are more likely to be committed to what they are doing.

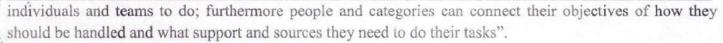
According to **Oracle white paper June 2012**, "In today's do-more-with-less economy it is more significant important than ever to develop high-performance teams. The solution is to maximize team impact using effective utilization and of each individual's distinctive talents to achieve strategic business goals." PMS is the heart and soul of managing people and it involves goal planning and tracking, performance assessment, ongoing coaching and reward and recognition activities.

As said in CIPD Factsheet "Overall, performance management is about establishing a culture in which individuals and groups be responsible for the ongoing enhancement of business procedures and of their own skills, behavior, and contributions. It is about sharing expectations. Managers can clarify what they expect



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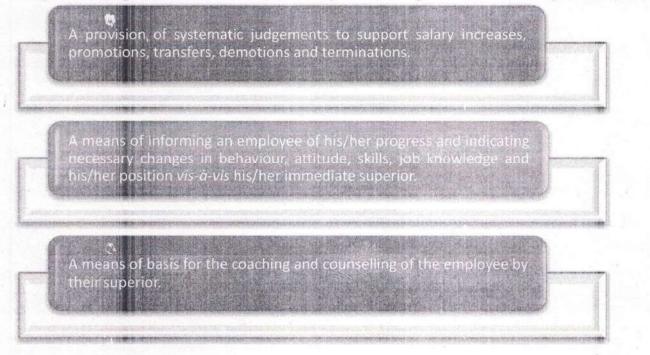
Gujarat Research Society



Thus, "Performance management is about maintaining and improving the quality of relationships – between managers and employees, between managers and teams, between members of teams and so on – and is, therefore, a joint process. It is also about planning, through defining expectations expressed as objectives and in business plans, and about measurement; in the words of the old dictum, 'If you can't measure it, you can't manage it'. It should apply to all employees, not just managers, and to teams as much as individuals. It is a continuous and holistic process".

Performance depends on the association as well as the individual. If there is ambiguity in performance, the organization's mission, goals, objectives and policies, and the individual's goals, skills and efforts and knowledge are to be responsible jointly. It creates accountability on individuals of their actions.

Douglas McGregor sets out functions of an organization's performance Management System as



1.2 DEFINITION OF PERFORMANCE MANAGEMENT

TheInstitute of **Personnel Management (1992)** given a definition: "A technique which associates to every activity of the organization set in the context of its human resources policies, culture, style, and interaction and communication systems. The nature of the technique relies on the business perspective and can vary from organization to organization".

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Performance Management mainly focuses on the following:

Improvement in organizational performance by focussing on the desired results and reducing the gap between actual and desired goals, that is only possible with the feed forward process.

A constructive feedback so as to identify the training and development needs and supporting their professional development

Motivating the employees to improve their engagement and efficiency and providing incentives to retain the top performers

Improving employee accountability for the work assigned to them

Dealing with the weak performers proactively through reinforcement and corrective behaviour.

Performance Management is not only concerned with the achievement of the organization's objectives and strategic goals but it also focuses on employee development. It emphasizes on building a culture of dialogue between the team and its managers. Performance Management addresses as to what the employees do, how they do it and what are the outcomes.

1.3 REVIEW OF LITERATURE

1.3.1 Performance Appraisal

Eichel and Bender (1984) expressed that performance assessment can likewise be called as the "Achilles high heel of management." In spite of the fact that management of numerous public associations endeavors to be employee focused or employee based, less focus is given to a procedure intended to help the organizations staff in accomplishing both individual and organizational objectives.

Cascio (1998) depicted performance appraisal is a methodology to improve employees task proficiency by helping them perceive and utilize their full potential in completing the organization's assignments and to give information to employees and managers for use in settling on performance related decisions. He proceeds to decide performance appraisal system as an activity in perception and judgment, "a feedback procedure and an organizational intervention.

According 'o Gupta, Upadhyay (2012), the assessment of effectiveness of performance management system and alongside evaluating both job satisfaction and organizational commitment has become a necessity.

1.3.2 Performance Appraisal in Indian Banks

Choudhary (2008), banking services is one segment where an extraordinary level of interest is being paid to Performance Appraisal Systems. A few of the public sector banks (PSBs) has altered their PAS



Some of these worked therefore

Zhang (2009) proposed that in the banking business, employees view of equity has a positive relationship to their general happiness and fulfilment with both the performance appraisal process, results, and its outcomes. In any case, measurably huge contrasts were found in whether employees had gotten training in performance appraisal or not.

According to **Bhatia (2010)**, "The performance appraisal or evaluation is fundamentally the possibility for the person and those focused on their efficiency in the lender, most usually their line administrator to get together to participate in a discussion about the individual's efficiency, growth and the assistance needed from the administrator. It should not be a top-down procedure or the possibility for one person to ask concerns and the other to react. It should be a free streaming discussion in which a variety of opinions are exchanged."

As per Shrivastava and Rai (2012)Banking sector is a developing at a rapid rate in Indian. Due to latest technological advancements and entry of many new giant competitors banks are now facing s ress on their organizational capabilities for example "the procedures of recruitment, placement, training, promotion and appraisal, in order to ensure that the employment, positioning, coaching, marketing, and evaluation, to make sure that the right variety of employees with the right capabilities are available at the right time and for the right places." They likewise recommended that performance evaluation is one of the key parts of business capacity which is additionally the principle focus of this investigation. In basic terms can say that performance appraisal is an investigation of employee's latest accomplishments and issues, individual qualities and shortcomings, and reasonableness for promotion or further training.

1.4 RESEARCH GAP

Above review of literature showing that many authors have been done their study on the performance management system, performance appraisal in various public and private sectors, even in banks too. But no one has done their study on IMPLEMENTATIONS OF PERFORMANCE MANAGEMENT SYSTEM IN PUBLIC AND PRIVATE BANKS OF JODHPUR

So this study will try to cover the gap of performance management system in public and private banks with their comparative study, on specifically banks of Jodhpur in Rajasthan.

1.5 OBJECTIVES OF STUDY

Performance management can be used as a powerful tool to achieve goals and employee motivation. PMS is rarely understood well in organizations, let alone its implementation which faces challenges especially when the measures have to be percolated to the lower level management.

The objectives of this study are:

- 1. To determine whether the employees and managers share a common understanding of the implementation of PMS in Banks.
- 2. To get the obstructions, if any, and recommend remedial actions if possible.

1.6 RESEARCH DESIGN

This study emphasizes on the Performance management system of banking industries both public and private banks which explored the performance management of employees by their banks and its relative advantages or benefits for employees and banks both. As Performance management is to promote and improve employee effectiveness. It is a continuous process where managers and employees work together to plan monitor and review an employee's work objectives or goals and his or her overall contribution to the



Banks. This study also focuses on the implementation of the factors of the performance management system by the adoptio : of Banks for the employees.

The present study both exploratory and conclusive research methods used. The conclusive research method here is descriptive in nature and the research design is single cross-sectional. In this study primary data has been collected through the structured questionnaire method. The research was conducted with the help of a questionnaire measuring the perceptions and acceptability by Banks for the employees. The chosen research design mainly emphasizes on the discovery of ideas and development of insight into the subjects under study.

1.7 SOURCES OF DATA COLLECTION

Data has been collected from selected two public (BOB & PNB) and two private sector banks (AXIS &ICICI) of Jodhpur. List of the banks has given below.

Table 1: Banks selected for the investigation;

S. No.	Name of the Bank	Type of Bank
1.	Bank Of Baroda (BOB)	Public
2	Punjab National Bank (PNB)	
3.	AXIS	Private
4.	Industrial Credit And Investment	
	Corporation Of India Bank (ICICI)	

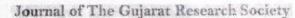
Source: Author's Compilation

Convenience sampling procedure is used to collect the data from the respondents (Employees). The process calls for data collection only from those respondents who are aware about the necessity of the research and who can predict that any of the productiveresults from the research will benefit them and their colleagues. The process also takes care that respondents provide supervised information without misleading and fraud type of information dissemination. Also one primary issue that was taken care of is that the respondents should understand the services and working of performance management system in their banks.

Total of 100 questionnaires were distributed to the respondents in Jodhpur Rajasthan state of India for collecting data with a purpose to analyze the perception of respondents about the performance management system and the factor influences them to measure their PMS by their banks. Out of total 100 questionnaires 50 questionnaires were distributed in public sector banks (BOB and PNB) and remaining 50 in private sector banks(Axis and ICICI). "This sample size is selected to obtain a simple and understandable image from the perception of respondents and so that it can be very helpful for analyzing the relationship between the PMS adoption and demographic factors of respondents."

1.8 RESEARCH HYPOTHESIS

For the purpose of analysis various hypothesis has been formulated to identify the relationship between the types of banks and factors of PMS (Performance Management System) in banks.





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Hypothesis between types of banks and Performance management system (PMS)

- The Axis and ICICI banks do notimplement performance management system better than BOB H01: and PNBbanks.
 - The Axis and ICICI banks implement performance management system better than BOB and H11: PNB banks.
 - The Axis and ICICIbank's performance management system (PMS) is not more successful than H02: **BOB** and **PNB**banks.
 - The Axis and ICICI bank's performance management system (PMS) is more successful than BOB H12: and PNB banks.
 - The Axis and ICICIbank's performance management system (PMS) is not more effective than BOB H03: and PNBbanks.
 - The Axis and ICICI bank's performance management system (PMS) is more effective than BOB H13: and PNB banks.
 - The Axis and ICICIbank's bonus system is not more effective than BOB and PNBbanks. H04:
 - The Axis and ICICI bank's bonus system is more effective than BOB and PNB banks. H14:
 - The Axis and ICICIbank's performance management follow-up system is not good than BOB and H05: PNBbanks.
 - The Axis and ICICI bank's performance management follow-up system is good than BOB and H15: PNB banks.

1.9 ANALYSIS AND INTERPRETATIONS

Table 1:- Descriptive table of type of banks with factors of PMS

2							
Ъ	Chef.	0.1	41.1	15.4-1	874	0	
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		N	Mean	Std. Deviation	Std. Error
Implement PMS	Public	50	2.375	0.218	0.0265
	Private	50	2.375	0.249	0.0135
	Total	100	2.375	0.244	0.012
PMS Succeed	Public	50	2.205	0.248	0.03
	Private	50	2.16	0.2635	0.0145
	Total	100	2.165	0.261	0.013
Effectiveness PMS	Public	50	2.13	0.2385	0.029
	Private	50	2.095	0.2535	0.014
	Total	100	50 2.375 0.218 50 2.375 0.249 100 2.375 0.244 50 2.205 0.248 50 2.16 0.2635 100 2.165 0.261 50 2.13 0.2385 50 2.095 0.2535	0.251	0.0125
Bonuses	Public	50	2.215	0.2635	0.032
	Private	50	2.19	0.272	0.015
Bonuses	Total	100	2.195	0.2705	0.0135
PMS Follow-up	Public	50	2.005	0.183	0.022
	Private	50	1.985	0.1775	0.0095
	Total	100	1.99	0.1785	0.009

Cource - Primary Data



Table 1 is showing the descriptive analysis of five parameters of Performance management system in public and private sector banks, higher mean values represent wider scope of performance management system in banks.

Test of Homogeneity of Variances						
	Levene Statistic	df1	df2	Sig.		
Implement PMS	0.011	1	48	0.441		
PMS Succeed	0.5565	1	48	0.0145		
Effectiveness PMS	0.61	1	48	0.135		
Bonuses	0.2455	1	48	0.024		
PMS Follow-up	0.19	1	48	0.269		

Table 2:- Test of Homogeneity of Variances

Source: - Primary Data

Table 3:- ANOVA table for types of banks and factors of PMS

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Implement PMS	Between Groups	1.023	1	0.2	1.626	0.012
	Within Groups	45 .	48	0.123		
	Total	46.023	49			
PMS Succeed	Between Groups	0.515	1	0.2575	1.893	0.014
	Within Groups	108.263	48	0.136		
	Total	108.777	49			-
Effectiveness PMS	Between Groups	0.317	1	0.1585	1.258	0.023
	Within Groups	100.28	48	0.126		
	Total	100.598	49			
Bonuses	Between Groups	0.141	1	0.141	0.481	0.043
	Within Groups	116.569	48	0.293		
	Total	116.71	49			-
PMS Follow-up	Between Groups	0.113	1	0.113	0.89	0.004
	Within Groups	50.684	48	0.127		
	Total	50.798	49			

Source: - Primary Data

"Levene's Test for Equality of Variance is performed to test the condition that the variances of both samples are equal or not. High-Value results normally in a significant difference"however it can be seen from Table 1thatresults are significant, which could be interpreted as no equal variance.



Table 2shows the "variation (Sum of Squares), the degrees of freedom (df), and the variance (Mean Square) are given for the inter and intra groups, as well as the F value (F) and the significance of the F (*Sig.*). *Sig.* indicates whether the null hypothesis – the population means are all equal – has to be rejected or not."

Table 3 shows reasons for PMS implementation in banks significant value is 0.012, which is less than p-value (0.05) so reject the null hypothesis and accepts the alternative hypothesis which shows that theAxis and ICICI banks implement performance management system better than BOB and PNB banks.

PMS success have significant value is less than p-value (0.014< 0.05) so accept the alternative hypothesis which shows u.at the Axis and ICICI bank's performance management system (PMS) is more successful than **BOB** and **PNB** banks.

Effectiveness of PMS have a significant value which is less than equal p-value (0.023 <0.05) so reject the null hypothesis and accept the alternative hypothesis which shows that The Axis and ICICI bank's performance management system (PMS) is more effective than BOB and PNB banks.

Parameter Banks pay the bonus to the employees, have a significant value which is less than p-value (0.043< 0.05) so accept the alternative hypothesis The Axis and ICICI bank's bonus system is more effective than BOB and PNB banks.

Parameter PMS follow-up system, have a significant value greater than p-value (0.004 <0.05) so accept the alternative hypothesis which shows that The Axis and ICICI bank's performance management follow-up system (PMS) is good than BOB and PNB banks.

CONCLUSION

The banking sector is very important for the economic development of any country and hence it is regarded as the lifeline of any modern economy and also as an important financial pillar of the economy. Banking industry plays a crucial role in the functioning of an economy. Banking industry supports and fulfils all the financing requirements of "export/import, industry and agriculture, construction, business etc. with a high level of commitment. Any country's overall development is directly related with efficient working of its banking industry. If banking system of a country is efficient it can successfully mobilize all the savings in fruitful sectors of the economy. An efficient banking system ensures the capability of banks to meet all the responsibility towards the depositors.Performance management system has now developed as the backbone of the banking industry where there exist severe cut throat competition and survival of the fittest has become the demands of the day.

Study discloses that the Axis and ICICI banks implement performance management system better thar BOB and PNB banks and PMS of Axis and ICICI bank's performance management system (PMS) is more successful and more effective than BOB and PNB banks. The Axis and ICICI bank's bonus system and follow up system is more effective than BOB and PNB banks. These findings make us realize that PMS of private sector banks are more effective as compared with the public sector banks.

The study also reveals that till now Indianbanksspecially private sector banks have completely adopted and embraced the fact that PMS is a necessity in their organizations to improve the effectiveness of employees as well as for manager's efficiency enhancement. PMS has been proved to be fruitful for all i.e. for employees, managers and banks. PMS includes various HR functions like remunerations decisions, promotions & transfers, employee development & training, etc.

The study proved that effective PMS possessa structured framework for the evaluation of employee productivity, with predefined roles for both the managers and employees. Also from study it was found out that banks using Performance Management system as a strategic tool for determining compensation and



other important HR decisions, are required ensure that all employees are treated in a fair and equitable manner.

Thus from the analysis of implementation of PMS in banks from the point of view of iys employees, it was discovered that banking sector employees these days are much knowledgeable and aware about the PMS benefits and procedure. They understand the evaluation pattern of PMS and know about the process, nature and implementation of PMS.

SUGGESTIONS

As discussed, PMS includes many important HR functions and they act as a strategic tool for "improving the service quality of banks in terms of employee's satisfaction, reduction in complexities to understand their PMS, accessibility of PMS plays a significant role."Thus banks management is required to pay attention on following issues for successful implementation of PMS in their organization:

- Administration and Top Control should organize proper two-way interaction regularly, the overall training, training to employees, not only to understand the means of applying Performance Management System but also to build up believe in about the effectiveness and credibility of the plan.
- 2. An evaluation procedure, which focuses on actual accomplishment rather than on style or personality, it may be described based upon the evaluation on decided goals, by making the employs interview itself as an open, two-way procedure and appealing employees to play a role in self-appraisal.
- 3. The performance is also required to be assessed based on the pre-agreed objectives. Personal biases while evaluation, may greatly affect the employee's objectivity.
- 4. Managers should evaluate the performance of employee very fairly and should not have any fear in mind, of losing valued subordinates.
- 5. Managers must appreciate the good performance of employees, in order to boost his/her morale and maintain the same for next years.
- 6. Managers must possess the positive and constructive attitude, which allows him to perform the Performance Appraisal activity seriously.
- 7. The approach of managers should also be very objective, transparent, and open to change and task based.
- 8. The basic aim of Managers or Administrators should be to develop an overview of the functions under him and identify employees and areas for improvement, with the help of Performance Management System.

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Increasing significance of Sustainable Business Model Practising Corporate Social Entrepreneurship by In

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Prof. (Dr.) Shishu Pal Singh Bhadu Head, Department of Management Studies Jai Narain Vyas, University

ABSTRACT

The main aim of this study is to bring awareness about the corporate in context to India. In this research two cases are presented in which about companies CSE activities is given. The two companies selecte group which are multinational conglomerate firms having a divers was evident from the study that the giants have started accepting Ctherefore developing sustainable business models. They strongly b activities couldn't solve the economic problems. So, they came up w not only brought money in the economy but also helped the societ study has contributed in the field of CSE literature. Other nationa should accept CSE and benefit the society. entrepreneurship iled description in and Mahindra siness model. It need of the hour that mere CSR projects, which c'eveloped. This ernational firms

Keywerds: Corporate Social Entrepreneurs, Sustainable Developmer

1: INTRODUCTION

Corporate Social Entrepreneurs are the entrepreneurs generating soc and building enterprises for the betterment of the society. They deficontext to solve certain prevailing issues like 'less recycling of wanon-renewable resources', 'less sustainable business models', etc. A that the social entrepreneur has similar traits as generic entrepreneusignificant differences which makes them influential. Firstly, they ma neficial projects business but in thaustive use of ned in the paper re are two most decisions about utilization of available resources. Secondly, they believed much in society and to those whom they provide goods or services. The No Yunus's 'Grameen Bank' concept was mentioned and it was entrepreneur develops the business with a specific cause and no (Huybrechts & Nicholls, 2012).

Corporate social entrepreneurship is defined as a person possessing taking ability, being pro-active, having innovative ideas, bringing plue of business and society and also contributing towards social value (Z

In the report presented by 'World Business Council for Sustainable it was mentioned about understanding the need of developing susta with the aim to satisfy the population of the world by limited availab the year 2050. Irrational use of the energy sources might make the f of many benefits. So, CSE developed idea from such gap and de businesses.

2: LITERATURE REVIEW

Chell et al. (2010) mentioned about the growing significance entrepreneurship in every sector; be it government, private orga companies or any other forms of business. Social entrepreneur is the ideas aiming social betterment. The project may also be profit cenfulfil social objectives. The entrepreneur can be the one who manage and grab the opportunities and bring innovation to organisation at the also identified that such entrepreneurs work with the aim of removing with respect to climate, economy, unequal distribution of develop Their aim is seldom wealth maximization.

Koe Hwee Nga & Shamuganathan (2010) presented a model depleaders and their personality. Personality traits like 'conscientiousn' great sense of responsibility about what is good for the society ar society; 'agreeableness' is the trait which makes the person a good bringing harmony in social interaction; 'openness' is a trait which new ideas and bringing innovation. Social entrepreneur's think f achieve economic as social objectives.

tability towards ce Prize winner 7ed that social a profit motive

s skills like risk ange in the field at al., 2015).

ment' in (2010), pusiness models he resources till herations devoid ally responsible

sorporate social s, public sector pring innovative will ensure to allable resources liversities. It was ues in the world pcial issues, etc.

be trait of CSE to think with a is not good for motivator and ad to exploring nable means to In an interview of Michael Porter by Driver (2012), he mentioned about the corporate social entrepreneurs and the transforming of nations. Porter mentioned that presently the CEO's are not only lim term goals of the organisation but to make the organisation profitable the socially beneficial outlook. Capitalism so far has been a narrow consumer needs were valued but it is time to emphasize more on the wholistic approach. They should not just limit their concerns to p contribute for a better tomorrow. Corporate Social entrepreneurs concept of shared value and focus on their role to improve the commto earn economic benefit out of the business.

Spitzeck et al. (2013) developed a model on corporate social entremarket external factors and non-market external factors leading to other factors like organizational antecedents, organizational outcome collaborations all affects the social intrapreneurship. In one exampl while developing hydro-electricity power plant its possible drawbacl in that locality are overlooked and this damage to the inhabitants was planning before but it has become significant now. There was a need vision for the business developers which would provide two benefits benefit would be that stakeholders would invest in the project anwould be that employees and intrapreneurs would be coming up with

The study by Ghauri et al. (2014) conducted exploratory approac studies based on three 'Base of the pyramid' (BOP) markets in Ind management were conducted and it was observed that with entrepreneurship the management have started focusing on the necwere initially neglected. The sustainable solutions to the increas resources for future generations and also other social stigma's affec MNC's joint hands with NGO's, together with the combined effort well as knowledge resources and NGO's human resource skill and s would create a better platform for CSE.

Niño (2015) discussed components of CSE which are: Idea. Oppo entrepreneur. The phase starts with having innate entrepreneur qua taking ability to believe in their own ideas. The entrepreneurs have leads them to grab an opportunity which is adversity for other busine significant facts t companies or deve the shortature along with pt wherein only anity needs as a king but should work with the istence and also

hip. There were apreneurs. The al outcomes and mentioned that people residing part of corporate g a sustainable isiness. The first cond advantage as.

ysing the case iterviews of top lvent of social e society which olem of limited community. The C's financial as ood relationship

y ganisation and vision and riskive ideas which ally, those ideas Mukt Shabd Journal

are channelized into reality by using the available resources from the three purpose of CSE i.e. investing in resources and innovation, or ideas ato reality and create social value. This cycle will continue a value will again motivate to solve other societal issues.

Singh et al. (2017) identified that in India the companies are wo social responsibility at philanthropic level by building schools, h measures are unsustainable. CSE should be inculcated by most of the 217 companies studied in the research only 33% of the companies Indian ecosystem is now becoming well developed so social entrepr with corporate to bring out the best result.

Research Gap

The study on large organisations and their CSR activities have been c far in the past studies but there is a gap of presenting the literature about corporate. g as sustainable business developers and doing CSE activities. This study aspires to fill D.

3: OBJECTIVE

3.1: Aim

The aim of the paper is to study the sustainable business models in / corporates and their contribution towards better India.

3.2: Motivation/Rational

The motivation behind studying this project is that in India many it onal companies focused on CSR philanthropy deeds but certain businessmen who al ink ahead of the times should be widely known so that other business houses take infrom them and develop sustainable business models.

4: RESEARCH METHODOLOGY

4.1: Research philosophy

In this research both the philosophies i.e. ontology and epister Ontology would present the factual data with an objective of independent of the researcher. Epistemology would identify the reaso it would go with interpretivism aspect for the case. All the other phy

ould be used. ing the reality d the reality and es would not be

ation. There are hose innovative ment of social

wards corporate etc. but these ions but out of ing-term vision. iould join hands

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suitable as either they deal with mixed method of data or nume particular person is CSE and has developed sustainable business moc the reason behind that set up would be epistemology interpretivisi 2012). ta. Example, a ntology whereas tz & Mahoney,

4.2: Research Approach

There are three different research approaches: Abductive, deductive ar approach is not used as it involves mixed data analysis and deductive it is done only on quantitative analysis. Inductive approach is use qualitative data would be studied in the research. The primary liter CSE would be studied and raw data would be collected. Based on 1 information would be found in real life world and qualitative analysis this paper case study analysis is done and CSE in India with susta would be discussed (Dwivedi & Weerawardena, 2018). tive. Abduvtive in is not used as paper because the concept of ta collected the conducted. In pusiness models

4.3: Research Strategy

Research strategies are of two types: Qualitative and quantitative. Que feasible for the present topic as the aim is to bring awareness al community benefit business model. Taking a survey might have prese the topic, not justifying the aim of the study.

This study will use the qualitative data based on pan India corporate depicting their story for the betterment of the society (Yitshaki & Krov

4.4: Research Design

Two types of research design are there: Cross-sectional and longitudina same parameters are studied over the period of time in order to identify in the number of years and analyse the reasons behind such variances. feasible as the paper discusses about presently working CSE in I design is the best fit for the study (Teise & Urban, 2015).

4.5: Methods of data collection

Data collection for any research can be done in two ways such as: prin well as secondary data collection. In primary data the response is approaching the participants in form of questionnaire, interview, etc. secondary data analysis would be used and entrepreneurs with the so research is not sinessman with fferent views on

i) entrepreneurs,5).

ongitudinal data ttern of changes study it is not cross-sectional

e present study, notive would be presented. Their structure of business and the purpose along with its lor m impact would be analysed (Raimi et al., 2015).

4.6: Sampling Method

There are two types of sampling methods: probability sampling and non-probability sampling. In probability sampling every sample has equal chance of selection from the population but in the present study the samples have been selected on convenient basis and did not have equal chance of selection. Therefore, in the present study non-probability convenient sampling is used for selecting the CSE corporates (Jemari, 2017).

4.7: Method of Analysis

Case study method of analysis is to be used for the study and two cases based on India would be selected (Chell et al., 2014).

5: CASE STUDY OBSERVATIONS

Case 1: Tata Group

Tata projects was found in the year 1979 and is the part of Tata group. The company is a conglomerate and is in the business of infrastructure developments, hospitality, steel, automobile, etc. It has a competitive advantage over building complicated projects of infrastructure. They provide the infrastructure facilities of building roads, metro systems, power transmission and distribution, water management, chemical process plant, waste management, power generation plant, buildings, airports, metal purification system, etc. They are leader in mining sector, pan India. Tata motivates innovation and also does activities by developing sustainable and innovative means to provide solutions in the field of projects it handles (Tata projects, 2020).

The following are the glimpse of corporate social entrepreneurship activities by Tata Group:

Tata Projects provides energy saving solutions to the municipal corporation and developed a model which could save the cost of the energy. Tata believes in developing sustainable business models (Tata Investment, 2020).

Tata also had indulged itself into water treatment plant. Tata services provides water treatment services to industries as well as corporations in urban areas. Company has competitive advantage in filtering the water, removing affluent from it, desalinisation of seawater, etc. The aim is to increase the sustainability of portable water (Tata Water, 2020).

Tata has also made the first 'River Rejuvenation Project in India' named as Dravyavati River Project purifies the contaminated river water with industrial waste, sewage, solid waste, etc. It had the capacity to purify 170 million Litres per day (Tata River Project, 2020).

Tata Steel has developed environmentally friendly measures in its plant and has recorded decrease in its carbon emission in steel plant by using sustainable business models. The company has accepted the policy of 'Reduce, Reuse and Recycle' (Tata Steel, 2012).

Tata group hotels have implemented environmentally friendly technologies in their hotels too. They have started generating energy from the bio degradable waste by way of composting. They do waste water management, use greener means to run the hotel and make optimum utilisation of available resources right from water and vegetables, to the maintenance and electricity use (Taj Hotels, 2013).

Hence, Tata which has the renowned credibility in terms of ethics and morality in the business, has accepted the concept of Corporate social entrepreneurship by developing sustainable business models and saving it for future generation.

Case 2: Mahindra & Mahindra

Mahindra group was established in the year 1945, it is doing business in information technology, insurance, farming vehicles, logistics, construction equipment, financial consulting to businesses, hospitality, rural housing finance, retail business, steel, automobiles, etc (Mahindra, 2020). The following are the Corporate social entrepreneurship activities:

The group under the name of 'Mahindra susten' provides its concern for developing sustainable eco system with a vision to be in the top list at world level in terms of renewable source of energy. This project provides training to women aspirants regarding installation of solar panels and becomes skilled and self-employed forever. This way it earns economic fees from the trainees and also contribute in the field of sustainable energy source. Enhancement in this project by women has helped to reduce 420 metric tines of emission till date (Mahindra Susten, 2020).

'Samriddhi' meaning prosperity, is the agricultural drive, run by the company to develop the agriculture sector of the country. India is an agrarian country and the farmers are devoid of many benefits. Mahindra has made an effort to provide high quality seeds, fertilisers, pests control for crops, farmers are also given advice regarding what they should sow, how many crops they can cultivate at a time, what are the nutrients in the farm and accordingly guidance would be given to sow the suitable crop. Irrigation facilities and other essistance are also

given under this. This is contribution towards society, the group is doing economically well in other corporate businesses but it is also sustaining the land fertility for future (Mahindra Samriddhi, 2020).

In this corporate drive Mahindra is working hard to save many farmers by exporting the fruits under the name of 'Saboro' fruits (Mahinndra Saboro, 2020).

In the 'Naandi' foundation, Anand Mahindra has worked on giving biodynamic solutions in farming and increased the productivity of the cherries and coffee by using sustainable agricultural means. The productions have increased over hundreds of kgs. It has covered 91 rural areas so far and is working impeccably (Karunakaran, 2015).

Anand Mahindra recently in January, 2020 mentioned to give INR 1 Crore for microenterprises whereby he was ready to invest in the skilful idea of Vishnu who developed ϵ bike out of electricity waste. This sustainable business idea just captivated Mahindra and they showed interest to develop it further (Sheth, 2020).

Hence, the company is doing a lot more such CSE contributions of which other business giants should take motivation.

6: INTERPRETATION OF CASE STUDY

In the case of Tata group's CSE activity there is a dedication to work for the betterment of society and build sustainable means for achieving the business objectives. As mentioned in the study by Chell et al. (2010) the group has rightly understood the significance of limited resources and work towards optimum utilisation of resources. Tata group has diversified business and it is trying to maintain the decorum of sustainability in almost all its businesses. It works on the ethical principles since inception and it is achieving its economic goals in context with social aspect even. It is a perfect blend of profit and social objective by one cf the giant business houses of India. The group has also received credit at world level for less emission of CO2 in its steel pant of Jamshedpur. As per the interview of Michael Porter by Driver (2012) Ratan Tata is the person whose thinking of sustainability and community development has made the company an epitome in the field of business and also its social responsibility.

In the case of Mahindra, the managing director and chairman has the view of not only providing money to reduce poverty but to help them earn their livelihood forever. His personality traits like conscientiousness, agreeableness and openness are the drivers for such CSE deeds which resembles with the study of Koe Hwee Nga & Shamuganathan, (2010). Mahindra just changed the adversity of the country i.e. the agricultural problems, renewable energy sources, unemployment, etc. to an opportunity as mentioned in the study of Niño, (2015). This way the company earned profit and also developed community.

7: CONCLUSION

In the above study on CSE in India, it is observed that giant business companies are engaged in such activities. The companies have started understanding the need of the hour to implement the change and judiciously use the limited resources available. Reckless use might lead the future generations devoid of such resources. This study presents a very contradictory view in context to the conclusion presented by Singh et al. (2017). As per the present study corporates in India does not limit their concerns to philanthropic CSR level activities but companies like Tata develop sustainable business models.

Mahindra group has many CSE activities and with the advent of time the group has understood its importance. The companies major focus has been on agriculture and renewable source of energy. Company also helps many social entrepreneurs, one of which is mentioned above

The limitation of this study is that, the researcher has covered a very limited number of reallife corporate examples with respect to CSE. The awareness level of people would not increase as required at the current need of the hour. This research also opens the door for future scope i.e., a further research in this area by conducting the interviews of the top management from various giant companies of India would present the good scenario. This would give an insight that how these business giants think? Are they behind economic appraisals of their company's or they are actually showing their concerns towards the betterment of community and future generations? Large number of corporations should implement CSE in their organisations to make this world a better place.

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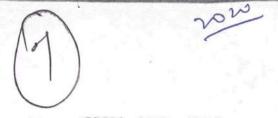
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IMPACT OF PANDEMIC COVID 19 ON EATING HABITS - AN INDIAN SURVEY

Shilpa Parihar Research scholar Department of management studies Jai Narain Vyas University Shilpa Parihar Research scholar Department of management studies Jai Narain Vyas University

Abstract

Background -

There is too much fuss about the prevailing COVID situation like; what the virus is, how long it will last, how it is affecting people, what are the ways to stay safe, how it is spreading, when will the vaccine arrive, etc. But there is much more than this. We are even more concerned about how life is getting changed due to COVID 19 and how life will change after the pandemic is over.

Corona infections are a massive group of viruses which might trigger human or animal sickness "Numerous corona viruses are proven to cause respiratory infections in humans ranging from common cold to more serious illnesses like Middle East Respiratory Syndrome (MERS) and Extreme Acute Respiratory Syndrome (SARS). The most recent corona virus identified causes COVID-19 corona virus disease. The latest virus and disease was unknown in December 2019, unit the outbreak began in Wuhan, China. COVID-19 is a pandemic which affects many countries worldwide".

ThisCovid 19 has changed the life of human being in the whole universe. The life &also the food habit havealso changed. The Covid -19 is a major influence on lifestyle, eating patterns, and social relationships. If it has absolutely modified the essential slogan like human is a social animal. Life has now changed to keep distance, to keep limits and to exercise more disconnection instead of mixim now.

Methods- ·

This study is aimed to investigate to immediate impact and change in eating habits due to Covid-19 pandemic among the selected respondents and it also analyses the factors responsible for the change For this purpose researcher has framed a self-structured questionnaire that analyzes the demographics factor(gender, age, home town, qualification, current employment) eatinghabit, food type, cooking method, Number of meals / day, work efficiency etc. The survey was conducted from April 2020 to August 2020.

Data Analysis -

A total of 1018 respondenthave been included in this survey with the help- of SPSS version 25. For analysisone sample test, one sample analysis, KMO and Barlet test, factor analysis etc. has been taken to extract the factors and find the difference between all categorical variablesbetween two at more group &also to establish the association between dependent & independent variables.

Conclusion - This study is one of a kind and it comes under the category of innovative study as the information investigated and provided through the study for the first time on the Indian population eating habits during COVID 19 lockdown. Results of the study reveal that eating habits of respondents have changed and are impacted during the COVID period due to several factors.

Keywords - COVID 19, Eating habits, Life style.

INTRODUCTION -1.1

The corona or now we can say Covid-19 transit from animals to humans, this pandemic had first been officially confirmed by China on 21 D been officially confirmed by China on 31 December 2019 and quickly spread from Wuhan city of China, from China to India the number of in the transfer 2019 and quickly spread from Wuhan city of the spread from Wuhan c China, from China to India the number of individuals growing day by day and becoming infected with new corona virus, we are residing the unit of individuals growing day by day and becoming infected with new corona virus, we are residing through unbelievable periods. The effect of the novel corona virus and the outbreak it produces COVID is virus and the outbreak it produces, COVID-19, has resonated into every part of the planet - taking jobs, damaging lives and health and transfer jobs, damaging lives and health, and transforming anything about how we communicate with each other and with the environment (Sahu Mich. other and with the environment. (Sahu, Mishra, &Lal, 2020)

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On 25 March 2020 India's prime minister declared a countrywide shutdown with socially distancing restrictions on most commercial operations and mass gatherings like educational and public institutions. In such an extraordinary situation of the century, it is important for us to understand how people respond to the restrictions imposed by government by coronavirus lock-down and its effect on the population and its routines and habits.

the population COVID19 has significantly disrupted various Indian sectors including petroleum, automotive, air transport, agricultural production, department stores, etc. We can not overlook the fact that the recession will not have left any sector and any individual untouched. It can have more or less of an impact. Same is with eating habits and pattern of Indians. (Gautam, Neha, Garg, 2020) According to Jakovljevic, Bjedov, & Jaksic (2020) National disasters of any crisis that comes in a nation will not go impacting the overall system of the nation. Soon after the declaration of lockdown and curfew due to the outbreak of COVID-19 in India the people are confined in their houses. The outbreak of COVID-19 across the globe has caused changes in the eating patern and preferences of people around the globe.

1.2 Corona virus in India -

The worldwide spread of novel coronavirus disease is seriously affecting life as nearly one-third to half of the world 's population is now under some sort of lockdown as per the recent updates.

Amount of people suffered from serious respiratory illness in the month of December 2019 in Wuhan Hubei Province, China. China told the World Health Organization (WHO) on 31 December 2019 of the number of patients with respiratory disorder symptoms of an unknown origin. Recent studies indicate that people may transmit the COVID-19 infection before they show the symptoms. Gössling, Scott, & Hall, C. M. (2020)

1.3 Literature Review

"WHO has announced an outbreak of corona virus 2019 (COVID-19), caused by extreme acute respiratory corona virus 2 (SARS-CoV-2), to be a pandemic on 12 March 2020 (WHO, 2020). The UN Educational, Science and Cultural Organization reported on March 18, 2020 that 107 countries had adopted COVID-19-related national school closures, affecting 862 million children and young adults, nearly half of the global student population. This crisis had worsened quickly from 29 countries with closures of the national school a week before (UNESCO, 2020)".

According to Renzo, Gualtieri and Pivar (2020) "The COVID-19 pandemic represents a massive impact on human health, causing sudden lifestyle changes, through social distancing and isolation at home, with social and economic consequences. Optimizing public health during this pandemic requires not only knowledge from the medical and biological sciences, but also of all human sciences related to lifestyle, social and behavioural studies, including dietary habits and lifestyle".

In a study titled as "Diet and physical activity during the COVID-19 lockdown period (March-May 2020): results from the French NutriNet-Santé cohort study". In the lockout time the authors tried to identify dietary behaviours. To this end 37,252 French adults from the web-based NutriNet-Santé cohort filled out lockdown-specific questionnaires in April-May 2020 for the authors' surveys. Results from the study indicate that the lockdown contributed to unhealthy dietary habits in a large part of the population, which, if sustained in the long term, may increase the dietary burden of disease and also impair immunity. Nevertheless, the situation of lockdown also provided an incentive for certain people to change their dietary behaviour, with high stakes in knowing the leverages to bring them on a long-term basis. (Pecollo, Edelenyi, Tanguy, 2020)

The Covid-19 pandemic led to lockdowns in many parts of the world and, as a result, changed some everyday behaviors, including social interactions, athletic ability, and likely diet. On 9 March 2020, the Italian government laid down and enacted lockout measures. The study attempted to determine the effects of Covid-19-induced confinement policies on self-reported food intake by self-selected Italians through a questionnaire created and disseminated on the Internet. Nearly half of respondents did not substantially alter their diet during the lockdown; however, remaining half of respondents

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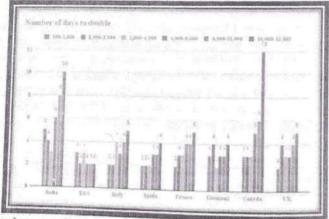
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reported eating more while in isolation, and few increased in weight. Reports note an rise in consumption of "comfort food," especially chocolate, ice cream and sweets and salty snacks among others. Interestingly, 21.2 per cent of respondents have increased their fresh fruit and vegetable intake. Just 33.5 percent of those who reported lower consumption attributed this dietary adjustment to reduced quality and ease of purchasing these products. Similarly interesting, more than half of respondents, acknowledged that when in lockdown, fruit and vegetables did not appeal to then. Ready-made meal sales have been popular by almost 50 percent. Similar large-scale research will be carried out globally and will help public health officials shape their reactions to potential, imminent pandemics. (Scarmozzino and Visioli, 2020)

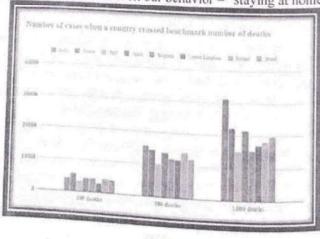
Data reveals that corona viruscases in India were doubled from 16000 to 32000 in 10 days (report as on 30thApril 2020) and now currently (21st august) India is reporting around 70000 cases in a single day with a highest one day spike.

As per Schwartz, King, & Yen, (2020) Pandemics are the most common disease outbreaks resulting from the spread of human to human infections we have seen in recent times that COVID 19 will have a cascading influence on overall medical systems, the world's economy, organizations of all shapes, sizes and people around the world. Before 2019, the patterns seen over the last few months would indeed be unthinkable. Advanced computational statistics are built nearly regularly. For example, on the financial aspect, the airline company is experiencing its worst ever crisis, with 90 percent of the world 's fleet suspended. In the meantime, global commodity prices reported their biggest drop, dropping by 20.4% in the month to March 2020. Global economy and trade are also affected bady and are forecasted to follow a declining trend even after the pandemic is over.

In most of the countries, Canada has shown remarkable progress stalling the spread of the vinus barring Canada; the rate of doubling has remained below.



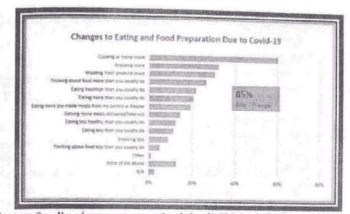
There are two keyimpactsof lockdown on our behavior - "staying at home and stockpiling"



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Source -https://www.foodbusinessnews.net/articles/16226-eight-in-ten-consumers-changed-theireating-habits-due-to-covid-19

1.4 RESEARCH OBJECTIVES

- To study the perception of respondents about change in eating habits during Covid-19 pandemic.
- To study the impact of lockdown on eating habits of respondents and identify the factors responsible for this change.

15 RESEARCH METHODOLOGY

For the purpose of research data is collected from Indian citizens from all over India. Respondents are selected from all age group, all places and from all occupational categories. A total of 1018 respondents are selected on the basis of convenience sampling procedure. The study made use of only primary data for achieving the objectives of the study. Online surveys were generated and mailed to all the respondents. Responses were also collected online.

Questionnaire comprises of three different parts of mainly closed ended questions. Part A of questionnaire enquires demographics of respondents like his age, gender, locality etc. Part B enquires eating habits related information through different statements and last part C comprises of statements that Impact of pandemic COVID 19 on Eating Habits. For the analysis of data, One sample T-test and Factor analysis is applied to test the major hypothesis and extract the factors.

1.6 ANALYSIS

Table 1:- Demographic information of respondents

Demographics	Options	Frequency	Percentage
Age Group	18-24	78	7.7
	25-34	310	30.5
	35-44	348	34.2
	45-54	106	10.4
	55-64	140	13.8
	65-74	36	3.5
San the second second	Total	1018	100.0
Gender	Male	566	55.6
	Female	452	44.4
A Stationary South State	Total	1018	100.0
lighest Qualification	High school Diploma	30	2.9
	Bachelor Degree	96	9.4
	University Degree	100	9.8
	Master's Degree or Above	792	77.8
Constraint in the sea	Total	1018	100.0

[90]

Head

	Student	104	10.2
Profession	Teacher (Public or Private	122	12.0
	sector)	84	8.3
	Academicians	6	.6
	Lawyer	4	
	Psychotherapist	4	.4
	Nursing assistant (Public or private sector)	22	2.2
	Other - Private sector	388	38.1
	Other - Public sector	62	6.1
	Elderly	48	4.7
	Job seekers	20	2.0
	Housewife	86	8.4
	Professor	72	7.1
	Total	1018	100.0
Income	Below -2 Lakh	258	25.3
income	200000-500000	206	20.2
	500000-800000	174	17.1
	000000 1000000	154	15.1
	1500000	226	22.2
	Total	1018	100.0

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In Table given above details of demographic variables of respondents are given. Regarding age it can be seen from table that most of the respondents (65%) are falling under the category of 25-44 years of age group. When gender is enquired, it is found that the sample data contains both type of gender substantially. Thus the results will give better results due to inclusion of both gender perceptions. Regarding educational qualification of respondents it can be said that most of the respondents (78%) are holding master's degree and above. When profession of respondent is investigated it is found that most of the respondents are working in private sector, followed by teaching profession. Regarding income of the respondents it can be seen form the data that most of the respondents are from below? lakhs of income group. However number of respondents from other income groups is also significant.

1.6.1 Hypothesis;

To find the significant change during Covid-19 pandemics on the eating habits of respondents following hypothesis is formulated;

Ho1: There is no significant change during Covid-19 pandemics on the eating habits respondents.

H₁₁: There is a significant change during Covid-19 pandemics on the eating habits respondents.

	N	Mean	Std. Deviat
Are you Eating healthy food Are you eating Vegetables every day	1018	1.01	.108
Are you drinking juice & Energy giving drinks every day	1010	1.04	.185
Do you eat Nuts & Protein added food every day	1010	1.44	.497
Are you eating Bread Cheese & all data	1014	1.29	.455
Are you eating Cream, Butter & other fat giving products every lay	1014	1.56	.497
day government at giving products every	1018	1.70	.458
Are you eating Sweets , Sugar & Carbohydrates giving products	1014	1.58	.494

Table 2:- One-Sample Statistics

[91]

every day	1018	1.02	.145	.005
every day Are you Eating more home made food Are you changed / Increase the number of meal during this Have you changed / Increase the number of meal during this	1018	1.62	.486	.015
period health conscious	1018	1.11	.318	.010
Are You taking any health drink kada etc. to fight covid19.	1018	1.40	.491	.015
Are You taking any neuron Complements	1018	1.40	.490	.015
Are your economic condition changed as a result of the Has your economic (Eg- Become jobless, private job closure, coronavirus outbreak? (Eg- Become jobless, private job closure,	1018	1.51	.500	.016
monthly salary cuts etc. monthly salary cuts etc. If the answer to the question above is "yes," you believe that the improvement in your economic condition will affect your eating	1018	1.59	.492	.015
patterns Do you believe there is some improvement in your food habits since the start of social isolation (for example, rise in serving	1018	1.46	.498	.016
since the start of start of start of sizes or decline in duration etc.)? sizes or decline in duration etc.)? Do you believe your main course (breakfast, lunch or dinner)	1018	1.55	.498	.016
Do you believe your intervention started? has changed since social isolation started? Do you believe your snack intake has improved after the onset	1018	1.39	.489	.015

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of social isolation? In the one sample Statistic table, the number of respondents (N), mean, standard deviation and standard error is represented for all the variables related with eating habits. Also from the table it is clear that highest mean is recorded for variable "Are you eating Cream, Butter & other fat giving products every day" (1.70) and lowest mean (1.01) is recorded for "Are you Eating healthy food".

		1. 7	N and
Table 24	One-Samp	ne i	est
12010 4."	Alle-Samp	1.8.8	

One-Sample Test	Test Val	ue = 0	in the second second			
	t	df	Sig. (2- tailed)	Mean Differ ence	95% Confidence Interval of th Difference	
					Lower	Upper
Are you Eating healthy food	298.9 57	1017	.000	1.012	1.01	1.02
Are you eating Vegetables every day	177.4	1009	.000	1.036	1.02	1.05
Are you drinking juice & Energy giving drinks	38 92.29	1009	.000	1.444	1.41	1.47
every day Do you eat Nuts & Protein added food every day	9 90.44	1013	.000	1.292	1.26	1.32
Are you eating Bread, Cheese & all dairy	2 99.69	1013	.000	1.556	1.53	1.59
product every day	3	1017	.000	1.701	1.67	1.73
Are you eating Cream, Butter & other fat giving products every day	56	1013	.000	1.580	1.55	1.61
Are you eating Sweets, Sugar & Carbohydrates giving products every day	76		.000	1.022	1.01	1.03
Are you Eating more home made food	224.0 54	1017		1.617	1.59	1.65
Have you changed / Increase the number of meal during this period	106.0	1017	.000		1.09	1.13
Have you become more health conscious	111.8	1017	.000	1.114		1.43
Are You taking any health drink kada etc. to fight covid19.	91.26	1017	,000	1,405	1.37	1.45

[92]

Head

Are you consuming any vitamin - C	91.10 3	1017	.000	1.399	1.37	1.0
supplements. Has your economic condition changed as a result of the coronavirus outbreak? (Eg- Become jobless, private job closure, monthly salary cuts etc.	96.51 7	1017	.000	1.513	1.48	EI
If the answer to the question above is "yes," you believe that the improvement in your economic condition will affect your eating patterns	103.2 36	1017	.000	1.591	1.56	1.62
Do you believe there is some improvement in your food habits since the start of social isolation (for example, rise in serving sizes or decline in duration etc.)?	93.31 1	1017	.000	1.458	1.43	1.49
Do you believe your main course (breakfast, lunch or dinner) has changed since social isolation started?	99.36 7	1017	.000	1.550	1.52	1.58
Do you believe your snack intake has improved after the onset of social isolation?	90.95 2	1017	.000	1.393	1.36	1.42

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The Sig. (2-Tailed) value in above Table is smaller than 0.05 for all variables. Because of this, it can be concluded that there is a significant change during Covid-19 pandemics on the eating habits of respondents.

1.6.2 Hypothesis;

H02: There is no significant impact of pandemic COVID 19 on Eating Habits of respondents.

H12: There is a significant impact of pandemic COVID 19 on Eating Habits of respondents.

Table 4:- KMO and Bartlett's Test

		The second s
Kaiser-Meyer-Olkin Measure of S	ampling Adequacy.	.822
Bartlett's Test of Sphericity	Approx. Chi-Square	15179.540
	df	496
	Sig_	.000

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0.822; hence factor analysis can be applied.

"Bartlett's test of sphericity is .000 which is less than 0.05 which indicate that a factor analysis may be useful with this data" and There is a significant impact of pandemic COVID 19 on Eating Habits of respondents.

Table 5:-	Communalities	table
Commun	alities	

Fallow backlife d. P. et al.	Initial	Extraction
Follow health food - diet rigidly	and a second sec	.641
Did your sense of hunger change during this period at home	1.000	.604
Distracted by thoughts of healthy eating		
Increase house hold budget	1.000	.610
There has been an increase in the amount of	1.000	.672
There has been an decrease in the amount of main meals	1.000	.756
There has been an accrease in the amount of main meals	1.000	.656

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There has been an decrease in the consumption frequency of main meals	1.000	.690
the time of consumption of main meals has changed	1.000	.661
and taking vitamin supplements in addition to meals	1.000	.735
a far frozen or canned foods more	1.000	.661
a far pre cooked ready to eat foods more	1.000	.575
profer cooking vegetables dishes more	1.000	.540
perfer consuming legumes more	1.000	.640
Prefer animal - based foods (Red meat . chicken , eggs etc.)	1.000	.621
Cook main meals mostly by frying or sauteing methods	1.000	.610
Cook main meals mostly by boiling or Grilling methods	1.000	.634
There has been an increase in the amount of snacks	1.000	.814
There has been an decrease in the amount of my snacks	1.000	.727
There has been an increase in the consumption frequency of snacks	1.000	.769
There has been an decrease in the consumption frequency of snacks	1.000	.759
The time of consumption of snacks has changed	1.000	.742
Food type and / or cooking method has changed	1.000	.631
Prefer salty & packaged snacks such as chips, crackers etc.	1.000	.342
Prefer food products such as cakes, pastries, biscuits, wafers, chocolate etc.	1.000	.326
Prefer pastry food such as puff pastry , pies etc. more	1.000	.771
Prefer milk desserts such as pudding, custard etc.	1.000	.558
There has been an increase in water consumption	1.000	.602
There has been an decrease in water consumption	1.000	.652
There has been an increase in my tea, coffee, etc. consumption	1.000	.544
Improve efficiency (In respect of working)	1.000	.544
Getting Support from family members	1.000	.737
Shared feelings with family members	1.000	.745
Extraction Mathod: Principal Component Analysis		

Extraction Method: Principal Component Analysis.

"Extraction communalities are estimates of the variance in each variable accounted for by the factors in the factor solution. Small values indicate variables that do not fit well with the factor solution, and should possibly be dropped from the analysis. The extraction communalities for this solution are acceptable, although the lower values of *Prefer salty & packaged snacks such as chips, crackers etc.* and *Prefer food products such as cakes , pastries , biscuits , wafers , chocolate etc.* show that they don't fit as well as the others".

Table 6:- Total	Variance	Explained	I table
Part		with the second of a	

m . . .

mponen	nce Explai	genvalues		Extractio	n Sums of Squared	Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
	10.521	26.629	26.629	8.521	26,629	26.629
	8.503	10.948	37.576	3.503	10.948	47.576
	5.664	8.326	45.903	2.664	8.326	55.903
	2.944	6.074	51.977	1.944	6.074	61.977
	1.264	3.951	55.928	1.264	3.951	65.928
	.179	3.684	59.612			10000
	.092	3.414	63.026			

[94]

0	.052	3.286	66.312			
8	the second se	3,103	69.415			
9	.099	2.749	72.164			
10	.088	2.565	74.729			
11	.0821	2.408	77.137			
12	.771	the second se	79.483		1	
13	.751	2.346	81.598			
14	.677	2.115	83.532	Chains The		
15	.619	1.934	85.244			
16	.548	1.712	86.814			3
17	.503	1.570	and being party of the second s			
18	.487	1.521	88.335	1000		
19	.437	1.367	89.702			
20	.390	1.219	90.921			
21	.376	1.175	92.095			
22	.356	1.111	93.207			
23	.342	1.068	94.274			
24	.274	.857	95.132			
25	.266	.830	95.962	La la sola	1	
26	.241	.753	96.715	har walke	No. Towney	and the second is
27	.232	.726	97.440		11 mar 1 mar	
28	.206	.643	98.083			
29	.182	.570	98.653			
30	.166	.518	99.171	-		
31	.137	.428	99.600	and the second second		
32	.128	.400	100.000			

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Extraction Method: Principal Component Analysis

From above table it is clear that only five factors in the initial solution have eigenvalues greater than 1. They combined account for almost 65% of the variability in the original variables. This suggests that five factors that are responsible for changes in eating habits due to COVID 19 lockdown can be extracted. These 32 variables can be thus divided into five broad categories as follows;

- 1. Increased time for diet plan
- 2. Increased/decreased Consumption pattern
- 3. Increased snack cravings
- 4. Frequency of meals
- 5. Extra Time for cooking

These are the factors identified as responsible for changes in eating habits of people due to COVID19.

1.7 CONCLUSION:

Assuming that the lockout is inclined to maintain for weeks, the daily activities and well-being of the population must be controlled urgently and Collect study data to establish evidence-driven approaches to mitigate the adverse effects of lockdown implementation and the consequences of these profound changes in the everyday lives of individuals. The COVID-19 pandemic (also widely called coronavirus) is causing a lot of changes in people's everyday lives across the globe. A balanced diet is an important part of supporting a strong immune system. But the lockout era has caused big changes in people's eating habits.

Due to lockdown conditions, present web-based survey study may be relevant to illustrate certain big trends in changing our eating patterns. The condition of lockdown has affected the habits and way of life of a given population. The study attempted to find the perception of respondents towards the change in their eating habits due to the lockdown period and the study identified five factors viz. Increased time for diet plan, Increased/decreased Consumption pattern, Increased snack cravings.

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Frequency of meals and Extra Time for cooking. Also form the study it has been established that there is a significant impact of pandemic COVID 19 on Eating Habits of respondents

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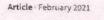
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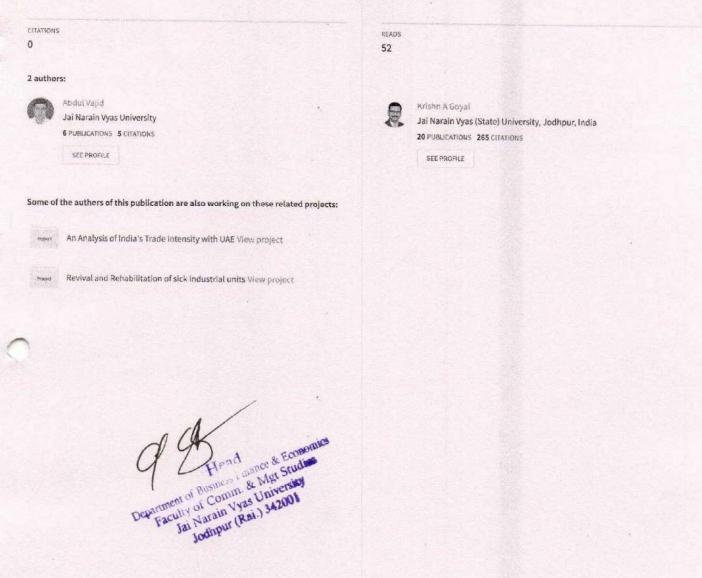
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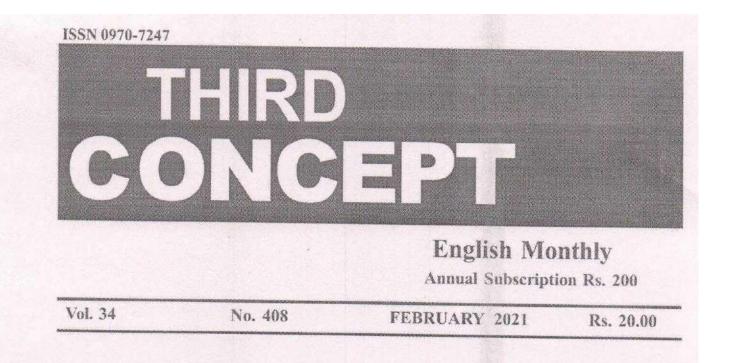
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Indo-Oman Trade and Economic Relations





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Indo-Oman Trade and Economic Relations

Dr. Abdul Vajid* & Prof. K.A. Goyal**

[India and Oman have very close and deep bilateral relations since long. Oman has been an important pillar of India's West Asia policy. The two countries are closely linked in a multi-dimensional relationship. Outstanding contributions of Indians and people of Indian origin in Oman in enhancing these relations have been recognized by both countries. Bilateral trade and economic ties have shown some significant developments in the past few years. According to the Indian Ministry of External Affairs currently, there are approximately 4,100 Indian companies in Oman with an estimated investment above \$7.5 billion. India is one of the top trading partners in Oman. For Oman, India was the third biggest import source and the third biggest non-oil export market. Bilateral trade between India and Oman has increased by 8.5% in 2019-20 to USD 5.93 billion over the previous year. While India's exports to Oman amounted to 2,26 billion USD, India's Oman imports amounted to 3.67 billion USD in 2019-2020. In this paper, an attempt has been made to analyze India's bilateral trade and economic relations with Oman. Data for last 10 years from 2011 to 2020 have been collected and analyzed.].

ndia understands the importance of Oman and has established strong bilateral relations with the country during the last few decades. Bilateral relations include political, diplomatic, commercial and strategic ties with Oman, which is emerging as one of the priority countries in India's political and diplomatic outreach to the Gulf. In June 2014, Yusuf bin Alawi, Minister of Foreign Affairs of Oman, became the first foreign official to call the Prime Minister after he took office. Minister of Foreign Affairs Sushma Swaraj visited Oman in February 2015, followed by a visit to Muscat by the then Minister of Indian Defense Manohar Parrikar in May 2016.

India is one of the top trading partners in Oman. In FY 2018-19, Oman was India's 39th largest commercial partner and the 36th largest worldwide export market. In 2018, India was the third-largest source of its imports (after UAE and China) and the third biggest market (after UAE and Saudi Arabia) for non-oil exports. India represented around 4.40% of the total imports of Oman and 10.21% of the 2018 non-oil exports of Oman. In 2018, India imported 6.90% of Oman's total oil exports.

Prime Minister Modi visited Oman in February 2018 tofurtherestablish bilateral ties. He had a meeting with

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Sultan Qaboos. The two leaders discussed several important bilateral, regional, and international issues of mutual interest. Improving trade relations through trade and investment and strengthening of security ties to counter mutual threats from terrorism and extremism and that emerged as the most important issue during the meeting. India and Oman also agreed to work together in the area of maritime security.

Review of Literature

Shaalan and Handy (1991) argued that the growth rate of public expenditure over the past three decades is closely followed by oil export growth rates, in Oman, Saudi Arabia, and the United Arab Emirates, but not in Kuwait. For Al-Youšif (1997), the interaction between exports and economic growth in several oilproducing countries (such as Saudi Arabia, Kuwait, UAE, and Oman) from 1973-1993 was investigated, and he used a model of aggregate production function which included production, labor, capital, exports, government expenditure, and trade conditions. The reciprocal dumping model has conducted some empirical tests suggesting that the gravity equation may not be fully explained by its specialization and differentiated commodity models.

Metwally (2000) applied the co-integration model by using the technique of maximum likelihood to evaluate the long-term relationship of oil expenditure and government expenditure between 1974 and 1996 in the Gulf Council Countries (GCC). The model results show that there was a long-term relationship between

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two variables in all but Kuwait. Feenstra, Markusen, and Rose (2001) demonstrated reciprocal dumping by assessing the effect of the home market on differentiated and homogeneous goods in separate serious equations. The effect on domestic markets showed a relation in the assessment of gravity for differentiated goods but showed the opposite of homogenous goods. The authors show that this result corresponds to the theoretical predictions of mutual dumping in homogeneous markets.

In addition to the basic gravity equation, trade relations' studies using the gravity model also attempted to assess the effects of various variables. The price and exchange rate variables showed a relationship in the gravitational model that represents a substantial amount of variance not explained by the fundamental gravitational equation. The impact of price levels varies according to the relationship examined, according to empirical results at the price level. For example, if exports are to be examined, a relatively high importer price rate would be expected to enhance trade with that country. Anderson and van Wincoop (2003) use a non-linear equation system to account for the endogenous change from trade liberalization to these price terms. A simpler method is to use a log-linearization first order of this equation system.

Varghese, John, and Qatroopi (2015) investigated the interaction of bilateral trade between India and Oman. The authors applied the gravity model of trade testing the relationship between the independent variable and dependent variable and to know the determinants of Indo-Oman bilateral trade. 18 years GDP and export data starting from 1996 to 2014 were taken for analysis. Authors concluded that Oman's export is a function of Oman's GDP.

Objectives of the Study

- To analyze India's economic relations with Oman
- To know about trade composition between India and Oman

Indo-Oman Trade: An Analysis

Table 1 shows that the export trade of India with Oman was just USD 1082.24 million in 2011, which now in 2020 has reached USD 2261.81 million with a CAGR of 7.65%. On the other hand, the import of India from Oman has decreased. In 2011 USD 4002.07 million of goods were imported from Oman but in 2020 it amounted to USD 3669.33 Million, thus we can see the major downfall in import trade. Total trade between India and Oman was around USD 6 billion with a CAGR of 2.42%.

S.No.	Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	EXPORT	1082.24	1322.13	2599.49	2812.27	2379.44	2,190,96	2,728.30	2,439.46	2,246,31	
2	%Growth		22.17	96.61	8.19	-15.39	-7.92	24.53	-10.59	-7.92	2,261.81
3	IMPORT	4002.07	3345.94	2009.72	2951.18	1752.24	1,674.71	1,290.50	4,264.29	2,759.00	3.669.33
4	%Growth		-16.39	-39.94	46.85	-40.63	-4.42	-22.94	230.44	-35.3	33
5	TOTAL TRADE	5084.31	4668.07	4609.21	5763.45	4131.68	3,865.67	4,018.79	6,703.76	5,005.30	5,931.14
6	Trade Balance	-2919.83	-2023.81	589.77	-138.91	627.2	516.25	1437.8	-1824.83	-512.69	-1407.52

Table 1. India's Trade with Oman (Million USD)

Source: Compiled from Director General of Commerce and Intelligence, Kolkata

Major Trade Items between India and Oman

India's main items of export to Oman for the last ten years are depicted in Table 2. Mineral Fuels (27), especially High-Speed Diesel (27101930), and other petroleum products like Tar, Light Diesel, etc. are the major items in this category. In the cereal (10) category, rice is the biggest exporting item to Oman by India. A significant amount of Meat (02), Organic Chemical (29), Apparel both knitted and non-knitted (61 and 61), Ceramic Powder (69) are also being exported by India to Oman. Furthermore, some items' export to Oman have increased in recent years like Nuclear Reactor (84), Electric Machinery (85), vehicle other than railway (87), and ships and floating structure (89).

Table 2. Major Commodities export to Oman from India (Million USD)

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HSN	Commodity	2011	2012	2013	2014	2015	2016	2015		-	1
02	Meat and Edible Meat Offal	32.05	48.57	43.01	47.49	42.54	45.65	2017 40.55	2018 47.17	2019 45.45	2020
10	Cereals	17.38	72.08	154.75	172.53	172.54	133.70	101.05			
27	Mineral Fuels/Oil	389.01	267.98	1548.21	1286.66	935.91		101.97	126.61	137.32	106.1
29	Organic Chemicals	10.88	11.61	19.01	16.42	13.47	1017.73	1262.58	1014.39	535.97	495.7
61	Apparel Knitted	1.60	4.38	6.78	50.21	No. of Contraction	23.76	46.21	61.72	57.57	67.78
62	Apparel Non-Knitted	9.88	9.82	12.86		17.01	14.70	14.52	29.64	42.77	29.73
69	Ceramic Powder	4.32	5.31	5.82	90.58	21.36	23.32	26.52	26.02	47.75	63.02
72	Iron Steel	42.14	71.18	78.60	19.84	20.92	38.83	59.83	54.69	58.19	59.95
73	Article of Iron	66.40	54.95	111.48	45.48	52.17	31.94	54.71	76.66	84.31	114.15
-970	and Steel	00.40	54.95	111.48	84.52	69.56	118.34	126.74	186.75	77.67	120.52
84	Nuclear Reactor, Boiler	109.47	73.34	120.88	194.80	147.37	168.45	133.16	145.87	176.22	204.40
85	Electrical Machinery	85.76	95.17	100.41	110.07	111.55	112.94	108.81	112.70	140.00	112.02
87	Vehicles other than Railway	12.13	27.46	54.66	49.53	69.97	50.66	52.10	113.79 43.20	138.70 36.37	120.41 56.91
89	Ships and Boat	22.04	267.19	7.01	158.29	352.45	0.03	228.43	2.47	276.46	236.54

Source: Compiled from Director General of Commerce and Intelligence, Kolkata

Import from Oman by India includes mainly Oil (27), Organic Chemicals (29), Fertilisers (31), Plastic (39) and Aluminum (76). Fertilisers (31) import from Oman has increased in last few years. It was just USD 348.78 million in 2011, which now has reached to USD 693.93 million. Moreover, import of items like Salt and Sulphar (25), Organic Chemicals (29), and Plastic (39) also increased in last couple of years. Heavy downfall has been reported in import of items from Oman; like Mineral fuel (27) and Aluminum (76). In 2011 Mineral fuels (27) import from Oman was USD 3293.14 Million, which has now shrunken to USD 1838.78 Million in 2020. Import of Aluminum (76) also plummeted to USD 39.39 Million in 2020 from USD 91.87 Million in 2011.

Table 3. Major Commodities import from Oman to India (Million USD)

HSN	Commodity	2011	2012	2013	2014	2015	2016	2017	2018	2010	
25	Salt, Sulphar	61.58	74.73	93.95	99.67	119.32		1000		2019	2020
26	Ores, Slag Ash	25.96	46.43				109.55	107.51	125.47	132.57	127.07
27	Mineral Fuels/Oil			35.34	28.50	60.99	132.23	11.53	32.39	21.87	2.74
-		3293.14	2083.84	507.88	1514.11	732.51	584.67	390.56	2880.79	1685.15	1838.78
29	Organic Chemicals	82.28	215.15	425.48	383.73	236.67	30.25	100,91	137.16	11.23	
31	Fertilisers	348.78	356.20	346.56	451.35	267.10	372.06	371.01			387.04
39	Plastic	19.02	18.61	22.57	28.03		The second second	March 1	468.99	394.80	693.93
68	Articleof Stone,	9.10		Contraction of the		32.48	21.79	32.76	55.75	38.02	36.72
	Plaster, Cement	9.10	20.04	38.73	41.85	61.22	70.44	50.12	42.04	34.30	24.85
76	Aluminum	91.87	76.92	153.71	152.44	131.26	87.81	163.14	79.49	49.09	39.39

Source: Compiled from Director General of Commerce and Intelligence, Kolkata

Oman Ministry of Commerce and Industry reports that there are 4,100 Indian businesses in Oman with investments estimated at more than USD 7.5 billion. The OIJIF is a 50-50 joint venture between Oman's State Bank of India (SGRF) and Oman's State General Reserve Fund (SGRF). It was established in July 2010 to put resources in India as a special

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purpose vehicle (SPV). OIJIF started functioning in 2011 with the inception of a US\$ 100 million seed capital contribution which came to a full extent from seven Indian organizations from broad areas (for example Solar Industries, ING Vysya Bank, HBL Power Systems, Indus Teqsite, GSP Crop Science, NCDEX and SSIPL).

As the DIPP information shows, the combined influx of FDI from Oman during April-2000 to March 2019

amounts to US\$502 million. The Oman Oil Company, an organisation of the Omani public sector, has 26% stake in Bharat-Oman Refineries Limited (BORL), which is claiming and operating Bina Refinery, India's largest oil and gas processing facility.

Oman-India Fertilizer Company (OMIFCO) is the US\$969 million joint venture between IFFCO and Oman Oil Company (half stake) (25% stake) and KRIBHCO (25% share) of India. The plant can produce 1,750 tonnes of anhydrous ammonia each day from two ammonia plants and 2,530 tonnes daily from two urea plants. The Indian Government concluded a Urea Off Take Agreement (UOTA) with OMIFCO to lift its urea production in its entirety. Under an agreed Gas Supply Agreement (legitimate up to 2025) OMIFCO is supplied as feedstock by the Omani Ministry of Oil and Gas for lower market costs. Indian firms have invested in Oman for various industries such as iron and steel, concrete, cement, fabric, cable, automotive, etc., including Indian companies that make up the largest foreign investment in Sohar with over US\$2 billion expected from the Indian companies from Larsen and Toubro, Jindal Shadeed Iron and Steel, Indsil Ferrochrome, Metkore Alloys and Industries, Moon Iron and Moons Industries.

The Indian companies in Salalah are in an assembly such as TVS Chennai's Dunes Oman LLC (car), Oswal Group's Saltic FZCO (chemicals), Hind aluminum (cable), Kailash Group preparation units, Nagarjuna Fertilizer Plant, Future Bio organics, Deepak Nitrate, Petiva Sugar Processing Plant and so forth. Similarly, L&T, Jindal, EPIL, Shapoorji Pallonji, Shriram, Aditya Birla Group, Nagarjuna Construction Company, Simplex, KEC International, and so on are some of the leading Indian organizations operating in Oman.

Indian Diaspora in Oman

Between India and Oman, there are close cultural relations. Due to thousands of centuries of ancient people exchanges, the presence of the large Indian community in Oman, and the geographical vicinity, Omanis are aware of the situation in Spain. Oman's Foreign Minister opened the first-ever 'India Festival in Oman,' organized by the Embassy with the support of the Indian Culture Ministry during November 2016-March 2017.

There are about 8,00,000 Indians in Oman, about 6,66,000 of whom are professionals and workers. Thousands of Indians are working as doctors, engineers, chartered accountants, teachers, lecturers,

nurses, managers, etc. Twenty Indian schools meet the educational needs of over 46,000 Indian children who offer catering for CBSE. The Indian community of Oman is organized under the Indian Social Club Oman, with branches in Muscat, Salalah, Sur, and Sohar. In these clubs, there are several subgroups called linguistic wings, which meet cultural and social needs.

Recent developments in India-Oman Relationship

The Ninth Meeting of the India-Oman Joint Commission Meeting (JCM) was held on the virtual platform on 20 October 2020. Both parties have reexamined recent developments in commercial and investment ties and confirmed their commitment to developing bilateral trade between them over the session and to encourage businesses to invest in each other to realize the extent of the untapped trade and economic potential of each other.

Both parties have agreed to cooperate in agriculture & food security, standards & metrology, tourism, IT, health and pharmaceutics, MSME, space, renewable energies, culture, mining, and higher education. They reviewed the progress in the prospective Memorandum of Understanding (MoU) of mining, standards and metrology, financial intelligence, cultural exchange, and information technology and agreed to conclude it expeditiously. Both Parties also agreed to speed up their internal procedures for signing and ratification of the Protocol amending the Indian/ Oman Double Taxation Agreement and the conclusion of the Indian and Oman Bilateral Investment Treaty.

Indian officials have highlighted recent government initiatives to improve business ease and boost domestic production in India, including production incentives in various industries, and have invited Omani Sovereign Wealth Funds and private businesses to invest in India.

Conclusion

Both India and Oman need each other. The current partnership is primarily based on oil and diaspora, but it needs to focus on a lot more areas. After analyzing the trade relationship between India and Oman, it can be concluded that there is a huge potential for both countries to take this economic relationship to the next level. Many mutual areas of concern can also be addressed by boosting trade relations, as trade is the first step towards each relationship in today's geopolitics.

Oman is one of the most important nations in the expanded neighborhood of India with its strategic

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location at the mouth of the Persian Gulf. Oman has formalized defense relations with India as the first Gulf nation. India and Oman are collaborating on several projects, such as the Iran-Oman-India gas pipeline and the Duqm port agreement. It can be said that the relationship between India and Oman will further improve, which is a good sign for both countries and the region.

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India-Bangladesh Trade Ties: Beacon for Asian Peace

Dr. Manoj Gupta*

[All eyes in Asia were on India and Bangladesh in December, 2020, to see if the two South Asian neighbours would succeed in disallowing political differences from clouding their trade relations. What exactly did one of the biggest leadership summits across the pandemic world in 2020, the Narendra Modi-Sheikh Hasina virtual summit, achieve bilaterally and for South Asia?]

India and Bangladesh are more than neighbours in the sense that they have an umbilical relationship that has not deterred either from pursuing their individual, political and economic goals to strictly suit their domestic priorities. The same goes for their bilateral trade too which has survived several tensions in the last few decades, particularly cross-border infiltration into India, the highly profitable informal border trade, the issue of terrorism raising its head in the neighbourhood and the latest, the interest being shown by China to influence the smaller countries in South Asia in a bid to "control" India.

This paper updates on the bilateral trade relationship as exemplified by the December 17, 2020 round of bilateral agreements between the two countries using most recent data. It locates the latest agreements in the context of the ever-looming tensions in the region and particularly the informal border trade that still lingers and will be an issue both sides would closely examine in the near future.

Economic Context

The India-Bangladesh bilateral trade crossed US\$10 billion in 2018–19. Compare this with bilateral trade that stood at US\$6.6 billion in 2013–14 with India's exports at US\$6.1 billion and imports from

* Editor- Investigations & Security Affairs, TV18 Broadcast Limited. Bangladesh at US\$462 million, representing more than double the value of US\$2.7 billion five years ago. The figures would be far more if there were no informal trade which itself runs into billions of dollars. Given the close association between the two countries, there is much more to the bilateral relationship than trade.

Both countries have made signal progress to augment bilateral ties since 2011. That year, they resolved the border demarcation disputes at Tin Bigha Corridor. Their armies the same year took part in Sampriti-II (Unity-II), a joint military exercise at Sylhet. The following year, Bangladesh permitted India's ONGC to ferry heavy machinery, turbines and cargo through Ashuganj for Tripura's Palatana power project. In 2013, India agreed to export 500 MW of power daily to Bangladesh for the next 35 years. Both sides have a joint venture for a coal-fired power plant at Rampal.

In 2014, the then foreign affairs minister, the late Sushma Swaraj, went to Bangladesh on her first official trip overseas. She signed far-reaching agreements: Easing of visa regime, proposing a special economic zone for Bangladesh and key agreements in the transportation sector.

The next year came the famous Land Boundary Agreement that was passed by Indian Parliament as

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A STUDY ON FOREIGN DIRECT INVESTMENT IN SERVICE SECTOR IN INDIA

Sajjan Kumar" Dr. R.P. Meena

ABSTRACT

FDI offers a bundle of benefits such as financial and non-financial. FDI is one such source of long term international capital. Service sector is a largest sector of India economy. Since 1991, FDI inflows in India is on an increasing trend. The FDI Inflows in service sector increased from Rs.14803.91 crores during 1991-2000 to Rs.63909.44 crores in 2018-19. It showed positive response. The easiest and cheapest way to increase the capital is foreign direct investment. There is also increase in foreign currency resources. This paper discusses about the trends of FDI equity inflows in service sector in India and to examine and analysis the relationship between total FDI equity inflows and FDI equity inflows in service sector in India during 2009-10 to 2018-19.

Keywords: Foreign Direct Investment, Service Sector, Sub-Sector, FDI Equity Inflows.

Introduction

Since 1991, Foreign Direct investment has become a main source of foreign capital inflows for India. When, for improving the economy of India, a policy of privatization, globalization and liberalization have been adopted by the finance minister of that time Dr. Man Mohan Singh. Since 1991, FDI inflows in India is on an increasing trend. The FDI Inflows in India increased from Rs.409 crores in 1991-92 to Rs.309867 crores in 2018-19. It showed positive response. FDI offers a bundle of benefits such as financial and non-financial. It has also impacted to that country's balance of payment and balance of trade account. FDI is one such source of long term international capital. Service sector is a largest sector of India economy. In recent time, It has been growing rapidly across the world. For purpose of foreign direct investment, Services sector includes Financial, Banking, Insurance, Non-Financial services, Outsourcing, R&D, Technical testing and other services. In service sector, FDI can solve various problems, Such as innovative financial products, technical developments in the foreign markets, problem of Inefficient management, financial instability and poor capitalization.

An investment which made to acquire a part of management control in a company operating in a country other than that of the investor. Such investment is called foreign direct investment. In India, there are very high quantity of man power and the resources are also in the appropriate quantity. If the quantity of capital is increased then the Indian economy can make a lot of progress. The easiest and cheapest way to increase the capital is foreign direct investment. There is also increase in foreign currency resources. Thereby strengthening the value of Indian currency. Foreign direct investment policy is reviewed on an ongoing basis to make it more investor friendly. There are two routes from which FDI inflows come in India. Such are automatic route and government route.

Foreign direct investment is restricted in some sectors in India. Such are lottery business, chit funds, nidhi company and gambling etc. In order to attract more foreign direct investment in India, the government of India has adopted the liberal policy. Under this 100% foreign direct investment has

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been allowed from automatic route on most sectors. Such are agriculture and animal husbandry sector, plantation sector, e-commerce sector and construction development atc. In defense sector, total foreign direct investment is allowed up to 100%, through the automatic route up to 49% and government route beyond 49% and up to 100%. In private security agencies sector, total foreign direct investment is allowed up to 74%, through the automatic route up to 49% and government route beyond 49% and up to 74%, through the automatic route up to 20% through automatic route. In private sector banks, it is allowed up to 74%, through the automatic route up to 49% and government route beyond 49% and up to 74%, through the automatic route up to 49% and government route beyond 49% and up to 74%.

Review of Literature

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Joo, Dr. Bashir A. and Dhar, Faiza Ali (Nov., 2018) in their study named "Role of Sector Wise FDI Inflows on Growth of India- An Empirical Analysis" examined that the relation between GDP and FDI inflows. Total 9 sectors have taken for study purpose. Regression analysis techniques was used for data analysis. Their time period of study was from 2000-01 to 2016-17. They find out that three sectors such as computer hardware and software, power sector and drugs & pharmaceuticals have a negative effect on growth of India, three sectors such as telecommunications, metallurgy and chemicals have not affect on growth of India and three sectors such as service sector, automobiles and petroleum & natural gas have a strong positive impact on growth of India. They suggest that India needs to revamp its FDI policy.

Gupta, Jyotl and Chaturvedi, Dr. Rachna (Sept., 2017) in their research "A Study of Analyze FDI Inflows to India" analyzed that the trend of FDI Inflows in India from 1991-92 to 2015-16 and prediction of FDI inflows to India for five years from 2017 to 2021, using by regression techniques. And also analyze top ten countries which made maximum FDI inflows to India. Mauritius has first position with 33%. They suggest that to attract more FDI inflows to India, improve in labour laws, cut down corporate tax and develop world class infrastructure facilities.

Kumar, Vinay (Oct., 2014) in his study "Trend of FDI in India and its Impact on Economic Growth" find out that the GDP growth rate and equity inflows in India through GDP were positively correlated with each other during the time period of from 2000-01 to 2009-10. The inflows of FDI and FII in India has positive relationship. The inflows FDI in India was showing a positive trend and was a very positive signal for Indian economy.

Research Methodology

Objectives of the Study

- To study and analyze the trends of FDI equity inflows in service sector in India.
- To study and analyze the trend of FDI equity inflows in Sub-Sector of service sector.
- To examine and analysis the relationship between total FDI equity inflows and FDI equity inflows in service sector in India.
- Sources of Data

The present study is mainly based on secondary date. The data are collected from various issue of FDI newsletter, bulletins of RBI, various newspapers, internet link, various website and consolidated FDI policy 2017.

Time Period of the Study

The period of study is ten years from 2009-10 to 2018-19.

Techniques Used for Analysis

Statistical techniques like mean, standard deviation, co-efficient of variation and correlation analysis and accounting techniques such as statement of percentage change have been used for analysis of data.

- Hypothesis of the Study
 - Total FDI equity inflows and FDI equity inflows in service sector has high degree positive correlation, not perfect positively correlated.
- Limitation of the Study
 - This study is mainly based only on secondary data.
 - Here only a period of 10 years or 2009-10 to 2018-19 has been studied.
 - Here only FDI equity inflows in service sector in India have been studied.

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Data Analysis

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Table 1

Amount in Rs. Crores

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10013	Total FDI Equity Inflows	% Change	FDI Equity inflows in Service Sector*	% Change
2008-09	122898.28		28410.69	
2009-10	123377.73	0.39	20958.12	-
2010-11	88519.36	-28.25	15538.64	-26.23
2011-12	165145.50	86.56	the second se	-25.86
2012-13	121906.74	-26.18	24656.49	58.68
2013-14	147517.79	21.01	26305.95	6.69
2014-15	189107.09	and the second se	13294.41	-49.46
2015-16	262321.59	28.19	19962,48	50.16
2016-17		38.72	45430.95	127.58
2010-17	291696.31	11.20	58213.56	28.14
	288888.51	-0.96	43249.01	-25.71
2018-19	309866.64	7.26	63909.44	47 77

Note: *Services sector includes Financial, Banking, Insurance, Non-Financial, Outsourcing, R&D, Technical testing and Other Services. Sources: Various Issues of DIPP-SIA News Letter on FDI from 2008-09 to 2018-19. Interpretation

The table no.1 indicated that percentage change in total FDI equity inflows and FDI equity inflows in service sector in India from 2009-10 to 2018-19. The percentage change in total FDI equity inflows has fluctuating trend during the study period. In 2009-10, it was 0.39%. But next year, it decreased by 28.25%, compared to 2009-10. In 2011-12, it increased by 86.56%. Then it decreased in just next year by 26.18%. After that, it was positive except 2017-18. Another hand, the percentage change in FDI equity inflows in service sector has fluctuating trend during 2009-10 to 2018-19. In 2009-10, it was -26.23%. In 2010-11, it also decreased by 25.86%. But just next continue two year, it was positive. Then after it decreased by 49.46% in 2014-15. After three continue year such as 2014-15, 2015-16 and 2016-17 it was positive respectively 50.16%, 127.58% and 28.14%. In 2017-18, it decreased by 25.71%. The maximum increment in total FDI equity inflows was in 2011-12, which increased by 88.56%, compared to 2010-11. The maximum increment in FDI equity inflows in service sector was in 2015-16, which increased by 127.58%, compared to 2014-15. There has been positive trend in total FDI equity inflows and FDI equity inflows in service sector in India except in the year of 2009-10, 2012-13 and 2013-14.

Table 2

Amount in Rs. Crores

	Sub-Sector	2015-16	2016-17	2017-18	2018-19	1	
Financial	10509.70	10557.78	11043.57			Total	% *
Banking	99.93	the second s	The second s	9918.00	32268.42	74297.47	32.20
Insurance		12.27	7874.69	8705.54	2976.82	19669.25	8.52
	2584.98	7534.07	21894.27	9226.09	10340.38	51579.80	and the second second second
Non-Financial	3305.31	20470.05	14449.14	8804.21	the second se	and the second design of the second se	22.35
Outsourcing	583.49	2771.32		the state of the s	8642.37	55871.07	24.21
R&D		the second s	166.40	277.42	2647.09	6445.72	2.79
	665.52	1536.16	563.78	691.52	772.23	4229.21	
Technical testing	169.56	83.22	222.79	510.25			1.83
Other Services	1843,99	2466.08	1009.00	and the second se	213.44	1199.26	.52
te: *% of Total FDI ed	with Inflows in	0.00	1998.92	5115.98	6048.69	17473.63	7.58

Note: *% of Total FDI equity Inflows in Service Sector

Sources: Various issues of DIPP-SIA News Letter on FDI from 2014-15 to 2018-19 Interpretation

The table no. 2 indicated that sub-sector of service sector wise FDI equity inflows in India from 2009-10 to 2018-19. In financial services, highest and lowest FDI equity inflows was received in 2014-15 and 2016-17, which was respectively 52.65% and 18.97% of total FDI equity inflows in service sector. In banking services, highest and lowest FDI equity inflows was received respectively in 2017-18 and 2015-16, which was 20.13% and 0.02%. In insurance services, highest and lowest FDI equity inflows was received respectively in 2016-17 and 2014-15, which was 37.61% and 12.95%. In non-financial services, highest and lowest FDI equity inflows was received respectively in 2015-16 and 2018-19, which was

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45.06% and 13.52%.In financial service, FDI equity inflows was received 52.65% in 2014-15, 23.23% in 2015-16, 18.97% in 2016-17, 22.93% in 2017-18 and 50.49% in 2018-19. In non-financial service, FDI equity inflows was received respectively 17.56%, 45.06%, 24.82%, 20.36% and 13.52%. The highest FDI equity inflows was received in financial services, which has 32.20% share of total FDI equity inflows in service sector in India.

Table 3

Statemer	nt of Total FDI Equity Inflows an	d FDI Equity Inflows in Son	Amount in Rs. Cro
Years and Parameters	Total FDI Equity Inflows	FDI Equity inflows in Service Sector*	% of Total FDI
2009-10	123377.73	20958.12	Equity Inflows
2010-11	88519.36	15538.64	16.99
2011-12	165145.50		17.55
2012-13	121906.74	24656,49	14.93
2013-14	147517.79	26305.95	21.58
2014-15	189107.09	13294.41	9.01
2015-16		19962,48	10.56
2016-17	262321.59	45430.95	17.32
2017-18	291696.31	58213.56	19.96
2018-19	288888.51	43249.01	14.97
Mean	309866.64	63909.47	20.62
and the second se	198834.73	33151.91	
Standard Deviation	77933.17	17242.61	
Co-efficient of Variation (%)	39.19	50.01	
Co-efficient of correlation (r)	+0.91		

Note: "Services sector includes Financial, Banking, Insurance, Non-Financial services, Outsourcing, R&D, Technicaltesting and Other services.

Sources: Various Issues of DIPP-SIA News Letter on FDI from 2009-10 to 2018-19.

Interpretation

The table no. 3 shows the relationship between total FDI equity inflows and FDI equity inflows in service sector in India from 2009-10 to 2018-19. The share of FDI equity inflows in service sector of total FDI equity inflows in lndia was 16.99% in 2009-10, 17.355% in 2010-11, 14.93% in 2011-12, 21.58% in 2012-13, 9.01% in 2013-14, 10.56% in 2014-15, 17.32% in 2015-16, 19.96% in 2016-17, 14.97% in 2017-18, 20.62% in 2018-19. It Shows that co-efficient of variation in total FDI equity inflows is service sector is 50.01%. It means co-efficient of variation in total FDI equity inflows in service sector. It shows that total FDI equity inflows are stable, consistence and unitary, compared to FDI equity inflows and FDI equity inflows in service sector. The Karl pearson's co-efficient of correlation is ±0.91 between total FDI equity inflows and FDI equity inflows in service sector also correlation. It shows that when total FDI equity inflows in service sector also increased or vice versa.

Findings and Conclusion

The percentage change in total FDI equity inflows has an increasing trend except for 2010-11, 2012-13 and 2017-18. On the other hand, the percentage change in FDI equity inflows in service sector has an increasing trend except for 2009-10, 2010-11, 2013-14 and 2017-18, in 2013-14, the percentage change in total FD equity inflows increased by 21.01% but same time percentage change in FDI equity inflows in service sector decreased by 49.46%. In 2010-11 and 2017-18, the trend of falling was found in both of them. The financial service has first position in receiving sub-sector wise highest FDI equity inflows, non-financial services was at second position, insurance at third position and banking service at fourth position, which has respectively 32.20%, 24.21%, 22.35% and 6.52% share of total FDI equity inflows in service sector in India. The highest and iowest share of FDI equity inflows in service sector of total FDI equity inflows and FDI equity inflows in service sector are respectively 198834.73 and 33151.91.Co-efficient of variation in total FDI equity inflows is 39.19% and in FDI equity inflows in service

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sector is50.01%. Total FDI equity inflows is stable, consistence and unitary because co-efficient of variation in total FDI equity inflows is less than co-efficient of variation in FDI equity inflows in service sector as it clears from this study. The co-efficient of correlation is +0.91. There is a high degree positive correlation between total FDI equity inflows and FDI equity inflows in service sector in India as it also clears from this study. Hence, the hypothesis of high degree positive correlation between total FDI equity inflows and FDI equity inflows in service sector in India is fully accepted. It means when total FDI equity inflows increased, FDI equity inflows in service sector also increased or vice versa.FDI limits in the service sector of India are increased with the aim to bring in more FDI inflows in the country along with the incorporation of advanced technology and management practices. So, government of India should paid more attention on the service sector.

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MPACT OF COVID-19 ON INDIAN FINANCIA MARKET

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Abstract

The global disease of COVID-19 has impacted the financial market because of lockdown and decreasing dema in the world. Where the price of domestic products increase and where the price of crude oil has furt deteriorated the economic scenario. There are lakhs of people affected in India and many of them died because corona virus. This research paper presents the impact of COVID-19 on Indian stock market. There are two ma stock exchange in india i.e. Bombay Stock Exchange (BSE) and National Stock Exchange. For the presresearch, top 10 companies of NSE were selected. The impact was measured by observing change in share pri of these companies over last three months period and post three post since the pandemic started. This Resear also shows the Pre and Post impact on financial market due to COVID-19 disease.

Key Words: - COVID-19, Bombay Stock Exchange, National Stock Exchange, Stock Market, Share Price.

Introduction

Coronoavirus disease 2019 (COVID-19) is a global disease caused by severe acute respiratory syndrom coronavirus 2. The first known case was identified in Wuhan, china in December 2019. The disease has sinc spread worldwide, leading to an ongoing pandemic. This virus where people get infected when they success c coughs or through droplets or saliva or discharge from the nose. More than 40% of global population is unde lockdown because of corona virus pandemic. Many people have lost their lives and another over lakh of peopl infect by this virus across the globe. Business from top to small each every business across the whole world i operating under the fear of collapse of global financial markets. In India, the economic growth has been ver: inactive/ slow. Due to lockdown in country unemployment has increased, interest rates have been reduced and even the stock market has become highly volatile. Although at the earlier stage number of people affected from corona virus in India is relatively low however after that the cases were increasing when second variant enters it

Review of Literature

Global financial market or stock market is very complicated network. Although very less study done to actually know the impact of one nation market to another nation market however it has been founded that US stock market largely impacts Indian stock markets. Analysts are of view before the covid-19 cases arise in India that financial market may get affected whenever the covid-19 case starts increasingly. According to the research done by the international institute for labour studies, these financial crises not only impact economy of nation but also have

According to a research done by Deepak, Lalwani Idnani, corporate governance is the major factor behind global crisis. Research performed by Kumar and Singh also identified that another research perofrmed by Salman et. al (2010) related to 2008 economic crises found that countries with less international currency courses in proportion

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anayake, Athukoralalage et al. (2010) used multivariate generalized autoregressive conditional croskedasticity (MGARCH) model to study the effects of financial crises on stock market returns and the harket volatility of four nations Singapore, Australia, UK and the US. Their findings indicate that volatilities of smaller economies are largely impacted by US stock market.

Eleftherios Thalassinos et al. (2015) carried out a research on the impact of financial crisis on the performance indicators of selected countries. They selected 10 countries for their study and carried out empirical analysis of various indicators such as turnover, stock market capitalization, share price indices, etc. to explain the impact of crisis on capital market. Their findings indicated that economics of Eastern Europe were hit badly by the economic crisis. Those countries where the impact was less also suffered losses because of decreased stock exchanges limited lending and collapse of exports.

Ksantinia and Boujelbène (2014) examined the impact of financial crisis by measuring the change in GDP growth and investment of 25 countries. They used control variables to study the change for the period 1998 to 2009. Their findings showed that financial crisis has a significantly negative impact on the GDP growth and level of investment.

Kumar and Vashist (2009) did a research on the impact of global economic crisis on India. Their findings were that since India is not integrated with global financial system, so first round adverse impacts were not there. But because of global downtrend, second round impacts were there which could be seen through credit crunch in the market and decline in GDP by more than 2% in the fiscal year 2008-2009.

Testing Hypothesis

This Research paper includes hypotheses to be tested by using SPSS. The hypothesis study is:

H0:- COVID-19 has no significant impact on India's stock market.

H1:- COVID-19 has Significant impacted India's Stock market.

Objectives of Study

The main objective of this research are:

- 1. To study the impact of COVID-19 on Indian's Stock Market.
- 2. To study the impact of COVID-19 of top 10 companies in the NSE(Nifty 50)

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3. To study the change in volume traded in top 10 companies.

Expected outcome

The present study helps to identify the impact of COVID-19 on Indian stock market. The study examines the changes in the stock / share prices and volume traded in top 10 companies in NSE (Nifty50).

Research Methodology

Secondary data was collected for this research from NSE website. The time period taken was from 20 January 2021 to 22 April 2021. The reason for taking data of this peiod is that we tried to analysis impact on market during the COVID-19 period.



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he Research desing is the approach that we choose the incorporate the diverse parts of the study in a rational and logical way so that we can attend to the research problem effectively. It is basically the blueprint for the collection, measurement and scrutiny of data. The research design used in this is empirical in nature. Only secondary data was used for this research which is already available on National Stock Exchange, Money Control website and Yahoo Finance site. Authentic data related to stock prices of different companies is always available on these sites. Quantitative as well as Qualitative techniques and methods were used to collect data of top 10 companies listed on National Stock Exchange (NSE Nifty 50). A well structured approach was used to analyses

Result and Analysis

The share prices of top 10 companies listed in national stock exchange were collected to measure the impact of corona virus on Indian financial market. The dasta was collected on weekly basis and on the closing price, high price and low prices are given. We have taken closing prices as it indicates in investors perception and the impact

Name of	Date	(Weekl	y data: '	Year 202	(0)				-	100					
Company	1/13	1/20	1/27	2/3	-		1	1	1	T		-	_		
Reliance	1.			41.3	2/10	2/17	2/24	3/2	3/9	3/16	3/23	-			
Industries	1581	1522	1383	1434	1400	1		1.00		5/10	3123	3/30	4/6	4/13	4/1
TCS	2219	2183	2165	2137	1488	1486	1329	1271	1105	1018	1000		1		
HUL*	2060	2074	2075		2184	2157	2000	2116	1806	1797	1066	1077	1220	1224	122
HDFC			12013	2160	2255	2248	2175	2189	2033	1000 C	1825	1654	1766	1806	1800
Bank	1278	1245	1199	1242					2033	2052	2141	2154	2372	2385	238
HDFC	2454	2451	2268		1219	1217	1178	1135	1070	883	1	10.25		1000	430-
Bharti			4400	2406	2402	2370	2176	2109	2067		904	814	925	910	910
Virtel	500	524	497	539					2007	1754	1754	1500	1703	1681	
nfosys	768	783	780		565	546	524	519	492	100				1 - 401	1681
CICI		- rap	180	777	786	797	732	739	642	463	449	424	489	502	502
ank	532	534	505	22.0				123	042	585	653	586	636	629	
TC	240	238	219	536	546	547	497	486	447					What	629
otak			419	213	208	207	198	182		346	340	287	343	376	292
ahindra	1698	1643	1010			-			162	176	163	178	185	188	376
ble 1 Share	nrico	£4. 1	1648	1653	1681	1686	1620	1631						100	128
Shidic	brice (n top 1	0 comp	anies in	NSE	Weak	dan C	10.51	1470	1262	1399	1141	1273	1186	

m 20 January to 20 April

From the given table if we observe that the first and last closing price, then it can be seen that share price of most of the companies have decreased. However the share price of companies such as Hindustan Unilever increased. The reason we all know because during lockdown the requirement of necessary commodities has increased manifold. But because of the lockdown in many countries and the unemployment or work from home approach, the demand for energy, transportation and projects professionals in various sectors like IT and infrastructure have reduced drastically.

Discussion and Conclusion

The impact of this global desease varies from sector to sector. The analysis of data indicated that the share prices of the most of the companies in our case top 10 companies list under NSE Nifty 50 have come down significantly with time period. That means impact of COVID-19 has been severe on India's Financial market. But overall volume traded has increased with time period. Money had invested in huge way while market were down and buying is on its high way to earn future profit. People shows the good faith in Indian economy. These facts are supported by recent article in Business line which states that stock prices have decline by nearly 30% in the march quarter and high net-worth

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dation and directions for future Research

he Study has certain limitation which be taken in to account while interpreting the findings. Sample data taken for the study was from January 2020 to April 2020. This period may not be entirely sufficient to support the findings. The main reason for this is that the country is in some state is still under partial or whole lockdown situation. Economy will definitely change after the change in situation or after 100% vaccination. Secondly the foreign portfolio investments also need to be considered as they play an important role in financial market.

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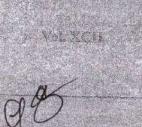
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TECHNOLOGICAL ADVANCEMENTS IN BANKING INDUSTRY & ITS IMPACT ON BANKS

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ABSTRACT

In most parts of the world today, in recent years, there has been a technological transition. Society has transformed significantly from historically based societies to the current information society, here imagination and creativity drive society. Advances in technology have a big positive impact on banking performance excellence. This study aimed at examining the analysis of the technological advancement in banking industry & its impact on banks & their customers with special reference to the city of Jodhpur (Rajasthan). The study is done in public and private sector banks on the basis of impact of technology advancement on banks performance as well as customer's satisfaction level. This research achieved its objectives by conducting analysis of the data collected on a reasonable

Key words: Technology advancement, Banking Industry, Customers, E-revolution, Public Banks,

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INTRODUCTION

Information systems have revolutionized a variety of facets of life and the world is approaching the 'net era' quickly. Internet is an interconnection of the world's computer networking systems. Internet and information technology development and extension have encouraged e-commerce materialization. As e-commerce refers to the electronic conduct of commercial transactions, it covers every business type, including banking. The effect of E-revolution is that modern banks are more information-based, fast and unlimited. Modern banks should be well-versed with the information technology - its users and technologies. Banking divisions in a new economy must be IT focused. In the last decade, many financial companies have routinely used computer technology. This change

is occurring in all fields of banking. In reality, IT is found mainly in two financial areas. One being coordination and networking, the other being re-engineering of industry dynamics aimed essentially at increasing customer penetration. The two different worlds are addressed by banks as they invest in and use the IT facilities, current and external operational atmosphere. How well these two worlds are combined and harmonized depends on the success of beneficial IT.

With old-fashioned approaches that spend more time with clients in such a modern technical environment, none have the time to handle its financing. Rather the consumers have switched into electronic or telephone banking or digital payments. By the Cloud Computing Revolution these conventional banking techniques have disappeared; modern methods have reached or absorbed clients in the short term due to their low costs and saving time spent by customers and large volumes

The Indian banking sector is undergoing a time of extreme transition, in which the liberalized economic climate influenced the banking industry by increasing competition and increasing consumer preferences. There are various kinds of banks, from "public sector banks to cooperative banks to the private sector banks". The banks are struggling to meet the needs of different segments of Indian society. Many banks in the public sector concentrate and operate in rural areas, while some

Opening doors to Indian private sector banks has resulted in a number of liberal financial reforms and modernization of Indian banking. A few famous private sector banks are ICICI, HDFC, Axis Bank. Private sector banks normally operate in urban areas. User-friendly policies have been introduced as a result of the adoption of superior and improved technologies. Banking has become

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easier and quicker due to technology adoption by banks. Banking operations have been designed and trusted with their customer-friendly practices and easy usability. The financial industry has grown quicker, more accurately, and more easily with private banks and superior technologies. The Indian banking industry is predominantly dominated by public sector banks, although their share

has declined. Their inefficiencies only came to light as the competition became intense. With the establishment of a modern business climate, new developments have been made to the share of banks in the public sector. Continued developments in Indian banking system are clearly evident. "Although there has been a gradual decrease in the share of public sector banks in overall banks' deposits, the role of the emerging private sector banks and international banks has increased"

Banking has long helped shape the national economy. The quality of banking service in Bank has an impact on customer satisfaction. There is a need for banks to offer and develop services in light of the current digital landscape and evolving customer requirements. To create customer loyalty, a comprehensive and self-contained technological advancement is required. To retain the customers banks may have to satisfy their technology-driven banking demand. Customers and administrators play an important part in all services delivered. This study examines how technology plays a role in the banking sector's growth. This research focuses in particular on the TECHNOLOGICAL ADVANCEMENTS IN BANKING INDUSTRY & ITS IMPACT ON BANKS & THEIR CUSTOMERS WITH SPECIAL REFERENCE TO THE CITY OF JODHPUR (RAJ.)

REVIEW OF LITERATURE

In his research, Nanaka L and Takeuchi (2001) examined the "importance of customer satisfaction for banking and the role of information technology in sustaining customers" and noted that businesses are increasingly focusing on e-Business, and the current CRM strategy needs to be

Sivakumaran (2005) through his study proposed that technology adoption has produced the following advantages: increased productivity, profitability and efficiency; increased quality and satisfaction for customers; comfort and flexibility; 24x7 operations; space and cost savings. Tiwari, Bure & Harstatte (2006) has explored a number of ways to extend online banking through

mobile applications. The survey shows that the most dominant mobile financial services are provided by banks in India which includes Indian Bank, Bank of Punjab, HDFC, and ICICI. The term 'banking technology' is described by Ravi (2007), banking technology in combination with

informatics allows banks to provide better services to their customers in a safe, reliable and affordable manner, and to maintain competitive advantage over other banks. Uppal R. K. (2008) studies bank customers' perceptions of e-banking services in India as well as

analyzing the efficiency of these services in the evolving banking climate". The study shows that most bank customers are extremely pleased with the services of e-banking. Because of the time and cost, they prefer e-channels. However, the organizational aspect of each channel and its transactional

OBJECTIVES OF THE STUDY

- To study the present technologies used in banking sector.

> To study how innovations have contributed to the development of Indian banking.

RESEARCH METHODOLOGY

The analysis studied successfully the function of technological development in the Jodhpur banking sector in Rajasthan, and the research found that the adoption and application of technology advancement tools by Jodhpur selected banks helps to improve bank performance and customer satisfaction. The data and gathered information acquired through the organized survey were studied and evaluated by utilizing suitable measurable techniques. Total respondents were 300.

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H₀₂: - "There is no impact of ATM Services as a technological advancement on the various age

H₀₃: - "There is no impact of Internet banking Services as a technological advancement on the various age groups of public and private sector banks customers". H₀₄: - "There is no impact of Telephone Banking Services as a technological advancement on

the various age groups of public and private sector banks customers". H₀₅: - "There is no impact of Mobile Banking Services as a technological advancement on the

various age groups of public and private sector banks customers". Table 1: Descriptive table of Impact of technological advancement on Age

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41-50 Years	20	3.70	1.129	.252	3.17	4.23	1	5
51-60	44	3.73	.845	.127	3.47	3.98	1	5
Above 60 Years	9	3.89	.601	.200	3.43	4.35	3	5
Total	300	3.68	.857	.049	3.58	3.77	1	5

Above Table shows the "descriptive statistics which represents the mean, standard deviation, and analysis of ATM Services, Internet banking Services, Telephone Banking Services & Mobile Banking Services and age of respondents. Higher standard deviation shows that wider scope of the study and the column of analysis showing the given response (in number) by the respondents." "Table 2: ANOVA table of Impact of technological advancement on Age"

		Sum of Squares	df	Mean Square	F	Sig.
ATM Services	Between Groups	3.363	5	.673	.769	.031
	Within Groups	257.317	294	.875		
	Total	260.680	299			
Internet banking	Between Groups	.798	5	.160	.206	.010
Services	Within Groups	228.202	294	.776		[
	Total	229.000	299			
Telephone Banking	Between Groups	5.193	5	1.039	1.384	.030
Services	Within Groups	220.594	294	.750		
	Total	225.787	299			
Mobile Banking	Between Groups	2.645	5	.529	.717	.011
Services	Within Groups	216.991	294	.738		and the ar a second second
	Total	219.637	299			

Table given above shows the results of the ANOVA test for finding the impact of technological advancement on age.

Rule for ANOVA: "For Sig. (2-Tailed) value > 0.05 null hypothesis is accepted.

For Sig. (2-Tailed) value < 0.05 null hypothesis is rejected".

"It can be seen from above table that sig (p) value is less than .05 for all the IT factors, thus null hypothesis is rejected and alternative is accepted" which states that;

"There is an impact of ATM Services, Internet banking Services, Telephone Banking Services and Mobile Banking Services as a technological advancement on the various age groups of public and private sector banks customers".

CONCLUSION

The final conclusion of the study is that the technological development in the banking business has several benefits for banks as well as for its customers. Internet banking and IT usage in banking is a key tool to increase customer satisfaction and to increase cross-selling opportunities. The banking business also acknowledged that the internet must be secured in order to attain a high level of confidence for customers. If banks need competitiveness to continue, they need to focus on the management, improvement, integration, and value-addition for customers satisfaction that can be achieved through technology. Technology enables banks to reduce transaction costs and boost productivity. India likewise has technology incorporated at the early phases of banking operations.

Study shows that advancement of technology has taken highly crucial roles in today's world because of its international recognition and importance. Progress in technology is the main instrument for an organization, driving its success. Stakeholders' positive contribution to the successful adoption of technology advancement should be encouraged. The present period is the age of competition; improvement of technology in a bank has shown to be one of the biggest competition sources.

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TREND OF FOREIGN DIRECT INVESTMENT IN INDIA

Sajjan Kumar^{*} Dr. R.P. Meena

ABSTRACT

Developed countries have openly supported to foreign direct investment. The result of foreign direct investment is in front of everyone today. The economy of these countries is very strong. In today's time, the foreign direct investment is very beneficial for any country. Foreign direct investment gives a lot of monetary end non-monetary benefits to that country. The most important benefit of foreign direct investment is the amount of capital. This paper discusses about the trend of total FDI equity inflows in India during 2009-10 to 2018-19 or tenure of UPA Government VS NDA Government. Further, this paper also present route wise trend of FDI equity inflows in India, trend of top five sectors which attracting highest FDI equity inflows in India and trend of FDI equity inflows to India by top five countries during 2009-10 to 2018-19.

Keywords: Foreign Direct Investment, Sectors, Route, Country, FDI Equity Inflows.

Introduction

When a company or organization of one country is invested in another country. Whereby the investor gets some cc. trol in management that company in which, he is invested. Such investment is called foreign direct investment (FDI). Developed countries have openly supported to foreign direct investment. The result of foreign direct investment is in front of everyone today. The economy of these countries is very strong. In today's time, the foreign direct investment is very beneficial for any country. Foreign direct investment gives a lot of monetary and non-monetary benefits to that country. The most important benefit of foreign direct investment is the increase in the amount of capital. Many types of benefits of foreign direct investment such are technical support, labour at cheap prices and increase in foreign direct investment such are technical support, labour at cheap prices and increase in foreign direct investment started in India. In 1991-92, the total FDI equity inflows were 409 crores, which was 309886.64 crores in 2018-19. From 1991 to 2019, there was 757.62 times increase in total FDI equity inflows in India. A very little attention was firstly paid in India on foreign direct investment. But now in view of its usefulness, the government is doing important work in this field.

The Government of India has prepared a framework on foreign direct investment, which is updated time to time by Department of Industrial Policy and Promotion (DIPP). At now, Consolidated FDI policy circular of 2017 is applicable. DIPP is the nodal department for preparing government policy on foreign direct investment. DIPP makes policy announcement on foreign direct investment through press notes / press release, which are notified by the Reserve Bank of India as amendments to FEMA regulations. DIPP is also responsible for the maintenance and management of data on FDI inflows in India based on the reported by Reserve Bank of India. Foreign direct investment may be received by an Indian company under the two routes such as Government route and Automatic route. Under the automatic route, there does not require prior approval of government. But under the government route, there requires prior approval of government. The Government approval is required. Such are, for Broadcasting and print media sector is Ministry of Information and Broadcasting, for banking sector is Department of Financial Services and for Private Security Agencies is Ministry of Home Affairs etc.

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Review of Literature

Jain, Dr. Kaustubh and Lodhl, Girbal Singh (June, 2013) their paper named "Foreign Direct Investment in India: A Critical Analysis" find out that the economic growth model show that FDI was a vital and significant factor influencing the level of growth in India. And all variables such as trade GDP, R&DGDP, financial position, exchange rate and reserves GDP were the important macroeconomic determinants of FDI inflows in India. It had been also noted that FDI has helped several countries when they faced economic hardship. Their time period of the study was from 1992 to 2011.

Duggal, Anil 'Dec., 2017) his paper "Foreign Direct investment in India" highlights that the total foreign direct investment inflows in India was US\$ 6051 million in 2005, which was US\$ 60082 million in 2017. It is a long journey of 13 years and represents an increase of 9.92 times. There is a significant relationship between FDI and FIPB, RBI and other routes. His time period of the study was 13 years from

Research Methodology

Objectives of the Study

- The present study will be based on the following objectives:
- To study and analyze the trend of total FD! equity inflows in India during the selected period.
- To study and analyze the trend of FDI equity inflows through various routes in India during the selected period.
- To study and analyze the trend of top five sectors which attracting highest FDI equity inflows in India during the selected period.
- To study and analyze the trend of top five countries which made highest FDI equity inflows to India during the selected period.

Sources of Data

The present study is mostly based on secondary data. The data are collected from DIPP's FDI data base, RBI bulletins, various news reports, internet link, various website and consolidated FDI policy

Time Period of the Study

The period of study is ten years from 2009-10 to 2018-19 or tenure of UPA government (2009 to 2014) VS NDA government (2014 to 2019).

Techniques Used for Analysis

Statistical techniques like mean, standard deviation and co-efficient of variation and accounting techniques such as trend ratio have been used for analysis and interpretation of data. Limitation of the Stury

- This study is based only on secondary data.
- Here only a period of 10 years or 2009-10 to 2018-19 has been studied.

Here only top five sectors which attracting highest FDI equity inflows in India have been studied. Here only top five countries which made highest FDI equity inflows to India have been studied. Data Analysis

Table 1

Total FDI Eq	uity Inflows (U	PA Goud)	Amount in R Total FDI Equity Inflows (NDA Gov				
Financial Year	Amount	Trend Ratio	I Otal FDI E	DA Govt.)			
2009-10	123377.73		rinancial Year	Amount	Trend Ratio		
2010-11	88519.36	100	2014-15	189107.09	100.00		
2011-12	100019.36	71.75	2015-16	262321.59	138.72		
2012-13	121906.74	133.85	2016-17	291696.31	154.25		
2013-14		98.81	2017-18	288888.51	152.76		
Total	147517.79	119.57	2018-19	309866.64	163.86		
Average	646467.12			1341880.14	100.00		
S.D.	129293.42			268376.03			
C.V. (%)	25959.90			42441.23	100		
UICAS: Various lection				15.81			

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Interpretation

It is evident from the table no. 1 that during the tenure of UPA government (2009 to 2014), the total FDI equity inflows in India was 646467.12 crores. During the tenure of UPA government, there was a tendency to increase and ever decrease in FDI equity inflows in India. During the tenure of NDA government (2014 to 2019), it was 1341880.14 crores. During the tenure of NDA government, there was a tendency to increase in FDI equity inflows except for the year 2017-18. The maximum FDI equity inflows during the ten e of UPA government was in 2011-12, which was 165145.50 crores and during the tenure of NDA government, it was maximum in 2018-19, which was 309866.64 crores. It shows that during the tenure of UPA government, co-efficient of variation in total FDI equity inflows was 20.08%. And during the tenure of NDA government, it was 15.81%. Trend ratio was 100 in 2009-10 but decline has been sought out in 2010-11 as 71.75. But, in 2011-12 it has again gone up i.e., 133.85. There after it has also decline in 2012-13. But, in 2013-14 it has again gone up. It means there was fluctuating trend during 2009-10 to 2013-14. During the 2014-15 to 2018-19, there was a tendency to increase in trend ratio except for the year 2017-18, which was 152.76. In 2018-19, there was maximum trend ratio, which was 163.86. Compared to the tenure of UPA government, the total FDI equity inflows increased 107.57% in the tenure of NDA government.

Table 2

Amount in Rs. Crores

Financial Year	1 Govt. route	2 Automatic Route	3 Acquisition of Shares	(1+2+3) Grand Total
2009-10	16728.20	91335.40	15314.13	123377.76
2010-11	8833.28	59142.93	20543.15	88519.36
2011-12	14151.97	97153.90	53839.63	165145.50
2012-13	15847.58	86806.37	19252.79	121906.74
2013-14	7105.54	90129.37	50282.88	147514.79

Table 3

Amount in Rs. Crores

Financial Year	1 Govt. route	2 Automatic Route	3 Acquisition of Shares	(1+2+3) Grand Total
2014-15	13402.31	138160.88	37543.90	189107.09
2015-16	23366.30	213090.73	25864.56	262321.59
2016-17	39661.05	204129.01	47906.25	291696.31
2017-18	49953.02	190637.45	48298.04	288888.51
2018-19	16652,54	253853.30	39360.80	309866.64

Interpretation

It is evident from the table no. 2 and 3 that during the tenure of UPA government (2009 to 2014), the highest FDI equity inflows in India through automatic route was received in 2011-12, which was 97153.90 crores and during the tenure of NDA government (2014 to 2019), it was received in 2018-19, which was 253853.30 crores. During the tenure of UPA government, the total FDI equity inflows through automatic route in India were received 42456.97 crores and during the tenure of NDA government, it was received 999871.37 crores. During the tenure of UPA government FDI equity inflows in India was received 9.69% through government route, 65.68% through automatic route and 24.63% through acquisition of shares. Another way, during the tenure of NDA government, it was received 10.66% through government route, 74.51% through automatic route and 14.83% through acquisition of shares. Compared to the tenure of UPA government, the total FDI equity inflows through automatic route increased 135.507% in the tenure of NDA government. FDI equity inflows in India through automatic route were higher compared to another route during both governments tenure.

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Amount in Rs. Crores

S. No.	Sector	2009-10	2010-11	2011-12	2012-13	2013-14	Total	% of Total FDI Equity Inflows
1	Services Sector	20958.12	15538.64	24656.49	26305.95	13294.41	100753.61	15.59%
2	Construction Activities	13544.49	5076.99	15236.03	7247.79	7508.36	48613.66	7.52%
3	Tele communications	12338.32	7542.04	8011.53	1654.30	7987.28	38533.47	5.96%
4	Automobile Industries	5609.20	6008,29	4346.77	8384.37	9026.58	33375.21	5.16%
5	Food Processing Industries	1316.27	858.03	826.17	2193.65	25106.77	30300.89	4.69%

Table

Table 5

Amount in Rs. Crores

S. No.	Sector	2014-15	2015-16	2016-17	2017-18	2018-19	Total	% of Total FDI Equity inflows
1	Services Sector	19962.48	45415.10	58213.56	43249.01	63909.44	230749.59	17.20
2	Comp. Hardware & Software	13564.27	38351.23	24605.16	39669.75	45297.17	161487.58	12.03
3	Telecommunications	17372.32	8637.38	37435.16	39748.20	18336.79	101500.00	
4	Trading	16961.85					121529.85	9.06
1711	the second se	10901.80	25243.92	15720.89	28077.93	30963.46	116968.05	8.72
5	Construction Activities	5311.91	29841.74	12478.00	17570.65	15926.94	81129.24	6.05

Interpretation

It is evident from the table no. 4 and 5 that during the tenure of UPA government (2009 to 2014), the highest FDI equity inflows in India was received in service sector, which was 15,59% of total FDI equity inflows in India and during the tenure of NDA government it was also received highest in service sector, which was 17.20% of total FDI equity inflows in India. Apart from this, during the tenure of UPA government, it was received maximum respectively 7.52% in construction activities, 5.96% in telecommunication sector, 5.16% in automobile industries and 4.69% in food processing industries. Another hand, during the tenure of NDA government, it was received maximum respectively 12.03% in computer hardware and software sector, 9.06% in telecommunication sector, 8.72% in tracing sector and 6.05% in construction activities. In 2013-14, attracting highest FDI equity inflows in food processing industries, which was 17.02% of total FDI equity inflows in India.FDI equity inflows in service sector was highest in 2012-13, which was 21.58% of total FDI equity inflows in India. It was higher compared to other sectors during both governments tenure. During the tenure of UPA government, total FDI equity inflows from top five sectors was 38.92%. But during the tenure of NDA government, it has been increased to 53.06% and remaining 46.94% received to other sectors. Computer hardware and software sector and trading sector were successful in making the place in top five sectors, during the tenure of NDA government. Construction activities was second highest FDI sector in 2009-10 to 2013-14, but in 2014-15 to 2018-19 it came down to fifth position. Service sector was successful in making the first position during both government tenure.

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Table 6

Amount in Rs. Crores

S. No.	Country	2009-10	2010-11	2011-12	2012-13	2013-14	Total	% of Total FDI Equity Inflows
1	Mauritius	49633.37	31854.78	46710.28	51653.86	29360.31	209212.60	32.36
2	Singapore	11294.82	7729.66	24711.53	12594.49	35624.61	91955.11	14.22
3	U.K.	3094.15	3434.20	36427.70	5797.37	20426.34	69179.76	10.70
4	Japan	5670.40	7062.98	14089.09	12243.42	10549.58	49615.47	7.67
5	Netherlands	4282.67	5501.23	6697.78	10053.72	13919.72	40455.12	5.26

Table 7

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Amount in Rs. Crores

S. No.	Country	2014-15	2015-16	2016-17	2017-18	2018-19	Total	% of Total FDI Equity Inflows
1	Singapore	41350.14	89509.74	58375.68	78541.81	112362.09	380139.46	28.33
2	Mauritius	55171.97	54705.95	105587.30	102492.01	57138.65	375095.88	27.95
3	Netherlands	20959.79	17275.24	22633.40	18048.38	27036.17	105952.98	7.90
4	Japan	12751.83	17275.49	31588.29	10370.52	20555.98	92542.12	6.90
5	U.S.A.	11149.66	27695.13	15956,65	13505.40	22335.06	90641.90	6.75

Interpretation

It is evident from the table no. 6 and 7 that during the tenure of UPA government (2009 to 2014), the highest FDI equity inflows in India was received from Mauritius, which was 32.36% and during the tenure of NDA government, it was received highest from Singapore, which was 28.33% of total FDI equity inflows in India. Apart from this, during the tenure of UPA government, it was received maximum respectively 14.22% by Singapore, 10.70% by UK, 7.67% by Japan and 6.26% by Netherlands. Another hand, during the tenure of NDA government, it was received maximum respectively 27.95% by Mauritius, 7.90% by Netherlands, 6.90% by Japan and 6.75% by USA. FDI equity inflows from Mauritius was highest in 2012-13, which was 42.37% of total FDI equity inflows in India.FDI equity inflows from Singapore was highest in 2018-19, which was 36.26% of total FDI equity inflows in India. During the tenure of UPA government, total FDI equity inflows from top countries were 71.21%. But during the tenure of NDA government, it has been increased to 77.83% and remaining 22.17% received from other countries. USA was successful in making the place in top five countries which made highest FDI equity. inflows to India, during the tenure of NDA government. Netherlands was fifth highest FDI sector in 2009-10 to 2013-14, but in 2014-15 to 2018-19 it came up to third position. Japan was successful in making the consistent forth position during both governments tenure. UK which has third position during the tenure of UPA government was removed from top five countries during the tenure of NDA government. Findings and Conclusion

Foreign direct investment is an indicator of progress in any country's economy. In India, total FDI equity inflows in the year 1991-92 was 409 crores, which increased to 309866.64 crores in 2018-199. From 1991 to 2019 FC equity inflows has increased 757.62 times. During the NDA government, total FDI equity inflows are 1341880.14 crores, which was 107.57% higher than the UPA government tenure. There is fluctuating trend in total FDI equity inflows in India during the tenure of UPA government. During the 2014-15 to 2018-19, there is a tendency to increase in trend ratio except for the year 2017-18. FDI equity inflows in India through automatic route are higher compared to another route during both governments tenure. Compared to the tenure of UPA government, the total FDI equity inflows through automatic route is increased to 135.507% in the tenure of NDA government. This indicates that the NDA government has adopted liberal policy to attract more FDI equity inflows. During the tenure of UPA government, highest FDI equity inflows is in service sector, which is 15.59%during the tenure of UPA government and 17.20%during the tenure of NDA government. Both governments have paid more attention on the service sector. During the tenure of NDA government, co-efficient of variation in total FDI equity inflows is less than co-efficient of variation in FDI equity inflows during the tenure of UPA

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International Journal of Advanced Research in Commerce, Management & Social Science (IJARCMSS) - January- March, 2021 government. It shows that during the tenure of NDA government, total FDI inflows is stable, consistence and unitary. The Government of India should be relaxing in foreign direct investment through government route to make foreign direct investment attractive. At the time, in the sector where the government approval is required, all facilities related to approvals will being brought under a roof.

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A Flashback of MSME in India: Role in Employment Generation

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Abstract

Micro, Small and Medium Enterprises (MSME) sector has developed as an enthusiastic and energetic division of the Indian economy over the last few decades. MSME is the second biggest sector after agriculture in terms of employment generation. MSME plays an important role in the economic development of the country. It is the spine of the Indian manufacturing segment and are also called as the engine of economic development. In developing nations, like India, most of the space isn't always appropriate for setting up of huge ventures and such type of lacuna can be minimized by a lesser amount of investment. MSME provides 80% of jobs in the industry, with only 20% of the investment.

The significance of proposed research lies in the fact that the Micro, Small and Medium Enterprises (MSMEs) sector plays a crucial role in India's economic development or can say monetary advancement with help of employment creation and this also contributes in the social development of the country as well.

This paper gives in-depth analysis of MSME sector in India. It focuses on the role of MSME in employment generation. It is divided into two parts i.e.(i) A Flashback of MSME in India, and (ii) Role of MSME in Employment Generation.

Keywords: Enterprise, MSME, Investment, Economic, Employment Generation.

Introduction

Micro, Small and Medium Enterprises (MSMEs) plays a key role in development of indigenous and global economy and also proven fact that it strives towards socio economic condition of its people. To remove regional imbalance and stabilizing growth in all sectors of country, the MSME is only sector identified for boosting and making it as a key driver of growth on which Govt. is emphasizing a lot. Like many other countries India is also taking more steps for stabilising this sector which is need of the time. On the other hand, where big entities like wall mart, Amazon and many others are coming in very organised way but at other side our small-scale entities are getting down and forced to close as they are unorganised and unskilled. By taking many more aspects the government of India has concentrated to boost this core sector that has power to create balance in market economy, employment creation and creativity in process and making friendly technologically innovative environment.

Objectives of The Study:

To have conceptual analysis of MSME.

To identify the role of MSME in employment generation in India.

Concept of MSME: Indian Perspective:

According to the latest amendment in Micro, Small and Medium Enterprises Development (MSMED) Act, 2006, basis of defining the MSME has been changed from investment in plant & machinery to annual turnover. The current definition is given in Table 1:

Table 1

Definition of MSME in India

(As Per Latest Amendment on 7th Feb'18 in Micro, Small & Medium Enterprises Development (MSMED) Act,2006)

Enterprise – On the Basis of Annual Turnover							
Description	Turnover (INR)						
Micro Enterprise	Up to Rs. 5 Crore						
Small Enterprise	Above Rs, 5 Crore & Up to Rs. 75 Cror						
Medium Enterprise	Above Rs. 75 Crore & Up to Rs. 250 Crore						

Source: https://www.hindustan times.com/India-news/govt-changes-definition-of- msmes-bases-it-on-annual turnover

Table 1 shows the recent changes done by Union Cabinet in the definition of MSMED Act, 2006. These changes were made by Union Cabinet under the supervision of Finance Minister MR. Arun Jaitley to reform the ease of doing business and to reduce the unnecessary inspections. The main reasons for amendment in the MSME definition are to encourage the MSMEs growth. It will also help in expelling the instabilities related on investment in plant and machinery and equipment. Besides this, the Reserve Bank of India decides to give more extended time period to small businesses who are unable to repay their loan on time. RBI gives them more time before declaring their loans as nonperforming assets (NPAs) or bad loans. The central bank raised the payment period from 90 days to 180 days for MSME loans.

Concept Of MSME: Historical View:

After Independence, the first step was taken by Central Government of India about the Industries Development was to arrange a conference in Dec'47 which was in favour of the advancement of small-scale industries. In this conference, the Central Government divided the SSIs (Small-Scale Industries) into three different categories

Which are as below:

Those units which are auxiliary to large-scale industries.

Those units which are engaged in the supply of repair service.

Those units which involved in the manufacturing of finished products.

In brief, SSIs are playing a crucial role since the beginning for the Indian economy in terms of developing employment and exports. Mr. K.T. Shah Former General Secretary of NPC (National Planning Committee) gave the first definition of SSI, but this was not complete in technical terms. Later on, in 1940, Pt. Jawahar Lal Nehru redefine SSI which was more practical and covered most of the dimensions. He used two categories i.e. electrification of the units and employment generating by the units to define SSI. After the independence, the first official definition of SSI given in 1950, which was divided into two categories, i.e. capital investment in the units and employed persons by the units. This definition has been revised over time which is given in below Table 2:



Year	Investment Limit	Other Condition		
1951	Up to Rs. 5 lakhs in fixed assets	Appointing < 50 workers if using power and <100 workers if not using		
1960	Up to Rs. 5 lakhs in plant & machinery	NIL		
1966	Up to Rs. 7 lakhs in plant & machinery	NIL		
1977	Up to Rs. 10 lakhs in plant & machinery	NIL NIL NIL NIL		
1980	Up to Rs. 20 lakhs in plant & machinery			
1985	Up to Rs. 35 lakhs in plant & machinery			
1991	Up to Rs. 60 lakhs in plant & machinery			
1997	Up to Rs. 3 crores in plant & machinery	NIL		
1999	Up to Rs. 1 crore in plant & machinery	NIL		
2006	Up to Rs. 5 crores in plant & machinery	NIL		
- th Feb'18 (As per the Latest Amendment in MSMED Act,2006)	No Condition	Annual Turnover up to Rs. 250.00 Crore		

Table 2	-
Various Definition of MSME in India in Chronological C	Irdor

SSIs in India was the mixture of Tiny, Cottage, Traditional, Village and Modern Small Industries, prior to the establishment of Micro, Small and Medium Enterprises Development (MSMED) Act, 2006. This act is commenced with the aim of development, promotion, providing new schemes and concessions. Sectors like handicrafts, khadi, coir, handloom were neglected before the launched of MSMED. So, in order to remove this barrier and negligence, Government of India implemented Micro, Small and Medium Enterprises Development Act which

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was launched on dated 16th June'06 with effect in operation from dated 2nd Oct'06.

The MSME Development Act classifies manufacturing units into medium, small and micro-enterprise depending upon the investment made in plant and machinery. Any unit with input up to 1000 lakhs INR in plant and machinery is considered as medium enterprise while those having investment between 25 lakhs INR to 500 lakhs INR is a small enterprise and those units with the investment with up to 25 lakhs INR is considered as micro enterprise. In the

service sector, any unit with the investment limit up to 10 lakhs INR, between 10-200 lakhs INR and of up to 500 lakhs INR is called as micro, small and medium enterprises respectively. But the Union Cabinet did the latest amendment in (MSMED) Act, 2006 on dated 07th Feb'18 for defining MSMEs on annual turnover criteria which was earlier defined in the terms of investment in plant and machinery criteria.

PROVISION OF MSMEACT, 2006:

The MSME Act,2006, established and came in effect from dated 02nd Oct'06 for regulation and development of micro, small and medium enterprises.

This act is made to encourage, create and expand the competitiveness of micro, small and medium industries of India. In this act, facilities are as below:

1. Access to finance facility from banks without collateral requirements.

2. This act explains medium enterprises to make technology upgradation easier.

3. Grievance redressal cell for disputed with buyers through arbitration.

4. To file the memorandum is optional for all the medium enterprises those who renders services.

5. Provides benefits regarding the taxes and octroi.

6. Subsidy in electricity bills of micro, small and medium scale industries.

7. It reinforces the lawful arrangements to check deferred payments to micro and small enterprises.

8. Arrangements for guaranteeing convenient and smooth stream of credit to MSMEs.

MSME: FOREIGN PERSPECTIVE:

In most of the countries, industries have divided into three sectors, i.e.

- a. Large-Scale Industrial Units,
- b. Medium-Scale Industrial Units,
- c. Small-Scale Industrial Units.

There is no single definition for MSME which is globally accepted. Different countries have different criteria for MSME. Some of the criteria are, (i) the number of workers, (ii) Based on Capital Investment, (iii) the management and character of Organisation, and (d) Based on of firm's annual turnover.

In Table 3, Definition of MSME in some selected countries is given.

	Definitions of SME	s in Selected Countries
Country/Region	Number of Employees	Other Conditions
Australia	Small: less than 100	
Canada	Less than 100	
Belgium	Less than 100	
Denmark	More than 5 and less than 500	
France	10 to 499	
Germany	Less than 500	
Greece	Less than 50	
Ireland	Less than 500	
Italy	Small: 11-50 Artigiano: less than 10	Capital: less than Lire 3 billion
Netherland	Less than 10	
UK	Mfg.: less than,200 Construction: less than 25	Trade: (Turnover) Retail: less than £50000 Wholesale: less than £200000 Transport: less than 5 vehicles

Table 3

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EU	Less than 50	Annual turnover: less than 10 million EURO.
Malaysia	Less than 75	Shareholder fund: less than RM 2.5 million
Mexico	15 to 99	
Singapore	Services: less than 100	Income / Sale: US\$175000 Manufacturing: less than Singapore \$12 million in fixed assets
Sweden	Less than 200	\$12 minion in fixed assets
Thailand	Labour Intensive Sector: less than 200 Capital Intensive Sector: less than 100	
Brazil	Less than 100	
Argentina	Medium: Up to 300	Annual Sales: Up to US\$18 million Production Assets: Up to US\$10 million
Japan	Medium: Up to 300	Capital: Up to ¥100 million
U.S. A	Up to 500	
Indonesia	Up to 20	
Thailand	Small: Up to 49	Capital: less than \$1.17 !!!
Vietnam	Small: Up to 29	Capital: less than \$1.17 million
China Source: (i)India: The S	Small: 50-100	Capital: less than \$65 thousand

Source: (i)India: The State Development of Small and Medium Enterprises -2005, Institute of Small Enterprises and Development (ISED) (

(ii)Soundarapandian,M. (2009), Economic Reforms and Small -Scale Industries, Concept Publishing Company,New Delhi,pp9 -1. Note: "These countries were using different definitions for SSIs, but since 6 May 2003, the European Union is found to be using the common definition for all EU member countries.

Review of Literature:

The reason of the literature review is to urge a few information from the existing works that have just been done in a particular area regarding the research. A few studies are discussed below:

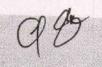
Chandraiah & Vani (2014) in their article entitled "The Prospects & Problems of MSMEs Sector in India- An Analytical Study", in their study author, highlight the prospects and problems of the MSME sector. This study is was based on the Indian history and other different segments which will help to improve the rural economy's standard. MSME in India was bound by the government's strict policy regarding export/import of goods. Due to the localisation of their trading location, this is the hurdle of comes between the growth of MSME in India. Indian Government should modify its trade policy for MSME.1

Garg (2014), in his article entitled "Role of MSME in Economic Development", the author highlights all the barriers which are facing by Indian MSME. This study helps to identify the gap between the success of MSME even after various steps has already taken. Even after interference by the government for the growth of MSME, still there has a gap in finance, and operational sector in MSME remain. So, unless this gap will not be covered, these kinds of barriers will not remove which comes between the success of MSME.2

Bouazza, Ardjouman & Abada (2015), in their article entitled "Establishing the Factors Affecting the Growth of Small and Medium-Sized Enterprises in Algeria", in this study, the author highlights all those factors which are affecting the growth of MSME. Both outer and inner factors are included in this study. Outer factors like government policies and procedures, access to credit etc. and internal factors like training deficiency, unskilled labours, lack of promotional techniques used by MSME staff become very crucial which affect the growth of MSME units. This study concludes that for the smooth functioning of MSME units and its continuous growth, both external, as well as internal factors get equal weightage.3

Singh and Kumar (2017), in his article entitled "Working Capital Requirements of Manufacturing SMEs: Evidence from Emerging Economy" in this study, author found that financial leverage, operating cash flow, sales growth, profitability, etc. all such are the main features of working capital needs for SME's in India. Through this study, knew that all these drivers such as cash flow provided from operating activities, leverage on equity, growth, size and

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age of the company would directly affect the working capital need in SME's in India.4

Upadhyay, Jahanyan and Dan (2011), in their article entitled "Factors influencing ERP implementation in Indian Manufacturing Organisations: A Study of Micro, Small and Medium-Scale Enterprises", this study was conducted on the investigation of Enterprise Resource Planning (ERP) implementation achievement factors in reference to India MSMEs (Micro, Small and Medium Scale Enterprises). According to this study, the author found that four factors are the most important factors which directly influenced the ERP Implementation process in MSME of India. These four factors organisational climate, technical perspective, project execution and, product perspective. Proper Controlling over all these factors in every MSME in India may provide smoothness in functioning and growth in MSME in India. 5

Role of Msme In Employment Generation:

The MSME in India are playing an important role in generating and providing huge number of employment eventuality at a relatively low cost of investment than large enterprises.

In the below Table 4, the No. of MSMEs in India and Employment generated through MSMEs from the year 1990-91 to 2015-16 is given. This is clear that the growth percentage of no. of MSME and the Employment generation wise is increasing every year. It is showing that around 11.10 crore jobs have been generated by the MSME sector according to the study conducted in 2015-16. Therefore, employment generated till the latest survey which is up to 2015-16 is 1109 lakhs as reported in the annual report of MSME 2018-19 and according to the projected figures of the year 2010-11 is 965.15 lakhs reported in the annual report 2008-09. The total difference in employment generated through MSME sector in both these reports or in these five years is approx. 144.74 lakhs, i.e. 15.00% growth showing in these five years. And number of MSME in India reported in annual report 2010-11 & in 2018-19 is 428.73 lakhs and 633.88 lakhs (Table 4) respectively. Therefore, total no. of MSME units increased in last five years is approx. 205.15 lakhs enterprises i.e. 47.85% growth rate showing in last 5 years.

Table 4

S. No.	Year	Total MSMEs (In Lakhs)	Employment (In Lakhs)
1	1990-91	67.87	159.24
2	1991-92	70.63 (+4.07%)	158.34 165.99 (+4.83%)
3	1992-93	73.51 (+4.07%)	174.84 (+5.33%)
4	1993-94	76.49 (+4.07%)	182.64 (+4.46)
5	1994-95	79.60 (+4.07)	191.40 (+4.79%)
6	1995-96	82.84 (+4.07%)	197.93 (+3.42%)
7	2000-01	101.10 (+22.04%)	238.73 (+20.61%)
8	2005-06	123.42 (+22.08%)	294.91 (+23.53%)
9	2010-11#	428.73 (+247.37%)	965.15 (+227.27%)
10	2015-16	633.88 (+47.85)	1109.89 (15.00%)

MSME's Performance: Employment Generation (From 1990-91 to 2015-16)

The figures showing in bracket is the growth rate as compared to previous year compiled from various annual reports from 2008-09 to 2018-19. **#Projected**

Source: Annual Report 2008-09, Ministry of MSME, Government of India, pp 33.

Annual Report 2018-19, Ministry of MSME, Government of India, pp 28-32.

QUANTUM OF MSME IN INDIA:

As per the NSS (National Sample Survey) 73rd round, conducted by National Sample Survey Office, Ministry of Statistics & Programme Implementation during the period of 2015-16, there were 633.88 lakhs unincorporated nonagricultures MSMEs in the country involved in various economic activities out of which 196.65 lakhs of enterprises are in Manufacturing Sector, 0.03 lakhs in Noncaptive Electricity Generation and Transmission, 230.35 lakhs is in Trade Sector and 206.85 lakhs is in Other Services excluding those MSMEs registered under (a) Section 2m (i) and 2m (ii) of the Factories Act, 1948, (b) Companies Act, 1956 and (c) Construction activities comes under Section F of National Industrial Classification (NIC)

2008.

MSME sector has generated almost 11.10 crore jobs as per the survey conducted during the year 2015-16 by NSS (National Sample Survey) 73rd round. MSMEs generated approx. 360.41 lakhs jobs in the Manufacturing sector, approx. 387.18 lakhs jobs in Trade, approx. 362.22 lakhs in Other Services and 0.07 lakhs in Non-captive Electricity Generation and Transmission. The latest scenario of Number of MSMEs and Estimated Employment Generation in MSME Sector in India (broad activity category wise) during the year 2015-16 has been discussed in detail in Table 5:

Table 5

Number of MSMEs and Estimated Employment Generation in MSME Sector in India (Broad Activity Category Wise 2015-16)

Category		Rural	1	Urban	1	Total	SI	nare (%)
	No. of MS ME	Employ ment Generati on	No. of MS ME	Employ ment Generati on	No. of MS ME	Employ ment Generati on	No. of MS ME	Employ ment Generati
Manufact	114.	186.56	82.5.	173.86	196.	360.41		on
uring	14		0		65	300.41	31	32.00
Trade	108.	160.64	121.	226.54	230.	387.18	36	25.00
	71		64		35	001.10	30	35.00
Other	102.	150.53	104.	211.69	206.	362.22	33	22.00
Services	00		85		85	002.22	00	33.00
Electricity	0.03	0.06	0.01	0.02	0.03	0.07	0	0
Total	324.	497.78	309.	612.10			·····	0
	88		00	012.10	633. 88	1109.89	100	100

Source: Annual Report 2018-19, Ministry of MSME, Government of India, pp 28-32.

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Conclusion:

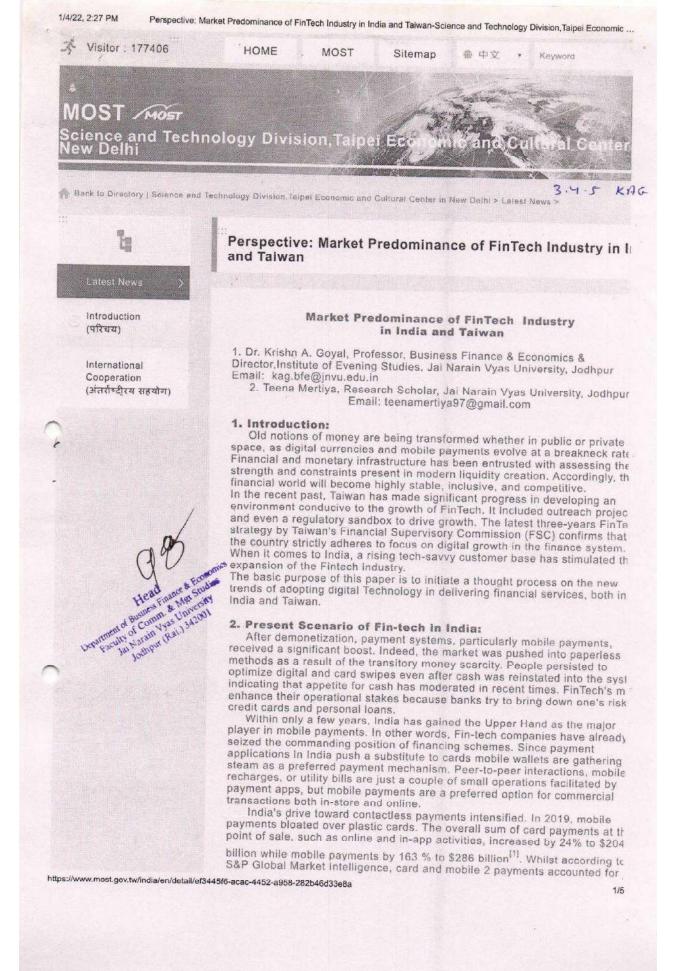
In this paper, the definition of MSMEs across the world have been discussed. There are many definitions of MSMEs have been seen based on different criteria country by country, and it has been redefined over the time. Some countries defined MSME based on capital investment, and some country defines on the ground of the number of employees working in their firm whereas some define on the ground of annual turnover of the firm. In India, the definition of MSME has been changed many times from 1951 to 2006. But in EU member countries, the definition of MSME is same since 2003. We come to conclude, the MSME sector plays an important role in employment generation in India. According to a survey conducting in 2017, MSME contributes around 31% to the nation's GDP, 34% shares of the overall manufacturing sector and 45% shares of the overall export output. It is the backbone of the Indian economy. Looking to its importance, government must try to facilitate MSME to grow at faster rate. The efforts so far done to exaggerate is not sufficient.

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Perspective: Market Predominance of FinTech Industry in India and Taiwan-Science and Technology Division, Taipei Economic ...

21% of \$781 billion in retail transactions at outlets in 2019. Again, the drop-i economic activity owing to the Coronavirus outbreak harmed cashless transactions, mobile payments remain rather rigorous. Anxiety over the handling of currencies or cards with conceivably virus-infected surfaces doe expedite their adoption.

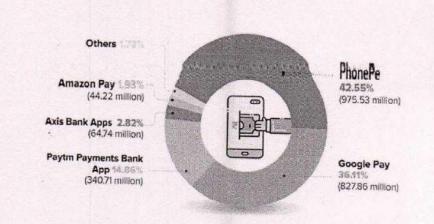


Fig.1 Leading applications in Unified Payments Interface (UP Source: National Payments Corporation of India, Feb. 2021

As per data released by the National Payments Corporation of India (NPCI). PhonePe has managed to lead the UPI app landscape, extending its market share to 46.04 %. Due to the rise of PhonePe, Google Pay has been pushed to second place. On comparing to PhonePe, Google Pay had a 0.04 percent dip in its share to 34.63 percent, triggering 972.26 million transactio worth Rs. 2, 07,287.73 crores in June, a 91.67 million rise from reported in May. The NPCI shows that PhonePe processed 1,292.71 million transaction: for Rs. 2, 62,565.88 crores in June; 142.87 million more than May. The surg in the volume of transactions supported widening the distance with Google Pay.

According to another study on instantaneous payments in five economie India generated the most real-time exchanges in 2019. Google pay and PhonePe have strengthened their hold on UPI payments, while Alibaba-back Paytm has done considerable work in developing a bank-like infrastructure. Now with the advent of WhatsApp, the sector is prepping for further competition. Conversely, on things turning negative: Google and Amazon, bo

Head the second feir losses mount. Head the second feir losses mount. Hence, out of an effort to ensure equity in the nation's rapidly developing fraction of the overall number of transactions on the UPI to 30 %. Such our India imposes a guardrail on market here in the first the fi Busines & Mine payment ecosystem, the NPCI has proposed standards, restricting the of Commune Data of the overall number of transactions on the UPI to 30 %. Such curb Natah (Rai) India imposes a guardrail on market hegemony in the conomic world. To ensure an

market additional two-year time to comply.^[2]

3. FinTech Market in India and Other Asian Countries:

FinTech has certainly taken off throughout the world, penetrating all markets, especially in Asia. Both India and China are making strides, with adoption rates of 87 %. For study FinTech facilities have been classified inte different subgroups: money transfer and payments, budgeting and financial planning, savings and investment, borrowing, and insurance. Through participants' responses whether or not they are acquainted with such offerin there can be seen significant awareness level across all segments, especial money transfer and payment services. Within India and Russia, 99.5% of individuals are aware of FinTech solutions concerning money transfers and payments. Such heightened interest in India is due to the government's pled

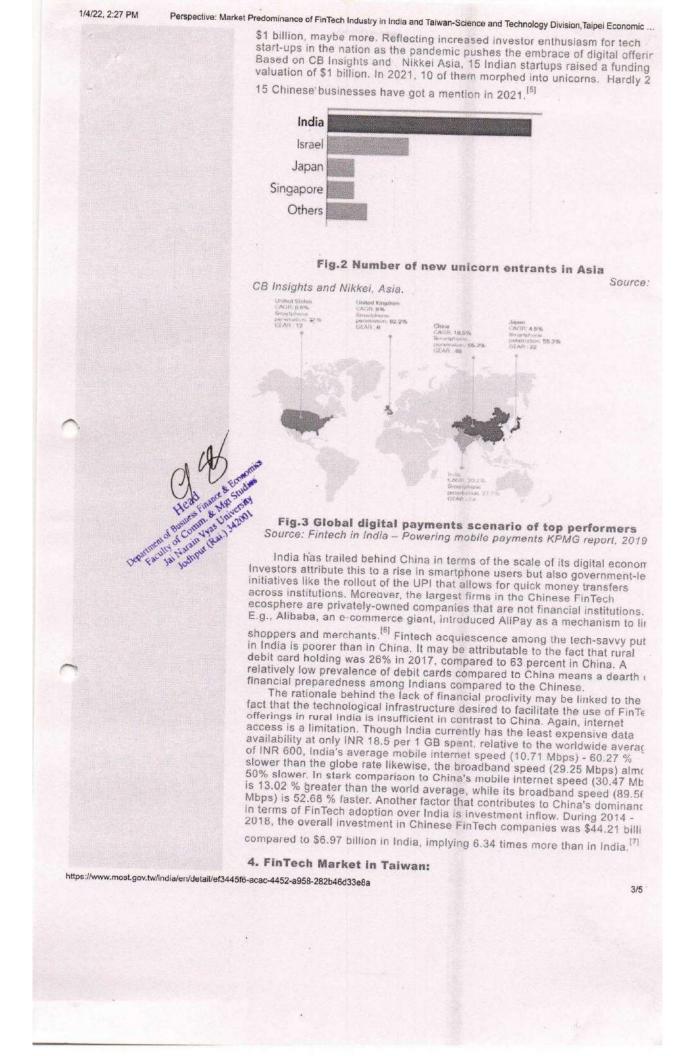
to reduce the proportion of printed currency in circulation.^[3]

Digital payments in India are prospering and gaining popularity, with a CAGR of 20.2 percent greater than China with a CAGR of 18.5 percent relat

to the number of transactions of noncash transactions.^[4] India is swiftly catching China with the number of unicorns - privately owned start-ups wor

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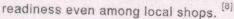
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Perspective: Market Predominance of FinTech Industry in India and Taiwan-Science and Technology Division, Taipei Economic ...

Asia has extended its worldwide dominance in FinTech adoption during t last few years. FinTech drill has evident splash among individuals and busin enterprises all across the region, prominently China, and India. Nevertheles ubiquity should not be misinterpreted with maturity. We may expect a lot mo transformations in the Asian financial environment in the coming years, owir to technological advancements, soothing policies, and enhanced competitiveness.

The financial landscape in Taiwan has been gradually shifting to digital transactions, notably card payment. In the previous three years, there has been a spike in card payments; however, because of the pandemic, overall consumption levels have mostly fallen substantially, thus a drop in card payments is guite perceptible in 2020. Still, a promising trend is expected in 2021, coupled with sustained growth in the following years. Financial supplie are offering unique cheapest payment gateways in the country to boost card



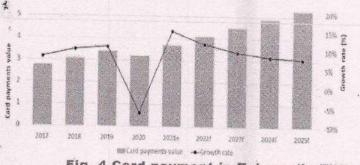


Fig. 4 Card payment in Taiwan (in TWD trillion) Source:

GlobalData's Payment Cards Analytics.

In Taiwan, digital payments are growing faster than ever. The rising rewards for payment mechanisms are driving both individuals and merchants accept digital and card payments. So far in Taiwan, mobile payments reportedly achieved a tipping point, overtaking credit cards usages for the fit time. As per official estimate statistics provided by the Taiwan government, about 10 million in the country's 23 million inhabitants leverage mobile payments. According to Market Intelligence & Consulting Institute (MIC), mobile payments have been endorsed by 35% of respondents, whereas crec cards picked by 33%. In 2018, with an anticipated 18.66 million Internet use its overall percentage of Internet connectivity has reached 79.2%. Again, the

percentage of mobile Internet connections has now approached 70%.^[9] No wonder that mobile payments are on the upswing considering the pervasiveness of cell phones and internet access in Taiwan.

The government of Taiwan already embarked on a journey of 90% mobil payment adoption by 2025. Indeed, the penetration rate had attained 62

percent by the end of 2019.^[10] Given, Taiwan has a total of 28 e-wallets (Financial Supervisory Commission). The most prominent digital wallet was Line Pay, which was followed by Jkopay, a native app, and Apple Pay (toget account for around 60% of the market). There are other wallets available, Samsung Pay, Taiwan Pay, and Chunghwa Post. PChome, a major local e-commerce company, has its wallet as well. But the problem for e-wallets is securing regulatory clearance to venture into higher-margin companies. Regardless of its desire to create a digitized financial services economy.

5. Conclusion:

Lastly unlike China, glancing at the Indian FinTech industry, one can s that conventional financial businesses are the key promoters of developmen With over 2100 start-ups functioning in India, the country holds excellent ground for a FinTech revolution. Thanks to factors like an innovation-driven start-ups landscape, a large market base, along with favorable regulatory policies and government-led initiatives, India is expected to be the fourth largest private wealth market globally by 2028. If India's IT revolution takes Chinese firms will be the ones that suffer the most. Similarly, Taiwan has a diverse skill reservoir, considerable rates of internet/mobile penetration, wid exposure to credit cards and bank accounts, and a usually stronger propens to pay and save.

Department of Business Finance & Former Department of Business Finance & University Jai Narain (Rain Linerin) Jai Narain (Rain Linerin) Perspective: Market Predominance of FinTech Industry in India and Taiwan-Science and Technology Division, Taipei Economic ...

As we know that the financial system in India and Taiwan is hugely affected regulations, hence the countries have yet to experience an iterative leap in t industry. Nonetheless, there is a significant chance to capitalize on it throughout the foreseeable future. A joint strategy between the authorities a

FinTech enterprises is essential to generate demand. As customer perceptio are often hampered by an insufficient financial literacy of either the usability benefits of the FinTech industry leads to customer truancy.

Finally, we can conclude, that a strong financial services sector can lead to economic growth while a failing system can drag down a nation's economy. Again, FinTech is the future of developing countries and should be speeded to boost economic development.

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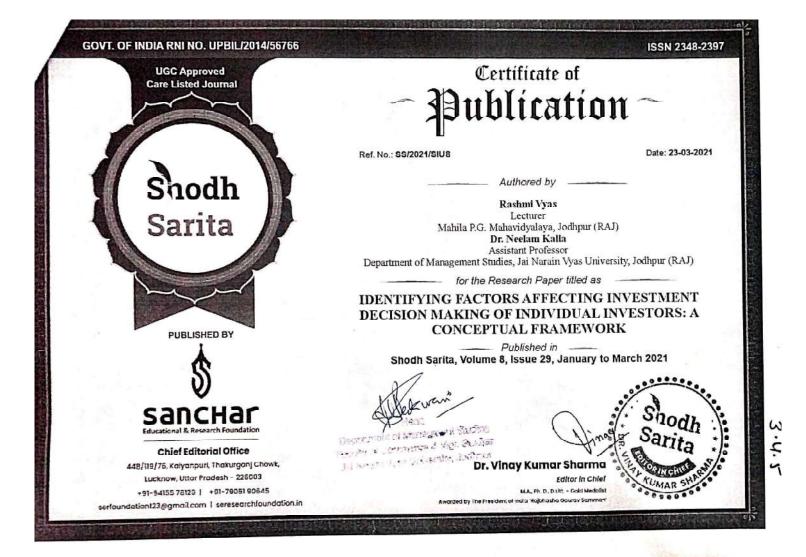
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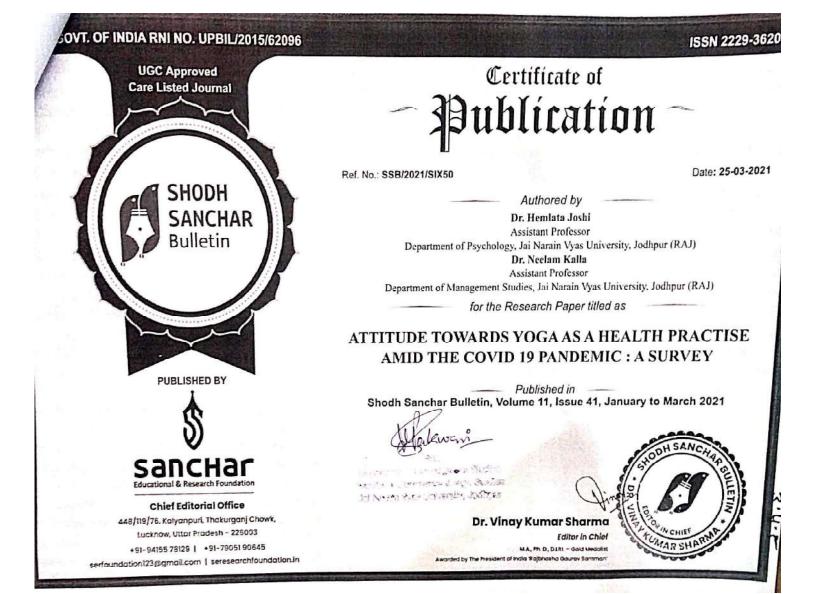
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FACULTY OF ENGINEERING

Automatic Generation Control for Three Area System Using Improved Bacteria Foraging Optimization Algorithm (IBFOA)

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Abstract— Simultaneous optimization of certain parameters like Ki, Ri and Bi has been done which grants not only the best dynamic response for the system but also permits us to use quiet larger values of Ri than put into practice. This will help the industries concerning power for simpler as well as cheaper realization of the governor. The performance of IBFOA is also investigated through the convergence characteristics which reveal that that the Bacteria Foraging Algorithm is relatively faster in optimization such that there is drop in the computational load and also minimum use of computer resource utilization.

Keywords—(IBFOA-Improved Bacteria Foraging Optimization Algorithm)

I. INTRODUCTION

Power systems are very large and complex electrical networks consisting of generation networks, transmission networks and distribution networks along with loads which are being disturbed throughout the network over a large geographical area. The rapid growth of industries has further lead to the increased complexity of the power system. The successful operation of interconnected power system requires the matching of total generation with total demand and associated system losses [1][2]. With time, the operating point of a power system changes, and hence, these systems may experience deviations in nominal system frequency and scheduled power exchanges to other areas, which may yield undesirable effects. In actual power system operations, the load is changing continuously and randomly. The ability of the generation side to track the changing load is limited due to physical/technical consideration, causing imbalance between the actual and scheduled generation quantities. This action leads to a frequency variation. The difference between the actual and the synchronous frequency causes mal operation of sophisticated equipment like power converters by producing harmonics [3].

In the power system, the system load keeps changing from time to time according to the needs of the consumers. Changes in real power affect mainly the system frequency, while reactive power is less sensitive to changes in frequency and is mainly dependant on changes in voltage magnitude. Thus active and reactive powers are controlled separately. The Load Frequency Control (LFC) loop controls the real power & Shri M. G. Soni, Assosiate Professor Electrical Engineering Department MBM Engineering College Jai Narayan Vyas University, Jodhpur, India

frequency and Automatic Voltage Regulator (AVR) loop regulates reactive power & voltage magnitude. Load frequency control has gained in importance with the growth of interconnected systems and has made the operation of interconnected systems possible [4].

Since, frequency is greatly depends on active power and voltage greatly depends on reactive power, so the control difficulty in the power system may be divided into two parts. One is related to the control of active power along with frequency and the other is related to the control of reactive power along with voltage regulation. The active power control and the frequency control are generally known as the Automatic Load Frequency Control (ALFC) [4]. The major objectives of AGC are

 To take care of the required MW power output of a generator matching with the changing load.

 To take care of the appropriate value of exchange of power linking control areas.

• To facilitate control of frequency for larger interconnections.

II. CHARACTERISTICS OF PROPERLY DEGINED POWER SYSTEM

A properly designed power system should respond to the changes in the load smoothly and it should maintain the balance between the powers generated and demanded. Further, the power system should have the following characteristics:

- It should supply power wherever demanded by the costumer.
- It should supply uninterrupted power to the consumer.
- The power system should be capable of meeting the changing load demands.
- The supplied power should be of good quality.
- The power system should supply power at economic rate.
- The necessary safety requirements should be satisfied.

The power delivered must satisfy certain minimal necessities with regard to the quality of supply. The quality of the power system is considered superior if the system frequency is kept around the specified value i. e. 50 Hz and the magnitude of the bus voltage is maintained within the prescribed limits around the normal value. Voltage and

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Assessment of impact of relaxation in lockdown and forecast of preparation for combating COVID-19 pandemic in India using Gro...

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Assessment of impact of relaxation in lockdown and forecast of preparation for combating COVID-19 pandemic in India using Group Method of Data Handling



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Keywords; COVID-19 Time series forecasting Group method of data handling

ABSTRACT

Ever since the outbreak of novel coronavirus in December 2019, lockdown has been identified as the only effective measure across the world to stop the community spread of this pandemic, India implemented a complete shutdown across the nation from March 25, 2020 as lockdown I and went on to extend it by giving timely partial relaxations in the form of lockdown II, III & IV. This paper statistically analyses the impact of relaxation during Lockdown III and IV on coronavirus disease (COVID) spread in India using the Group Method of Data Handling (GMDH) to forecast the number of active cases using time series analysis and hence the required medical infrastructure for the period of next six months. The Group Method of Data Handling is a novel self organized data mining technique with data driven adaptive learning capability which grasps the auto correlative relations between the samples and gives a high forecasting accuracy irrespective of the length and stochasticity of a time series. The GMDH model has been first validated and standardized by forecasting the number of active and confirmed cases during lockdown II-IV with an accuracy of 2.58% and 2.00% respectively. Thereafter, the number of active cases has been forecasted for the rest of 2020 to predict the impact of lockdown relaxation on spread of COVID-19 and indicate preparatory measures necessary to counter it.

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1. Introduction

Human civilizations have been periodically challenged by the onset of infectious diseases. In the realm of infectious diseases, a pandemic is the worst case scenario. The latest one in the series of pandemics has been caused by the family of corona viruses. Corona viruses are pleomorphic, single stranded ribonucleic acid (RNA) viruses. The "novel" coronavirus is a new strain that has not been previously identified in humans. The name derives from the crown like appearance produced by the club shaped projections that stud the viral envelope. The 21st century saw its first pandemic in 2002 as Severe Acute Respiratory Syndrome or SARS followed by Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV) [1]. Today the world is fighting another pandemic known as Coronavirus disease 2019 abbreviated as COVID-19. The initial cases of COVID-19 were reported on & December 2019 in Wuhan, Hubei province, China.

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Cases were reported after exposure to the local Hunan South China seafood market that sells a variety of wild animals, suggesting that the zoonotic Coronavirus crossed the barrier from animal to human at this market [2]. The COVID-19 is said to be caused by 2019nCoV (Novel Coronavirus 2019, 2020) termed by World Health Organization (WHO) or SARS-CoV-2(Severe Acute Respiratory Syndrome Coronavirus 2) as termed by the International Committee on Taxonomy of Viruses. COVID-19 virus is categorized by WHO as β -CoV of group 2B [3]. The genome of this virus is identified and it resembles the SARS-CoV (80% similarity) and MERS-CoV (50% similarity) [4,5]. As of 30/06/2020, the world has registered 1,01,85,374 confirmed cases and 5,03,862 deaths due to COVID-19. With nearly 25% of total cases in world, USA has been the most effected country followed by Brazil, Russia, and India. The first confirmed case of novel coronavirus in India was reported on 30 January 2020, in the state of Kerala. As of today, India has reported 5,66,840 confirmed cases and 16,893 deaths due to COVID-19 [6,7].

The spread of coronavirus is by sneezing, cough droplets and contact. This virus tends to enter the body through the mouth, nose, and eyes [8]. It is speculated that the virus may infect a person at a distance of about 6 ft (1.8 m) radius. The virus can sur-

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Analysis of Modelling of Double Diode PV Panel and Effects of Various Parameters and Its Efficiency

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Abstract – This paper presents P-V characteristics and efficiency of double diode model equivalent circuit for modeling of photovoltaic cell using MATLAB program. The main work of this simulation is to observe effect of variations in solar cell parameters on output power and efficiency. Since simulation with double diode model require extra equations but due to using efficient iterative method it reduced and less equation for faster calculation. This simulation is based on data provided by solar panel manufacturer.

Key Words: P-V Characteristics, Double Diode, Irradiation, Temperature, No. of Cells, Ideality Factor, Parasitic Resistance

1. INTRODUCTION

Today most of the country use fossil fuel to run vehicles, airplanes, and to power houses and industries but this fossil fuel is limited on earth and will get empty in few decades. [1] To extend this time renewable source of energy is available sun is the great example of renewable source of energy for millions of year as long as the life of sun will give energy. [1][2] Solar gives solar energy in abundant amount of energy in the form of light and various energy, some are harmful like UV some are useful like irradiation and sunlight used by plants and irradiation to heat water, cooking and to generate electricity. [2][3]

Due to blackbody effect almost all material absorbs solar radiation for example a red plate absorbs all visible light 250nm to 2500nm wavelength except 700nm which is red colour's wavelength which is reflected. This absorbed energy heat up the surface, this same pheromone is done with irradiation whose wavelength starts from 700 to make electrical energy with solar cell which captures photons which convert to electrons in junction point and semiconductor will try to make balance between electrons and holes which produce potential across terminals. The energy is very dense in radiation as 1.75W/m²/nm for 500nm wavelength however after 1.5W/m²/nm it starts decreasing near to 0.1 for irradiation. Single layer solar cell is not efficient to collect this amount of densed energy, for higher efficiency multilayer solar panel is used. [4][5][6]

PV technology is getting popular among the world due to it generates energy from free source of energy sun and require less maintenance. Electrical power is generated by a plate of semiconductor its same as other diode with p-n junction where electron-holes pair is generated by collision of sunlight (photons) with atom which release electrons and a hole is left behind this imbalance produces potential across terminals. A single solar cell produce 0.5 to 0.7 V and 0.1 to 0.3A current, which means it requires large array to produce required power this further require large area of land which is an drawback of using solar energy the solution is to increase efficiency of absorption of irradiation, this can be achieve by research in photovoltaic technology which is done by simulation of solar cell. [7]

Researchers use simulation software like matlab and spice for solar cell many pv model is available for an ideal pvcell ideal diode model is used with 3 parameter, single diode model with parasitic resistance with 5 parameters and double diode model with 7-8 parameters and three diode model with 9 parameters.[2][6][7]

In this paper double diode is chosen because this model gives higher accuracy for simulation of solar cell, to reduce simulation time 8 parameter is reduced to seven this result in reduction in no. of equations by the help of efficient iterative method and simulation is done on 7 selected parameter (irradiation, temperature, parasitic resistances, and no. of series and parallel cells and ideality factor) for wide observation on P-V characteristics and their effect on performance & efficiency.

2. Equivalent circuit with double diode model

For mathematical expression of solar cell an equivalent electrical circuit is required as shown in fig 1 which is a double diode model with an current source(lph) which represent current generated by photons, an ideal diode (D1) in parallel to source whose ideality factor is 1, another diode (D2) in parallel with known ideality factor, series and parallel resistance which represent internal resistance of solar cell, Id1 and Id2 is diode leakage current and I is the output current get by removing all losses from Iph. By efficient iterative method ideality factor, series & parallel resistance and saturation current is obtained. [14] The simulation is based on real model data provided by manufacturer of adani eternal series (300wp) whose specifications are shown in Table 1.

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Investigation of Complex Power Quality Disturbances using Discrete

Wavelet Transform

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Abstract – This research work aims to investigate power quality disturbances using discrete wavelet transform technique. MATLAB is used for generation of power quality disturbances using mathematical relations as per IEEE Standard-1159. The investigated power quality disturbances are single stage as well as complex power quality disturbances. These power quality signals are decomposed using discrete wavelet transform with db4 as mother wavelet up to level 4 of decomposition. The plots related to detail coefficients and approximation coefficients are analyzed for detection of PQ disturbances. Power quality disturbance present in the signals are detected and classified using the features of these plots.

Key Words: IEEE, Single Stage Power Quality disturbances, Complex power quality disturbance, discrete wavelet transform, power quality.

1. INTRODUCTION

The considerable changes in a business environment have increased the use of sensitive electronic components, computers, programmable logic controllers, protection and relaying equipments, which have increased the power consumption [1]. The simultaneous occurrence of two or more than two of these disturbances is known as complex power quality disturbance. These disturbances causes the problems such as failure of equipments, short life time of the equipments, malfunction of equipments, instability of the system, reduced efficiency of equipments etc. [2]. Increasing consumer expectation with the requirement of green supply around the globe, where integration of renewable energy sources to the distribution grid is the focus area of smart grid, Electrical Power Systems are expected to deliver power supply continuously at high quality to the consumers. Economy of ant country suffers with huge losses when there are voltage or current abnormalities present in the power delivery. Any deviation / disturbance manifested in the voltage, current and frequency from the standard rating is treated as power quality (PQ) problem that results in failure or malfunctioning of electrical/electronic equipments [3]. Power quality disturbances and resulting problems are due to increasing use of the solid state switching devices, power electronically switched loads, non-linear loads, lighting controls, unbalanced power systems, industrial plant rectifiers and inverters as well as data processing

equipments [4]. Therefore, power quality needs to be monitored and improved. The advanced signal processing and Artificial Intelligence techniques are proposed for recognition of Power Quality Disturbances [5]. The mathematical and signal processing techniques have been utilized for the detection and classification of single stage as well as complex PQ disturbances. An approach for the recognition of PQ disturbances in the power system using wavelet transform and radial basis function neural network (RBFNN) has been reported in [6]. Mahela et al. [7], presented a comprehensive review of various signal processing and artificial intelligent techniques utilized for the automatic recognition of PQ disturbances as well as effect of noise on the detection and classification of these events. Commonly used PQ detection techniques include Fourier transform, Kalman filter, wavelet transform, Stransform, Hilbert Huang transform, Gabor transforms etc. The artificial intelligent tools used for the classification of PQ disturbances are support vector machine, artificial neural network, expert systems, Fuzzy logic, k-nearest neighbor etc. [8]. One variant of Fourier Transform, the Short Time Fourier Transform (STFT) divides the signal into small segments, where these signal segments can be assumed to be stationary and utilized for detection of PQ disturbance [9].

2. SIGNALS GENERATION OF PQ DISTURBANCES

The single stage power quality disturbances are generated using the mathematical relations reported in [10]. The generated single stage power quality disturbances include pure sine wave, voltage sag, voltage swell, momentary interruption, oscillatory transient, impulsive transient and notch. The discrete wavelet transform based plots of pure sine wave are used as the reference curves for the detection of PQ disturbance present in the signal. Single stage Power Quality Disturbances has been investigated in [11] & [12]. The complex power quality disturbances are generated using the various combinations of the above mentioned single stage PQ disturbances. The generated complex power quality disturbances include (voltage sag + harmonics), (voltage swell + harmonics), (momentary interruption + harmonics), (oscillatory transient + voltage sag), (impulsive transient + voltage sag), (oscillatory transient + voltage sag + harmonics), (impulsive transient + voltage sag + harmonics), and (Oscillatory Transient + Impulsive Transient + Voltage sag + Harmonics). The discrete wavelet transform based

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RESEARCH ARTICLE

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Effect of Irradiance on Performance for Poly-Crystalline Photo-voltaic Cell

Digvijay Sarvate¹, M. K. Bhaskar², Manish Parihar³, Deepak Bohra⁴, Dharmendra Jain⁵ ¹ME Scholar, ² Professor, ³ME Scholar, ⁴ME Scholar, ⁵PhD Scholar ^{12,3,4,5}Deptt of Electrical Engg, JNV University, Jodhpur, Rajasthan-India

Abstract:

In this paper, simulation of 60 Cells Eldora Ultima Silver 1500 V Series by Vikram Solar Panel using Matlab Simulink approach is presented. The method is used to determine the PV & I-V characteristics of proposed module in various conditions especially in different levels of irradiation. In addition, all results from Matlab Simulink are verified with the data sheet of Eldora Ultima Silver 1500 V Series by Vikram Solar Panel.

Keywords — Solar photovoltaic cell, mathematical model, modeling, PV module, standard test condition (STC), PV characteristic; simulink/matlab.

I. INTRODUCTION

Studies of polycrystalline silicon are numerous especially through the technical development of characterization methods in order to raise the performance of solar cells made of this material document is a template. The polycrystalline PV cell (solar cell) converts the sunlight into the electrical energy by the photovoltaic effect. Energy from PV modules offers several advantages, such as, requirement of little maintenance and no environmental pollution. The polycrystalline PV module typically consists of a number of PV cells in series. The conventional technique to model a PV cell is to study the p-n junction physics. The polycrystalline PV cell has a non-linear voltagecurrent (V-I) characteristic which can be modelled using current sources, diode(s) and resistors. Single-diode and double-diode models are widely used to simulate PV characteristics. The singlediode model emulates the PV characteristics fairly and accurately. The manufacturer provides information about the electrical characteristics of PV by specifying certain points in its V-I characteristics which are called remarkable points.

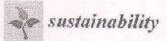
In this paper, a simplified polycrystalline PV equivalent circuit with a diode (The single-diode model) equivalent as model is proposed. The main contribution of this work is the implementation of a generalized polycrystalline PV model with Matlab/simulation.

II. A MATHEMATICAL MODEL OF PHOTOVOLTAIC MODULE

A solar cell is basically a p-n junction fabricated a thin wafer of semiconductor. The in electromagnetic radiation of solar energy can be directly converted to electricity through photovoltaic effect. Being exposed to the sunlight, photons with energy greater than the band-gap energy of the semiconductor creates some electronhole pairs proportional to the incident irradiation. The equivalent circuit of a Poly-Crystalline PV Cell is shown in figure 1. This model is known as a single diode model of solar cell. The current source Iph represents the cell photo-current. Rsh and Rs are the intrinsic shunt and series resistances of the cell respectively. Usually the value of Rsh is very large and Rs is very small, hence shunt resistor may be neglected to simplify the analysis. The polycrystalline panel can be PV modelled mathematically with the equations [(1) to (4)] given below:

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Article

Design and Performance Analysis of Hybrid Battery and Ultracapacitor Energy Storage System for Electrical Vehicle Active Power Management

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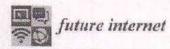
Copyright: © 2022 by the authors. Licensee MDPI, Basel, 3witzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). Abstract: The electrical energy storage system faces numerous obstacles as green energy usage rises. The demand for electric vehicles (EVs) is growing in tandem with the technological advance of EV range on a single charge. To tackle the low-range EV problem, an effective electrical energy storage device is necessary. Traditionally, electric vehicles have been powered by a single source of power, which is insufficient to handle the EV's dynamic demand. As a result, a unique storage medium is necessary to meet the EV load characteristics of high-energy density and high-power density. This EV storage system is made up of two complementing sources: chemical batteries and ultracapacitors/supercapacitors. The benefits of using ultracapacitors in a hybrid energy storage system (HESS) to meet the low-power electric car dynamic load are explored in this study. In this paper, a HESS technique for regulating the active power of low-powered EV simulations was tested in a MATLAB/Simulink environment with various dynamic loading situations. The feature of this design, as noted from the simulation results, is that it efficiently regulates the DC link voltage of an EV with a hybrid source while putting minimal load stress on the battery, resulting in longer battery life, lower costs, and increased vehicle range.

Keywords: electric vehicles; battery; ultracapacitors; energy storage system

1. Introduction

Electric cars (EVs) are becoming more popular as a result of environmental concerns and rising gasoline prices. When compared to gasoline-based internal combustion engine (ICE) vehicles, EVs have superior fuel economy and adhere to modern world pollution requirements. Standard EVs are available on the market as a power source. It is worth noting that EVs are subjected to a variety of time-varying power needs, such as abrupt acceleration and deceleration (regeneration period). This acceleration and regeneration period is analogous to pulse load changes, and the battery must absorb a huge transient charging current at this time, negatively impacting the battery's performance. A supplementary energy storage technology (ultracapacitor) is occasionally used to mitigate this negative effect on the battery [1].

By incorporating diverse topologies of ultracapacitor connection, the influence of the battery's performance on abrupt charging and draining can be mitigated. An ultracapacitor



Article



A Fusion-Based Hybrid-Feature Approach for Recognition of Unconstrained Offline Handwritten Hindi Characters

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Abstract: Hindi is the official language of India and used by a large population for several public services like postal, bank, judiclary, and public surveys. Efficient management of these services needs language-based automation. The proposed model addresses the problem of handwritten Hindi character recognition using a machine learning approach. The pre-trained DCNN models namely; InceptionV3-Net, VGG19-Net, and ResNet50 were used for the extraction of salient features from the characters' images. A novel approach of fusion is adopted in the proposed work; the DCNN-based features are fused with the handcrafted features received from Bi-orthogonal discrete wavelet transform. The feature size was reduced by the Principal Component Analysis method. The hybrid features were examined with popular classifiers namely; Multi-Layer Perceptron (MLP) and Support Vector Machine (SVM). The recognition cost was reduced by 84.37%. The model achieved significant scores of precision, recall, and F1-measure—98.78%, 98.67%, and 98.69%—with overall recognition accuracy of 98.73%.

Keywords: Bi-orthogonal; DCNN; DWT; Hindi characters; hybrid-features; fusion; MLP; PCA; SVM; transfer learning

1. Introduction

The increasing demand for the automation of language-based systems is high due to the associated vast application field. It includes digitalization and preservation of the manuscripts of historic significance, computerized editing of handwritten documents, automatic processing of cheques in the bank, recognition of postal address written on mails, parcels, etc. and their address-wise sorting through computer vision, translation of road safety-instructions written in the local language on roadside boards, computerized recognition of medical-aids as mentioned in handwritten prescription, and many more related applications. The machine-based recognition of handwritten scripts is much more difficult than that of printed ones due to inherent unconditional variation in shape, size, skewness, and degree of connectedness between various characters. Countries like India. China, Saudi Arabia, and the United Arab Emirates are developing automation systems in country-specific languages to serve its advantage to the mass of the people as large populations of these countries have not adopted English as their first language.

Many advancements have been reported for English language-based automation systems due to their global acceptance. Extra attention is needed for systems based on languages like Hindi (Devnagari), Chinese, Urdu, Farsi, etc., as they are in a developing



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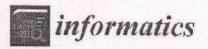
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Voltage-Based Hybrid Algorithm Using Parameter Variations and Stockwell Transform for Islanding Detection in Utility Grids

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Abstract: This paper has introduced an algorithm for the identification of islanding events in the remotely located distribution grid with renewable energy (RE) sources using the voltage signals. Voltage signal is processed using Stockwell transform (ST) to compute the median-based islanding recognition factor (MIRF). The rate of change in the root mean square (RMS) voltage is computed by differentiating the RMS voltage with respect to time to compute the voltage rate of change in islanding recognition factor (VRCIRF). The proposed voltage-based islanding recognition factor (IRFV) is computed by multiplying the MIRF and VRCIRF element to element. The islanding event is discriminated from the faulty and operational events using the simple decision rules using the peak magnitude of IRFV by comparing peak magnitude of IRFV with pre-set threshold values. The proposed islanding detection method (IDM) effectively identified the islanding events in the presence of solar energy, wind energy and simultaneous presence of both wind and solar energy at a fast rate in a time period of less than 0.05 cycles compared to the voltage change rate (ROCOV) and frequency change rate (ROCOF) IDM that detects the islanding event in a time period of 0.25 to 0.5 cycles. This IDM provides a minimum non-detection zone (NDZ). This IDM efficiently discriminated the islanding events from the faulty and switching events. The proposed study is performed on an IEEE-13 bus test system interfaced with renewable energy (RE) generators in a MATLAB/Simulink environment. The performance of the proposed IDM is better compared to methods based on the use of ROCOV, ROCOF and discrete wavelet transform (DWT).

Keywords: distribution grid; islanding event; renewable energy; Stockwell transform

1. Introduction

Renewable energy (RE) provides clean energy to the consumers and reduces transmission losses when integrated to the grid in large quantum near-load centers. The structure of the conventional power network has been modified, and the power network is smarter and more efficient. In addition, problems arise because of grid convergence that urgently needs to be solved. Unintentional islanding is an important problem that can lead to poor quality of power (PQ), frequency instability and a risk to the personal safety of the consumer. Hence, it becomes essential for detecting this scenario accurately and reliably to isolate islanded network immediately [1]. According to the IEEE Std. 1547, the islanding event should be identified within 2 s after it has an incident on the network. The methods of islanding detection (IDMs) are graded into passive IDM, active IDM and hybrid IDM [2]. For identification of the islanding, passive IDMs use under/over voltage, under/over frequency,



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Convolutional Neural Networks with Transfer Learning for Recognition of COVID-19: A Comparative Study of Different Approaches

by

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Combined Stockwell and Hilbert Transforms Based Technique for the Detection of Islanding Events in Hybrid Power System

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Abstract—This paper presents a technique using hybrid features extracted from current signals using Stockwell and Hilbert Transforms for detecting the islanding events and operational events of renewable energy generators and loads. The study is performed on a hybrid power system test network incorporating wind and solar power generators. Results are computed using MATLAB/Simulink software for a variety of case studies. Through the applied technique islanding events are successfully identified and discriminated from operational events.

Keywords-Hybrid power system; wind energy; Hilbert Transform; solar energy; Stockwell Transform,

I. INTRODUCTION

Integration of the Renewable Energy (RE) to grid is being continuously increasing due to the requirement of pollution free energy all around the world [1, 2]. However, the use of renewable energy as green energy has imposed many challenges to the utilities in terms of power quality, power system protection; and reliability [3]. This has caused due to the uncertain nature of the renewable power generation. This has also caused unwanted tripping of the power system equipments and generators. Sometimes, this may also disconnect a section of energy network from the rest of the supply network, and this isolated part of the network would operate in an isolated mode and known as islanding operation of the power system operation. In this mode, the load demand is met by the local generators. Islanding takes place when a distributed generation (DG) and connected load are disconnected, and these DG sources supply power to the loads in isolated mode. Islanding poses many challenges for the power system network. The existing standards do not permit the DGs to operate in islanded mode. Hence, there is a need to detect the islanded operation of the power system network and discriminate the same from the other operational events. The operational events with renewable energy (RE) sources sceanrios like outage of RE plants, grid synchronization of RE plants and islanding of test grid also affects quality of the power. Techniques of signal processing have played important

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roles in the detection of islanding events [4]. However, available techniques use only the single signal processing methods, where the efficiency is quite low [5-10]. The use of combined features of more than two methods may improve the efficiency of islanding detection. In [5], the authors proposed an algorithm for anti-islanding, which is passive in nature and can be used for the inverter, based distributed generation (DG) units as well as synchronous machine supported DG units. At the moment when mismatches between the active power and reactive power approach near to null value, most of the antiislanding techniques, which are passive in nature, cannot be effective for the detection of the islanding phenomenon with good accuracy. In [6], an algorithm was introduced for the identification of islanding of wind turbine based power system network. Applications of trajectory based on state variables and wavelet transform (WT) have been tested in a micro-grid system. Relays are used for the estimation of variations in the energy state of coefficients of time-frequency transform of signals recorded in two-dimensional space [6]. Performance of relay has been improved with the help of selection of signals supported method and using the correlating islanding as well as non-islanding phenomena [6]. In [7], a method is proposed for the detection of islanding, which inserts sufficient and variable impedance on low voltage part of the grid. Identification of islanding will be affected by intelligent agents inserted in a central switch of the micro-grid. It is converted to a hybrid automatic transfer switch (HATS). HATS agent is effective in identification of operational mode of the micro-grid supported by measuring the local parameters and supervising the grid status. In [8], a detailed comprehensive review on Islanding detection methods is presented aiming to aid the design efforts of islanding identification methods and standards of anti-islanding. In [9], a detailed study is presented, which is related to islanding identification scheme that can be implemented in remote areas for the hybrid power plant based on the wind and solar PV systems. Method has also been implemented based on the solution reached using the classification supported by the currents. The proposed techniques are effective in monitoring

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Article

Convolutional Neural Networks with Transfer Learning for Recognition of COVID-19: A Comparative Study of Different Approaches

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Abstract: To judge the ability of convolutional neural networks (CNNs) to effectively and efficiently transfer image representations learned on the ImageNet dataset to the task of recognizing COVID-19 in this work, we propose and analyze four approaches. For this purpose, we use VGG16, ResNetV2, InceptionResNetV2, DenseNet121, and MobileNetV2 CNN models pre-trained on ImageNet dataset to extract features from X-ray images of COVID and Non-COVID patients. Simulations study performed by us reveal that these pre-trained models have a different level of ability to transfer image representation. We find that in the approaches that we have proposed, if we use either ResNetV2 or DenseNet121 to extract features, then the performance of these approaches to detect COVID-19 is better. One of the important findings of our study is that the use of principal component analysis for feature selection improves efficiency. The approach using the fusion of features outperforms all the other approaches, and with this approach, we could achieve an accuracy of 0.94 for a three-class classification problem. This work will not only be useful for COVID-19 detection but also for any domain with small datasets.

Keywords: convolutional neural networks; transfer learning; K-means clustering; principal component analysis

1. Introduction

COVID-19, a global pandemic, is still spreading in many parts of the world since its identification in late December 2019. In these nine to ten months, this disease has become one of the most significant public health emergencies requiring remedial measures and early diagnosis. In many countries till recently, reverse transcription-polymerase chain reaction (RT-PCR) tests are the most popular diagnostic method for detecting COVID-19. Although popular, this method suffers from limitations in its long wait time and low sensitivity. Therefore, for the early diagnosis of COVID-19, many have started using molecular tests to determine the coronavirus. For example, many existing machines like Genmark's ePlex Respiratory Pathogen instrument or Abbott's ID, etc., have a COVID-19 feature for testing, which takes much less time [1,2]. The other advantage is that the sensitivity of these molecular tests is around 90% better than the RT-PCR method having a sensitivity of about 70%. However, both the RT-PCR method or molecular testing approach need expensive equipment and trained professionals. Further, the availability of these methods is limited in remote areas and low and middle-income

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Recognition of Islanding and Operational Events in Power System With Renewable Energy Penetration Using a Stockwell Transform-Based Method

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Abstract-Integration of RE sources to the utility grid offers technical and operational challenges causing problems of PQ, stability, identification of operational events, etc. This article presents an algorithm to identify events including islanding, grid integration, and outage of the solar PV and WG plants in grid using a ST. Islanding event may occur in the presence of any kind of plant. Processing of negative sequence component of voltage is performed by utilizing ST based multiresolution analysis at the test node and the output matrix is evaluated. The features (F1-F4), VI and STD indexes are obtained from this matrix. These features are utilized for identifying the events and transient phenomenon. The VI and STD indexes are used to recognize the type of RE source present during the islanding and outage events. Moreover, for recognizing the type of RE source at the time of synchronization event, an SI is proposed. This is computed by the ST depended processing of voltage signals. Performance of the algorithm is found satisfactory for all incidence angles and complete voltage cycle under the noisy conditions of 10 dB SNR. As compared to the time-frequency transform based coefficients of the voltage signal, the proposed technique is found to be superior in terms of small NDZ and low computation time and least affected by noise. Further, the developed technique is also efficient to detect various events stated above and the type of RE source. Study is performed using MATLAB/Simulink software and validated in real time using RTDS.

Index Terms-Grid synchronization event, islanding event, outage event, power system network, renewable energy (RE), Stockwell transform (S-transform), transient phenomenon,

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Alternating current.	
Aluminum conductor steel reinforce	d.
Artificial intelligence.	

NOMENCLATURE

- ANFIS Adaptive neuro-fuzzy inference system. DC Direct current. CWT
- Continuous wavelet transform.
- DFIG Double fed induction generator.
- DG Distributed generation.
- FT Fourier transform.
- HID Human interface device.
- IDI Islanding detection index.
- Institute of Electrical and Electronics Engineers. IEEE
- IID Island interconnection device.
- MGP Multigene genetic programming.
- NDZ Nondetection zone.
- NSC Negative sequence component.
- PHEV Plug-in hybrid electric vehicle.
- PQ Power quality.
- PV Photovoltaic.
- Renewable energy. RE
- RTDS Real-time digital simulator.
- SAM Sum absolute magnitude.
- SAV Sum absolute values.
- Synchronization index. SI
- SNR Signal to noise ratio.
- SPS System protection schemes.
- STD Standard deviation.
- ST Stockwell transform.
- STA Absolute values matrix of ST-matrix.
- Short time Fourier transform. STFT
- SVM Support vector machine.
- VI Variance index.
- WG Wind generator.
- WT Wavelet transform.
- kW Kilowatt.
- kVAr Kilovolt ampere reactive.
- kV Kilovolt.
- **MVA** Megavolt ampere.
- MW Megawatt.
- Ω Ohm.

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Estimation of Faults in Grid Connected Solar Photovoltaic Farm Using Voltage Based Median and Summing Values Features of Stockwell Transform Based Algorithm

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Abstract—Research work under taken in this paper is concentrated to design an algorithm using Stockwell Transform for estimation of faults in grid integrated solar PV farm. An algorithm based on Features such as median and summing absolute values of Stockwell Transform using the voltage signal has been presented in this manuscript. Proposed algorithm can be utilized in protection schemes of the transmission and distribution feeders in the grid integrated solar PV farms. Algorithm has been tested for the estimation of the faults such as phase to ground, phase to phase, two phases to ground and three phases to ground fault on the AC side of the grid. Algorithm is also tested for estimation of faults on the DC bus of the solar PV farms. Study is carried out using MATLAB software.

Keywords—AC grid; DC bus; fault; Solar PV farm; Stockwell Transform.

I. INTRODUCTION

Power utility network is complex in nature which may be considered as spatial and temporal complexity. This network is also nonlinear and non-stationary in nature which includes many uncertainties at different levels of generation. transmission and distribution of electrical power. Transmission lines are constructed with long distances in different geographical regions having variable nature like deserts, plains and hills. These lines are used to transfer power in bulk quantity from generator station to centres of loads over long distances. Hence, possibility fault occurrence on the transmission lines is very in comparison to other components of the utility power network. Frequently observed faults on the transmission line may be included in the categories such as line to ground (LG) fault, double line (LL) fault, double line to ground (LLG) fault, three phase (LLL) fault, three-phase to ground (LLLG) fault and faults of nature inter circuits [1]. Long distance transmission lines are essential requirement of the electric power utility grid to transfer bulk power over long distances from generators to load centres. This includes multiple sending end generators and the multiple receiving load centres. In recent years the power system network

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transmission system deployed the high voltage direct current (HVDC), ultra high voltage DC (UHVDC), multi-terminal DC (MTDC) and multi-terminal AC for transmission of bulk power from one point to the other [2]. Power transfer capability of the existing corridors of the transmission lines have been increased by the use of the compensations devices like series and shunt. In addition of power transfer capability of transmission lines, these compensations also help to increase the voltage profile and improve the transient stability of the system. However, presence of renewable power generation creates additional problems related to protection due to the uncertain in nature of RE sources. The issues observed due to deployment of compensation devices include [3] as detailed.

- Sudden change impedance of line at compensation point
- Inversion of current and voltage
- Frequency components other than the power frequency are introduced in voltage and current signals.

When the solar PV farms are integrated with network of distribution part of the power system, protective devices faces change in behaviour due to fact related to flexibility of changes in number of solar PV plant units. Further, these units are spread over the large area and power output of these units may change due to the variation in solar insolation and wind speed. The solar energy source production capacity is low in terms of volume. It has low operational cost compared to the large sized generators and power plants. Also integration of these units to distribution and transmission networks has been gaining interests due to the economic issues associated with the development of the power plants, reduced environmental pollution, increased power generation efficiency, improved quality of power supplied to customers, reduced losses in power network, improved voltage profile, and liberalized network capacity [4].

Time frequency methods play important role on the detection of transmission line faults to design the efficient

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Information Processing in Extended Hodgkin-Huxley Neuron Model

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Abstract—Models of a variety of neurons share the same form as the Hodgkin-Huxley (HH) neuron and evidence suggests that single-compartment models can capture the key properties of in vivo and in vitro neurons. In this paper we are going to discuss about how the conductance of the excitatory and inhibitory synapse vary when the pre synaptic action potential arrived at the synapse and how this synaptic conductance affects the information transfer in the single neuron. In our model the injected current is replaced with the synaptic current in the HH model. In order to validate the impact of excitatory and inhibitory synapse in the generation of action potential, the extended HH model is examined with various synaptic inputs.

Index Terms- HH Model, Mean Firing Rate, Entropy, Synaptic Conductance, Spike Train.

I. INTRODUCTION

Many models of brain function have been built; they differ in their objectives, requirements and limitations. Based on the questions what, how and why that a model can answer, the models can be classified as conceptual/phenomenological/black box type, mechanistic type/realistic or interpretive type models respectively. Hodgkin & Huxley model is a biological model which is accurately designed to describe and predict the behaviour of the neuron .Izhikevich[6] in his paper reviewed neurocomputational features of various spiking models and ranked the models based upon the neuro-computational behaviour, their implementation efficiency, etc. HH model is the only biological model which finds its way to achieve the complete fit of data which Izhievich have discussed.

II. HODGKIN & HUXLEY MODEL

Intracellular recordings of the neuron state that the action potential is characterized as the sudden increase in the membrane potential (depolarization) followed by a slow sharp decrease towards the resting potential. This may be followed by a fall below the resting potential due to the fall in membrane potential below the resting potential called after hyperpolarisation phase. Hodgkin and Huxley (partly in collaboration with Katz) were the first to describe the active mechanisms quantitatively [5]. The final paper of Hodgkin and Huxley [5] shows the complete expression for the three ionic currents. The description of how the membrane potential changes in time is explained in the equation

$$\sum_{m} \frac{dV}{dt} = -\overline{g}_{Na}m^{3}h(V - E_{Na}) - \overline{g}_{K}n^{4}(V - E_{K}) - \overline{g}_{L}(V - E_{L}) + I_{inj}$$
(1)

The HH model is stimulated by the external injected current. Similar to real neuron this model generates repetitive firing and the greater the input current, the faster the firing rate. However the real single neuron firing traces show high variability, for instance, the coefficient of variation in the spike interval (ISI) of neuron firing in response to the stimulus for a period of several seconds is approximately equal to 1 as expected from the Poisson process[4].Furthermore, the neuron receives inputs from several other neurons. The current generated by these neurons may be from the excitatory or from inhibitory, which are approximately balanced to each other [10]. To study this behaviour, the original HH model described in the equation 1.1 is extended by adding additional synaptic currents. Simulations based upon applying Poisson distributed excitatory and inhibitory inputs demonstrate that the neuronal firing output shows considerable variability in the ISI. Depolarizing with balanced synaptic current reduces the membrane time constant and also affects the information processing in several aspects[1-2],[7-9].

In this paper the extended HH model is modelled with the network consisting of 1000 excitatory and 200 inhibitory synapses. The excitatory and inhibitory synapses are activated by the spike train generated by a Poisson process of various rates f_{ex} , f_{in} respectively [3]. The behaviour of the membrane potential is approximated using the conductance-based relationship is now given below by (2).

$$C_{m}\frac{dv}{dt} = -\overline{g}_{Na}m^{3}h(V - E_{Na}) - \overline{g}_{K}n^{4}(V - E_{K}) - \overline{g}_{L}(V - E_{L}) + I_{evn}$$
(2)

where, I_{syn} is the synaptic current and the synaptic current is given by (3).

$$I_{syn} = -\overline{g}_{exe}(V - E_{Na}) - \overline{g}_{in}(V - E_K)$$
(3)

The time course of synaptic input can de described by a simple decaying exponential function. The synaptic conductance [4], [11] is calculated as given below in (4).

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Protection of Distribution Feeder Using Stockwell Transform Supported Voltage Features

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Abstract— This paper presents a research work focussed on the identification of faults on the distribution feeder supported by Stockwell transform based summing of absolute values and median features using the voltage signals. A fault index is proposed which is obtained by the multiplication of H-index (obtained summation of absolute values S-matrix evaluated by ST supported decomposition of voltage) and VS-index (obtained median of absolute values S-matrix evaluated by ST supported decomposition of voltage). Classification of faults is achieved using decision rules. Investigated faults include phase to ground, fault between two phases, two phases to ground fault and fault involving all three phases and ground. Performance of algorithm is tested on high fault impedance and fault incidence angle. Proposed study is performed using MATLAB software in Simulink environment.

Keywords— Distribution Feeder Fault, Hilbert transform, protection, Stockwell Transform, voltage.

I. INTRODUCTION

Feeders used to transform power from grid substations (GSS) to the consumer ends are normally known as power distribution lines. These are exposed to different various natures of failures which are commonly not expected due to involvement of the random causes. These failures adversely affect the availability as well as reliability of the network. Accurate detection and identification of type of fault on these distribution feeders help to restore the power supply timely and also avoid the severe damage to the power system equipments [1]. Many schemes have been reported in last decades for the recognition of faults to design protection scheme for the radial distribution feeders. Signal processing methods have played a significant role for the identification of the faults. Signal analysis approaches like Wavelet transform (WT), Fourier transform (FT), Short time Fourier transform (STFT), fast Fourier transform (FFT), Stockwell transform (ST), Gabor transform (GT) etc. are reported for identification of faults [2]. Mahela et al. [3], introduced an approach using Stockwell transform for identification of faults on the transmission line in the presence of Thyristor switched capacitor (TSC). An intelligent scheme for identification of HIF on distribution network based on a combination of probabilistic neural network (PNN) and adaptive extended Kalman filter (AEKF) is found in [8]. AEKF is implemented

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for estimation of separate components of harmonic in HIF as well as no-fault (NF) associated with the current signals in the presence of non-linear loads. These harmonic components have been used utilized for training and testing of PNN which helps for classification of HIF from NF accurately. In [9], authors introduced an approach for location of fault in network of power system based on the processing of voltage signals. Voltage signals are converted into absolute values of phasor of complex valued which indicate travelling waves associated with the faults. This has been processed further for localization of faults using Hilbert-Huang transform (HHT). Results are validated on in mixed feeder for all types of faults including HIF of arcing. In [10], authors presented modelling of HIF on distribution feeder. Proposed model uses resistance of non-linear nature which represents high impedance path in the faulty event. Performance analysis of various parameters which are electric in nature and pertains to the fault of high impedance has been evaluated. In [11], a methodology for detection of HIF in distribution feeder of power network using Mathematical Morphology (MM) is proposed. Current signals are utilized for detection of HIF faults. MM is implemented for extraction of the features (in time domain) and a classification of HIF faults has been achieved using the rule supported algorithm. Data has been collected on network of power distribution utility. Low impedance faults (LIF) and switching transients have been simulated in MATLAB. It is established that proposed method is effective in detection and differentiation of HIF from switching transients. This is achieved is time lesser compared to that utilized by different approaches maintaining high security as well as dependability. Performance of introduced algorithm is independent on location of fault, time of fault inception, and fault type. Following is the main contribution of the paper:-

- An algorithm supported by Stockwell transform using voltage signals for identification of faults on the distribution feeder is proposed.
- Classification of faults is achieved using decision rules.
- Performance of algorithm is tested on high fault impedance and fault incidence angle.

II. PROPOSED DISTRIBUTION TEST SYSTEM

Proposed study related to fault identification and classification associated with distribution feeder is performed with the help of IEEE-13 bus distribution network. IEEE-13

Effect of Solar Radiation on the Thermal Performance of Power Transformer and its Life Estimation

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Abstract-With the continuous rise in the load demand at consumer end, the performance of the existing operating electrical machines gets affected. The increasing temperature of earth's surface due to solar radiation is another reason of the rise in the temperature of the electrical machines. Power transformers are one of the electrical machines whose performance is directly affected by its inner and outer temperature values as they are generally installed outdoors. The life of the power transformer reduces gradually with the time and sometimes the severe outdoors surface temperatures may lead to sudden explosions that also obstruct the operation of the other associated machines as well. Therefore, thermal modeling of outdoor power transformers should include the consideration of variation in environmental temperature. This is expected to create an opportunity for the research in this field. This includes developing computational thermal models simulation using appropriate software tools. These models can be employed to evaluate the actual operational age of power transformers by estimating equivalent life at the reference temperature on the basis of the time period of the estimated temperature cycle causing acceleration of aging. This paper presents a MATLAB/ Simulink based thermal model determining temperature in increasing the aging acceleration factor, which has been used for estimation of the loss of life of the transformer. Further, the effect of outdoors surface temperature due to the influence of solar radiation for increasing the loss of life of power transformer has also been studied and verified by using the thermal model. The proposed model has been validated using real time data gathered from the power transformer in operation at 220kV GSS, Jhalamand, Jodhpur.

Keywords—life of power transformers, solar radiation, thermal modeling, aging acceleration factor, loss of life.

I. INTRODUCTION

Power transformers are one of the main electrical machines in any electrical substation whose functioning directly governs the operational efficiency and the economic capability of the power system. The reliability of any electrical substation is directly affected by the performance of the constituent power transformers. Any kind of failure in the power transformer normally occurs due to the failure of inner insulation materials caused by high stress, under abnormal or critical operating conditions. The most challenging problem in every power transformers is heat dissipation. Greater the heat accumulated without being dissipated, lesser is the life of the power transformer. Although, the design concept of the power transformers include a robust cooling arrangement system, still the changing environmental conditions outside the power transformers always affect its thermal performance. The inner temperature of the power transformer is directly affected by its inside as well as outside conditions.

The inside conditions include the increase in the power losses of the windings and the core which rises the temperature of the power transformer drastically. This generally happen due to the increase in the load of the power transformers. The insulating oil circulating inside the power transformer absorbs heat from the interior of transformer windings and core through conduction. This heat must be transferred to the transformer oil by convection and further, from the oil to the cooling medium via a heat exchanger.

The outside surrounding conditions that impact on the heat dissipation process may include natural conditions as well as built in conditions. The natural conditions include the effect of solar radiation, wind, rain, dust, natural landscape and humidity. Likewise, the built in condition includes transformer external layout, sheds, buildings, abstractions and design of enclosures, etc. The IEEE loading guides and IEC standard documents of the oil- immersed power transformers provide no such information regarding the above surrounding effects and their impact on the thermal performance of power transformer. By doing the thorough study of the above mentioned environmental conditions, it was found that all those factors have different level of harshness which affects the safe and reliable operation of the power transformers.

This paper presents a technique for estimating the loss of life of power transformer with the help of computational thermal model and employing it to calculate the accelerated aging. Further, the proposed thermal model is modified by incorporating the effect of solar radiation on the surface of power transformer. The most important factor while determining the accelerated aging is the hot spot temperature (HST), which is a major reason for the loss of life of transformer. The HST of a transformer primarily depends on the ambient temperature, the rise in the top oil temperature (TOT) over the ambient temperature and the rise in the winding HST over the top oil temperature. HST values for different load conditions can be estimated with the help of these thermal models on the basis of the thermal characteristics of the power transformer and the cooling system.

The proposed thermal model has been used to predict the loss of life of a 160MVA power transformer in operation at 220kV GSS, Jhalamand, Jodhpur (Rajasthan, India). After Introduction section, the paper includes four more sections that present the state of art, proposed methodology, MATLAB/ Simulink model, results and discussion.

II. STATE OF ART

The research work in the field of thermal modeling of power transformers is having some commonly accepted procedures that primarily come under either IEEE or IEC guidelines. IEEE Guide for Loading Mineral Oil-Immersed Transformers [1] is applicable to oil- immersed distribution and power transformers, with different types of constructions, along with



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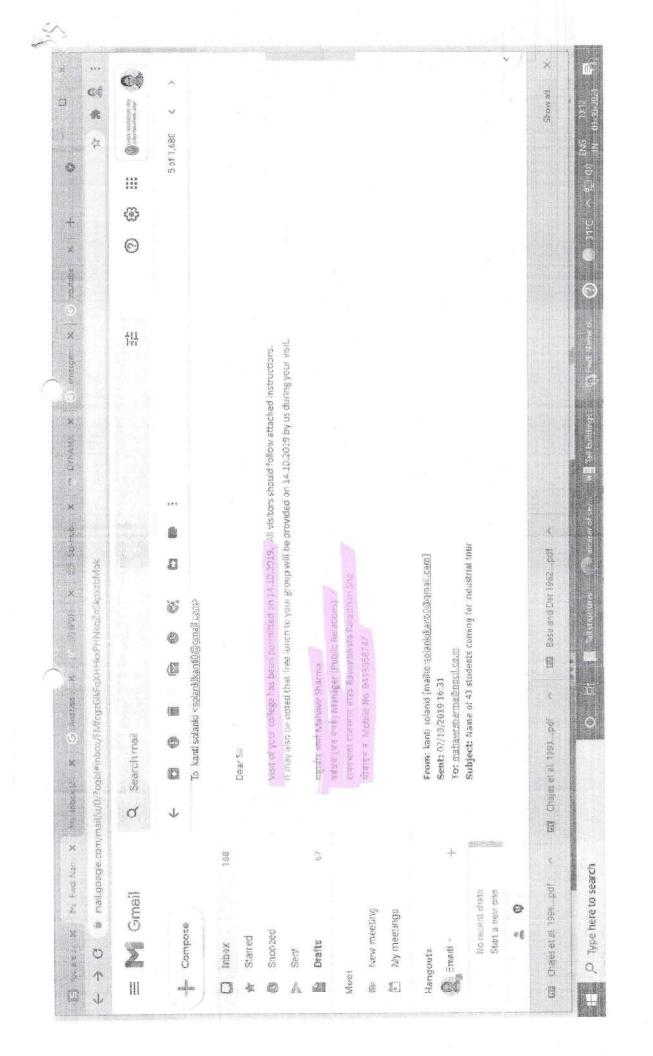
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Sr/Madapa,

The viva voce examination of MsJMr. Ramesh Parihar for award of the degree of Ph.D. in "POTENTIAL OF WIND ENERGY AND IT'S TECHNOLOGY DIFFUSION" has been fixed to be held on 20th December, 2019 at -11.30 a.m. in the Department of Mechanical Engineering.

All the members are requested to witness his her performance.

Yours faithfully,

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Dated: 07/12/19

Copy to:

1. All the Members of the Syndicate.

The Head, Deptt. of Mechanical Engineering, JNVU, Jodhpur with a request to make necessary arrangement for the viva-voce examination.

3. Prof. Kamiesh Purchit, Res. Sup. Dept. of Mechanical Engineering, INVU. Jodhpur.

 Ms. Ramešh Paribar, Dev Villas' Shiv Nagar, Behind Mahamandur Raliway Station, Joelipur.

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JAI NARAIN VYAS UNIVERSITY JODHPUR 342001 (Rajasthan)

Professor and Head

Department of Mechanical Engr. (1307), Faculty of Engineering & Architecture JNV University

Jodhpur

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Regards, the list of qualified students of MPET 2019 for your estcemed Department is enclosed. You are requested to initiate the admission procedure as per vacancy at your Department for these students in Pre-Ph.D. program as per University regulations and the essential points as approved by the Honourable Vice Chancellor for communication to you are as under:

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- Merit shall be computed in a similar way as that of previous session i.e. as approved iii. by the Academic Council and notified by the University
 - a. Percentage of Postgraduate marks and MPET marks be averaged, and be considered for computing benefits
 - b. Residential benefit (5% for State of Rajasthan and 5% for the Students of JNV University) be added to computed percent
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 - No other benefit is allowed. d.
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For Example; if a student has obtained 70% in postgraduation and 60 marks in MPET, and did his/her postgraduation from JNVU, qualified NET (LS), then his/her merit score shall be:

1	PG marks in percent	= 70
		= 60
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	Residential benefit	$= 65 \times 5/100 = 3.25$
5.	JNV University benefit	$= 65 \times 10/100 - 6.5$
6.	NET (LS) benefit	= 65 + 6.5 + 6.5 + 13 = 78
7.	Marks for Merit	= 03 + 0.3 + 0.3 + 10 - 70

The list of qualified students is enclosed, for postal address if required you may ask Academic section for the same. You may advise all the qualified students to submit the printed MPET application form along with statement of marks from schooling as per the requirements for Ph.D. admission, valid category (castc) certificate, domicile certificate, etc. providing sufficient time to these students so that they can submit these to your office. After proper verification of these documents at your end, you may proceed for admission as per rules.

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manne au ur

Sincerely your

(Sundaramoorthy)

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MPET Score (Marks) MG 81 72 52 50 64 64 64
Category OBC ST SC OBC SC SC CBC CBC
Fatter Name Motiram Chaudhary Prathu Lal Ram Dayal Banshi Lal Bajrang Lal Natthi Lal Rajari Lal
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Effect of Derating Factor on the Thermal Performance of Earth Air Tunnel Heat Exchanger: A Review

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Guest Faculty, Department of Mechanical Engineering, Government Women Engineering College Ajmer, India¹ Head of Department, Department of Mechanical Engineering, Government Women Engineering College Ajmer, India²

ABSTRACT: For the transient operating conditions derating factor is used to evaluate deterioration of Earth Air Tunnel Heat Exchanger's thermal performance. Derating factor depends upon soil's thermal conductivity, duration of continuous operation and the pipe length. Collection/rejection of heat from pipe to nearby sub soil is one the major problem in operating earth air tunnel heat exchanger because it alters the soil temperature which have adverse effect on the thermal performance of EATHE system with time. Hence the efficiency of EATHE system greatly depends upon extent of thermal saturation and the time required for self-recovery of soil around the buried pipe. Problem of derating factor are more severe with the soil having poor thermal conductivity.

KEYWORDS: Derating factor, Transient operation, Continuous operation, Thermal saturation

I. INTRODUCTION

Earth air tunnel heat exchanger used underground soil as heat source/sink and air as heat transfer medium. Earth can be considered as huge energy collector and storage medium. Ground has high heat capacity and have a large insulation potential. Hence soil temperature up to a depth of about 3-4 m remain constant throughout the year. Air after passing through underground tunnel exchange heat with surrounding soil and thus outlet air temperature higher in winter and lower in summer. Several researchers studied the EATHE system such as Ghosal et al. [10] investigate the performance of EATHE integrated with green house. Svec et al. [14] presented numerical model for steady-state, transient and cyclic behaviour of several configurations, and it was shown that substantially reduced heat flows were obtained when plastic pipe was used. Sodha et al. [11] also investigated the effect of length, radius of pipe and air mass flow rate on the seasonal cooling potential of an underground air pipe system. Sensitivity analysis based on system parameters such as inlet air temperature, air velocity, pipe length, pipe radius and the pipe depth for evaluating the performance of earth-toair heat exchangers was carried out by Tzaferis et al. [12] using eight different algorithms. Hakan et al. [13] investigated the performance of Ground Heat Exchangers (GHE) system consisted of pipes buried in the soil, which was used for transferring heat between the soil and the heat exchanger pipes of the Ground Source Heat Pump (GSHP) using a software developed in MATLAB environment. Bansal et al. [7] have studied the effect of three different types of soils with thermal conductivities of 0.52, 2, 4 (W m⁻¹ K⁻¹). It was found that maximum performance deterioration with prolonged operation takes place with soil having lowest thermal conductivity. It has been clearly seen through the literature review that thermal performance of EATHE system deteriorates upon its continuous operation, especially in case of lower soil thermal conductivity. Various researcher works on intermittent operation of EATHE to solve the system deterioration problem. Mathur et al. [2] investigated the transient conditions for three different soil conditions considering three operating modes. In first mode EATHE system works continuously for 12 h, in mode-2 it works for 60 min then turn off for 20 min. and in the mode-3 EATHE runs for 60 min and remain off for 40 min. The 3-different soil used i.e. soil-1, soil-2, soil-3 having thermal conductivity 0.52, 1.00, 1.28 (W m⁻¹ K⁻¹) respectively.

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A Experimental Study on Performance and Emission Characteristics of JATROPHA & DIESEL blend

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 3 Head of Department Mechanical Engineering, Government Women Engineering College Ajmer

ABSTRACT

The objective of this experimental study is to check the performance characteristics of four stroke single cylinder air cooled diesel engine by using different blends of biodiesel (Jatropha). Two different types of emulsion fuels were taken: B5 (95% diesel and 5% bio-diesel by volume) and B10 (90% dieseland 10% hio-diesel by volume) to compare its' performance with the 100 % diesel. Experiments on the engine were conducted with varying loads from 0 watts to 2000 watts with the help of electrical dynamometer by keeping engine speed constant at 1500 rpm. Experimental study shows the effect on fuel consumption, Mechanical efficiency, exhaust gas temperature and CO₂ (carbon dioxide), CO (carbon monoxide), NO_X (Nitrogen Oxides) and HC (hydro carbon) emission etc. with respect to the load on the engine. Emission of smoke, CO, CO₂, HC and NO_X of blend mixture were higher than the diesel but exhaust temperatures were lower than diesel.

Keyword : Jatropha, Straight vegetable oil, Blend, Mechanical efficiency

INTRODUCTION

Continuous increase in fuel prices and fast depletion of the available petroleum reservoirs has renewed an interest in the field of Alternative fuels. Some popular proposed alternatives include ethanol and gasoline blended fuels, plant based oils blended with or substituted for diesel fuel, waste vegetable oil in diesel engines. Biodiesel refers to a vegetable oil or animal fat-based diesel fuel consisting of long chain alkyl (ethyl, methyl or propyl) esters. Biodiesel is typically made by chemically reacting lipids (e.g. Vegetable oils, animal fat {tallow}) with an alcohol producing fatty acid esters. The national biodiesel board (USA) also has a technical definition of "biodiesel" as a mono alkyl ester. As per the National Biodiesel Policy, 2008 government of India aims that 20% of the diesel consumption from plants. To reach these targets we have to cultivate the biodiesel plants in 140,000 km² of land, presently in India fuel

yielding plants cover less than 5,000 km². Most cultivated plant for biodiesel production in India is "JATROPHA". It was reported that the research on the production of biodiesel has increased significantly in recent years because of the need for an alternative fuel which endows with biodegradability, low toxicity and renewability.

Some other alternate fuels which contain hydrogen and oxygen molecule like alcohol fuels, dimethyl ether and biodiesel fuels etc., have been analyzed. Many researches on biodiesel have been found to employee biodiesel as a fuel for diesel engine without modification in the available design. Biodiesels are one of the most promising alternate fuels for diesel engines because of its biodegradable, oxygenated, sulphur free and renewable characteristics. But the viscosity of biodiesel is higher than the diesel which put restriction over the use of larger volume of biodiesel in a blend mixture. To eliminate the problem of viscosity, Turpentine have been used in many researches as matching blend with Jatropha as it has lower viscosity and greater calorific value than Jatropha. Turpentine contains comparable autoignition temperature, boiling point and flash point with that of diesel so as to form a homogeneous mixture having more conducive physical properties. Some other problems such as carbon deposition on cylinder wall, fouling of injector nozzles due to unburned fuel, polymerization and gum formation in the presence of oxygen. The issue of gum arrangement can be mitigated by transesterification of bio-fuel and oxidation can be forestalled through the expansion of greasing up oil to bio-fuel. The advantages of biodiesel also includes as follows:

- Closeness to important diesel properties
- · Renewable in nature and local availability

• High miscibility with diesel without a blending agent in any proportion

- Excellent lubricity to reduce wear and to increase life of fuel injection pump
- · Safe storability and ease in handling and transport
- Ability to reduce CO₂ emissions compared to fossil diesel or remaining CO₂ neutral

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Date: 17 5 2018

The Head Department of <u>Mechanical</u> Engg. Jai Narain Vyas University Jodhpur.

Dear Sir/Madam,

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Waste Heat Recovery from the Exhaust of Internal Combustion Engines for the Purpose of Refrigeration and Air Conditioning: A Review

Swaraj Das^{1**}, Chandrapal Singh Inda¹, Prof. Dilip Sharma²

¹M. Tech in Thermal Engineering, Malaviya National Institute of Technology, Jaipur-302017, Rajasthan Professor, Mechanical Engineering, Malaviya National Institute of Technology, Jaipur-302017, Rajasthan **e-mail: swaraj.das30@gmail.com

Abstract--- The depletion of fossil fuels is a serious concern now a days. Internal combustion engines are one of the major consumers of fossil fuels. A large amount of energy from the internal combustion engine is wasted into the environment. Out of the total heat supplied to an internal combustion engine in the form of fuel, approximately 30-40% is converted into useful mechanical work; the remaining heat is expelled to the environment through exhaust gas and engine cooling systems, resulting into entropy rise and serious environmental pollution. So it very important to utilize this waste heat into useful work. The recovery and utilization of waste heat not only conserves fuel but also reduces the amount of waste heat and greenhouse gases dumped into the environment. In this paper a detailed study has been presented about the various conventional and recent methods of refrigeration and air conditioning used for the recovery of waste heat from internal combustion engines.

Keywords—waste heat recovery, vapour absorption refrigeration, adsorption

I. INTRODUCTION

Waste heat can be defined as the heat which is generated in a process by way of combustion of fuel or chemical reaction, and then rejected into the environment even though it could still be reused for some useful and economic purpose. The essential quality of heat is not the amount but rather its "value". The strategy of how to recover this heat depends in part on the temperature of the waste heat gases and the economics involved. Waste heat recovery is the collection of heat created as an undesired by-product of the operation of a piece of equipment or machinery to fill a desired purpose elsewhere. Large quantity of hot flue gases is generated from Boilers, Kilns, Ovens and Furnaces. If some of this waste heat could be recovered, a considerable amount of primary fuel could be saved. The energy lost in waste gases cannot be fully recovered. However, much of the heat could be recovered and loss minimized by adopting various measures [3].

Depending upon the type of process, waste heat can be rejected at virtually any temperature from that of chilled cooling water to high temperature waste gases from an industrial furnace or kiln. Usually higher the temperature, higher the quality and more cost effective is the heat recovery. In any study of waste heat recovery, it is absolutely necessary that there should be some use for the recovered heat. Typical examples of use would be preheating of combustion air, space heating, or pre-heating boiler feed water or process water. With high temperature heat recovery, a cascade system of waste heat recovery may be practiced to ensure that the maximum amount of heat is recovered at the highest potential

Out of the total heat supplied to an internal combustion engine in the form of fuel, approximately 30-40% is converted into useful mechanical work; the remaining heat is expelled to the environment through exhaust gas and engine cooling systems, resulting into entropy rise and serious environmental pollution. So it very important to utilize this waste heat into useful work. The recovery and utilization of waste heat not only conserves fuel but also reduces the amount of waste heat and greenhouse gases dumped into the environment.

Waste heat losses occur both from the equipment inefficiencies and thermodynamic limitations on equipment and processes. For example, let us consider an internal combustion engine converting 30-40% of supplied energy into useful mechanical work. This implies 60-70% of the supplied energy is lost as waste heat. Exhaust gases leaving the engine can have temperatures as high as 400-600°C which means that these gases have high heat content. Figure 1.1 shows the total energy distribution of an internal combustion engine [19].

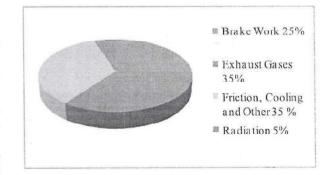


Figure 1: Total fuel energy distribution in LC Engine

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Review

A comprehensive review of biodiesel production from waste cooking oil and its use as fuel in compression ignition engines: 3rd generation cleaner feedstock

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ARTICLE INFO

Handling editor: Prof. Jiri Jaromir Klemeš

Keywords: Waste cooking oil Biodiesel Physicochemical properties Performance Emissions

ABSTRACT

Latest research on fuels focused on exploring better alternatives for compression ignition engines. A large number of studies reported that the properties of biodiesel are comparable with traditional diesel fuel, which makes it a suitable alternative source of energy. Among various available feedstocks, waste cooking oil is considered as the most viable source for biodiesel production. Apart from being economical, it also reduces waste disposal issues. High free fatty acids and water content in waste cooking oil cause the production of biodicsel difficult. In order to overcome this difficulty, two-step transesterification method is preferred for commercial scale biodiesel production. Several factors like catalyst concentration, alcohol to oil molar ratio, reaction temperature, and time of reaction affect the yield of biodiesel. This article provides a comprehensive review of biodiesel production from waste cooking oil and its use in compression ignition engines. In this review, fatty acid composition, pre-treatment process, catalytic and non-catalytic approaches of biodiesel production with their advantages and limitations are included. The effect of transesterification reaction parameters on biodiesel yield is also covered. The high viscosity of biodiesel than diesel fuel causes an increase in brake specific fuel consumption and a decrease in brake thermal efficiency of engines. Significant reduction in CO, HC, PM, and smoke emissions are identified; however, NO_X and CO₂ emissions found increased due to the oxygenating nature of biodicsel. Overall, it could be concluded that biodiesel produced from waste cooking oil serves as a cleaner and economical alternative source of fuel for compression ignition engines.

1. Introduction

Continuous increase in the world population causes a rapid rise in energy demand. By the y 2030, the world demand for energy was projected to rise by 53% in comparison with y 2001 (Talebian-Kiakalaich et al., 2013). Non-renewable fossil fuels will soon be depleted at this rate of consumption (Maceinos et al., 2011). The continued use of fossil fuel reserves like coal, oil, and gas may take another 200, 40, and 70 y, respectively (Shafice and Topal, 2009). Transportation, manufacturing industries, and power production are the major sectors of fossil fuel consumption (Vin et al., 2020). The burning of these fuels generated environmental issues, such as carbon emissions and global climate change (i an et al., 2018). The growing world's energy demand and global climate change create the need to explore alternative cleaner sources of energy (Yadav et al., 2014). Solar, wind, nuclear, hydro, and biofuels are possible alternative sources of energy (Sharma et al., 2024). Alternative fuel should be technologically viable, affordable, environmentally sustainable, and readily accessible (Lee et al., 2017). In this search, biofuels are the promising renewable source of energy with less carbon emissions (Mikuleić et al., 2020). Biodicsel is found to be the most suitable alternative to diesel fuel due to its comparable properties and cleaner-burning in compression ignition (CI) engines. It is classified into four generations on the basis of the type of feedstocks. First-generation biodiesel is derived from edible feedstocks like palm, sunflower, soybean, etc. Commercialization of biodiesel produced from these feedstocks is difficult due to the high cost of feedstock and food versus fuel competition (Jamil et al., 2018). If these oils are used to produce biodiesel, it will require more plantations, and due to this, unnecessary clearing of forests will happen (Mansir et al., 2018). These

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Review article

A comprehensive review of physicochemical properties, production process, performance and emissions characteristics of 2nd generation biodiesel feedstock: Jatropha curcas

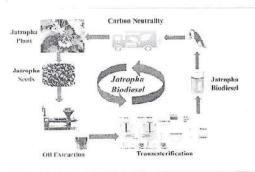
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GRAPHICAL ABSTRACT



ARTICLEINFO

Keywords: Non-edible feedstock Jatropha curcas Biodiesel production Biodiesel stability Physicochemical properties of jatropha Performance and emissions analysis

ABSTRACT

Due to limited reserves of conventional fossil fuels and their negative impact on global climate and human health, researches are focused to find the alternate energy substitute. Comparable properties of biodicsel make it one of the most promising alternatives of conventional diesel fuel. Jatropha curcas oil (non-edible oil) belongs to the second-generation of biodiesel. In this review, the physicochemical properties, fatty acids distribution, stability of jatropha oil are discussed in detail. The change in fatty acid profile affects the fuel properties, performance and emissions of diesel engines operated on jatropha biodiesel. Oxidation stability of jatropha biodiesel is poor due to the high amount of unsaturated fatty acids. Blending, thermal eracking, micro-emulsification, and transesterification are four basic approaches for production of biodiesel. Transesterification is the most adoptive method due to less expensive operation and high product yield. This article also highlighted the performance and emissions of compression ignition engines operated in jatropha biodiesel and its blends. The lower calorific value of jatropha biodiesel is responsible for the decrease in brake thermal efficiency and an increase in brake specific fuel consumption. High availability of oxygen in jatropha biodiesel reduces HC, CO, and PM emissions, while NOx emission increases significantly. This article provides

Abbreviations: JCO, jatropha curcas oil, CI, compression ignition; EASAC, European academies science advisory council; ASTM, American society for testing and materials; LHV, lower heating value; STI, self-ignition temperature; NTP, normal temperature and pressure; BSFC, brake specific fuel consumption; RDJO, refined deodorized jatropha oil; CSTR, continuous stirred tank reactor; PM, particulate matter; FAME, fatty acid methyl ester; B, biodiesel-diesel blend; FFA, free fatty acid; HHV, higher heating value; BTE, brake thermal efficiency; BP, brake power; RPM, rotation per minute; CC, cubic capacity; FAAE, fatty acid alkali ester

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A Comprehensive Review on 1st-Generation Biodiesel Feedstock Palm Oil: Production, Engine Performance, and Exhaust Emissions



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Abstract

The rapid depletion of conventional fuel reserves and the increase in environmental pollution prompted the search for a sustainable energy solution. Biodiesel is one of the most promising energy substitutes with similar properties as conventional diesel fuel. Surplus availability of palm oil makes it suitable for biodiesel production. Due to the lack of availability of review articles that cover the entire process of palm biodiesel production and its optimum use in diesel engines, the authors were motivated to write this article. Cultivation parameters of palm trees, extraction of oil, and physicochemical properties of palm oil-based biodiesel are explained in this review. The production of palm biodiesel from raw oil can be done through pyrolysis, micro-emulsification, blending, hydro-esterification, and transesterification processes. For high biodiesel yield and less cost of operation, the transesterification method is adopted. The performance and emission parameters of diesel engines that operated on palm biodiesel and its blends are also explained. There is a decrease in brake thermal efficiency and an increase in brake-specific fuel consumption observed with the use of palm biodiesel in diesel engines. A reduction in CO and HC emissions and an increase in NOx emissions are found due to the oxygenating nature of palm biodiesel. This article provides the scientific approach to find out the optimum parameters for palm biodiesel production and its efficient use in compression ignition engines.

Keywords Edible oil feedstock · Palm biodiesel · Biodiesel standards · Physicochemical properties · Palm oil fatty acid profile

Nomenclature

ASTM	American Society for Testing and Materials
BTE	Brake thermal efficiency
CI	Compression ignition
CN	Cetane number
SVO	Straight vegetable oil
CPO	Crude palm oil
BX	Biodicsel blend level
BP	Brake power
EASAC	European Academies' Science Advisory Council

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s12155-020-10171-2) contains supplementary material, which is available to authorized users.

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FFA Free fatty acid BSFC Brake-specific fuel consumption FAME Fatty acid methyl ester RPM Rotation per minute PM Particulate matter SIT Self-ignition temperature MW Molecular weight AN Acid number CP Cloud point SV Saponification value PP Pour point OSI Oxidation stability index FP Flash point MTBE Methyl tert-butyl ether IV Iodine value DI Direct injection HHV Higher heating value IDI Indirect injection WC Water cooled AC Air cooled S Stroke

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Evolution of solar still : A review

Amrit Lal*, Rishi Purohit, Chandrapal Singh Inda

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*Presented in International Conference on Advancements and Futuristic Trends in Mechanical and Materials Engineering held at Indian Institute of Technology Ropar (IITR), Rupnagar, during December 5-7, 2019.

ABSTRACT

Keywords: Nano-Fluids, Solar Still, Heat Transfer, Evolution, Thermal Efficiency. Solar still is a device which gives distilled water as a yield using solar thermal energy on a distillation of brackish water and seawater. This study discusses the results of previous efforts ratify that insulation thickness has a significant impact on the performance of the device. Also, the basin material has an ample effect on the production of distillate. Use of solar storage material in the basin increases productivity. Previous researches show that nano-fluids are widely used to enhance the evaporation rate, which increases distillate production. The results intimate that basin water level plays a significant role in the performance of still. Some modifications like installation of solar mirrors, fins, shallow solar pond, mini solar pond are done on still, which shows an increase in productivity of the device. This review paper gives an overview of the basics of solar still working, performance, and developments to enhance its efficiency.

1. Introduction

Water is an important constituent for human life. Now a time water is a fundamental human need for domestic and industrial use. As earth is covered from 71% of water, of which 97.5% being salt water and 2.5% is fresh water and only 1% is easily accessible, most of it trapped in glaciers and snowfield, only 0.007% of the whole water is available for use and to fulfil human fresh water demands. Now a time water scarcity is a global issue and due to urbanisation and industrialisation, human population had increased so demand for fresh water is also increasing day by day.

To solve this problem, Solar still water desalination technique was developed. Solar desalination is an alternative method to provide fresh water from saline sea water, brackish water. Solar stills can serve ultimate solution for providing potable water in those areas where availability of solar energy is in abundance but water quality is not up to standards. It uses solar radiation to evaporate water vapour from brackish water (waste water) which is then condensed and

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collected to give distilled water to be served as potable water.

Along with fresh water as global need, energy demand is also a major issue, 80% of global energy demands are fulfilled by fossil fuel [3] which are non-renewable sources of energy, which create carbon emission issues , which leads to unexpected climate change, global warming such environmental issues rises due to use of non-renewable resources to meet global demand. Total worldwide renewable energy desalination installation amount to capacities less than 1% of that of conventional fossil fuel desalination plants. This revive us to make renewable energy as an alternate source for clean, efficient energy [4] source and so comes the solar still water desalination technique which provide fresh potable water. Solar distillation uses solar energy as a renewable source of energy which makes it eco-friendly and feasible for clean energy crises. Also, the construction material required is easily available and subtly fabricated.

Solar still has advantages like its simplicity, low installation cost, great advantage in remote areas, easy maintenance, uses zero cost solar energy, pH and other water qualities of distillate are claimed to acceptable and are under standards [1],[2]. Although the major disadvantages with

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Synthesis of steam through parabolic trough collector-a review

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*Presented in International Conference on Advancements and Futuristic Trends in Mechanical and Materials Engineering held at Indian Institute of Technology Ropar (IITR), Rupnagar, during December 5-7, 2019.

ABSTRACT

Keywords: Parabolic Trough Collector (PTC), Steam Generation System, Concentrated Solar Power (CSP).	fossil fuels, it has become essential for having alternate sources of energy. Over the years, researchers and technocrats have advanced in the technology of converting solar energy, obtained from sunshine to heat energy. This paper reviews the practical development of solar steam generation system through Parabolic Trough Collector (PTC), using concentrated solar power, and making all this happen in an economically feasible way. This
	system through Parabolic Trough Collector (PTC), using concentrated solar

1.Introduction

The modern era has been dealing with the deficiency of energy, and the introduction of renewable energy sources is the need of the hour. Energy crisis and increased demand for energy have also spiked the energy costs. The current situation has compelled the industries, to use conventional fuels and for paying high prices to generate the same amount of heat that could be generated by a simple setup of renewable sources of energy. Solar energy is one such renewable, high exergy, radiant, and adaptable form of energy. With modern devices and techniques, the use of solar energy is made possible and economically feasible not only at industrial scale but also at small scale for the use at homes and commercial places in the form of solar heaters, boilers, and air heaters and also generate steam which is further used in cooking and for other purposes.

The primary requirement of most of the industries, i.e., thermal energy, which used to drive a range of simple and complex industrial processes, is called Industrial Process Heat

*Corresponding author, E mail: cpsinghinda@gmail.com (IPH). The thermal energy demand for IPH is generally below 300°C. According to Stadjuhar [1], 37.2% of the total IPH demand is utilized in the temperature range of 92-204°C.

The solar thermal collector works as a heat exchanger that transform solar radiation energy into internal energy of the transport medium. The significant component of any solar system is the solar collector. A collector is a device that absorbs the incoming radiation of solar energy and transmits or concentrates this energy onto a receiver. Solar collectors are either concentrating or non-concentrating type. In non-concentrating collectors, the collector area is much larger than the absorber area.

Among the two, concentrated plate collectors are more efficient and are capable of achieving high temperatures. There are various designs of concentrated collectors available currently like - parabolic trough collector, power tower, Fresnel concentrator, and parabolic dish collector. Among these, the parabolic trough collector is the most efficient.

The very first working module of a parabolic trough collector was developed by a Swedish engineer John Ericsson with a total collector surface of 3.25m2 and was able to drive the small steam engine of 373W. Later, in 1913, the

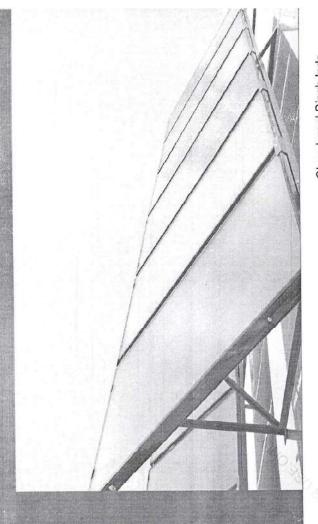
Manufacturing Technology Today, Vol. 19, No. 2, February 2020



Analysis of Solar Air Heater with and without Heat Storage material

Integrated with Thermal Heat Storage

Chandrapal Singh Inda Dilip Sharma Hemant Raj Singh



at plate collector. Solar air heater is ying the crops uprovement in the ir heater with and withcu e performance o Energy stored in the form of heat and cold can be us means of absorbing solar radiation r Solar ai to ai nce it can be very helpful in improving th ective of the work. II Solar a r energy into thermal en energy storage gaining impoed for the purpose of spa is an alternative sou mance ana ng more popularity olications tiat p

He is B.Tech (Mechanical Engineering), M.Tech (Thermal Engineering) and presently working as Assistant professor on contract with MHRD (NPIU, TEQIP-III) in the department of Mechanical Engineering M.B.M. Engineering college, Jodhpur, India. His research area is solar thermal system, heat transfer and heat storage system.



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Thermally sprayed alumina and ceria-doped-alumina coatings on AZ91 Mg alloy



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Keywords:

Thermal spray coatings Friction Wear Hardness

ABSTRACT

Present study deals with the development of ceramic based coatings for Mg alloys using thermal spray technique, where Al₂O₃ is doped with CeO₂. Coatings characteristics and other responses are recorded using Nano-indenter, Scanning Electron Microscopy (SEM). Energy Dispersive Spectroscopy (EDS), X-ray Diffraction (XRD) and Tribometer. The tribological behavior is recorded in terms of specific wear rates and coefficient of friction under lubricated reciprocating sliding condition for different loads and speeds. Ceria doped alumina coatings showed improved responses. The elastic modulus and nano-hardness of CeO₂ doped alumina coating was 13% and 53% higher than alumina coating, respectively. Under high load and high velocity conditions, ceria doped coating registered 40% reduction in specific wear rate. Also, the ceria doping helped in lowering the coefficient of friction during sliding.

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1. Introduction

With promising mechanical and physical properties, Mg alloys can be seen as a futuristic material of the 21st century. Mg alloys have been used in many applications for aerospace, automotive and electronic, biomedical industries [1]. However, the low corrosion and wear resistance of these alloys restricts their widespread use [2]. Corrosion and wear resistance are surface related properties and can be enhanced by surface protection. According to Archard's equation surface hardness controls the wear resistance [3]. Being one of the economical and versatile method, hard coating on Mg alloys can enhance the surface related responses. There are many coating techniques such as chemical vapor deposition (CVD) [4,5], physical vapor deposition (PVD) [4-6], electrodeposition [7,8], micro-arc oxidation [7,9], thermal spray [10,11], cold spray [11,12], etc. Thermal spray techniques are found to be promising tool to deposit wear and corrosion resistant coatings because of their good density and adherence to substrate. These coatings are well suited even at higher temperature applications [13-15]. The tribological behavior of thermal spray coatings are significantly improved than that of the bulk material [16]. Among thermal spray techniques, Detonation gun provides the coatings with low porosity, high bond strength and hardness [17]. Many researchers [5,8,10,18–20] have attempted coating to enhance the surface properties of Mg alloys but through thermal spray is barely reported.

Ceramic coatings have been extensively used in various industries such as power generation, automotive, aerospace for heat and wear resistance requirements. Especially, Al_2O_3 or Al_2O_3 based coatings possess high stability to chemical attack, high hardness and refractoriness which make them suitable for wear resistant applications [21]. He et al. [22] and Zhang et al. [23] reported that doping with rare earth elements into ceramic based coatings improves the mechanical properties and microstructural characteristics. Sharma et al. [24,25] reported that flame sprayed La₂O₃ doped Ni based coatings led to improvement in tribological properties of the coating. Li et al. [26] observed that addition of Y_2O_3 in laser cladded TiB/TiC reinforced coatings improves the sliding wear resistance and refines microstructure of the coatings. So it can be sought that doping with rare earth oxides in thermally sprayed coating can lead to improvement in ceramic based coatings.

Among rare earth elements, ceria has promising characteristics leading to improved mechanical and chemical properties [22,27]. Zhang et al. [28] conducted a tribological study on Fe based Ni-Cr-RE coatings, and concluded that addition of ceria in a small amount strengthen the metallurgical bond between coating and substrate thereby strengthening the interface by refining the microstructure and making more fine and compact. In another study conducted by He et al. [22]. microstructural and wear properties of Al₂O₃ – CeO₂/Ni based plasma sprayed

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EXPERIMENTAL ANALYSIS OF A SOLAR PARABOLIC TROUGH COLLECTOR

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ABSTRACT

In this study, an experimental analysis of a small-sized solar parabelic trough collector (PTC) has been done to investigate its performance. A PTC system with 4.075 m² operture area was evaluated in this paper. The experimental song is made up of statuless steel reflector. The performance of PTC was investigated in use parts. In the first part, performance low-sligation was done by using copper and stainless steel (1 inch diamoner) as receiver take material at different mass flow rates. In the second part, a comparison was done using have receiver take and receiver take (0.5inch) covered with acrylic cover at different mass flow rates. Both the cases were studied by using water as the locat transfer fluid. This study was conducted for fluiding out the better combination of receiver take, receiver take manufal diameter of receiver lube and mass flow rate. From first analysis, it was observed that the copper receiver tube is showing better performance at lowh the mass flow rates 0.01 kg/s and 0.02 kg/s in comparison of stainless sized take. The maximum thermal efficiency of 35.9% is obtained in case of a copper receiver at 0.01 kg/s mare flow rate. From the second analysis, it was observed that receiver take with acrylic cover is showing better performance than a bare take. The maximum deemsi efficiency of 61.4% was obtained in case of a receiver with an acrylic tube

Kay words: Parabolic trough collector, receiver tabe, acrylic tabe, thermal efficiency

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I. INTRODUCTION

Population explosion and advancements in reciprologies increase world's energy demand. At present, most of these energy demands are fulfilling by the next-tenewable energy sources such as fossil fuels, coal, oil and natural gas. These energy sources produce harmful emissions along with electricity generation which is dangaroas for human bralth and to the environment. Therefore, consideration of renewable energy sources is very important to reduce harmful gases and to mast the nequinements of the living population. On our planet, renewable energies are present in various forms such as solar energy, hydropower, gesthermal energy, wind emergies be present in various forms such as solar energy, hydropower, gesthermal energy, wind emergies because power and others, Solar energy is one of the biggest energy sources

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editor@latene.com

Experimental Analysis of a Solar Paraholic Trengh Collector

among all these renewable energy sources. It is one of the promising and most proven renewable energy option to substitute these non-renewable energy sources [1]. Solar energy on the earth surface can be harness by various concentrating and non-concentrating technologies such as flat plate collector, linear freshel collector, parabolic trough collector (PTC) and parabolic dish collector. Among all the concentrating and non-concentrating energy technologies, PTC is the parast suitable and osed technology.

Experimental analysis on PTC was conducted by various researchers to invest enhance its performance. Zou et al. [2] experimental study has been done to evalperformance of PTC using mirror reflector and evacuated aluminum receiver. They ob-67% thermal efficiency over with solar radiation loss than 310 W/m³. Results of this study indicated that when temperature of working fluid is under 100°C, thermal efficiency improves

Narendra Sing

Proceedings of the Adabit Intel International Machanical Regissoring Congress and Republica Riceanibus 11-17, 2016, Phoonis, Asizona, USA

IMECE2016-68074

ANALYZING THE EFFECT OF WORKPIECE STEPRIESS VARIATION ON THE STABLITY IN FLANK MILLING OF AN APPELLER BLADE

Narandra Bingh, Ankita Aground, Kapil Vibraskur, V. Kontis and Bukas B. Jeohi Bagarbares of Netherstail Engineering Relate Institute of Testimotogy Binetikey, Powel, Aturbie: 600075

ARSTRACT

This the blade like composition of archives their layer averstagated for their stability is samificance, investigat rade take components with varying dischasses along the length and with varying width along the keight have received links alteration to far. Therefore, this work forcases on gendycing the consistent of the constraints, one wave severate for energy or effect of energian workpress flexibles, confidence and rightley confidences and rightley of flack bins of the severation are supported black bins consponses and another experimentations are done on work opermises of its varying distributes should beight and its varying widts should bright Cupility foreign, neurisestion and defectives widths along beight Cvititig foreten, secretization and deflections of not not work spectramine work equivalent during of the expressions: through FPT plats, chanter boundary plats tofknowal by the sublidity togant slogitzens. The summa form data was negatived in laws dimains at form different locations under varying confollours of spinille spinile and slogitzes of cit, and were the mean impair line plotting induiting the summa longer for consolvisied stability rughts aligned along the suphi-mentioning, having the few chatter peeds of the single-maning in manufile in the foot set of 240 meaning. magneticales, in parasible at the feed rate of 240 semi-totat and depete of cut of 1.5 most, when the thickness, as much as the widtha so the suspecter black like spectromous are concentred

INTROQUE THOM

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hist matchess any of these stational structuritys Analytical modulity have been developed to produce and control adarwer ordentizones by controlledge the statisticating personations. These events at set [5] providential is 10.3 SUE for these wellow dottentizes to obtain silverstimin frequentizy an each processing of unitating operations. This doublets angularity the set of spravidic sprace and depite of each to tank the charger variations dataset of the (b) trachedad dur stidlingen and reterral Frequerrey of the considered systems of tool and readgeses for predicting stable depth of car and quent for flamble plans. Long et al. [7] program HD SLB for this wall workparter substing and depth of our, estim depth of det and speedle speed Unlike for sound exter depth of samo no can non species appears contain our traine access angles on curit for cuties depice of cruit dependent E.D. Itary proposed a instituted, where accessing an evel or restrict depicts of act and opendie aparatic votes considered within picture a 10 Ki D. Functions of 1 [4] suggestion direct and only the middle depict of our can be found used for a proper infiltence and workprises that depices of a statements. But also the stiffness and wookpares thickness can be produced for seable associations and a given specific and depetitio of can curveletions. Addresses and Beskeh (%) more time veryway dependence custome force confluences into an expansion (1) and units of your descen-rerise toronymetrics on calipletes through the task of the same and spansible spansis, using analytical random. Solar as at [10] proposed an advanced mander for stability nersbyes in message present of telefold-supported workniett inset as a dense

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EXPERIMENTAL WORK

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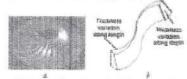


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Erosive Corrosive Wear Performance of Single Layer CrN Coatings on AISI 304 Stainless Steel in Sea Water Centrifugal Pumps using Steady State Analysis

Alok Vats

M. Tech, Production Engineering, MNIT Isipur, Pass out 2016 Address: Plot No. 761 Mundka, New Deibi- 110041 (Near Swati Modern Public School)

Abstract- The purpose of present study was to investigate the erosive corrosive wear behavior of single layer (CrN) coatings on AISI 304 Stainless Steel samples with varying coating thickness (0-200 nm) in the range of 50 nm. The clurry jet erasive test was conducted on Sherry Jet Erosion tester in saline slurry (3 5wi% sult) under the different working conditions with varying impact velocity (10-25 m(x), impingement angle (30* 75*) and evident discharge (160-280 gm/mm) Steady state analysis was applied to find optimum parameters for the minimization of erosion rute of various coated and uncoated samples. The finding of steady state condition tests indicated that the crosson rate increased with the increase in impact velocity and crodent discharge but decreased with the increase in coating thickness. The results also indicated that erodent discharge was the most significant factor, followed by impingement angle and impact velocity for the CrN coated samples. The SEM characterization of the croded samples was carried out in order to analyze the topography of the cruded surface to investigate the wear mechanisms induced by slurry jet erosion lest

Keywords— Erosive wear, corrasive wear, single layer coating, Steady state analysis, Scanning electron microscope (SEM).

I. INTRODUCTION

Prosion corrosion is the increase in the rate of degradation of the material caused by the combined action of electrochemical corrosion and mechanical wear processes. Corrosion is a material degradation process which occurs due to electrochemical action, while erosion is a incchanical wear process. When these two processes act together especially in the marine environments, it is known as erosion-corrusion. It is one of the major causes of failure in the nuclear power plants, chemical, petrochemical industries and marine environments where combined effect of erosion and corrosion phenomena occurs. In the marine held, this study applies to ship and boats. The study is

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equally beneficial in those areas where the underground saity water is supplied for household purposes, and the same has to be delivered to the overhead tank.

in the liquid- particle flow, the sand particles get impinged on steel surface which remove a layer of protective film from its surface. The chloride ions act rapidly on the exposed surface having discontinuity. In this way pure crosion and crossion enhanced corrosion are the dominant mechanisms that degrade the metal surface in crosion corrosion [1-6]. In order to improve the physical, mechanical and surface wear of metal such as steel, surface treatment such as mexification of surface using silanc. electroplating, Nuriding and coating etc are used [7-13]. A majority of surface modification lead to improved corrosive characteristics of the steel. Hence, they are also called corrosion inhibitors and are used on variety of steels. Neville et al. [7] studied erosion corrosion of engineering steels by the use of chemicals on X65 pipeline steel, 13Cr martensitic stainless steel and super-duplex stainless steels. They concluded that inhibitor has a greater effect on the corrosion component of carbon steel but offers no protection on super-duplex stainless steel under the conditions tested. In another research, Ilu et al.[14] essessed the effect of corrosion inhibitor on crosion corrosion of APJ-5L-X65 stainless steel in multi-phase jet impingement conditions and found that corrosion inhibitor provides up to 20% protection in crosion corrosion conditions and that oil phase reduces the crosion component by reducing the particle velocity in the flow conditions. Yao et al. [15] investigated a new method for protecting bends from crosion in gas-particle flows and reported that adding ribs on the outer-wall of the inside bend can significantly improve bend's crosion protection ability. Surface coating technology has also been deployed to enhance the crosive corrosive characteristics of the metals. Multilayer coatings offer protection against synergistic effects on bare stainless steel surfaces.

Corrosion Measursement, Friction testing and 2 XRD Analysis of Single Layer CrN Coatings on AISI 304 Stainless Steel

Alok Vats

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Abstract— The purpose of present study was to investigate the erosive correstive wear behavior of studie layer (CrN) coatings on AISI 304 Stainless Steel samples with varying coating thickness (0-200 nm) in the range of 50 nm. The sturry jet erosive test was conducted on Slurry Jet Erosion Tester in saline sturry (3.5wt% salt) under the different working conditions with varying impact velocity (10-25 m(s), impingement angle (30°-75°) and erodent discharge (160-280 gm/min). Corrusion tests were conducted in 3.5 wt 96 NaCl solution using a Polentiastat, in order to analyze the corrosion behavior of the coated samples in sea water environment. Coefficient of friction was measured using a Scritch Tester XRD analysis of the eroded samples indicated the presence of bath CrN and Cr₂N (200) in the coatings.

Keywords-Ecosive -corrosive wear, single layer coating, Potentiostat, Coefficient of friction, XRD analysts.

I. INTRODUCTION

Froston corrosion is the increase in the rate of degradation of the material caused by the combined action of electrochemical corrosion and mechanical wear processes. Corrosion is a material degradation process which occurs due to electrochemical action, while erosion is a mechanical wear process. When these two processes act together especially in the marine environments, it is known as crosson-corrosion. It is one of the major causes of failure in the nuclear power plants, chemical, petrochemical industries and massive environments where combined effect of crossion and corrosion phenomena occurs in the marine field, this study applies to ship and boats. The study is equally beneficial in those areas where the underground salty water is supplied for household purposes, and the same has to be delivered to the overhead Lunk

in the liquid-particle flow, the sand particles get impinged on steel surface which remove a layer of protective film from its surface. The chloride ions act rapidly on the exposed surface having discontinuity. In this way pure crosion and crosion enhanced corrosion are the dominant mechanisms that degrade the metal surface in crosion corrusion [1-6] In order to improve the physical. mechanical and surface wear of metal such as steel. surface treatment such as modification of surface using silane, electroplating, Nitriding and coating etc are used [7-13]. A majority of surface modification lead to memored corrosive characteristics of the steel. Hence, they are also called corrosion inhibitors and are used on variety of steels. Neville et al. [7] studied crosion corrosion of engineering steels by the use of chemicals on X65 pipeline steel, 13Cr martensitic stainless steel and super-duplex stainless steels. They concluded that inhibitor has a greater effect on the corrosion composent of carbon steel but offers no protection on super-duplex. stainless steel under the conditions tested. In another research, Hu et al [14] assessed the effect of corrosion inhibitor on crosion corrosion of API-5L-X65 stainless steel in multi-phase jet impingement conditions and found that contasion inhibitor provides up to 20% protection in crosson corrosion conditions and that oil phase reduces the environ component by reducing the particle velocity in the flow conditions. Yno et al. [15] investigated a new method for protecting bends from crosson in gas-particle flows and reported that adding ribs on the outer-wall of the inside bend can significantly improve bend's crosion protection ability. Surface coating technology has also been deployed to enhance the crosive corrosive characteristics of the metals. Multilayer coatings offer protection against synergistic effects on bare stainless steel surfaces.

Corrosion resistance can also be increased by providing an interlayer of a suitable material [16]. Coatings of CrN and CrCN have been commonly used in industry and research to improve surface properties of materials. However, CrCN coatings provide better corrosion resistance than CrN coated samples due to its superior mechanical properties [17]. Shan et al. [18] fabricated CrN coatings on 3161, stainless steel substrate by multiarc ion plating system, performed Polarization tests and

Taguchi analysis of single layer CrN coatings on AISI 304 Stainless Steel to study its erosive corrosive wear behaviour

Alok Vats

M. Tech, Production Engineering, MNIT Jaipur, Pass out 2016 Address: Plot No. 761 Mundka, New Delhi- 110041 (Near Swati Modern Public School)

Abstruct- The purpose of present study was to investigate the erosive corrasive wear behavior of single layer (CrN) coatings on AISI 304 Stainless Steel samples with varying coating thickness (0-200 nm) in the range of 50 nm. The sharry jet erosive test was conducted on Sturry Jet Kroston Textor in value shary (3 Swith soft) under the different working conditions with varying impact velocity (10-25 m/s), impangement angle (30°-75°) and erodent discharge (169-280 gm/min). Taguchi analysis was upplied to find optimum parameters for the minimization of erosion rate of various coated and uncoated samples. The results of Taguchi experiments also indicated that among all the factors, impact velocity became least significant when samples were conted with UrN whereas it was most significant for uncoated samples. Conting thickness was the second must significant factor in the cuse of CrN coated samples. PVD: CrN coatings reduced the wear rate by nearly 2 times.

Keywords — Erasise wear, corrasive wear, single layer couting, Taguchi Orthogonal Array.

I. INTRODUCTION

Prosion corresion is the increase in the rate of degradation of the material caused by the combined action of electrochemical corrosion and mechanical wear processes. Corrosion is a material degradation process which occurs due to electrochemical action, while erosion is a mechanical wear process. When these two processes act together especially in the marme environments, it is known as croshin-corrosion. It is one of the major causes of tailure in the nuclear power plants, chemical, petrochemical industries and marine environments where combined effect of erosion and corrosion phenomena occurs in the marine field, this study applies to ship and boats. The study is equally beneficial in those areas where the underground salty water is supplied for household purposes, and the same has to be delivered to the overhead tank

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Jagmohan Rao

Processings of the Asian Congress on Gan Turbings ACCEVENTS 14-16 November 2016, Indian Institute of Yechnology Bombey Manufaul, India

ACGT2016 ***

COMBUSTION IN THERMALLY AND COMPOSITIONALLY STRATIFIED MIXTURE: A 2D DNS STUDY

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Keder G. Mada IC Engine and Combustion isconstory, ST Bombay Munbal, Inda

2.,

R.Szooghara IC Engine and Combustion interatory, IT Bombay Mambai, India

ABSTRACT

HCCI mode of constantion suffers from drawbacks like lack of ignition coarrol, rapid pressure rise. Stratification of charge prior to combustion is one of the ways to control the combustion in the HCCI engine. 2D DNS has been carried out to study the effect of thermal and charge stratification on combustion in a-Heptane/air minture at high pressure stad constant volume. Peak HRR fails in the stratified environment compared to homogeneous environment due smaller number of sites favorable for combustion in the stratified environment. Peak HRR was found to drop sharply and combustion duration increased with increasing level of temperature stratification. Equivalence rates stratification also affected the peak as well as duration of combustion. These effects were attributed to the primary dependence of ignition delay on imperature. Keywords: DNS. HCCI, Stratification, Jenitica delay

NOMENCLATURE

- 20 **Two Dimensional**
- Specific beat at constant pressure of all species Can
- Direct Numerical Simulation DINS
- RCCI Homogeneous Charge Compression Ignition
- 冠鼠科 Heat Release Rate
- 12345 Root Mean Square
- Val f" component diffusion velocity of a" species (su's)
- W Molecular weight (lig/male)
- 钢
- Mean malecular weight of mixture (g/male) Mass fraction of a²⁰ species ¥.,
- Total energy per unit volume (1/us') Entitalpy of ath species (1/kg) r,
- AN9 .. Heat of formation of a species (L'sg)
- Pressure (Nim⁴) 13
- Heat flax in 1⁴ direction (Wim²)
- Time (a)
- 1 (* component of velocity (m/s)
- à. Kronecker delta Dynamic viscosity (N-s/m²)
- 봟 Density (hg/m⁴)

Stress tearce (N/m²)

Molar rate of production of ath species (meda/m¹-s) 63.

MTRODUCTION:

Combastion in the isoccal combastics engines takes place at the extremes of stratification levels, from nearly koningeneum minture in \$1 magine to mistage with high tempeneture and composition gradients in conventional CI engines. High fast concentration regions in CI engine produce sont and high flame integenature regions produce NOx. Attempts are underway to combine properties of \$7 and CI engines through HTYI technology to sweld such regions. Herever HECI made of construction presences derwenche like lack of ignition control, high noise, processes rise at high lands. Stratification of integerative and composition midway between histogeneous and conventional Cl engine is one of the trategies proposed for eliminating these depulsicles . Yes er of [1]. Study of influence of stratification on the ignition and combastion is thus essential and applicable to the gas turbine comfunctor as well.

a-Heplane is reference find used to study som-optimize in CI engines environment and engine knock because cenase number of a-Meptane, appendiantely 56, is closer to commercially available diesal fael. Curran or of [2] It has been ubnoved that depending on the initial temperature and greatester conditions. s-Meptane can undergo ignizion and conduction in (900 stages [2-4]. Several Direct Namerical Stradation (DNS) studies have been doze to understand its ignition and combustion. Based on 2D as well as 3D DAS studies of m-Heptans in a ans pressined minters, Sreedhara and Lakahmidas [5.6] found that anto-ignition occurred at places, where loss scalar dissipation and must meetive mixture fraction value isentity exist. Location of auto-ignition points relative to vortices was also studied and auto-ignition spons were found at cure of variation. Bansal and his [7] studied the auto-lenitors of Hy/mir mixture with different correlations between temperature and equivalence ratio fluctuations. Different modes of

8

combustion were observed and the criterios to damaguish between these modes was also proposed. Locate of al [8] performed the DNS of n-Hoptane/air mixture only in presence of transposations furtuations. Again different patterns of combustion were observed depending on level of anstitication Common feature of many studies is that, with straitfication heat release spreads over a longer duration and peak of heat release rate also falls. However behavior of tentities delay with version levels of stratification is not respectatic, Takel et al. [9].

The objective of the present study is to investigate the effect of thermal and composition stratification on hear release rate and ignition delay. Single step mechanism of n-lieptune oxidation is used. In our study five different cases with thermal and mixture studification have been considered. Local fluctuations in temperature have negative correlation with fluctuations in equivalence ratio. Thermal strauffeation of 15 K. 30 K, 60 K and compositional stratification of 0.1, 0.15 and 0.2 have been used.

Conservation of Species:

$$\frac{\partial_{\mu}Y_{\mu}}{\partial t} + \frac{\partial(\mu Y_{\mu}u_{\mu})}{\partial x_{\mu}} = -\frac{\partial(\mu Y_{\mu}V_{\mu,\mu})}{\partial x_{\mu}} + W_{\mu}\partial u_{\mu} \qquad (4)$$

Where.

Total enorgy (#,) is defined as

$$c = \rho \frac{u^2 + v^2 + u^2}{2} + \rho \sum_{a=1}^{n} (k_a T_a) - \rho$$
 (5)

The pressure ρ is computed using the perfect gas law.

$$=\rho \frac{R}{W}T$$
 And $\overline{W}=\rho \sum_{i=1}^{N} \left(\frac{Y_{i}}{W}\right)^{-1}$

Westerne startin ressure (P) :

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Conference Proceedings

EuroSun 2016 Palma de Mallorca (Spain), 11 - 14 October 2016

11th ISES EuroSun2016 – Design and Dynamic Simulation of a Small Multipurpose Solar Thermal System for Rural Necessities

Simone Amicebile¹, Christophe Hick², Surendraneth Yagnemurthy³, Metile Roccabruna¹, Ankk Dey⁴, Luigi Crema¹

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Abstract

The proposed paper explains in detail the sizing process and dynamic simulation of a solar powered system designed to satisfy the energy demand of a school in the rural area of Haridwar district, India. The system is able to satisfy heterogeneous power demands for typical rural applications: hay pasteurization process, refrigerated storage for vegetables (explained in a second publication) and steam cooking. The considered layout is first described and evaluated under steady state assumption to identify the rough size of the main components. The specific configuration is then implemented and annulated using a Modelica-based layout, specifically developed for the case study. The dynamic behaviour of the system for different power requirements is simulated and analyzed over a typical day of usage. The goal to properly size and study the solar field. Phase Change Material (PCM) thermal storage and overall Balance Of Plant (BOP) is achieved. Simulations results show that an optimal sizing can be achieved despite the large area of solar collectors required to ensure the power requirements of the facility. A better trade off between economic investment and system effectiveness can be accomplished slightly shifting the daily cooking activities. The final designed system is going be implemented and commissioned in the proposed rural area. Future

work will consist in comparing experimental data with the dynamic model predictions.

Keywords: CSP, Solar cooking, Solar cooling, Solar hay processing, Dynamic modeling, Dymola.



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Carter Ralph · Meredith Silberstein Piyush R. Thakre · Raman Singh Editors

Mechanics of Composite and Multi-functional Materials, Volume 7

Proceedings of the 2015 Annual Conference on **Experimental and Applied Mechanics**





Solanki"

राष्ट्रीय परियोज्तना कार्यान्त्यता एक्ट्रक (199-1)1781 में 1974 के मलाइक परिमाजना के कार्य कार्या कार्या गांवन वा स्वय मा एक्ट्र) National Droject Implementation Unit (A UNIT OF MINISTER OF INJOINTEE - - + DIVIDEMENT - - + INCALIBUTATION (A UNIT OF MINISTER OF INJOINTEE - - + DIVIDEMENT - - + INCALIBUTATION (MULTIMENTATION OF WORLD AND - - + DIVIDEMENT - - + INCALIBUTATION

18th June 2019

CERTIFICATE OF SANCTION

This is to certify that a Research Proposal entitled, "Development of HVOF coatings on Al alloy composites for impeller blades in centrifugal pumps." has been approved under "TEQIP Collaborative Research Scheme" to the team of following Collaborators:

1	Mr. ALOK VATS	Principal Investigator	MBM Engg College, Jodhpur
2	Mr. PRADEEP KUMAR	Co-Principal Investigator	MBM Engineering College, Jodhpur
3	Mr. AMAR PATNAIK	Co-Principal Investigator	MNIT JAIPUR MNIT JAIPUR
4	Mr. MAKKHAN MEENA	Co-Principal Investigator	

A grant of ₹1307000 (Rupees Thirteen Lakh Seven Thousand Only) has been sanctioned for the project, as per following details:

S.No.	Expenditure Head	Sanctioned Amount	
1	Non-recurring	950000	
2	Recurring		
den	(i) Domestic Travel	90000	
	(ii) Contingencies	83333	
	(iii) Consumables	133333	
	(iv) Miscellaneous	50000	
	Total	1307000	

The project is to be completed with expected outcomes achieved on or before 30th Sept 2020.

Prof. (Dr.) P M Khodke Central Project Advisor

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Saksham Microsoft CERTIFICATE OF PARTICIPATION This is to certify that of Alok, Vats Mr. /Ms. _ M.B.M = Engineering College, Jodhpur College/University has successfully completed SAKSHAM - TEACHING WITH TECHNOLOGY 26th March to 27th March from____ 2018 TRAINING Vinie Je cs Scanned with CamScanner









Virtual Labs Workshop MBM ENGINEERING COLLEGE, JODHPUR 3-4 April 2019

CERTIFICATE

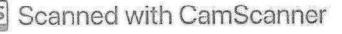
This is to certify that Mr./Ms. ALOK VATS, MECHANICAL ENGINEERING, M. B. M. ENGINEERING COLLEGE JODHPUR attended the Workshop on Virtual Labs under the National Mission on Education through ICT, (MHRD Govt. of India) on 3-4 April 2019 jointly conducted by Virtual Labs, IIT Roorkee and MBM Engineering College, Jodhpur,

MBM Engineering College

Nodal Coordinator, Virtual Labs

Team Virtual Lat HT Roorkee

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Review on Fabrication of Aluminium Metal Matrix Composite

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Abstract

Engineering works are full of exploration and always seeking for the better material to build with. The properties that are shown by already existing pure materials have their own limitations in terms of strength to weight ratio. Thus, the composite materials are used in many engineering applications due to their excellent properties. The sandwich composite materials replace the metals owing to their excellent strength with low weight. This work gives an introduction



about Metal Matrix Composite to fabricate the composite of Aluminium with other constituents. Fabrication is not the only part, further AMC (Aluminium Matrix Composite) is tested for different aspects to achieve the required tailored properties. Various tests refer to mechanical strength testing of the material and investigation of the matrix at micro level which is known as Micro Structural Investigation. SEM (Scanning Electron Microscope) and XRD (X-Ray Diffraction) are the test and analyses which are performed to obtain the best results in machining and smoothness in fabrication.

Keywords: MMC (Metal Matrix Composite), AMC (Aluminium Matrix Composite), Microstructural Investigation, SEM (Scanning Electron Microscope), XRD (X-Ray Diffraction)

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INTRODUCTION

Current engineering applications require lighter as well as stronger materials i.e. major focus is given on strength to weight ratio. Modern manufacturing sector demands for materials with broad range of properties like high thermal resistance, minimum wear rate, good damping properties, high specific stiffness etc. Metal-matrix composites (MMCs) are engineered combinations of two or more materials (one of which is a metal) where tailored properties are achieved by systematic combinations of different constituents. Typically, a composite material is made of reinforcement and a matrix. The reinforcement material provides the mechanical strength and transfers loads in the composite. The matrix binds and maintains the alignment or spacing of the reinforcement material and protects the reinforcement from abrasion or the environment.

MMCs are classified into different categories depending upon the matrix materials. Some examples of most commonly used metallic matrix configurations are:

- Aluminium-based composites; aluminium as matrix can be either cast alloy or wrought alloy (i.e., Al Mg Si, Al Mg, Al Cu Si Mn, Al Zn Mg Cu, Al Cu, Al Si Cu Mg)
- Magnesium-based composites
- Titanium-based composites
- Copper-based composites

Aluminium Matrix Composite

A study on Life Cycle Assessment

Arjun Ram, Piyush Sharma Dr. Dinesh Shringi

Abstract

Over the last decades, stringent regulations forced the manufacturing industry to take concrete steps towards greener production. Despite reduction in total emissions through implementation of best available techniques (BATs), industrial waste generators still need guidance to minimize environmental impacts of manufacturing processes. Environmental impact assessment will soon become a compulsory phase. An impact assessment tool is therefore used for the environmental evaluation. The evaluation method used is the life cycle assessment (LCA) method. The quick and easy assessment of energetic and environmental performances contributes to determine the weak points of various products technologies and services or production processes or the best suited treatment in a specific context.

Index Terms— Life cycle assessment (LCA); Environmental impact; Energy consumption; Potable water supply

I. INTRODUCTION

The global ecological footprint of humans, which considers human resource use, has increased by 80% from 1960 to 2000 Presently, every year 1.2 times more resources are consumed than can be renewed in the world [1]. The scarcity of natural resources is reflected in increases in the price of raw materials and natural substances. As environmental awareness increases, industries and businesses are assessing how their activities affect the environment. The environmental performance of products and processes has become a key issue, which is why some companies are investigating ways to minimize their effects on the environment. Many companies have found it advantageous to explore ways of moving beyond compliance using pollution prevention strategies and environmental management systems to improve their environmental performance[2]. One such tool is LCA. Life cycle assessment is a "cradle-to-grave" approach for assessing industrial systems. "Cradle-to-grave" begins with the gathering of raw materials from the earth to create the product and ends at the point when all materials are returned to the earth[3]. LCA evaluates all stages of a product's life from the perspective that they are interdependent, meaning that one operation leads to the next. LCA enables the estimation of the cumulative environmental impacts resulting from all stages in the product life cycle, often including impacts not considered in more traditional analyses raw material extraction. material (e.g.,

Manuscript received October 01, 2011. (Fill the Details)

Arjun Ram , Mechanical Engineering ,MBM ENGINEERING COLLEGE, JNVU, JODIIPUR, (Email- arbanawariya@yahoo.co.in) Piyush Sharma, Mechanical Engineering ,MBM ENGINEERING COLLEGE, JNVU, JODHPUR, (Email- <u>piyush138090@gmail.com</u>). Dr. Dinesh Shringi, Mechanical Engineering ,MBM ENGINEERING COLLEGE, JNVU, JODHPUR, (Email- drdshringi@gmail.com). transportation, ultimate product disposal, etc.). LCA provides a comprehensive view of the environmental aspects of the product or process and a more accurate picture of the true environmental trade-offs in product and process selection [4]. Figure 1. illustrates the possible life cycle stages that can be considered in an LCA and the typical inputs/outputs measured.

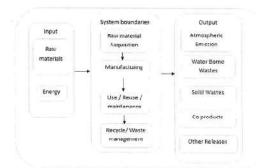


Fig 1 Life Cycle Stages

The LCA process is a systematic, phased approach and consists of four components [5]: goal definition and scoping, inventory analysis, impact assessment, and interpretation as illustrated in Fig 2:

 Goal Definition and Scoping - Define and describe the product, process or activity. Establish the context in which the assessment is to be made and identify the boundaries and environmental effects to be reviewed for the assessment.

 Inventory Analysis - Identify and quantify energy, water and materials usage and environmental releases (e.g., air emissions, solid waste disposal, waste water discharges).

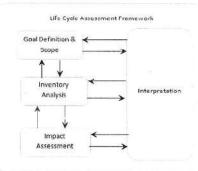


Fig 2 Life cycle framework

 Impact Assessment - Assess the potential human and ecological effects of energy, water, and material usage and the environmental releases identified in the inventory analysis.

4. Interpretation - Evaluate the results of the inventory analysis and impact assessment to select the preferred product, process or service with a clear



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A REVIEW OF DEVELOPMENT AND FINITE ELEMENT MODELING OF THERMO-MECHANICAL BEHAVIOR OF NANOPARTICLE REINFORCED ALUMINUM BASED COMPOSITE

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Abstract

Metal matrix composites reinforced by nano-particles are very promising materials, suitable for a large number of applications. These composites consist of a metal matrix filled with nanoparticles featuring physical and mechanical properties very different from those of the matrix. The nano-particles can improve the base material in terms of wear resistance, damping properties and mechanical strength. Different kinds of metals, predominantly Al, Mg and Cu, have been employed for the production of composites reinforced by nano-ceramic particles such as carbides, nitrides, oxides as well as carbon nanotubes. The main issue of concern for the synthesis of these materials consists in the low wettability of the reinforcement phase by the molten metal, which does not allow the synthesis by conventional casting methods. Several alternative routes have been presented in literature for the production of nano-composites. This work is aimed at reviewing the most important manufacturing techniques used for the synthesis of bulk metal matrix nanocomposite.

Keywords- Nano particles, bulk metal matrix nano-composite, nano ceramic particles.

I. INTRODUCTION

Aluminum is one of the most exploited materials in various fields of applications including constructions, packaging, and transportation and of course product design. It can be recycled numerous times wielding to products of almost equal quality. Some of its basic properties such as exceptional strength, low density and resistance in corrosion have placed it as an ideal matrix for the creation of composite materials.

Particulate reinforced metal matrix composites (PRMMCs), especially aluminum alloy matrix composites, are

currently being used in many automotive components such as drive-shafts in trucks, brake rotors and liner of engine blocks, etc. Addition of ceramic particulates into aluminum alloy matrix improves the stiffness and strength of the reinforced matrix while conserving a quasi-isotropic nature and traditional manufacturing techniques for casting alloy. However, the microstructure of PRMMCs becomes as very complicated due to the variation in the size, shape and distribution of particulates, and then a precise prediction to its mechanical

1



A REVIEW OF FABRICATION, CHARACTERIZATION AND MATHEMATICAL MODELING FOR DESIRE RESPONSES DURING MACHINING OF ALUMINUM METAL MATRIX COMPOSITES

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Abstract

This work deals with study of producing aluminum based Metal Matrix Composite and then observing its microstructure and mechanical properties such as tensile strength, impact strength and Hardness of produced test specimen. A composite material is a combination of two or more chemically distinct and insoluble phases; its properties and structural performance are superior to those of the constituents acting independently. Metals and ceramics, as well, can be embedded with particles or fibers, to improve their properties; these combinations are known as Metal-Matrix composites. Aluminum alloy constitutes a very important engineering material widely employed in the aircraft and aerospace industry for the manufacturing of different parts and components. It is due to its high strength to density ratio that it a sought after metal matrix composite. Various processing techniques for the fabrication of Aluminium matrix composites, testing of their mechanical properties are available.

Keywords- Aluminum alloy, metal matrix composite, insoluble phases

I. INTRODUCTION

In the present scenario, automobiles, recreational industries and aerospace applications require materials that have high strength, hardness, wear resistance and strength to weight ratio and less expensive where fuel economy with improved engine performance are becoming more important. It is very difficult to achieve these properties in any monolithic material (Tjong, 2014). Metal matrix composites (MMCs) materials has been noted to offer such tailored property combinations due to their unique

mechanical and physical properties such as high specific strength, low coefficient thermal expansion and high thermal resistance, good damping capacities, superior wear resistance, high specific stiffness and satisfactory levels of corrosion resistance (Rino, et al., 2012; Alaneme and Bodunrim, 2011; Surappa, 2003; Kok, 2005).

In recent year, MMCs are widely used engineering material which replacing conventional metallic alloys in so many applications likes aerospace and

1

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Facility Layout Optimization Using Simulation: A Case Study of a Steel Utensils Industry

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Abstract- Facility Layout Problem (FLP) is one of the essential problems of several types of manufacturing and service sector. It is an optimization problem on which the main objective is to obtain the efficient locations, arrangement and order of the facilities. The utensils industry in this study is a typical instance of a work-flow shop based production system. The efficiency of production system depends on how well the various machines, services production facilities and employee's amenities are located in a plant. This research paper aims to study and improve the current plant layout. An attempt is made to simulate the current and the proposed factory layouts by using ARENA software. The efficiency of the current and the proposed plant layouts are compared.

Keywords: Computer simulation, Factory Layout, facility-layout problem, Manufacturing system, ARENA, Layout design.

1. Introduction

Plant layout is the arrangement of facilities such as machinery, equipment, furniture etc. within the factory building for flow of material at the lowest cost and with the minimum material handling in processing the product from the raw material to the finished product [1].

A good facility-layout problem (FLP) is known for to make significant impact on the manufacturing costs, work in process, lead-time and productivity. A good facility layout affect the overall efficiency and as well as reduced total operating costs up to 50% [2]. FLP used to finding the optimal facility-arrangement in the existing layout in such a manner that a set of criteria is met and/or some objectives are optimized. Also, it is a fundamental optimization-problem can be used in many industry such as manufacturing and service organizations [3].

This study focuses on developing a new production layout for a utensils industry in view of the need to increase the production capacity. The simulation is used to solve facility layout problem and hence minimizing the total material handling cost.

2. Literature review

Spending a little time to plan the arrangement before installation can prevent unnecessary losses [4. Producing products with high quality and provides good service with low cost in short time using the fewest resources is the objective of properly managing a facility [5]. It is important that the facilities must be managed properly in order to attain the objective. [6]

Stefan Bock [7], proposed the detailed layout-planning by simulation for determining machine-arrangement and transportation-paths. Facilities planning could be arranged the entire layout may have irregular shapes and sizes [8]. Iqbal and Hashimi [9] demonstrate that factory-layout is the focal point of facility-design. It dominates the thinking of most managers.

Simulation is applied in various field such as manufacturing, services, defense, healthcare, and public services, etc. Simulation is recognized as the second mainly used technical instrument in the field of operations management [10].

Fox [11] presented the definition of factory simulation is defined as "extendable and interactive discrete simulation system constructed to interpret the factory model directly. It allows the user to dynamically query the simulation for state information (e.g., state of a machine, process, etc.), where objects are located (e.g., what operation is being carried out on an order), and regular statistical analyses. It also allows the user to alter the factory model before and during simulation. The factory can be simulated and displayed at variable levels of detail".

Bobby John et al simulate the factory layout using the software ARENA (student's version). They defines that production efficiency depends on various factors such as machines, production facilities and employee's amenities. A simulation study was under taken to find out the efficiencies of the machines in the industry [12].

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CFD Based Thermal Efficiency Analysis of Solar Air Heater with Smooth Plate & Perforated Plate

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Abstract: This paper presents study of computational fluid dynamics (CFD) based thermal efficiency analysis to determine heat transfer characteristics of solar air heater Artificial roughness is used in one side wall of solar air heater absorber plate to break laminar boundary sub layer. It enhances rate of heat transfer from the absorber plate to flow of air stream. A CFD-based investigation of 3-dimensional forced convective fluid flow over solar air heater rectangular duct with smooth plate & half perforated transverse baffles plate has been performed in ANSYS FLUENT software. The system & operating parameter studied are duct width-to-height ratio of 7.77; the baffle relative roughness pitch ratio is 7.06; the relative baffle height ratio is 0.495 for the Reynolds number ranges from 3000 to 9000. The effect of roughness geometry [i.e., relative roughness height of baffle (e/h). relative roughness pitch of baffle (p/e), open area ratio (β)] on the heat transfer coefficient and Nusselt number are predicted. Solar air heater with artificial roughness experimental model's 3-dimensional geometrical modeling made with aid of ANSYS Workbench. The simulation results were predicted by ANSYS FLUENT 14.5 solver. Validation of results compared with performed experimental work and found to be in good agreement. Over the range of study the raise in heat transfer coefficient of half perforated absorber plate in range of 7-13 W/m²K over smooth absorber plate of solar air heater for variable mass flow rate. The 15% minimum raise in thermal efficiency of roughen plate compare with smooth plate of solar air heater.

Keywords: Solar air heater, CFD, Artificial roughness, Thermal efficiency, ANSYS-FLUENT.

1. Introduction

This paper present computational fluid dynamics approach to determine the thermal performance of flat plate solar air heater by considering the different system and operating parameters to obtain maximum thermal performance. The report

ascertains about thermal performance for different mass flow rates, for absorber plate, at same solar flux intensity. Several methods are used to increase rate of heat transfer and thermal efficiency. Some of these are, use of fins, electro hydrodynamic method, packed bed, use of artificial roughness on absorber plate etc. Among these the easiest and most acceptable method to enhance the thermal and Thermo-hydraulic efficiency is the creation of artificial roughness on the absorber plate of solar air heater. It is observed that thermal resistance to the heat transfer is due to the formation of laminar sub-layer on absorber plate. Roughness clements have been used to improve the convective heat transfer by creating turbulence in the flow. However, it would result in an increase in friction losses and hence, greater power requirement by fan or blower. (Karmare, cfd. 2010)

There are different factors affecting the solar collector efficiency, e.g. collector length, collector depth, type of absorber plate. glass cover plate, wind speed, etc. Increasing the absorber area or fluid flow heat-transfer area will increase the heat transfer to the flowing air (Chaane*et al.*, 2013a-e). B. K. Maheshwari et al. [1] Roughness elements in

The form of ribs (small height projections), baffles (thin elements of greater heights) or blocks (the thick elements) have been employed to enhance heat transfer in gas turbine blade cooling channels and solar air heaters. Chaube et al. [2] conducted two dimensional CFD-based analysis of an artificially roughened solar air heater having ten different ribs shapes, namely, rectangular, square, chamfered, triangular, and so forth, provided on the absorber plate. CFD code, FLUENT 6.1 and SST k- ω turbulence model were used to simulate turbulent airflow. The best performance was found with rectangular rib of size 3 × 5 mm, and CFD simulation results were found to be in good agreement with existing experimental results.

Experimental studies of evaluation performance of various design of solar air heating system with specific value adding parameter has been conducted more as compare to computational and numerical analysis of such system, due to complicated flow simulation methodology and

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Different designs and parametric study of solar water distillation system

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Abstract

Solar desalination is one of the promising methods of harnessing the solar renewable energy for fulfilling potable water requirement for small communities where the natural fresh water supply is inadequate. This paper presents the literature review to categorize solar stills into six sorts based on the design guidelines and their parametric study. It presents designs and the studies carried out by various researchers to find out the effect of various design and operating parameter on the efficiency (out put) of distillation units suggested. Basin type solar still with simple symmetrical still, vertical basin with improved condensation, increased surface area and basin still with a built in sandy heat reservoir, weir type solar still with cascade and concave type have been enlisted as per studied by various researchers.

Keywords: Solar still, basin type solar still, vertical basin, weir type, stepped solar still, evacuated tubes.

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QUALITY IMPROPVEMENT THROUGH SIX SIGMA DMAIC PHASES

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Abstract: - An organisation has several objectives. These are not only in form of products to be manufactured and marketed but also include goals of capacity utilisation, achieving profitability as well as intangible objectives of customer satisfaction and societal goals. Resources are utilized as inputs to achieve these objectives. If an organisation wants to improve its capacity, it will have to improve its plans, identify the action which is desirable to improve its working, will have to fix the responsibility and lay down the time schedule. Operational management includes all facts related to the art and practice of capacity and for its successful implementation; it is desirable for an organization to have a well-planned audit system and proper monitoring plan.

Keywords: Six sigma, DMAIC. DOE. Quality management, TQM.

I. INTRODUCTION

Quality in business, engineering and manufacturing has a practical interpretation as the non-inferiority or superiority of something, it can be defined as fitness for purpose. Quality is a perceptual, conditional and somewhat subjective characteristic and may be understood differently by different people. It is supposed that consumers focus on the specification/quality of a product /service, or how it compares to competitors in the market environment. Producers must measure the conformance quality, or degree to which the product /service was produced correctly.



Fig. 1 Systematic and Essence of Six-Sigma

Numerous definitions and methodologies have been developed to improve product or service quality. There are two common quality related functions within a business. One is quality assurance which means the prevention of defects, such as by the implementation of quality management system and preventative activities like Failure Mode and Effect Analysis (FMEA). The other is quality control which is the detection of defects, most commonly associated with testing which takes place with in a quality management system typically termed as verification and validation.

II. QUALITY MANAGEMENT AND TOOLS

The term quality management has a specific meaning within many business sectors. This specific definition, which doesn't aim to assure 'good quality' by the more general definition, but rather to ensure that an organization or product is consistent, can be considered to have four main components: quality planning, quality control, quality assurance and quality improvement. Quality management is focused not only on product/service quality, but also the means to achieve it. Quality management therefore uses quality assurance and control of processes as well as

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Review of Six Sigma DMAIC Methodology

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Abstract: - During the past 50 years, more than 69 quality related initiatives have been taken. Statistical Process Control (SPC), Quality Circles (QC), Total Quality Management (TQM), Bench Marking, Quality Management System (QMS), Standard and other such initiatives have created a visible impact in the business world. 'Keep it Simple' formula has always been the basic concept of specialists for performance measurement over the past 70 years in an effort to have the greatest impact on business. In a competitive environment different types of classic tools and metrics have been applied in a different manner.

Keywords: Six sigma, DMAIC, DOE, Quality management, TQM.

I. INTRODUCTION

Six Sigma is both a philosophy and a methodology that is mainly used to improve quality of product by analysing data with application of statistics method to find out the root cause of quality problems and to implement controls. Although Six Sigma is a method which is first implemented to improve manufacturing but it can also be used in other business processes, such as product design and supply chain management. Although Six Sigma has its roots in large corporations, it can be used in small to medium - sized companies as well. Small companies are typically more agile and may have an easier time getting management team commitment, but they may have more difficulty with committing employee time and funds for training. As an improvement drive, the major advantage of Six Sigma is to introduce a common metric of customer perceived quality, which should be applicable to any size and any type of organization.

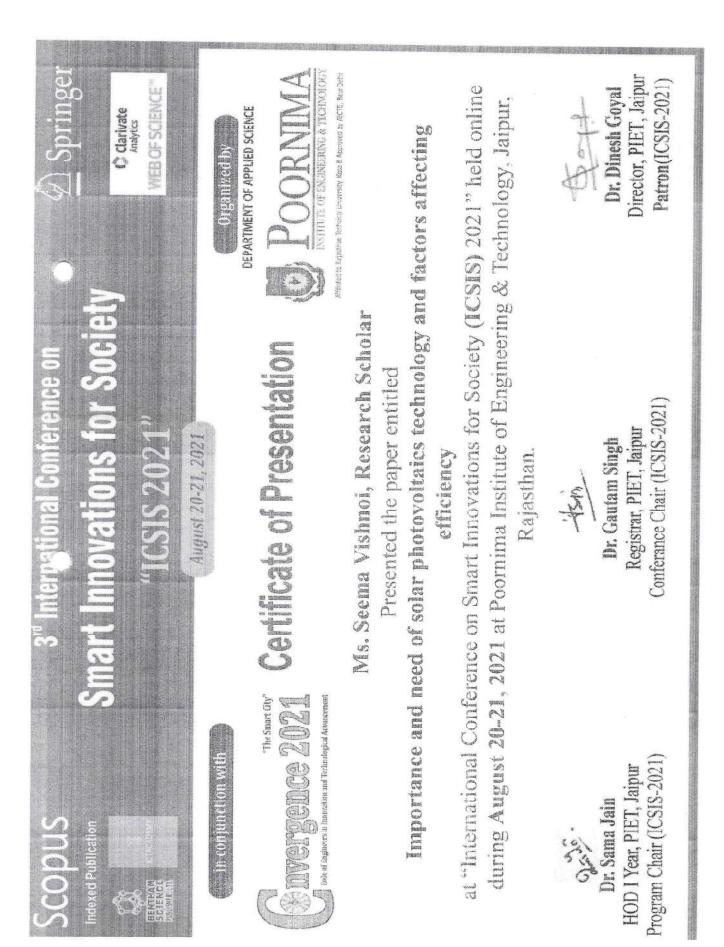
II. LITERATURE REVIEW

Mach Pavel et al. (2001) stated that a constant improvement has been accepted as the main objective of companies for all the fields, but this improvement is always keeping SPC and its Seven Ishikawa tools as the base. One of the latest strategies utilized is a six sigma strategy, which works having as the base the quality statistical tools and techniques combined with a well-focused management. There is an important relation between the Seven Ishikawa tools and the six sigma strategy. Six sigma strategies require tools that enables visualize, analyse, and make conclusions about processes, problems, and activities in general. The Seven Ishikawa tools contribute to that purpose, they are important elements that belong to the SPC which is an essential part for the implementation of the six sigma strategy.

Prasad (2002) discussed the six sigma initiatives taken by a bulb manufacturing company to reduce the shell cracking during the manufacturing of bulbs. The company started the initiative with training for champions and black belts. By using DMAIC methodology, the whole process was operating at 4.5 sigma levels, which was earlier at 3.2 sigma level, resulting in significant improvement in the bottom line.

Rowlands et al. (2003) reported the application of design of experiment to spot welding process in order to discover the key process parameters, which affect the tensile strength of welded joints. They have used statistical analysis to identify the process parameters, which affect the mean strength and variability in weld strength. The objectives of the experiment in this study were two-fold. The first objective was to identify the precarious welding process

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Estimation of Changes in the Effectiveness of Parabolic Trough Solar Collector Due to Dust Particles

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Abstract - Present work provides the insight of dust particle effect on the overall efficiency of collectorreceiver tube water heating used in the power plant. Since the characterisation of dust particles deposited on collector plate and its controlled effect on plant efficiency has limitation for field scale study, we have proposed a new methodology to carry lab scale experimentation to characterise dust concentration followed by simulation to estimate the plant performance. Present study showed the effect of dust with respect to the clean surface efficiency. It should be noted that thermal efficiency of the system against clean surface is 20.59% and due to dust deposition efficiency of system reduced to 8.91 % at dust concentration 26.637 x 10-6gm/m2. Comparatively change in maximum thermal efficiency is reduced upto 56.726 %. Efficiency curve with dust concentration suggests that cleaning of the collector should be done in an optimised time interval rather than fixed time interval for better efficiency.

Keywords - Solar radiation, Solar parabolic trough concentrator, Image J, Plot Digitizer, Optical properties.

1. INTRODUCTION

In modern world, energy is primary requirement for human culture. All the energy sources we are using today can be classified into two groups; renewable and non-renewable. Renewable and non-renewable energy sources can be used to produce secondary energy sources as electricity. The release of large amounts of waste heat from power plants has caused thermal pollution in lakes and rivers leading to the destruction of many forms of plant and animal life. In the case of nuclear power plants, there is also concern over the possibility of radioactivity being released into the atmosphere and long term of problems of disposal of radioactive wastes from these plants.

So, solar energy is alternative source of energy. A worthy investment option is concentrating solar power (CSP) technology which has the capacity to provide for about 7% of the total electricity needs projected for the world by 2030 and 25% by 2050 (Izquierdo et al., 2010).

The performance of a parabolic trough solar collector measured experimentally differs slightly

from the simulation results due to inaccurate prediction of absorbed solar energy. The amount of absorbed energy of such systems mainly depends on various parameters like reflector/collector, absorptivity of absorber tube and transmissivity of glass cover of absorber tube etc. The optical properties of these systems are strongly affected by the dust deposition Singh et al., [1]. Solar absorption and thermal power production are strongly related to the optical properties of the collectors (Yaghoubi et al., 2011 and Sahin, A.D., 2007) [2,3].

Several authors have tried to quantify the effect of dust deposition on flat plate collectors at field scale as well as in laboratory setups with some assumptions. Garg (1974) investigated the effect of dust on the transmittance of solar radiation through various inclined glass plates and plastic film [4]. Sayigh et al., (1985) observed 64, 48, 38, 30 and 17% reduction in the transmittance of the glass plates after 38 days of exposure to the environment with tilt angles of 0, 15, 30, 45 and 60° [5]. El-Shobokshy and Hussein (1993) investigated the effect of dust on the performance of photovoltaic cells [6]. Goossens and Van Kerschaever (1999) investigated the effect of wind velocity and airborne dust concentration on the drop of photovoltaic (PV) cell performancecaused by dust accumulation on such cells. Performance drop and I-V characteristics were investigated at four wind velocities and four dust concentrations [7]. Hegazy (2001) investigated dust accumulation on glass plates with different tilt angles and associated reductions in solar transmittance experimentally over a period of one year under the climate conditions of the Minia region, central Egypt. His results show that the fractional reduction in glass normal transmittance depends strongly on dust deposition in conjunction with plate tilt angle, as well as on the exposure period and site climate conditions [8]. El-Nashar (2009) studied the seasonal effect of dust deposition on a field of evacuated tube collectors of a solar desalination plant. The system is located near the city of Abu Dhabi, UAE, and the results are therefore relevant to this region, it was found that dust deposition can cause a monthly drop in glass tube transmittance of 10-18%. The drop in transmittance of the glass tubes due to dust deposition can cause a large drop in plant production [9].

Review Paper on Optimizations of Thermoelectric System

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ABSTRACT

Thermal management and energy crisis have been two major problems in this 21st century. Engine exhaust has tremendous amount of energy which can be recovered by waste heat recovery systems. The thermoelectric concept is seen as a perfect solution for recovering waste heat from engine exhaust and converts in to electric energy. Since the use of semiconductor materials for thermoelectric applications, there has been a huge quest for improving its figure of merits (ZT) to make it commercially viable. This synopsis report presents the simulation and experimental validation study on the transient behavior of a proposed combined exhaust heat recovery device and thermoelectric power generation system. The proposed system consists of waste heat recovery that provides a heat flux source for thermoelectric generators. In this research, thermoelectric generator device are consist of two major part, first one is exhaust recovery device and second one is thermoelectric generation system. In the first phase of study, optimize the waste heat recovery system design, performed cfd analysis and get heat and temperature data then cfd model coupled with thermoelectric model, find out the thermoelectric effect on particular devices. This paper presents of numerical simulation for several the thermoelectric materials. Numerical simulation is carried out by using a finite element package ANSYS.

Keywords

Thermoelectric Generator (TEG), Thermoelectric Material (TEM) Automotive Exhaust, Numerical Simulation.

1. INTRODUCTION

Thermoelectric generators are all solid-state devices that convert heat into electricity. Unlike traditional dynamic heat engines, thermoelectric generators contain no moving parts and are completely silent. Such generators have been used reliably for over 30 years of maintenance free operation in deep space probes such as the Voyager missions of NASA.1 Compared to large, traditional heat engines, thermoelectric generators have lower efficiency. But for small applications, thermoelectric can Become competitive because they are compact, simple (inexpensive) and scale able. Thermoelectric systems can be easily designed to operate with small heat sources and small temperature differences.

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Such small generators could be mass produced for use in automotive waste heat recovery or home co-generation of heat and electricity. A thermoelectric produces electrical power from heat flow across a temperature gradient. As the heat flows from hot to cold, free charge a carrier (electrons or holes) in the materials are also driven to the cold end. The resulting voltage (V) is proportional to the temperature difference (ΔT) via the Seebeck coefficient, α , (V - $\alpha \Delta T$). By connecting an electron conducting (n-type) and hole conducting (p-type) material in series, a net voltage is produced that can be driven through a load. A good thermoelectric material has a Seebeck coefficient between 100μ V/K and 300μ V/K; thus, in order to achieve a few volts at the load, many thermoelectric couples need to be connected in series to make the thermoelectric device. A thermoelectric generator convert's heat (Q) into electrical power (P) with efficiency ri.

$$P = \eta Q \tag{1}$$

The amount of heat, Q, that can be directed though the thermoelectric materials frequently depends on the size of the heat exchangers used to harvest the heat on the hot side and reject it on the cold side. The thermoelectric systems have been the subject of major advances in recent years, due to the development of semiconductors and the incorporation of the thermoelectric devices into domestic appliances. Generally, if a thermal gradient is applied to a solid, it will always be accompanied by an electric field in the opposite direction. This process is called as the thermoelectric material applications include refrigeration or electric power generation. The efficiency of a thermoelectric material is given by the figure of merit. Z, which is defined as [2]

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Where:

 α - Material's Seebeck coefficient, V/K, σ - Electrical conductivity of material, S/m,

k – Thermal conductivity of material, W/(m.K).

 $Z = \alpha^2 \sigma/k$, [1/k]

The numerator in equation (2) is called the power factor. Therefore, the most useful method in order to describe and compare the quality and thermoelectric efficiency of different material systems is the dimensionless figure of merit (ZT), where

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Thermal Energy Storage in Sensible Materials: A Review

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Abstract: The intermittent, variable and unpredictable nature of solar energy lead to mismatch the rate and time of solar energy collection and its thermal applications. As a result, it is necessary to have energy storage unit which stores solar energy when the collection is in excess of load and discharges the same when the direct collection is inadequate. To store solar energy in sensible heat storage materials, pebble bed systems are simpler, economical in design and development as compared to latent or thermo-chemical energy storages. A number of studies are available on heating and cooling of pebble beds describing their parameters like pebble size/diameter, bed porosity, surface area, a shape factor of storage mediu/pebbles to observe the behaviour and characteristics of storage devices. Many correlations are available to analyse the heat transfer coefficients, friction factors and pressure drops in between the solids and circulating fluids in pebble beds. The relations are of importance and best suited for energy storage system modelling.

Keywords: Pebble Bed, Solid-fluid Interface, Thermal Stratification, Heat Transfer and Pressure Drop in Beds.

I. INTRODUCTION

Availability of cheap and abundant supply of energy is an index of national prosperity. The man has needed and used energy at an increasing rate for his sustenance and well-being ever since he came to the earth. The large scale use of commercial energy has led man to a better quality of life. Indeed, energy starvation could be more widespread than food starvation. But the conventional energy supplier fossil-fuel resources are finite, depleting fast and this fossil fuel-era is gradually coming to an end. The potential applications of solar energy in space and water heating, industrial process heating, refrigeration/air conditioning, cooking and power generation can reduce the dependence on fossil fuel usages, environmental pollution, and global warming issues.

But the intermittent, variable and unpredictable nature of solar heat lead to a mismatch of the rate and time of energy collection and thermal applications. As a result, it is necessary to have thermal energy storage (TES) unit in between the energy demand and supply to alleviate the energy mismatch. The storage system stores solar energy when the collection is in excess of load or in no load conditions and discharges the same when the direct collection is inadequate of load/demand for off sun shines hours' applications. Storage system allows the more effective use of capital equipment by improving capacity and permit cost effective substitution of scare conventional fuels. Thus, thermal energy storage is required to ensure round the clock heat supply. A relation between solar collector average collection temperature and heat delivered directly to load / thermal storage can be written as,

T (collector) – T (delivery) = ΔT (collector to storage) + ΔT (into storage) + ΔT (storage loss) + ΔT (out of storage) + ΔT (storage to application) + ΔT (into application) ... (1)

The thermal energy can be secured as shown in Fig. 1, sensibly/latent heat storage, chemical and solid sorption processes. Sensible and latent heat storages systems are in practical use while thermo-chemical reaction and fuel cell systems are proposed for medium and high temperature applications. The choice of material depends on the product of density and specific heat of material (ρ ,C_p) values and temperature limits, water being used for less than 100°C heat storage and refractory /bricks for high temperature applications, about 1000°C.

CFD simulation of thermoelectric generator installed on waste heat recovery system

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Abstract: In the present research work, thermoelectric generation is numerically solved for waste heat recovery based hot junction point. All experiments are designed as per DOE methodology 'Taguchi method'. In the first part of this study, CFD simulation is performed for waste heat exchanger run on IC engine exhaust gas. Total nine cases are designed for this task using the Taguchi method. Wall temperature is the response variable for CFD work. In the second part, CFD based results are carried forward to FEM simulation which was conducted for thermoelectric generation numerical work. The same nine cases are used for this task also. It is found that the number of fins used in WHRS is not the prime factor, but mass flow rate is the main factor for this study. S/N ratio and ANOVA analysis are performed for wall temperature and eurrent density of TEG system.

Keywords: thermoelectric generator; CFD simulation; Taguchi method; linear regression model equation; ANOVA analysis.

Reference to this paper should be made as follows: Purohit, K.K. and Meena, P.M. (2017) 'CFD simulation of thermoelectric generator installed on waste heat recovery system', *Int. J. Renewable Energy Technology*, Vol. 8, Nos. 3/4, pp.208–285.

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This paper is a revised and expanded version of a paper entitled 'CFD simulation of thermoelectric generator installed on waste heat recovery system' presented at International Conference (ICONRER), Swami Keshvanand Institute of Technology (SKIT), Jaipur, 2–4 February 2017.

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Computational Fluid Dynamics Simulation and Benchmarking for Ranque Hilsch Vortex Tube

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ARTICLE INFO	ABSTRACT
Received 21 November 2017 Accepted 16 December 2017 Published 23 December 2017	The objective of this work is to gain an insight into complex fluid dynamic phenomena inside the working of vortex tube. For this a fabricated vortex tube was tested experimentally, CFD simulations were carried out, generalizing simulation process with dimensional analysis, initialization and benchmarking the results obtained locally with numerical forward differencing technique using spreadsheet and computer program. It can be concluded that vortex tube can generate a heat sink near the hot end while making the objects (air) near the cold end acting as heat source simultaneously. From both these source and sink, heat is carried away by diffusion and convection consistently even at steady state.
	Keywords: dimensional analysis, fluid dynamics, numerical finite difference methods, circular iterations, partial difference equations.

1. Introduction

Physicist James Clerk Maxwell postulated in 19th century, that since heat involves movement of molecules, it would be possible to get hot and cold air from the same device which would sort out and separate the hot and cold molecules of air. Vortex tube was invented by French physicist George R. (1934) accidently. It was thought that the separation of hot and cold streams occurred due to adiabatic compression and expansion. Physicist Hilsch (1947) improved the design and gave first conclusive working model on R.H.V.T after adding wall friction and pseudo-adiabatic processes to George's model. Fulton (1950) rejected previous models and reckoned turbulence and fluid friction phenomena responsible for the separation. Fulton (1950) and Nimbalkar (2009) emphasised more on vortex flows inside R.H.V.T. Xue et al., (2010) critically examined the models proposed earlier and found that none was complete and satisfactory.

2. Methodology

A need for developing a generalized process of simulation based on scientific method was felt.

Approach analogy, abstraction and quantification were realized as important analysis tools while reviewing, repetition, and simul-tasking involving multiple tools with common objective, were realized as quality control tools. Numerical finite differencing using spreadsheet and dimensional analysis were used for benchmarking and initialization of the problem. Software applications including OpenFOAM, Ansys fluent student version, Salome, Gmsh, office tools, netgen, gnuplot, paraview, qtiplot, mendeley etc. were tested and used in this work. The outline of the paper begins with abstract giving objectives, work done and conclusion in brief, followed by introduction with short literature survey, methodology describing systematic approach and process of working, system selection with description of working and worked system, results and discussion with plots and contours, their analysis, effects of various design and input output parameters on its performance, working of R.H.V.T. explanation of cooling effect produced and V.E.D classification of R.H.V.T parameters and ending with conclusion, future work, source code program and references.

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Computational Fluid Dynamics Simulation on Vortex Tube: A Review

Meena P. M.¹ & Verma K.² ¹ Professor, Dept. of Mech. Engg., MBM Engg. College ² M.E Thermal Engg, Dept. of Mech. Engg., MBM Engg. College

Abstract: The main objectives of this work is to investigate Range Hilsch effect and D-Alembert's paradox through literature survey of a mysterious device called vortex tube using a systematic and disciplined. It can be concluded that vortex tube is an application based device. Its design and performance can be tuned for a particular application and all its performance parameters cannot be optimized simultaneously.

Keywords: C.F.D. D-Alembert's paradox, R.H.V.T

1. Introduction and present status

Vortex tube is a mechanical device without any moving parts which separates compressed air into cold and hot streams. This can be of three types counter flow (standard vortex tube), parallel flow (uniflow vortex tube), both of which can be of cylindrical or conical shape. Its general applications can be classified as (1) cooling and air conditioning (2) phase changing and (3) separation. Vortex tube is required for cooling or chilling machining parts, food, chambers, circuits, setting solders, where as its air conditioning applications are found in manned underwater suits, hyperbaric chambers and suits, shot blasting suits etc. Its phase changing applications are found in liquefaction of natural gas while separation applications are found in particle and gas separation units and quick startup of steam power plant given there is considerable density difference in participating matter. Working in multiple stages, its performance can be further enhansed as demonstrated by Guillaume and Jolly (2001) [1] when the cold exit of first tube becomes the input for the next vortex tube. These applications are not stagnant but are diversifying with more research.

Due to high concentration of aerospace organizations in Bangalore, a range of C.F.D activities are now in progress at number of centers including, I.I.Sc, NAL, H.A.L. A.D.E. A.D.A. G.T.R.E. Space launch vehicle related C.F.D activities are in progress at Vikram Sarabhai Space Centre (V.S.S.C) at Trivandrum. Missile related C.F.D activities are in progress at Defense Research and Development Laboratory (D.R.D.L) at Hyderabad. Tejas (multirole L.C.A) developed both for Indian navy and air-force by A.D.A from interactions with H.A.L. I.I.Sc, and I.I.Ts used C.F.D extensively Around 500 researchers were working in the field of C.F.D by 2010 (Chakraborty D., 2010 [2]). At N.A.L in-house codes (JEWEL3D, JUMBO3D) are being developed for the HANSA and SARAS projects. SARAS project which was abandoned earlier due design problems was promised to be revived in 2017. To summarize, think parallel and do parallel is the motive of Indian C.F.D program.

1.1. Design and performance of R.H.V.T

The design of a vortex tube depends on its geometrical dimensions such as length of tube (L), diameter of tube (D), diameter of orifice (d_{ϕ}) or cold tube diameter (d_c) , number (N), diameter (d_n) , area (A_i), shape and location of nozzles, cold exit area (A_c) hot exit area (A_h) or hot side valve opening angle, angle of taper of tube ($0 \le \alpha \le 4$, in case of conical tube). These parameters were optimized by various authors for improving its performance parameters (with their typical range of values) such as

 $\begin{array}{l} \mu_{c} - \frac{m_{c}}{m_{1}}, \mbox{ where } 0 < \mu_{c} < 1 \\ \Delta T_{c} = (T_{1} - T_{c}), \mbox{ where } 0 < \Delta T_{c} < 230 \mbox{ K}, \mbox{ (Comassar 1951 [3])}, \\ Q_{c} = \mu_{c}C_{p}(T_{1} - T_{c}), \mbox{ where } 0 < Q_{c} < 1000 \mbox{ kW} \\ COP = \frac{Q_{c}}{W_{c}} = \frac{\mu_{c}C_{p}(T_{1} - T_{c})}{W_{c}}, \mbox{ where } 0 < COP < 0.3 \\ n_{e} = \mu_{c} \frac{(T_{1} - T_{c})}{W_{c}}, \mbox{ where } 0 < n_{c} < 0.42 \end{array}$

$$\eta_c = \mu_c \frac{1}{T_i(1 - (\frac{p_i}{p_a})\frac{\lambda - 1}{\lambda})}, \quad \text{where} \quad 0 < \eta_c < 0.$$

(Camire, 1995 [4]).

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Gaps in existing technology and bridging these gaps

Indian C.F.D program still has bottlenecks in the form of computer performance speed (FLOPS) which is 10th order of magnitude below par as compared to those used in developed countries along with computer memory (Chakraborty D., 2010 [2]). Many of the complex problems such as inverse problem, parametric research and multidisciplinary problems have not been address so far. Boandarov and Galaktionov (2014) [5] mentioned factors which

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Review Paper on Effect of Dust on the Solar Parabolic Trough and Applications

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ABSTRACT

In the present scenario, the huge demand of energy and economy create the necessity to give importance to all types of energy resources either it is conventional or nonconventional. Since the rapid consumption of fossil fuel over billions of people across the world are still unable to assess electricity. Furthermore, if the consumption of fossil fuel will be continued then our future generation will certainly have to face the shortage of it and the global warming potential and ozone layer depletion will also increase. Solar collectors (mirrors) suffer from the dust deposition which requires frequent cleaning to maintain their efficiency. Since hundred thousand square meters of solar mirror are required even for a relatively small solar power plant, the cleaning on such a large mirror surfaces involves a significant operation and maintenance (O&M) activities and cost in concentrating solar thermal power plants. Dust deposition on solar mirror surface is site specific and the dust characterization for each site is required in order to optimize the solar mirror cleaning activities.

Keywords

Solar Parabolic Trough, Concentrated Solar Thermal (CST).

1. INTRODUCTION

One main reason why the performance of a parabolic trough collector measured experimentally differs from the simulation results is inaccurate prediction of absorbed solar energy. The amount of absorbed energy of such systems mainly depends on optical properties of mirrors, absorber tube, and transmissivity of glass cover of absorber tube. One of the main challenges is to develop a reliable simulation tool to predict accurately the performance of solar thermal plants. Solar absorption and thermal power production are strongly related to the optical properties of the collectors (Yaghoubi et al. 2011 and Şahin, A.D., 2007). Such properties are the reflectivity of mirrors, solar transmissivity of cover glass and absorbtivity of absorber tube (Sansoni et al.2011).

The reflectivity of mirrors and glass cover transmissivity of a collector are highly affected by the amount of dust deposited on these surfaces. This effect has been well understood and different power plants have considered various cleaning schedules to reduce dust effect on the performances of solar systems. Different studies have been performed to study dust effect on various solar systems: for example, Kaldellis et al. (2010) have studied dust deposition impact on photovoltaic-assisted water pumping systems. Several authors have studied the effect of dust deposition on flat plate collectors. Goossens and Van Kerschaever (1999) investigated the effect of wind velocity and airborne dust concentration on the drop of photovoltaic (PV) cell performance

caused by dust accumulation on such cells. Performance drop and I-V characteristics were investigated at four wind velocities and four dust concentrations. El-Shobokshy and Hussein (1993) investigated the effect of dust on the performance of photovoltaic cells. Garg (1974) investigated the effect of dust on the transmittance of solar radiation through various inclined glass plates and plastic film. Hegazy (2001) investigated dust accumulation on glass plates with different tilt angles and associated reductions in solar transmittance experimentally over a period of one year under the climate conditions of the Minia region, central Egypt. His results show that the fractional reduction in glass normal transmittance depends strongly on dust deposition in conjunction with plate tilt angle, as well as on the exposure period and site climate conditions. Sayigh et al. (1985) observed 64, 48, 38, 30 and 17% reduction in the transmittance of the glass plates after 38 days of exposure to the environment with tilt angles of 0, 15, 30, 45 and 60°, respectively. Mastekbayeva and Kumar (2000) and Nahar and Gupta (1990) also investigated the effects of dust on transmittance of different materials. El-Nashar (2009) studied the seasonal effect of dust deposition on a field of evacuated tube collectors of a solar desalination plant. The system is located near the city of Abu Dhabi, UAE, and the results are therefore relevant to this region. It was found that dust deposition can cause a monthly drop in glass tube transmittance of 10-18%. The drop in transmittance of the glass tubes due to dust deposition can cause a large drop in plant production. For example, the author states that for a transmittance decrease from an initial value of 0.98 (clean glass condition) to a low value of 0.6, corresponding to a very dusty glass condition, production drops from 100% to 40% of the clean collector production level. Although various studies have been performed to study dust effect on the performance of different solar systems, very limited published studies on dust effects are available for parabolic trough collectors (PTC) of solar thermal power plants.

Dust is the dominant source for solar collectors deposition in CST power plants and regular cleaning is required to recover the reflectance lost caused by mirror deposition. The effective cleaning method has to address the significant characteristics of dust such as the size, distribution, density, shape, composition, chemistry and charge. Shao, et al. (2008) showed that the particle sizes range from 20 to 70 μ m has short-term suspension and the long- term suspension particles must be less than 20 μ m. This indicates that the particle size deposit on solar mirror should be less than 70 μ m if the airborne dust is the main cause for mirror deposition according to this study. The significant characteristics of dust are site specific. The influence of dust on the reflectance of solar mirrors is a complex function of dust deposition behavior.

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Influence of rounding corners on unsteady flow and heat transfer around a square cylinder

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Abstract-A numerical study is performed to study the effect of rounding corners on flow and heat transfer characteristics around a square cylinder. Two square cylinders, one with sharp corners and other with rounded corners are considered. The rounded corners have a corners radius of d/4. Where, d is projected width of the square cylinder. The heated square cylinder is assumed to be horizontally placed in unconfined boundaries and flow of sir (Pr = 0.7) is In vertical upward direction. The Reynolds number (Re) of the flow is 100. Numerical simulation results are presented in form of streamlines, vorticity contours, isotherm patterns, time history of lift and drag coefficients, power spectra of lift coefficients, Strouhal number, recirculation length, averaged drag coefficient, local Nusselt number and averaged Nusselt number. A comparison of the results for sharp corners and rounded corners square cylinders are presented. Results show that due to rounding corners of the square cylinder, flow separation becomes smooth and instability in the flow field is delayed. The size of the recirculation region as well as transverse extent of the wake decreases. Therefore, drag coefficient decreases due to reduced pressure drag. An enhancement in heat transfer from the cylinder is observed due to effective utilization of whole front face including rounded corners.

Key words-Heat transfer, Rounded corners, Square cylinder, Vortex shedding.

I. INTRODUCTION

Cylinders of different cross section e.g. circular and square finds many applications in engineering such as heat exchanger tubes, high-rise buildings, electronice cooling etc. When fluid flows over these cylinders, separation occurs from both sides of the cylinder and instability is produced in the flow field that cause periodic shedding of vortices from the cylinder. For a sharp corners square cylinder, the separation points are fixed.

Sharma and Eswaran [1] studied the flow structure and heat transfer characteristics for an isolated sharp corners square cylinder. It is imperative that if sharp corners of the square cylinder are changed with the rounded corners, a drastic change in the flow and heat transfer characteristics of the cylinder can occur. Tamura et al.[2] studied the effect of corner shape on aerodynamic characteristics of

the square cylinder. Dalton and Zheng [3] studied uniform flow past square and diamond cylinders with and without corner modifications. Hu et al. [4] experimentally studied the near wake of square cylinder with different corners radii. Park et al. [5] performed numerical analysis for critical Reynolds number with corner radius variation. Kumar et al. [6] studied near wake characteristics of transversely oscillating cylinders with different corner radii. The above mentioned studies involving corner modifications mainly deals with the effect of rounding corners on the aerodynamic behaviour. No systematic study is available in the literature that deals with the effect of rounding corners on flow structures and heat transfer from a square cylinder. Therefore, a numerical study is done to study the influence of rounding corners on flow and heat transfer characteristics of a square cylinder. One sharp corners and other rounded corners cylinder is modelled. The rounded corners cylinder have a corners radius of d/4. Where, d is projected width of the square cylinder. The heated cylinders are placed horizontally and flow of air (Pr = 0.7) is in vertical upward direction. The Reynolds number (Re) of the flow is 100. Numerical simulation results are presented by streamlines, vorticity contours, isotherm patterns, time history of lift and drag coefficients, power spectra of lift coefficients, Strouhal number, recirculation length, averaged drag coefficient, local Nusselt number and averaged Nusselt number. A comparison of the results for sharp corners and rounded corners square cylinders are presented.

II. PROBLEM DEFINITION

Fig. I shows a schematic diagram of physical model of the problem, flow geometry and boundaries of two-dimensional computational domain for rounded corners square cylinder. The cylinder has a projected width 'd' and a corner radius 'r'.

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Effect of aiding buoyancy on the wake characteristics of a semi-circular cylinder

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Abstract-Two-dimensional numerical simulations are performed to investigate the effect of aiding buoyancy on the wake characteristics of a semi-circular cylinder. The heated cylinder is assumed to be horizontally placed in un-confined boundaries with curved surface of the cylinder facing the flow of air (Prandtl number, Pr = 0.7) directed in vertical upward direction. In this flow configuration, upward thermal buoyancy forces are aided to the forced air flow. The flow Reynolds number (Re) based on the projected width of the cylinder is 100. The effect of buoyancy is brought about by Richardson number (Ri), which is varied in the range of $0 \le Ri \le 1.0$. The results are presented with the help of instantaneous streamlines, vorticity contours, isotherms patterns, lift and drag coefficients, Strouhal number and averaged Nusselt number. Present results show that at a critical value of Richardson number, vortex shedding around the cylinder is suppressed. The value of critical Richardson number for suppression the vortex shedding around a semicircular cylinder is much higher as compared to that for a circular cylinderavailable in literature at similar Reynolds number. Therefore, strong buoyancy forces are required to suppress flow instability for a semi-circular cylinder as compared to that for a circular cylinder. This interpretsthat length of afterbody from the separation point into the wake have significant influence on the instability in flow field.

Keywords—buoyancy;mixed convection; semi-circular cylinder;vortex shedding

I. INTRODUCTION

The flow of fluids over unheated and heated bluff bodies have great significance in engineering applications as well as fundamental importance. Cross-sectional shape of the bluff body influences the wake characteristicspast the body. Literature deals with a variety of bluff body shapes e.g. circular, square and triangular cylinder. In contrast, flow over a semi-circular cylinder has received attention in the recent past and literature is scarce. Considerable changes in the flow field and heat transfer can be obtained with the semi-circular cylinder as compared to circular cylinderdue to manipulated after body. Flow over a semi-circular cylinder is important in the design of heat exchanger with enhanced heat transfer performance, electronics cooling components of various crosssectional shapes, under water submarines etc. In all bluff body flows, fundamental instability results in periodic vortex shedding around the body above a critical Reynolds number. These vortices are responsible for flow and heat transfer characteristics of the bluff body. Chandra and Chhabra [1] numerically identified that critical Reynolds number for onset of vortex shedding occursomewhere in the range 39.5 < Re < 40 for a semicircular cylinder. The authors reported that this value is slightly lower than the value of 46-47 for a circular etal.[2] literature. Chatterjee cited in cylinder numericallystudiedunsteady forced convection heat transfer around a semicircular cylinder at low Reynolds numbers (Re = 50-150) with a fixed Prandtl number (Pr=0.71). Chandra and Chhabra [3] studied flow and heat transfer from a semicircular cylinder to power-law fluids in the vortex shedding regime for a range of Reynolds numbers, Re = 40-140 and prandtl numbers, 0.7 ≤ Pr ≤ 50.Bhinder et al. [4]carried out numerical investigation to study flow over and forced convection heat transfer past a semi-circular cylinder at incidence for Reynolds numbers, 80 ≤ Re ≤ 180 utilizing air as working fluid. Above studies [1-4] were carried out inforced convection regime where buoyancy forces are negligible. For low velocity flows, both the buoyancy forces and forced flow determines the flow field and flow is in mixed convection regime. In this case, flow and thermal field is a function of Richardson number (Ri = Gr/Re²). Where Gr is the Grashof number. For a horizontally placed heated cylinder, buoyancy forces act in vertical upward direction and ifthe forced flow is directed in vertical upward direction, it is termed as buoyancy aided flow. Buoyancy aided mixed convection flows past a circular cylinder have been studied by Chang and Sa [5] numerically and Singh etal. [6] experimentally. When the forced flow is directed in horizontal direction over a horizontal heated cylinder, it is termed as cross buoyancy flow. Chatterjee and mondal [7] investigated the effect of cross-buoyancy on unsteady mixed convective flow and heat transfer around a semicircular cylinder. Above literature reveals that no study is available that deals with the effect of aiding buoyancy on the wake characteristics of a semicircular cylinder. Therefore, the aim of the present work is to investigate numerically the effect of aiding buoyancy on flow and heat transfer characteristics around a semicircular cylinder. The cylinder is placed horizontally in unconfined boundaries and the flow of air (Pr = 0.7) is in vertical upward direction. Based on the projected width of thecylinder, the Reynolds number (Rc) is kept at 100. Richardson number (Ri) is varied in the range of $0 \le Ri \le 1.0$. The results are presented by streamlines, vorticity contours, isotherms, Strouhal number, drag and lift coefficients, and Nusselt number.



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Effect of Orientation on Fluid Flow and Heat Transfer Characteristics of an Equilateral Triangular Cylinder

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ABSTRACT: Two-dimensional numerical simulations are performed to study the effect of geometrical orientation on fluid flow and heat transfer characteristics of an equilateral triangular cylinder. The heated cylinder is assumed to be placed horizontally in un-confined boundaries and flow of air is in vertically upward direction. Reynolds number of the flow is kept at Re = 100 based on projected width of the cylinder. Three different orientations of the cylinder with respect to the flow direction are considered i.e. vertex facing, base facing and slant face facing the flow direction. The results are presented by instantaneous streamlines, instantaneous vorticity contours, instantaneous isotherms, timeaveraged isotherms, lift and drag coefficients. Strouhal number and averaged Nusselt number. A comparison of the results for three orientations of the cylinder is presented. Results show that primary instability in the flow field is induced at different rates due to different flow separation mechanisms. Among the three orientations of the cylinder, time averaged drag coefficient is highest for the base facing flow orientation due to a wider wake and a high pressure drag. However, averaged Nusselt number is highest for the vertex facing flow orientation due to the effective utilization of the slant faces for heat transfer.

KEYWORDS: Triangular cylinder, orientation, vortex shedding, forced convection.

1. INTRODUCTION

Fluid flow and heat transfer around bluff bodies of different cross sections have been studied extensively in literature due to wide engineering applications in heat exchangers, electronics cooling and design of vortex flow meters etc. In past, most of the investigations have been done on the circular cylinder. Significant changes in the flow field can be obtained with the sharp-edged square and triangular cross-section cylinders as compared to circular cylinder. Square cylinder has also received a fair attention in literature. However, triangular cylinder has gained attention in last few years and literature is scarce. For a sharp-edged bluff body, separation is likely to occur at the sharp edges. When a fluid separates from a bluff body, it forms a separated region behind the body with periodic generation and shedding of circulating flow structures called vortex shedding. For a triangular cylinder, it is imperative that geometrical orientation of the cylinder with respect to the flow direction also influences flow instability and corresponding vortex dynamics. Most of the available literature e.g. De and Dalal [1], De and Dalal [2], Dhiman and Shyam [3], Chatterjee and Mondal [4] and Srikanth et al. [5] have focused on low Reynolds number flow past an equilateral triangular cylinder with vertex of the cylinder facing the flow direction. There is scarcity of investigations dealing with fluid flow and heat transfer characteristics for other orientations of the triangular cylinder. Therefore, a numerical study has been carried out for forced convection flow around a heated equilateral triangular cylinder with three different orientations of the cylinder with respect to the flow direction i.e. vertex facing, base facing and slant face facing the flow direction. The heated cylinder is placed horizontally in un-confined boundaries and air flow (Pr = 0.7) is in vertical upward direction. All the simulations has been carried for Reynolds number, Re = 100 based on projected width of the cylinder (i.e. same for all three orientations). The Results have been produced related to flow and thermal field by instantaneous streamlines,

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A Review of Unsteady Flow and Heat Transfer around a Triangular Bluff-Body

Babita Rai⁺ and S.K. Singh²

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ABSTRACT: Fluid flow and heat transfer characteristics of bluff bodies of different cross-sections have been studied by researches due many engineering applications e.g. in electronics cooling, heat exchangers, nuclear reactors and flow dividers etc. Circular and squarc cross-section bluff-bodies are mostly studied. Triangular cross-section cylinder however being a potential vortex generator has very limited available literature. Present paper first discusses the fundamental aspects and terms related to the fluid flow and heat transfer around bluff-bodies in general. Then the paper reviews recent literature for the flow past a triangular cross-section cylinder. The review has been presented considering the effect of five variables e.g Reynolds number, blockage ratio, geometrical orientation, aspect ratio, and prandtl number on the flow and heat transfer parameters. Struchal number (St), drag coefficient, lift coefficient, critical Reynolds number, local and averaged Nusselt number have been discussed. Flow and thermal field have been illustrated by instantancous streamlines, vorticity contours, and isotherms.

KEYWORDS: Triangular bluff-body, wake, vortex shedding, forced convection.

I. INTRODUCTION

When a fluid flows around a stationary body, there is a relative velocity between the body and fluid. These flows are referred as flow over immersed bodies. Depending on overall shape of the immersed body, it is said to be streamlined body or bluff body. In a streamlined body, streamlines in the flow conforms to the boundaries of the body. However, a bluff body tends to block the flow and subdivides it by separation at or near leading edges. Bluff bodies are used to enhance unsteadiness, mixing in the flow and heat transfer. The flow of fluid over bluff body finds wide engineering applications e.g. in electronics cooling, heat exchangers, nuclear reactors, design of flow dividers, probes and sensors etc. Fundamental aspects related to the fluid flow and heat transfer around bluff-bodies are discussed below.

1.1 Flow past bluff-bodies

When a fluid separates from a bluff body, it forms a separated region behind the body called wake. In all bluff body flows, there is the periodic formation and shedding of circulating flow structures (vortices) in the wake region and is referred to as vortex shedding. Vortex shedding generates unsteadiness in the flow and thermal fields that governs fluid flow and heat transfer behavior around bluff bodies. Bluff bodies of different cross sections (e.g. circular, square, elliptical and triangular etc.) have been studied by the researches.

1.2 Sharp-Edged triangular cylinder

The literature reveals that the most of the studies have been done on circular cross-section cylinder. The significant changes in the flow and thermal field can be obtained with the sharp edged cylinders (e.g., cylinders of square and triangular cross section, etc.). Square cylinder has also received a fair attention in literature due to its importance in flows over Buildings, heated electrical components etc. However, triangular cylinder being a potential vortex generator has gain attention in recent past with limited literature available. The flow past sharp edged cylinders is



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Effect of Thermal Buoyancy on the Wake Behaviour of a Triangular Cylinder: A Review

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ABSTRACT: Heat transfer characteristics of cylindrical bluff bodyfinds importance in the design of thermal systems. For a heated cylinder, flow becomes complicated due to developed buoyancy forces. Contamination of the thermal buoyancy in low Reynolds number forced flow significantly influences the wake dynamics, flow field and heat transfer. Cross-section of the cylindrical body also decides heat transfer from the body. Heated circular and square cross-section bluff-bodies are mostly studied. Heated triangular cross-section cylinder has very limited available literature. Present paper first discusses the fundamental terms related to the effect of thermal buoyancy on the fluid flow around cylindrical bluff-bodies. Then the paper reviews recent literature for the flow past a triangular cross-section cylinderin mixed convection regime considering the effect of buoyancy. The review has been presented for cross-buoyancy, aiding-buoyancy and opposing-buoyancy flow configurations. Effect of buoyancy parameter i.e. Richardson number (Ri) on Struohal number, drag coefficient, lift coefficient, critical Reynolds number, local and averaged Nusselt number have been discussed.Effect of Richardson number on the flow field has been illustrated by instantaneous streamlines.

KEYWORDS: Triangular cylinder, vortex shedding, thermal buoyancy, mixed convection.

I. INTRODUCTION

Heat transfer behavior of cylindrical bluff-bodies has been the topic of great significance due to its engineering applications in heat exchangers, electronics cooling, nuclear reactors and design of thermal systems. Researchers have extensively studied the flow past circular and square cross section cylinders. Triangular cylinder being a sharp edged bluff body has potential to change the flow and temperature field significantly. Rai and Singh (2017) presented a comprehensive review of unsteady flow and heat transfer around a triangular bluff-body. The authors discussed basic terms and parameters related to fluid flow and heat transfer around cylindrical bluff-bodiesand presented recent review of flow past a triangular cross section cylinder in great detail. Rai and Singh (2017), in their review covered investigations of flow across unheated triangular cylinder and heated triangular cylinder without considering the effect of thermal buoyancy. In the present paper, effect of thermal buoyancy on the wake behavior of a triangular cylinder is reviewed. Therefore, related basic terms and parameters are omitted here and can be viewed in Rai and Singh (2017). However, basic theory and definition related to effect of buoyancy are discussed below.

1.1 Heat transfer from a cylindrical bluff-body

When a cylindrical bluff-body is heated and its temperature is higher than the temperature of the surrounding fluid, heat transfer takes place between the body and the surrounding fluid primarily by convection mode.Natural convectiontakes place when fluid motion is caused by thermal buoyancy forces that result from the density variations, due to variations of temperature in the fluid. Heat induced thermal buoyancy force in natural convection heat transfer is characterized by a non-dimensional number known as Grashof number (Gr). It is defined as:

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Abstract--- Huoyancy added adved convection flow past heated equilateral triangular cylinder with base of the cylinder facing the flow direction is numerically simulated using FLURNT. The heated cylinder is assumed to be placed horizontally in un-conflued boundaries and the oir flow (Pr = 0, 7) is in vertical apward direction i.e. apward hunyancy force added to the forced flow, Reynolds number is kept at Re ~ 100 and Richardson number (RI) is varied in the range of $n \le Rl \le 1.0$. Reynolds number and Richardson number are based on the projected width of the cylinder. Flow and heat trainfer parameters are presented as a function of Richardson number. The results are presented by Instantaneous streamlines, instantaneous vordely contours, Instantaneous Isotherms, lift and drag coefficients, Stronkal number and averaged Nusselt number, With Increase in the value of the Richardson number, Stroubal number lucreases and at a critical Richardson number suppression of vortex shedding takes place and Stronhal number reduces to zero. Present shaulation results indicate that critical Richardson number for suppression the vortex shedding past an equilateral triangular cylinder is much higher as compared to the volue of critical filfor circular and square cylinders at similar Reynolds number available in literature. This indicates that triangular body induces more Instability in the flow field that requires strong huoyant force to suppress the vortex shedding.

Key words---Ruoyancy, Mixed convection, Triangular cylinder, Vortex shedding

I. INTRODUCTION

The fluid flow and heat transfer mechanism around bluff bodles (e.g. cylinders of circular and square cross section, etc.) has been the tople of intense research to many researches. The topic finds many applications e.g. in electronics cooling, heat exchanger systems, design of flow dividers, probes and sensors etc. Most of the investigations have been done on eircular cylinder that has continuous surface curvature. Sharp edged cylinders (e.g., cylinders of square or triangular cross section) can also produce significant changes in the downstream flow field. The location of separation points are fixed for sharp edged cylinders, whereas for circular cylinder, the location of separation points depends on the state of the boundary layer. Among the sharp edged bluff bodles, square cylinder has also been studied extensively. However, triangular cylinder has gained attention in recent past and literature is scarce. In all bluff body flows, the flow separates from the body with the formation and shedding of circulating S. K. Singh, Professor

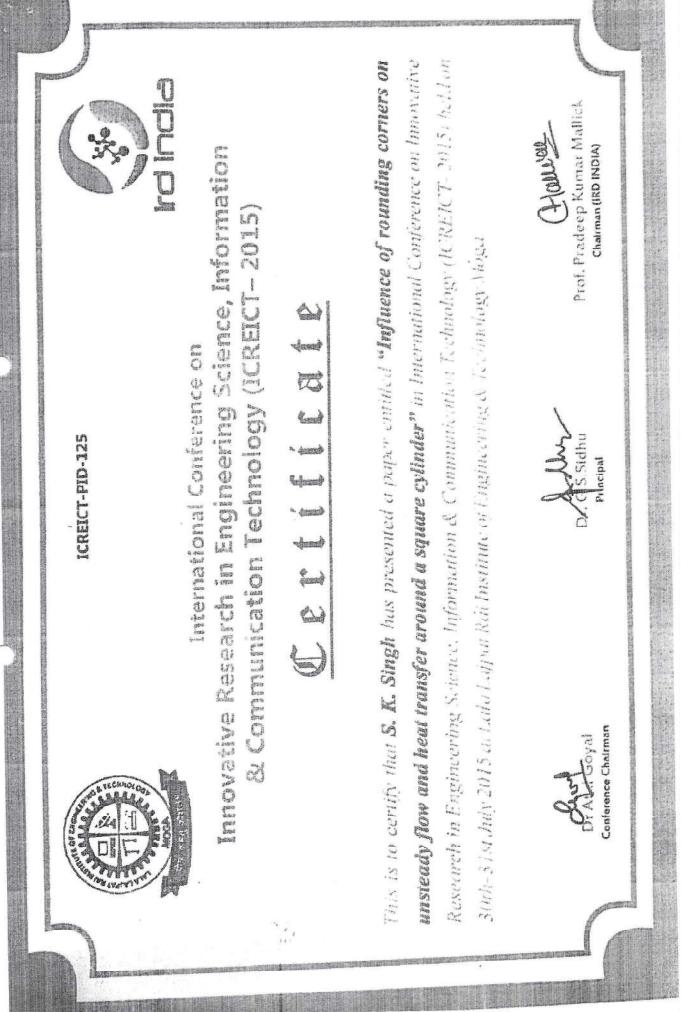
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flow structures, called vortices in the wake region. The periodic generation of these vortices in downstream flow is referred to as vortex shedding.Researchers havestudied the problem of fluid flow over triangular cylinder with two orientations of the cylinder i.e. vertex of the triangular cylinder facing the flow and base of the cylinder facing the flow De and Dalal [1], Dhiman and Shyam [2], Chatterjee and Mondal [3] have focused on low Reynolds number flow past an equilateral triangular cylinder with vertex of the cylinder finding the flow direction. Zeitounet. al [4], Jiahuanget al. [5], Singh and Rai[6] have studied vertex facing and base facing the flow orientations, both. However, above studies [1-6] were carried out in forced convection regime where buoyancy forces are negligible. For low velocity flow over a highly hented body, both the buoyancy force and forced flow influences the flow field and flow is in mixed convection regime. For mixed convection, flow and thermal field is governed by Richardson number (Ri = Gr/Re²). Where, Gr is the Grashof number. For a horizontally placed heated cylinder, buoyancy forces act in vertical upward direction. If the forced flow is directed in horizontal direction over a horizontal heated cylinder, it is termed as cross buoyancy flow. Chatterjee and Mondal [7], Rasoolet. al. [8], Dulhani and Dalal[9]investigated the effect of cross-buoyancy on unsteady mixed convective flow and heat transfer around a triangular cylinder. If the forced flow is directed in vertical upward directionover a horizontal heated cylinder, it is termed as buoyancy-aided flow.Buoyancy aided mixed convection flows past a circular cylinder has been studied by Chang and Sa [10] numerically. Singh et al. [11] studied buoyancy-aided mixed convection flows past circular and square cylinder experimentally. Above literature reveals that no study is available that deals with the effect of alding buoyancy on the wake characteristics of a triangular cylinder. Therefore, the objective of thepresent paper is to investigate numerically the effect of alding buoyancy on flow and heat transfer characteristics around a triangular cylinder. The cylinder is placed horizontally in base facing the flow configuration in unconfined boundaries and the flow of air (Pr = 0.7) is in verileal upward direction. Based on the projected width of the cylinder, the Reynolds number (Re) is kept at 100. Richardson number (R1) is varied in the range of $0 \le Ri \le 1.0$. The results are presented by instantaneous streamlines, instantaneous

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GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES DESIGN AND PROCESS INTEGRATION OF MULTIPLE EFFECTS EVAPORATORS Amit Meena¹, Mukesh Kumar² & Zelalem Weyuma³ *1Assistant Professor, MBM, Engineering College, JNVU, Jodhpur ²Lecturer, Assosa University, Ethopia

ABSTRACT

Evaporators are widely used in process industries for concentrating solutions. Heat supplied to evaporator is principally latent heat of vaporization of solvent. Evaporators are large consumers of energy. Multiple effect evaporation is most frequently used to conserve energy. Mathematical modeling serves as a valuable tool for the detailed thermal and hydraulic design of evaporation system as well as for simulation of existing unit. This report covers the detailed thermal and hydraulic design and performance analysis of multiple effect evaporators. The effect of inclusion of thermo vapor recompressor in multiple effect evaporation system is also studied. A mathematical model together with the concept of heat-path diagram is used to determine optimal design of process integrated multiple effect evaporator. The proposed mathematical model includes the effect of pressure drop on heat transfer area requirement for each effect. Available correlations are used to calculate two-phase pressure drop and corrected temperature is introduced into model equations. A case study is chosen from literature to illustrate the effect of pressure drop on area requirement. To demonstrate the application of proposed methodology, a corn glucose process plant is chosen. The capital energy trade-off for different effect systems is studied and it was found that minimum total cost occurs for process integrated triple effect system. A heat exchanger network to achieve minimum utility requirement of optimal design configuration is also proposed.

Keywords: Evaporator, Energy, Compressor, evaporation.

INTRODUCTION I.

Process industries require significant amount of energy in converting raw materials into final desired products. One of the energy intensive operations involved in these industries is evaporation. Process evaporators are energy intensive equipments used for concentrating a variety of solutions. The nature of solution decides the selection of evaporator. The heat supplied to evaporator is mainly latent heat of evaporation. Thus there is need to employ energy conservation techniques to reduce utility requirement and associated operating cost. Several techniques have been applied in process industries to improve economy ratio of evaporator. Multiple effect evaporation is most frequently used energy conservation technique. In multiple effect operation, several evaporators are connected in series such that vapor produced in one effect is utilized as heating medium in next effect, operating at lower pressure than the previous one. The net result of this arrangement is the multiple re-use of heat and a marked increase in the steam economy of the system. Other techniques include heat recovery exchange, condensate recovery, thermo-vapor and mechanical recompression. Traditional design of multiple effect evaporator is based on stand-alonc approach in which latent heat of vaporization is supplied by steam. Other heat requirements associated with the evaporation process are sensible heat duties for heating inlet feed stream, heating/cooling of outlet product stream and cooling of condensate and vapor streams. Now that process industries are becoming energy conscious due to steeply rising fuel price, the design of evaporation system with minimum utility must be considered. In this context, process integration technique for evaporator is a valuable tool in minimizing total utility consumption and results in improved overall process efficiency.



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A study on parabolic mass distribution

Meena, Amit

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Abstract

Civil Engineering structures have to withstand natural environmental forces like wind, earthquake forces and wave forces, along with loads that they are designed to resist. All this environmental forces are random and dynamic in nature. Therefore the response of the structure is also dynamic and that is what causes the unsafe and uncomfortable conditions. Therefore there is always a need for some sort of control of response of structure. This project aims at studying both methods of the Tuned Mass Dampers. It has been well established that Single tuned mass damper (STMD) and Multiple tuned mass damper (MTMD) are effective in reducing the response of the structure. The project aims and study of two devices, the Single Tuned Mass Damper and Multiple Tuned Mass Damper using new control strategy. The tuned mass dampers, consisting of one larger mass block (i.e. one larger tuned mass damper) and one smaller mass block (i.e. one smaller tuned mass damper), referred in this report as the STMD,

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Dept. of Mechanical Engg. Gurukula Kangri University Haridwar, India Email :amit08310004@gmail.com have been studied to seek for the mass dampers with high effectiveness and robustness for the reduction of the undesirable vibrations of structures under the ground acceleration. Multiple tuned mass dampers (MTMD) consisting of many active tuned mass dampers (TMDs) with uniform distribution of natural frequencies have been, proposed to attenuate undesirable oscillations of structures under the ground acceleration.

Keywords: MTMD | STMD | DMF | Parabolic mass

Introduction

Civil Engineering structures have to withstand environmental forces like wind, earthquake forces and wave forces along with loads that they are designed to resist. All this environmental forces are random and dynamic in nature. Therefore the response of the structure is also dynamic and that is what causes the unsafe and uncomfortable conditions. Therefore there is always a need for some sort of control of response of structure. The fact is more important in present times due to following factors:

1. Increased flexibility: it is now a necessity and trend to use tall, long or in general more flexible structures. There is also a growing



A STUDY ON SKEWED MASS DISTRIBUTION

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Abstract

Civil Engineering structures have to withstand natural environmental forces like wind, carthquake forces and wave forces, along with loads that they are designed to resist. All this environmental forces are random and dynamic in nature. Therefore the response of the structure is also dynamic and that is what causes the unsafe and uncomfortable conditions. Therefore there is always a need for some sort of control of response of structure. This project aims at studying both methods of the Tuned Mass Dampers. It has been well established that Single tuned mass damper (STMD) and Multiple tuned mass damper (MTMD) are effective in reducing the response of the structure. The project aims and study of two devices, the Single Tuned Mass Damper and Multiple Tuned Mass Damper using new control strategy. The tuned mass dampers, consisting of one larger mass block (i.e. one larger tuned mass damper) and one smaller mass block (i.e. one smaller tuned mass damper), referred in this report as the STMD, have been studied to seek for the mass dampers with high effectiveness and robustness for the reduction of the undesirable vibrations of structures under the ground acceleration. Multiple tuned mass dampers (MTMD) consisting of many active tuned mass dampers (TMDs) with uniform distribution of natural frequencies have been, proposed to attenuate undesirable oscillations of structures under the ground acceleration Key word: MTMD, STMD, DMF, Parabolic mass, Skewed, Bell shape

1. Introduction

Civil Engineering structures have to withstand environmental forces like wind, earthquake forces and wave forces along with loads that they are designed to resist. All this environmental forces are random and dynamic in nature. Therefore the response of the structure is also dynamic and that is what causes the unsafe and uncomfortable conditions. Therefore there is always a need for some sort of control of response of structure. The fact is more important in present times due to following factors:

1. Increased flexibility: it is now a necessity and trend to use tall, long or in general more flexible structures. There is also a growing tendency to use lighter and more flexible construction materials. These factors promote the idea of control of vibrations of structure.

2. Increased safety levels: As structure becomes more complex, costly and as it serves more critical function, it demands higher safety levels. Stringent performance requirements: 3. Structures are required to respond to the forces acting on them within the safety limits. Hence for environmental loads, which are random and dynamic in nature, more stringent safety limits are generally set, which demand for control of vibrations of the structure. Due to the above listed reasons, the concept of structural perception using control systems is not only becoming increasingly popular but it is becoming almost a necessity in modern days. The Tuned Mass Damper is a classical engineering device that is used for vibration control. It consists of mass, a spring and a damper, which is attached to the main structure Fig 1.

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A compression on parabolic and skewed mass distribution

Meena, Amit

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Abstract

Natural environmental forces like wind, earthquake forces and wave forces, along with loads that they are designed to resist. These forces are random and dynamic in nature. So the response of the structure is also dynamic and that is what causes the unsafe and uncomfortable conditions. The aim of study both methods are to compare the effectiveness and the response on the structure. It has been studied to seek for the mass dampers with high effectiveness and robustness for the reduction of the undesirable vibrations of structures under the ground acceleration.

Keywords: DMF | Parabolic mass | Skewed | Bell shape

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Introduction

Engineering structures have to withstand environmental forces like wind, earthquake forces and wave forces along with loads that they are designed to resist. All forces are random and dynamic in nature. So the response of the structure is also dynamic and that is what causes the unsafe and uncomfortable conditions. These are the factors due to this engineering structure play an important role.

Stringent performance requirements: Structures are required to respond to the forces acting on them within the safety limits Hence for environmental loads, which are random and dynamic in nature, more stringent safety limits are generally set, which demand for control of vibrations of the structure.

Increased flexibility: There is also a growing tendency to use lighter and more flexible construction materials. These factors promote the idea of control of vibrations of structure.

3. Increased safety levels: As structure becomes more complex, costly and as it serves more critical function, it demands higher safety levels. WALIA journal 32(S2): 33-42, 2016 Available online at <u>www.Waliaj.com</u> ISSN 1026-3861 © 2016 WALIA

Vibration control using tuned mass damper

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Abstract: Civil Engineering structures have to withstand natural environmental forces like wind, earthquake forces and wave forces, along with loads that they are designed to resist. All this environmental forces are random and dynamic in nature. Therefore the response of the structure is also dynamic and that is what causes the unsafe and uncomfortable conditions. Therefore there is always a need for some sort of control of response of structure. This project aims at studying both methods of the Tuned Mass Dampers. It has been well established that Single tuned mass damper (STMD) and multiple tuned mass damper (MTMD) are effective in reducing the response of the structure. The project aims and study of two devices, the Single Tuned Mass Damper and Multiple Tuned Mass Damper using new control strategy. The tuned mass dampers, consisting of one larger mass block (i.e. one larger tuned mass damper) and one smaller mass block (i.e. one smaller tuned mass damper), referred in this report as the STMD, have been studied to seek for the mass dampers with high effectiveness and robustness for the reduction of the undesirable vibrations of structures under the ground acceleration. Multiple tuned mass dampers (MTMD) consisting of many active tuned mass dampers (TMDs) with uniform distribution of natural frequencies have been, proposed to attenuate undesirable oscillations of structures under the ground acceleration.

Key words: Vibration; Damper; Tuned mass damper (Single and multiple)

1. Introduction

Civil Engineering structures have to withstand environmental forces like wind, carthquake forces and wave forces along with loads that they are designed to resist. All this environmental forces are random and dynamic in nature. Therefore the response of the structure is also dynamic and that is what causes the unsafe and uncomfortable conditions. Therefore there is always a need for some sort of control of response of structure. The fact is more important in present times due to following factors:

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The Tuned Mass Damper is a classical engineering device that is used for vibration control. It consists of mass, a spring and a damper, which is attached to the main structure Fig. 1. Single tuned mass

Dampers (STMD) have proved to be vcry sensitive even to the small offset in tuning ratio when it is optimally designed. This is the greatest disadvantage of STMD. This is due to following reasons. Errors in predicting or identifying the natural frequency of the structure and also the error in fabricating a TMD are inevitable to some degree. Some structures have nonlinear properties even in small amplitude range due to contribution of secondary members.

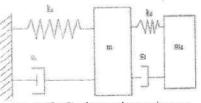


Fig. 1: The Single tuned mass damper

Therefore, in practical design the optimum values of parameters of TMD are not chosen. The damping of the TMD is intentionally made higher than the optimal value such that TMD become less sensitive to tuning errors. This results increase the mass of TMD to meet the design requirement.

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A Project on three axis pneumatic modern trailer

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Abstract: Three axis modern trailer used mainly in construction site as well in industrial site where the place is very less, here we can load material at any side of trailer where as in ordinary unloading done at back side only here we can unload the load on left side, right side and back side also. This system is totally operated with pneumatic component with linkage mechanism. In this project control valve is used to activate deactivate the air input the valve is ON the air goes to cylinder and then pushes cylinder so that lifting is applied at the time of valve is ON.

Mechanization is broadly defined as the replacement of manual effort by mechanical power pneumatic is attractive medium for low cost mechanization particularly sequential or repetitive operations. Many factories and plants already have a compressed air system which is capable of providing the power or energy requirements and the control system (although equally pneumatic control system may be economic and can be advantageously applied to other forms of power). The main advantage of all pneumatic system is usually economic and simplicity the latter reducing maintenance to a low level. It can be also have outstanding advantages in term of safety.

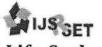
Key word: Pneumatic, Trailer, Compressed, Cylinder

1 INTRODUCTION

A Trailer is generally an unpowered vehicle pulled by a powered vehicle. Commonly, the term trailer refers to such vehicles used for transport of goods and materials. Sometimes recreational vehicles, travel trailers, or mobile homes with limited living facilities where people can camp or stay have been referred to as trailers. In earlier days, many such vehicles were towable trailers. Mechanization is broadly defined as the replacement of manual effort by mechanical power pneumatic is attractive medium for low cost mechanization particularly sequential or repetitive operations. Many factories and plants already have a compressed air system which is capable of providing the power or energy requirements and the control system (although equally pneumatic control systemmay be economic and can be advantageously applied to other forms of power). The main advantage of all pneumatic system is usually economic and simplicity the latter reducing maintenance to a low level. It can be also having outstanding advantages in term of safety.

2 WORKING PRINCIPLE

In our project, we are doing unloading material in using three axis pneumatic modern trailer. In this working the loading material is unloaded by using pneumatic cylinder. The compressed air passes through the compressor. Compressor is control by the controller for ON the pneumatic. This pneumatic force used for rivet to moves downwards. After a few seconds delay the controller will off the compressor, so that the pneumatic moves upwards. In automatic control movement controller control the pneumatic cylinder positioning with the help of relay and solenoid valve. The controller gives the signal to relay drive. The main function of relay drives to change the direction of air flow movement in solenoid valve. Then the piston movement automatically changes in pneumatic cylinder. Then



Themed Section: Engineering and Technology

Life Cycle Analysis in Manufacturing Industry - A Case Study

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ABSTRACT

The method used in this project is LCA and the study is performed from gate (beginning of the company) to gate (end of the Company). LCA is a method to assess the potential environmental impacts associated with a specific product or service. All stages in the life cycle are taken into account and use of natural resources, transportation, energy consumption, waste and emissions are considered. LCA can be used for identification of improvement possibilities, decision-making etc. but has also an important application in learning about environmental impacts caused by substances and processes used in the life cycle. This is mainly what is done in this study.

Keywords: Environmental Impacts, NBC, ISO, LCIA, LCA, GWP, LCI

I. INTRODUCTION

The increasing environmental concern in today's society puts lot of pressure on the industry to produce less environmental damaging products. At this point, this is principally experienced by industries producing consumer goods but these industries are in their turn increasing the pressure on their suppliers. So far it is in most cases questions about environmental management systems but the nature of the questions are slowly changing and becoming more product-related. Questions about LCA work and performed LCAs are becoming more frequent. With this as a background I decided that it was time to perform an LCA on one of key products of NBC.

In recent years Life Cycle Assessment (LCA) has become one of many useful tools in assessing the environmental aspects and potential impacts associated with a product. In LCA the product is followed from the cradle to the grave, i.e. from raw material acquisition, through production, use and waste disposal. LCA is multidisciplinary and deals with the social system, the technical system, the natural system and their relationships. The LCA method provides researchers or companies with quantitative data for their current products. By looking at a product's life from the raw material extraction to its disposal, the environmental impact of each process and material can be analysed. The LCA allows analysts to determine and analyse the technological, economic, environmental, and social aspects of a product or process necessary to manage the complete life cycle. With this quantitative data, desired changes can be justified with respect to the cost and environmental impacts of a product or process.

LCA is an increasingly important tool for environmental policy, and even for industry. Analysts are also interested in forecasting future materials/energy fluxes on regional and global scales, as a function of various economic growth and regulatory scenarios. A fundamental tenet of LCA is that every material product must eventually become a waste. To choose the 'greener' of two products or policies it is necessary to take into account its environmental impacts from 'cradle to grave'. This includes not only indirect inputs to the production process, and associated wastes and emissions, but also the future (downstream) fate of a product. The first stage in the analysis is quantitative

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An Overview Study of Solar Cookers

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bstract - Conking is the major necessity for people all over he world. It accounts for a major share of energy onsumption in developing countries. Therefore, solar cookers are commonly used in the domestic sector in these countries. The advantages of the use of solar cookers would result in the reduction of the release of CO_2 in the environment. Cooking is the most important energy consuming operation in the domestic sector, as energy for cooking accounts for 50% of the total primary energy consumption. According to Indian government survey, over 77% of rural households in the country were estimated to depend on firewood and chips for cooking. Over 7% used dung cake and only 9% used LPG. In urban areas, LPG was the primary source of energy in nearly 62% of households. Hence, replacing the traditional cooking methods by solar energy can be considered as an alternative for meeting the energy crisis. This paper presents a short review on different types of solar cookers.

Key Words: Box Solar Cooker, Solar Energy

1. INTRODUCTION

Solar cookers are not a new idea. Designers as far back as the 19th century recognized the potential of the sun's energy to provide heat for cooking and other purposes and designed appropriate tools to harness it. It is indeed likely that solar energy was used for cooking long before then.

Solar cookers have many potential benefits, both to their user and to the environment. A frequently cited advantage of solar cookers is that they reduce users' dependence on fuel sources for cooking. This reduction has economic benefit to the user by reducing their expenditure on fuel and also environmental benefit by reducing deforestation (in regions where wood is used as a cooking fuel) and release of combustion products into the atmosphere. Because a good deal of wood-based cooking is performed indoors with poor ventilation, solar cooking also has the potential to reduce smoke inhalation and related health difficulties

2. LITERRTURE SURVEY

C Z M Kimambo et al (2007) in their paper optimized various parameters and concluded that results obtained from this study show that under various conditions of insolation and wind, different types of solar cookers are superior to others. However, under best respective operating

conditions, box solar cookers have lower performance compared to the reflector cookers. The reflector cooker with glass reflector achieved highest temperatures and accordingly shortest cooking times than any other cookers tested under sunny days with no cloud cover. It is recommended as being the most suitable type of cooker in areas with long durations of strong solar radiation with no cloud cover and low wind interference. However, special attention should be paid to protect the users from possible burns or eye damage that may occur due to the reflected radiation of the cooker. The reflector cooker with polished aluminium reflectors has significantly lower performance than that of the reflector cooker glass mirror reflectors, under clear sky conditions. The reflector cooker with unpolished aluminium reflectors has the poorest performance of all the solar cookers even the box solar cookers under clear sky conditions. The ordinary unpolished aluminium should therefore never be used as reflector for solar cookers. Dissemination of such cookers would definitely end up in failure as the cookers would not be able to meet the cooking expectations of the intended users. The 'SunStove' box cooker was able to cook 2 kg of rice, which is sufficient for a moderate family in Tanzania. Both the 'SunStove' and the wooden box cooker can be used for cooking where the global insolation is high and wind effects are not pronounced. This work had shed some light on the status of solar cooking worldwide and provided a detailed account of activities taking place in Tanzania, in relation to solar cooking. Results obtained indicate that many of the cookers could be used to cook food for households in areas with medium and high insolation with appropriate selection of the type and specification of the cookers. The specification should be based on the measured insolation data of the location indicating the direct and diffuse components. This should go hand in hand with proper instruction and training of the users for successful dissemination. As a guiding tool, reflector cookers offer best comparative performance in areas with longest durations of clear sky (greatest direct beam), panel and collector cookers under moderate cloudy conditions and box cookers under very cloudy conditions. It should be noted here that all types of cookers offer best performance under clear sky conditions.

Prof. Viral K Pandya, Prof. Shailesh N Chaudhary, Prof. Bakul T Patel et al. (2011) started their study with the objective to analyze the performance of Box Type Solar Cookers under Gujarat Climate Condition in Mid Summer to

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Implementation of Industry 4.0 to achieve Sustainable Manufacturing in Steel industry : A Case Study

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Abstract: Sustainable manufacturing has been a popular topic of research for quite some time now. There are various concepts and ideas which have claimed to have a significant impact on sustainability of the manufacturing industry like lean, green and agile manufacturing. Industry 4.0 is the latest and by far the one with the maximum potential of changing the manufacturing sector forever. It is rightly called as "the fourth industrial revolution". It is a wide concept which covers many state of the art technologies like the Internet of Things (loT), Artificial Intelligence, Big Data. Augmented reality etc. But like every big revolution, it is to face many challenges also. In this review, we are looking at this 'yet in infancy' concept and its role in achieving a sustainable manufacturing sector as discussed by researchers. Different scholars have come up with different challenges to implementation of 14.0 which they thought to be of some significance. There is going to review such challenges making a list of 13 such challenges. Then, it also throw some light on the new challenge faced by all of humanity in the form of SARS-CoV-2 pandemic and how it is affecting the manufacturing sector.

Keywords: Industry 4.0, Sustainable Manufacturing, Sustainability, Manufacturing.

1. INTRODUCTION

Manufacturing industries are forced by increasing challenges such as resource depletion, economic stagnation, human beings pursuing higher life quality and stricter laws and environment protection policies. Sustainable manufacturing has intended to empower the companies to cope with such challenges and guide them to stand out in the competitive market today. Therefore, manufacturers are now tending to reset to manufacturing processes and manufactured products that minimise environmental impacts while considering social and economic dimensions. Indian manufacturing units, especially SMEs, have long been avoiding any big transformation. The ongoing pandemic has disrupted the global as well as domestic demand and supply chains [1]. Recent data released by Gol shows that manufacturing is the worst performing sector (at -39.3%) after Construction. At this point of time, the long pending restructuring of the processes and methods has become absolutely necessary. Further continuing with the traditional manufacturing techniques

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without adapting to the new order might prove to be a recipe for disaster. Now the question arises how a manufacturing industry should approach towards achieving goals offered by sustainable manufacturing?. How to implement these changes in the current system? How to make complete use of industry 4.0 ? its focusing on the implementation of industry 4.0 in order to enhance sustainability in Indian manufacturing industries. It also focuses on the challenges faced by Indian manufacturing industries in implementation of industry 4.0 and the methods that can be used in obtaining maximum output by implementation of Industry 4.0 Industry 4.0 is based on the establishment of smart factories, smart products, and smart services embedded in an internet of things. Sustainable manufacturing or Green manufacturing focuses on energy efficiency, conservation of resources and low waste production and reduces environmental impact. In this process we need to identify, quantify, assess, and manage the flow of environmental waste with the goal of ultimately reducing the environmental impact to that of the self-recovery capability of the Earth could deal with while also trying to maximise resource efficiency . The OECD Sustainable Manufacturing Toolkit illustrates three aspects of sustainability as Environmental, Economic and Social. The 17 well known SDGs (Sustainable Development Goals) of the UN (United Nations) summarizes the need of the hour in a very simple manner and for all three aspects. These SDGs, since their adoption by the UN, have served as the guiding light for policy makers across the globe. Adoption of the SDGs was, according to the UN, "a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030". In this journey to improve sustainability in all aspects of life, many challenges have come our way and many are waiting for us in the journey ahead. We have reviewed such challenges mentioned by earlier researchers. In the end we have reviewed the current situation of COVID-19 pandemic in light of challenges it offers to our agenda of achieving SDGs by 2030.

Selection of the literature to be reviewed by searching on google scholar with keywords, "Sustainability manufacturing" OR "Industry 4.0 Sustainability" in "Sustainable manufacturing" OR "Industry 4.0 challenges". OR

Implementation of Industry 4.0 to achieve Sustainable Manufacturing in Steel Industry : A Case Study

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reduction, pollution, faults in process can be made to obtain sustainability in manufacturing.

1.3. Cloud Computing

Cloud Computing is a new technology which helps in easy storage of data over the internet, which provides easier computing and access of data from all over the world via

better decisions like product quality, product life, product cost

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Process improvement in an Indian automotive part manufacturing company: a case study

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Abstract: Problem-solving and ongoing procedure enhancements are key elements to obtaining quality improvement in tusiness operators. Many process improvement strategies have been suggested and implemented in organisations, where define, measure, analysis, improve and countrol (DMAIC) is mostly apptied. This study presents a practical application of an improve eversion of DMAIC, for reducing the defects generated through a process within the auto part manufacturing firm. The paper reviews the most commonly used lean and Six Signat acids, explicitly, DMAIC, is in modifications, and restrictions. Based on this, the study provides define, measure, pre-analysis, experiment, analysis, improve, and coursed (DMAIC) modifications, and restrictions that DMPEAIC is an efficient approach resulting in the case study shows that DMPEAIC is an efficient approach resulting in the case study somasting of et a reduction of 76.4% defects in problems related to maintenance methods, and informal issues.

Keywords: anomobile part manufacturing; defect; define, measure, analysis,

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M.L. Meena et al.

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improve and control; DMAIC; process improvement; Six Signar; waste reduction. India.

Reference to this paper should be made as follows: Meena, M.L., Jain, R., Kumar, P., Gupta, S. and Dangayachi, G.S. (XXXA) "Process improvement in an Indian automotive part manufacturing company: a case study", *Int. J. Productivity and Quadity Management*, Vol. X, No. Y, pp.XXX-XXX.

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Suppliers Selection Using Fuzzy AHP and Fuzzy TOPSIS Method—A Case Study of a Bearing Manufacturing Company

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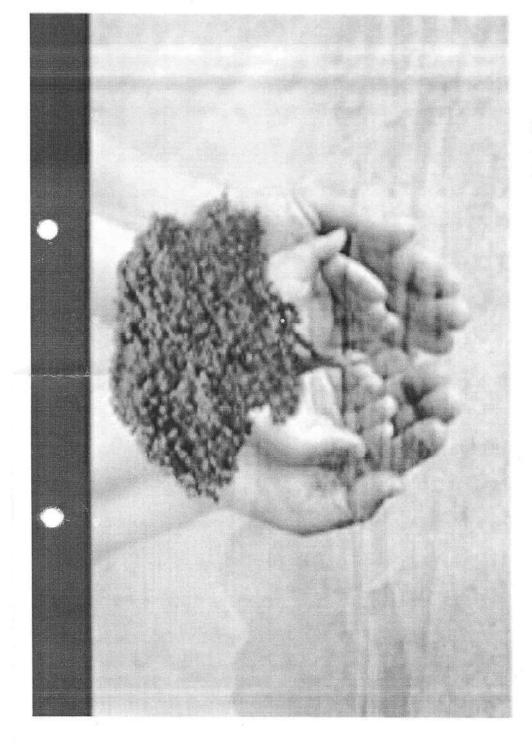
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Sustainable Development using Six Sigma in Automobile Industry

M. L. Moona Pradomy Kumar G. S. Dangayach



Mechanism and Machine Theory 93 (2015) 127-146

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Optimal dynamic balancing and shape synthesis of links in planar mechanisms



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ABSTRACT

This paper presents a two stage optimization procedure for dynamic balancing of planar mechanisms and finding optimum link shapes. In the first stage, the shaking force and shaking moment are minimized by optimizing mass distribution of links using the equimomental system of pointmasses for each link. Then for the optimum inertial parameters of the balanced mechanism, the optimum links shapes are synthesized systematically using closed parametric curve such as cubic B-spline in the second stage. The control points of cubic B-spline curve are taken as the design variables for link shape formation to minimize the percentage error in the resulting link inertia values. The constraints on design variables are defined for both symmetrical and nonsymmetrical shapes in the optimization problem formulation. The proposed method of balancing and shape synthesis can be applied to any planar single and multiloop mechanism with revolute as well as prismatic joints. Its effectiveness is demonstrated by applying it to four-bar, five-bar, sixbar and slider-crank mechanisms.

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1. Introduction

The resultant inertial forces and moments of the moving links of a mechanism are termed as shaking force and shaking moment [1]. These forces and moments transmitted to the frame result in vibrations, wear and noise which adversely affect the dynamic performance of the mechanism. Several methods to reduce the shaking force and shaking moment based on various principles are discussed in [2–4]. The complete force balancing can be achieved by making the total mass center of moving links stationary either using mass redistribution [5,6] or by adding counterweights [7]. Force balancing and trajectory tracking are achieved in a five-bar real-time controllable mechanism using adjusting kinematics parameter approach [6]. However, the full force balance generally increases the other dynamic performance characteristics like shaking moment, driving torque and bearing reactions in the joints [9]. Similarly, the complete moment balancing needs elimination of the total angular momentum of the moving links. The complete climination of the total angular moment is reduced by adding inertia or disk counterweights [11–13], duplicate mechanism [14] and moment balancing idler loops [15] along with the full force balancing. Alternatively, shaking force and moment can be minimized by properly designing and making the moving links of bi-material [16]. The effects of dynamic balancing on the elastodynamic properties of the mechanisms are investigated in [17–21]. In all these methods, the overall mass is increased and mechanism becomes more complex.

Instead of complete balance of shaking force and shaking moment, some methods are developed to minimize them simultaneously through optimization. The conventional optimization technique is used to optimally balance the planar four-bar mechanism [22,23] and to analyze the sensitivity of shaking force and shaking moment to the design variables [24]. The shaking moment is minimized in

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Optimal design of planar slider-crank mechanism using teaching-learning-based optimization algorithm[†]

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Abstract

In this paper, a two stage optimization technique is presented for optimum design of planar slider-crank mechanism. The slidercrank mechanism needs to be dynamically balanced to reduce vibrations and noise in the engine and to improve the vehicle performance. For dynamic balancing, minimization of the shaking force and the shaking moment is achieved by finding optimum mass distribution of crank and connecting rod using the equimomental system of point-masses in the first stage of the optimization. In the second stage, their shapes are synthesized systematically by closed parametric curve, i.e., cubic B-splinc curve corresponding to the optimum inertial parameters found in the first stage. The multi-objective optimization problem to minimize both the shaking force and the shaking moment is solved using Teaching-learning-based optimization algorithm (TLBO) and its computational performance is compared with Genetic algorithm (GA).

Keywords: Dynamic balancing; Equimomental system; Link shape; Optimization; Slider-crank mechanism; Teaching-learning-based optimization algorithm

1. Introduction

The slider-crank mechanism consisting of crankshaft, connecting rod and piston is the fundamental mechanism used for vchicle engines. The shaking force and shaking moment in the mechanism are defined as the resultant inertial forces and moments of the moving links [1] and need to be eliminated to dynamically balance the mechanism. For an unbalanced mechanism, these forces and moments are transmitted to the frame which worsen the dynamic performance of vehicle engine and generate vibrations, wear and noise. It leads to expensive repairs and replacement of crankshaft and connecting rod and their reverse effects on the other parts such as cylinder block and piston. Few review papers discuss the methods to reduce the shaking force and shaking moment based on different approaches [2-4]. To achieve full force balance in the mechanism, the total mass center of moving links is made stationary either by adding counterweights [5] or by mass redistribution [6, 7]. The complete force balancing increases other dynamic quantities like shaking moment and driving torque in the mechanism [8]. For complete balancing of moment in the mechanism, the total angular momentum of the moving links is eliminated by using duplicate mechanism [3],

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inertia or disk counterweights [9-11] and moment balancing idler loops [12]. However, the complexity and overall mass for mechanism are increased in these methods.

Alternatively, the shaking force and shaking moment are minimized simultaneously by optimizing links inertial properties, i.e., mass, center of mass location and moment of inertia. The conventional optimization technique is used to optimally balance the planar mechanisms [13, 14] and to analyse the sensitivity of shaking force and shaking moment to the design variables [15]. The mechanism balancing problem is formulated as a multi-objective optimization problem and solved using evolutionary optimization techniques like particle swarm optimization [16] and genetic algorithm [17, 18].

Once the optimized inertial properties of mechanism links are obtained, their shapes are to be decided to carry loads. A method to find link shapes is presented in Ref. [19] by discretizing initial assumed shape into small mass elements and locate them systematically along the link length. The link shapes are synthesized on the basis of maximum work done by taking volume of all links as the constraint [20]. Similarly, the link shapes are formed through topology optimization based on parametric curves [21] and non-intersecting closed polygons [22]. The Evolutionary structural optimization (ESO) method is used to optimize the shaft shape for rotating machinery by gradually removing the ineffectively used material from the design domain [23, 24]. Alternatively, by identi-

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Kailash Chaudhary¹ and Himanshu Chaudhary²

Optimal dynamic design

teaching-learning-based

optimization algorithm

of planar mechanisms using

Abstract

A two-stage optimization method for optimal dynamic design of planar mechanisms is presented in this paper. For dynamic balancing, minimization of the shaking force and the shaking moment is achieved by finding optimum mass distribution of mechanism links using the equimomental system of point-masses in the first stage of the optimization. In the second stage, their shapes are synthesized systematically by closed parametric curve, i.e. cubic B-spline curve corresponding to the optimum inertial parameters found in the first stage. The multi-objective optimization problem to minimize both the shaking force and the shaking moment is solved using evolutionary optimization algorithm – "Teaching-learning-based optimization (TLBO) algorithm". The computational performance of TLBO algorithm is compared with another evolutionary optimization algorithm, i.e. genetic algorithm.

Keywords

Dynamic balancing, equimomental system, dynamic design, planar mechanism, teaching-learning-based optimization algorithm

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Introduction

High speed machines and mechanisms must be designed such that the unbalance of shaking force and shaking moment should be minimum to avoid undesirable vibrations. Thus, the balancing problems are actually design problems in disguise. The shaking force and shaking moment are defined as the resultant inertial forces and moments of the moving links of mechanisms.1 These forces and moments need to be eliminated for dynamic design as they create unbalance and are transmitted to the frame. This results in poor dynamic performance of the mechanism and generates vibrations, wear and noise. The methods to reduce the shaking force and shaking moment based on different approaches are discussed in few review papers.2-4 To achieve full force balance in the mechanism, the total mass center of moving links is made stationary either by adding counterweights⁵ or by mass redistribution.^{6,7} The complete force balancing increases other dynamic quantities like shaking moment and driving torque in the mechanism.8 For complete balancing of moment in the mechanism, the total angular momentum of the moving links is

eliminated by using a duplicate mechanism,³ inertia, or disk counterweights⁹⁻¹¹ and moment balancing idler loops.¹² However, the complexity and overall mass for mechanism are increased in these methods.

Alternatively, the shaking force and shaking moment are minimized simultaneously by optimizing links inertial properties, i.e. mass, CG location and moment of inertia. The conventional optimization techniques are used to optimally balance the planar mechanisms^{13,14} and to analyse the sensitivity of shaking force and shaking moment to the design variables.¹⁵ The mechanism balancing problem is formulated as a multi-objective optimization problem and solved using evolutionary optimization

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A study on critical order of joints with clearances and its effect on kinematic performance of multiloop planar mechanisms

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Abstract. Simulation and study of joint clearances has usually focused on appropriate simulation strategies and their validation against experiments. The effect of joint clearances on the output of a mechanism has been usually evaluated qualitatively. The relative importance of different joints in a mechanism in producing deviation from the output of an ideal mechanism has not been studied. This work identifies the appropriate statistical measure for quantifying this deviation and uses it to rank the joints of one degree of freedom multi-loop planar mechanisms. The inversions of six-bar mechanism have been studied through ADAMS simulations involving different clearance sizes and speed of crank. A trend in clearance location ranking has been identified which can probably be extended to planar mechanisms of higher complexity.

Keywords. Planar mechanism; joint clearance; simulation; kinematic performance.

1. Introduction

A mechanism is designed to perform a specific task and it may produce errors when used in real working conditions. These errors occur due to unavoidable factors such as flexibility of links, joint clearances, friction, lubrication and wear. Links and joints are the main constituents of any mechanism and a designer needs to carefully consider their function and limitations. The links form the basic structure of the system while the joints are used to define the relative interactions between them. In general analysis of the mechanism, it is assumed that the joints are ideal and there is no clearance in them. However, clearances are unavoidable due to machining tolerances, wear, and local deformations. Joint clearances are necessary to allow motion between the links and hence they are essential for correct functioning of the mechanism. The performance of a mechanism is adversely affected by the wear and tear of the joints as a result of impact forces generated due to joint clearances [1].

Due to clearances, there is a deviation from the expected ideal behavior which is considered as error. These errors are small for small clearance size but they cannot be neglected for high precision operations. However, reduction in these joint clearances increases the overall cost of the manufacturing. In order to reach a compromise between the manufacturing cost and the output error, it is necessary to analyze the errors and their patterns to estimate the

*For correspondence Published online: 15 May 2020 effects caused by the clearances for the given set of conditions.

Researchers around the world have reported various methods for studying the effects of joint clearances and predicting their effect on a mechanism's performance as accurately as possible. Research in this area is mainly focused on developing mathematical models for joint clearances to predict the mechanism's dynamic and kinematic behavior in a variety of situations [2–5]. Neural networks have also been used for this purpose [6–10].

Models for taking into account both joint clearance and link flexibility/compliance have also been reported [11-35]. Models to capture system dynamics and mechanism optimization for reducing their effect was the natural progression in this field and have been reported by many [36-43].

Low joint clearance is certainly preferable but it increases the cost of manufacturing. Mechanism designers and manufacturers need to take a decision on how much clearance can be allowed at which location in the mechanism. In order to take this decision, one needs to know whether the location of joint clearance makes a difference to the output of a mechanism. Such a study, which does not appear to be reported, has been undertaken in this work. One degree of freedom planar mechanisms with only revolute and prismatic pairs have been simulated in ADAMS and the effect of clearance location, clearance size and crank speed have been studied. The first step necessary for such a study was quantification of the deviation of the kinematic output of a mechanism with clearance from that of an ideal mechanism. The appropriate statistical tool for

Dynamic balancing and link shape synthesis of slider-crank mechanism for multi-cylinder engines

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Abstract: A two-stage optimisation method is proposed to dynamically balance a planar slider-crank mechanism to minimise the shaking force and shaking moment and synthesise its link shapes. In the first stage, the dynamic balancing is achieved by optimally distributing masses of crank and connecting rod using the equimomental system of point-masses. Their shapes are synthesised systematically by closed parametric curve, i.e., cubic B-spline curve corresponding to the balanced mechanism's inertial parameters in the second stage. When such optimised mechanism is used in a multi-cylinder inline engine, the loads on main hearings get reduced. The optimisation problem thus formulated to minimise shaking force, shaking moment and bearing loads as well as to find optimum link shapes are solved using the popular evolutionary optimisation algorithm, i.e., genetic algorithm.

Keywords: optimisation; dynamic balancing; link shape synthesis; shaking force and shaking moment; slider-crank mechanism; multi-cylinder inline engine.

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Shape optimization of dynamically balanced planar four-bar mechanism

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Abstract

This paper presents an optimization method to find link shapes for a dynamically balanced planar four-bar mechanism. The shaking force and shaking moment developed in the mechanism due to inertia are minimized by optimally distributing the link masses. The link shapes are then found using cubic B-spline curves and an optimization problem is formulated to minimize the percentage error in resulting links inertia values in which the control points of B-spline curve are taken as the design variables. The effectiveness of the proposed method is shown by applying it to a numerical problem available in the literature.

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Keywords: Dynamic balancing; Equimomental system; Four-bar mechanism; Genetic algorithm, Shape optimization

1. Introduction

The four-bar mechanism is the basic mechanism used in the machines. When operated with high-speeds, these mechanisms transmit forces and moments to the ground known as shaking forces and shaking moments. These are defined as the vector sum of inertia forces and moments of all moving links of the mechanism. The dynamic performance of mechanism is adversely affected by vibrations, wear and noise associated with these forces and moments and several methods are presented in the literature [1-3] to reduce them. The complete force balancing in a

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SHAKING FORCE AND MOMENT BALANCING IN MECHANISMS - A REVIEW

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Abstract

This paper reviews the various methods developed for balancing of the planar mechanisms. The methods used for complete force balance as well as complete force and moment balances are reviewed.

Index Terms: Dynamic balancing, Shaking force, Shaking moment

I. COMPLETE SHAKING FORCE BALANCING

The complete shaking force balancing known as static balancing requires the total center of mass of a mechanism to be fixed. The two common approaches used to achieve this are the redistribution of the link masses and use of the counterweights for the mechanism links.

The analytical methods have been developed to trace and keep the total mass center of the mechanism fixed. Shchepetilnikov [1] presented the method of 'Principal Vectors' in which the position of the mass center is described using the vectors directed along the links of the mechanism. Similarly, Berkof and Lowen [2] introduced the 'Method of Linearly Independent Vectors' for the complete force balancing of four and six-bar planar mechanisms with arbitrary link mass distribution (Fig. 1). The balancing conditions are presented for the internal mass redistribution and for the counterweight addition. In this method, the links masses are redistributed in such a way that it eliminates the time-dependent terms coefficients in an equation representing the trajectory of the total center of mass of the mechanism.

This results in a fixed center of mass of the mechanism and thus the complete shaking force balancing is achieved.

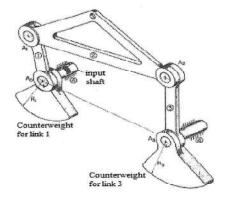


Fig. 1 Complete force balancing of planar four-bar mechanism using counterweights [2]

Tepper and lowen [3] extended this method and proved that the counterweights required for the complete force balance of an n-link planar mechanism are half of the total number of the links. They developed the 'Contour Theorem' to differentiate between the mechanisms which can be fully force balanced and those which cannot. Contour theorem examines the nature of the paths from the individual links to the ground. It was found that the pinned planar mechanisms can always be force balanced as they do not have time-dependent coefficient in the center of mass equation. Based on the same approach, Walker and Oldham [4], [5] presented the complete force balancing conditions for various types of planar mechanisms with multi-degrees of freedom. The counterweights are used to balance

FATIGUE LIFE IMPROVEMENT BY SHOT PEENING

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Abstract: The main advantage of using shot peening process is to increase the fatigue strength of components subjected to high alternating stresses. The fields of application for shot peening include all metallic components, which are subject to fluctuating and fatigue loads. Additional advantages of using shot peening include design of lighter weight and lower cost components, prevention of stress corrosion, formation of lubrication pockets and compensation of manufacturing related surface defects.

1 Shot Peening Process

Shot peening is a process used to produce a compressive residual stress layer and modify mechanical properties of metals. Residual stresses are stresses that remain after the original cause of the stresses (external forces, heat gradient) has been removed. They remain along a cross section of the component, even without the external cause. Machine parts when subjected to fatigue loading will experience maximum tensile stresses, normally over the surface. These tensile stresses initiate and propagate fatigue cracks. In order to counteract the effect of these tensile stresses, residual compressive stresses are induced over the surface of the metal parts by the controlled process known as shot peening [1].

Shot peening is a cold working process in which the surface of the finished part is bombarded with shots under controlled conditions. Each shot acts as a tiny peening hammer; making a small dent in the outer surface of the metal (Fig. 1). This impact causes a plastic flow of the surface fibers to a depth depending on the angle of impact, size of shots and physical properties of the material [2]. The resultant

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Effectiveness of Shot Peening Process in Wide Range of Applications

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The main advantage of using shot peening process is to increase the fatigue strength of components subjected to high alternating stresses. The fields of application for shot peening include all metallic components, which are subject to fluctuating and fatigue loads. Some common fields of shot peening application are:

1. Vehicles and agricultural machinery.

- 2. Power drive and transmission system.
- Internal combustion engines.
- Steam and gas turbines.
- 5. Aviation equipment.
- 6. Chemical equipment.

The shot peening can improve the performance of the parts through:

- 1. Usage of the abrasive effect.
- 2. Removal of stress concentrations.
- 3. After-machining process.
- 4. Wear reduction on sliding surfaces.
- 5. Reduction of the danger of stress corrosion cracking.
- 6. Straightening or forming of metallic components.

Surface stabilization before chromium plating.

Increased fatigue strength due to shot peening has been firmly established by extensive fatigue tests on a wide variety of machine parts. The process is used very extensively on leaf springs, coil springs, torsion bars and other machine parts.

A gain in fatigue strength can be obtained even under poorly chosen peening conditions for a particular application, and even under poorly controlled operating conditions of the peening machine. In spite of this adverse combination, sufficient increase in fatigue strength may be obtained to justify the use of shot peening in that particular application. Shot peening is economical and environmental friendly. It leads to significant improvements of the mechanical properties of work pieces. Table 1 gives numerous applications of shot peening [1].

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RESEARCH ARTICLE

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Design Optimization of Planar Mechanisms

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Abstract:

This paper presents an optimization technique to dynamically balance the planar five-bar mechanisms in which the shaking force and shaking moment are minimized using the genetic algorithm (GA). A dynamically equivalent system of point-masses that represents each rigid link of a mechanism is developed to represent link's inertial properties. The shaking force and shaking moment are then expressed in terms of the point-mass parameters which are taken as the design variables. These design variables are brought into the optimization scheme to reduce the shaking force and shaking moment. This formulates the objective function which optimizes the mass distribution of each link. The balancing problem is formulated as a multi-objective optimization problem and multiple optimal solutions are created as a Pareto from by using the genetic algorithm. The masses and inertias of the optimized links are computed from the optimized design variables. The effectiveness of the proposed methodology is shown by applying it to a problem of five-bar planar mechanism available in the literature.

Keywords — Dynamic balancing, Shaking force and shaking moment, Equimomental system, Optimization, Genetic algorithm.

1. INTRODUCTION

An unbalanced mechanism running at high speed transmits forces and moments to the ground known as shaking forces and shaking moments. These forces and moments are vector sum of the inertia forces and moments of all the moving links. They adversely affect the dynamic performance of the mechanism. Several techniques are presented in the literature for reducing these shaking forces and shaking moments due to inertia. The complete force balancing can be achieved by making the mass center of moving links of a mechanism stationary [1]. This is achieved either by mass redistribution or by adding counterweights to the moving links. This methodology was extended for the mechanisms having prismatic joints under certain conditions [2, 3]. Force balancing and trajectory tracking is achieved in a five-bar real-time controllable mechanism using adjusting kinematics parameter approach [4].

The complete force balancing increases other dynamic performance characteristics such as shaking moment, driving torque and bearing forces in joints [5]. Therefore, along with the full force balancing, several methods proposed in the literature to balance the shaking moment [6, 7]. The complete force and moment balancing is achieved by adding duplicate mechanism, inertia or disk counterweights [8-10]. However, this method is not recommended due to complexity and practical reasons.

Several trade-off methods were developed to minimize different dynamic quantities simultaneously [11, 12]. As the shaking force and shaking moment depend on link masses, their locations of mass centers and moment of inertias, these trade-off methods find the optimal distribution of the link masses [13].

The conventional optimization methods like gradient based search method is used to optimally balance the planar mechanisms [14,15] and to analyse the sensitivity of shaking

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A COMPARATIVE STUDY OF ARC WELDING AND RESISTANCE WELDING PROCESSES

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Abstract: This paper makes an in-depth comparative study of arc welding and resistance welding processes. The objective is to present the current challenges and future aspects of these welding processes and their usefulness as fabrication technology. The important considerations and application areas of both the techniques are discussed in this paper.

1INTRODUCTION

The American Welding Society (AWS) defines welding as "a materials joining process which produces coalescence of materials by heating them to suitable temperatures with or without the application of pressure or by the application of pressure alone and with or without the use of filler .erial" [1].

Mechanical parts are often highly complicated in design or large in size. Manufacturing a unit of such a part as a single entity is not always possible. However, it can be produced in the form of different components or structures and could be joined by several joining processes to get the complete unit or assembly. It is here that welding has been found the most useful fabrication technology in joining different components and synthesizing them into a whole system.

2ARC WELDING PROCESSES

One of the most popular and common types of welding in use today is arc welding. It uses an electric arc as the source of heat to melt and join metals. The arc is formed between the metal being worked on and an electrode connected to the arc welder. The electrode is manually or mechanically moved along the joint. The electrode is either a consumable wire or rod, or a nonconsumable carbon or tungsten rod which serves to carry the current and sustain the electric arc between its tip and the workpiece. When a nonconsumable electrode is used, a separate rod or wire can supply filler metal, if needed. The consumable electrode is specially prepared so that it not only conducts the current and sustains arc but also melts and supplies filler metal to the joint and may produce a slag covering as well.

The arc and the weld pool are protected from the ill effects of surrounding atmosphere by some type of an externally supplied inert or semi inert gas, known as a shielding gas, and/or coating electrode or using flux. These processes use either direct (DC) or alternating current (AC) for welding power supply to create and maintain an electric arc between an electrode and the base material to melt metals at the welding point. The major arc welding processes are described below.

2.1Carbon Arc Welding (CAW)

It is the oldest known are welding process in which fusion of metal is accomplished by the heat of an electric are. The arc is established between a nonconsumable carbon (graphite) electrode and the workpiece (Fig.1). The weld can be made by the application of heat with or without the dition of filler material. When filler material is used it is normally of the same composition as the base metal and is added to the arc in the form additional wire or rod. Though the carbon electrode (4-19 mm diameter and 300-450 mm length) is nonconsumable, but it infact disintegrates slowly and generates CO and CO₂ which replace the air around the arc and thus provide necessary protection. Normally DC power source of constant current type is used with straight polarity to keep the rate of disintegration low. The current carrying capacity of electrode depends upon its diameter and type.

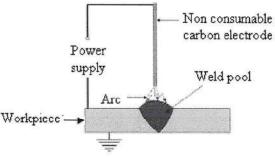


Figure 1: Carbon arc welding [2]

Although this process has been almost completely replaced by the newer processes used in the welding industry, it is still used in certain applications. The process produces adequate welds in thin sheet steel, but should be used with caution in any critical application because it provides only limited shielding from the atmosphere [3, 4].

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IMPORTANCE OF CONTROLLING PARAMETERS IN SHOT PEENING PROCESS

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Abstract: The critical peening parameters for fatigue life improvement are: exposure time, shot flow rate, distance between shots throwing station (blast wheel or nozzle) and work surface, shot diameter and shot hardness. The objective of the present work is to investigate the effect of various controlling parameters of shot peening on the material properties of the product to be shot peened.

Keywords: Shot peening, Material properties, Process parameters

INTRODUCTION

The outcome of shot peening is the result of interaction between the following two sets of parameters [1]:

1. Material parameters.

2. Shot peening parameters.

4.1 Material Parameters

These include microstructure, hardness, surface condition and hardening characteristics of the work material. The result of their interaction with the shot peening parameters is:

- 1. Generation of residual stresses in the work material.
- 2. Strain hardening of the surface and sub-surface layers of the work material.
- 3. Changes in microstructure and substructure of work material.
- 4. Change in surface conditions of the work material.

4.2 Shot Peening Parameters

- The shot peening treatment is characterized by the following parameters:
- 1. Shot material (grade, shape and hardness of shot; fraction of broken shot).
- 2. Peening parameters (shot velocity, mass-flow rate, peening time and impact angle).
- 3. Intensity and coverage of components (depending on the peening parameters).

These parameters have to be controlled carefully in order to constantly guarantee top quality shot peened components [2]. The parameters that affect the shot peening process and its efficiency are discussed below.

4.2.1 Shot Material and Its Hardness

The shots used for peening are usually of cast steel with the hardness of 40-50 on the Rockwell C scale. Cast iron can also be used as the material. However, as it is brittle it breaks down quickly and causes difficulty in maintaining the effectiveness of the process of peening [53]. The majority of peening is undertaken using ferrous shots which have high impact energy and good durability. For the use on thin parts,

glass beads have been found to be the best option. They can be used when lower peening intensities are permitted. Using them avoids having to decontaminate nonferrous parts after processing, but glass has a higher breakdown rate and higher risk of irregular particles in the blast stream. Ceramic bead is very hard but with much lower density than ferrous shot. It is less prone to breakage than glass bead, but initial purchase costs are higher.

Shot must be at least as hard as the surface being peened. Standard peening shot has a hardness range of 45-55 RC but usually is furnished toward the low end of the hardness range. Consequently, when peening hard parts such as carburized and hardened gears at nominally 60 RC, while there will be some cold work effect on the part, it will not be as great as when a harder shot is used. For these applications, a special hard shot in the range of 55-65 RC should be used to maximize the effect of peening. In residual stress studies performed on steel in the 60 RC range, it was found that the residual compressive stress obtained by using special hard shot was roughly double that produced by using regular hardness shot [4].

4.2.2Shape and Size of Shots

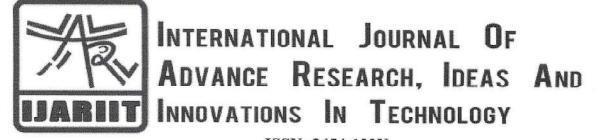
The shots or beads should be free from sharp edges and deformed shapes. For ideal peening application, it is preferable that all shots be of perfectly round shape arid of same size and material properties. The size of the shots chosen depends on the thickness of the work. Small shots give better coverage while large size shots give smoother finish.

It has been demonstrated both in the laboratory and in the field that if the shot striking the work is not uniform in size, the gain in fatigue strength is likely to be less than that obtained with uniformly sized shot, even though the arc height and coverage specifications have been met [5].

Using steel balls, higher deformation energy is obtained at the same impact velocity than with lighter glass or ceramic spheres. 1lowever, the maximum size of the balls is limited by technical restrictions. If the ball diameter is increased, the component surface roughness will become greater and there are certain machine operating restrictions. A ball size of 0.05 to 1 mm diameter is commonly used.

Since the shots break down due to the repeated usage, there is the need for the maintenance of the shots. The metallic shots should be checked once in an eight hour operation, glass beads once in two hour operation to ensure that not more than 10 % of the shots or beads are deformed. Shot for fatigue life enhancement is typically 1mm or less in diameter, depending on the smallest radius to he peened and the

Chaudhary Kailash, International Journal of Advance Research, Ideas and Innovations in Technology.



ISSN: 2454-132X Impact factor: 4.295 (Volume3, Issue6) Available online at <u>www.ijariit.com</u> Shape Optimization of Planar Mechanisms

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Abstract: This paper presents an optimization method to find link shapes for a dynamically balanced planar four-bar mechanism. The shaking force and shaking moment developed in the mechanism due to inertia are minimized by optimally distributing the link masses. The link shapes are then found using cubic B-spline curves and an optimization problem is formulated to minimize the percentage error in resulting links inertia values in which the control points of the B-spline curve are taken as the design variables. The effectiveness of the proposed method is shown by applying it to a numerical problem available in the literature.

Keywords: Dynamic Balancing; Equimomental System; Four-bar Mechanism; Genetic Algorithm; Shape Optimization.

1. INTRODUCTION

The four-bar mechanism is the basic mechanism used in the machines. When operated with high-speeds, these mechanisms transmit forces and moments to the ground known as shaking forces and shaking moments. These are defined as the vector sum of inertia forces and moments of all moving links of the mechanism. The dynamic performance of mechanism is adversely affected by vibrations, wear and noise associated with these forces and moments and several methods are presented in the literature [1-3] to reduce them. The complete force balancing in a mechanism is achieved by making the mass center of moving links stationary either by mass redistribution [4] or by adding counterweights [5].

The complete balancing of force increases the shaking moment, driving torque and bearing forces in joints of the mechanism [6]. The shaking moment is reduced along with the full force balancing using inertia or disk counterweights [7] and duplicate mechanism [8]. However, these methods are not preferred as they increase the complexity and mass in the mechanism. Some other methods are developed to minimize shaking force and shaking moment simultaneously through optimization [9-11]. These methods find the optimal distribution of link masses to reduce shaking force and shaking moment as they depend on link masses, their locations of CGs and moment of inertias. The mechanism balancing problem is presented as a multi-objective optimization problem and solved using evolutionary optimization techniques like particle swarm optimization (PSO) and genetic algorithm (GA) considering appropriate design constraints [12, 13].

Very few methods deal with finding the optimum shape of links corresponding to the balanced mechanism. The small element superposing method is used to form link shape considering the link as a combination of several small rectangular elements [14]. A shape optimization problem for mechanism links is formulated using external work done by a given external force as the objective function to maximize and volume of all the links is used as the constraint function [15]. The shape of a compliant mechanism is generated by topology optimization method using Cubic Bezier curves [16]. However, the dynamic balance for mechanisms is not considered in these methods. Also, these methods require an initial shape or design domain to start the procedure.

This paper presents an optimization problem formulation for balancing of the planar four-bar mechanism. The rigid links of the mechanism are presented as a dynamically equivalent system of point-masses, known as an *equimomental system* [11, 17]. This problem is presented as a multi-objective optimization problem to minimize both shaking force and shaking moment and solved using a genetic algorithm. For the resulting optimum inertial properties for the balanced mechanism, shapes of mechanism links are then found using cubic B-spline curves. The inertial properties of resulting link shapes are presented as constraints to keep the same as that of the balanced mechanism. The percentage error in resulting links inertia values is presented as the objective function which is minimized by taking the control points of the B-spline curve as design variables.

Role of Pollution Control Equipment in Shot Peening Machines

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Abstract— Abrasive blasting can have minimal environmental impact if it is located in an appropriate area and sited, designed and operated properly. If proper care is not taken in addressing environmental issues, however, it has the potential to cause environmental harm. The necessity and importance of effective air and noise pollution equipment is evident in wake of prescribed environment and health or safety norms. The dust collector and air-wash separator are the "lungs" of a shot peening machine. The dust collector provides the necessary ventilation to remove dust from the blast cabinet. It also provides an air stream across the "air-wash" separator to clean the small fines and foreign contaminants from the shot before it is reused. All shot peening machines require good dust collection and air-wash separators for reliable and efficient long term operation. The average shot peening or blast cleaning machine can produce decibel levels between 85 and 125 dBA and experts agree that continued exposure to noise above 85 dBA over time will cause hearing loss. This paper covers the developments and applications of the pollution control equipments in surface finishing industry. It highlights the process characteristics, its operational features and its resulting influence over the control of environmental pollution. The process parameters are explained with a view to control the process in order to achieve the desired results.

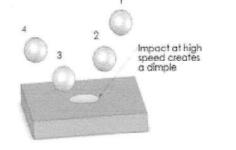
Index Terms - Shot peening, Environmental assessment, Pollution control

I. SHOT PEENING PROCESS

Shot peening is a process used to produce a compressive residual stress layer and modify mechanical properties of metals. Residual stresses are stresses that remain after the original cause of the stresses (external forces, heat gradient) has been removed. They remain along a cross section of the component, even without the external cause [1].

Shot peening is a cold working process in which the surface of the finished part is bombarded with shots under controlled conditions. Each shot acts as a tiny peening hammer; making a small dent in the outer surface of the metal (Fig. 1). This impact causes a plastic flow of the surface fibers to a depth depending on the angle of impact, size of shots and physical properties of the material [2]. The resultant residual stressed surface layer, which is in compression, prevents formation of cracks, thus increasing the life of the component (Fig. 2). The maximum residual compressive stress produced on the surface is at least half the ultimate tensile stress of material. Shot Peening serves to increase the fatigue strength of parts subjected to high alternating bending or torsional stresses. The process has very effectively replaced other time consuming and expensive processes of improving fatigue strength. It permits the design of less expensive and light weight components.

Conventionally, when a part is not able to withstand the stresses that it is required to, a lot of trial and error effort is put into design of the part. Its material may be changed, the part may be subjected to heat treatment process, attempt may be made to change its machining techniques, or the designer may even go to the extent of changing the design of the part. If analyzed properly, it may be found out that all the above exercises are totally uncalled for. What may have offered a better solution at a nominal cost could have been the shot peening of the part [3].



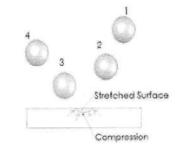


Fig. 1: Shot Peening Process

Fig. 2: Shot Peened Surface

II. ENVIRONMENTAL ASSESSMENT FOR SHOT PEENING

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Application of Equimomental System of Point Masses for Dynamic Balancing of Mechanisms

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Abstract: This paper presents the concept of equimomental system of point-masses for rigid body to balance the mechanisms dynamically. The links of mechanism are modelled as rigid bodies for kinematic and dynamic analysis. The mass and moment of inertias of the links govern the shaking force and shaking moment transmitted to the frame on which they are mounted. Optimization of mass and moment of inertias methodology is used in minimizing the shaking force and shaking moment. The formulation of optimization problem is greatly simplified using the equimomental system of point-masses. The effectiveness of the method is illustrated with an example.

Keywords: Equimomental system, Dynamic halancing, Shaking force, Shaking moment, Mechanisms

1. Introduction

A rigid body can be defined as a system of particles where the distances between particles remain essentially unchanged. However, this is an idealization as all solid bodies change shape to some extent when the forces are applied to them. Moreover, if the movements associated with the changes in shape are very small compared with the overall movements of the body as a whole, then the ideal concept of rigidity is quite acceptable. The machine mechanisms, land and air vehicles, rockets and spacecrafts, and many moving structures can be analysed using the concept of the rigid body [1-3].

To balance a mechanism, one has to eliminate the shaking force and shaking moment transmitted to the ground. The links of such mechanism can be modelled as rigid bodies for simplifying the kinematic and dynamic analysis [4]. The mechanisms are to be balanced either statically or dynamically. In some cases, static balancing can be acceptable substitute for dynamic balancing and is generally easier to do.

Like any system of forces acting on a rigid body can be replaced by an equivalent system of forces which produce identical motion, an equivalent mass distribution of a rigid body can be determined. For example, spatial mass distribution of a rigid body can be converted into a system of point-masses keeping the dynamic behavior identical. Such dynamically indistinguishable systems are called equimomental systems. The general requirements for the dynamical equivalence were laid down by Routh [5]. The set of point-masses and the rigid body are equimomental if they have the same total mass, the same center of mass, and the same inertia tensor with respect to the same coordinate frame [6]. However, there is no such limit on the maximum number of point-masses. The number of parameters related to the point-masses increase with increase of point- masses. It is shown that a set of seven point-masses is very effective in reducing shaking force and shaking moment in the mechanism [7]. This set of rigidly connected seven pointmass systems is explained in this paper to balance the mechanism dynamically.

This paper is organized as follows. Section 2 explains the equations of motion for rigid body. Equations of motion for equimomental point-masses are re-written in section 3. Problem of minimizing shaking force and shaking moment for a rotating link is then formulated in Section 4. A numerical example is solved using the proposed method in section 5. Finally, conclusions are given in Section 6.

2. Equations of Motion of Rigid Body

A link of a multibody system is modelled as the rigid body for the dynamic analysis. The Newton-Euler equations of motion for the *i*th rigid body of a multibody system shown in the Figure 1 are expressed as [8]:

 $\mathbf{I}_i^c \dot{\boldsymbol{\omega}}_i + \boldsymbol{\Omega}_j \mathbf{I}_i^c \boldsymbol{\omega}_i = \mathbf{n}_i^c; \ \mathbf{m}_j \dot{\mathbf{v}}_i^c = \mathbf{f}_i^c \ (1) - (2)$

Where \mathbf{n}_i^c is resultant of pure moment and moment of external forces about the mass center, C_i , and \mathbf{f}_i^c is resultant force acting on the body at C_i . Moreover, \mathbf{I}_i^c is the centroidal inertia tensor with respect to C_i . In Eqs. (1) and (2), m_i, ω_i and $\dot{\omega}_i$ are defined as the mass, angular velocity and angular acceleration of the body. The three-dimensional vector $\dot{\mathbf{v}}_i^c$ defines the linear acceleration of the mass center.

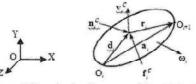


Figure 1 Free-body diagram of the ith body

Let the *i*th body is connected to the previous and next bodies at O_i and O_{i+1} through joints. The reference frame OXYZ is the fixed inertial frame. Then a_i can be defined as the link length. As in linkage balancing problem, we are more interested to know the forces at

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Shape Optimization of Slider-crank Mechanism

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Abstract: - In this paper, a two stage optimization technique is presented for optimum design of planar slider-crank mechanism. The slider-crank mechanism needs to be dynamically balanced to reduce vibrations and noise in the engine and to improve the vehicle performance. For dynamic balancing, minimization of the shaking force and the shaking moment is achieved by finding optimum mass distribution of crank and connecting rod using the equimomental system of point-masses in the first stage of the optimization. In the second stage, their shapes are synthesized systematically by closed parametric curve, i.e., cubic B-spline curve corresponding to the optimum inertial parameters found in the first stage. The multi-objective optimization problem to minimize both the shaking force and the shaking moment is solved using recently developedevolutionary optimization algorithms-"Teaching-learning-basedoptimization algorithm (TLBO)". The computational performance of TLBO is compared with another evolutionary optimization algorithm (genetic algorithm).

Keywords: Dynamic balancing, Equimomental system, Link shape, Optimization, Slider-crank mechanism, Teachinglearning-based optimization algorithm

I. INTRODUCTION

The slider-crank mechanism consisting of crankshaft, connecting rod and piston is the fundamental mechanism used for vehicle engines. The shaking force and shaking moment in the mechanism are defined as the resultant inertial forces and moments of the moving links [1] and need to be eliminated to dynamically balance the mechanism. For an unbalanced mechanism, these forces and moments are transmitted to the frame whichworsenthe dynamic performance of vehicle engine and generate vibrations, wear and noise. It leads to expensive repairs and replacement of crankshaft and connecting rod and their reverse effects on the other parts such as cylinder block and piston. Few review papers discuss the methods to reduce the shaking force and shaking moment based on different approaches [2-4]. To achieve full force balance in the mechanism, the total mass center of moving links is made stationary either by adding counterweights [5] or by mass redistribution [6, 7]. The complete force balancing increases other dynamic quantities like shaking moment and driving torque in the mechanism [8]. For complete balancing of moment in the mechanism, the total angular momentum of the moving links is eliminated by using duplicate mechanism [3], inertia or disk counterweights [9-11] and moment balancing idler loops [12]. However, the complexity and overall mass for mechanism are increased in these methods.

Alternatively, the shaking force and shaking moment are minimized simultaneously by optimizing links inertial properties, i.e., mass, CG location and moment of inertia. The conventional optimization technique is used to optimally balance the planar mechanisms [13, 14] and to analyse the sensitivity of shaking force and shaking moment to the design variables [15]. The mechanism balancing problem is formulated as a multi-objective optimization problem and solved using evolutionary optimization techniques like particle swarm optimization [16] and genetic algorithm [17-18].

Once the optimized inertial properties of mechanism links are obtained, their shapes are to be decided to carry loads. A method to find link shapes is presented in [19] by discretizing initial assumed shape into small mass elements and locate them systematically along the link length. The link shapes are synthesized on the basis of maximum work done by taking volume of all links as constraints [20]. Similarly, the link shapes are formed through topology optimization based on parametric curves [21] and non-intersecting closed polygons [22]. The Evolutionary Structural Optimization (ESO) method is used to optimize the shaft shape for rotating machinery by gradually removing the ineffectively used material from the design domain [23, 24]. Alternatively, by identifying the feasible material domain associated with the link geometries, the geometric shapes are determined for interference free motion [25]. Some other methods are available in the literature for mechanism dimensional synthesis to generate specified path or motion based on graphical and analytical techniques [26, 27]. However, these methods have limitations as they require a pre-defined design domain to start with. Also, they do not consider the dynamic balance for the mechanisms.

In this paper, a two stage optimization method is presented to synthesize link shapes for minimizing the shaking force and shaking moment in the planar slider-crank mechanism. In the first stage, the balancing problem is formulated as an optimization problem by modeling the rigid links of mechanism as dynamically equivalent system of point-masses, known as equimomental system [28, 29]. This problem is presented as a multi-objective optimization problem to minimize both shaking force and shaking moment and is solved using genetic algorithm (GA) and recently developed teaching-learning-based algorithm (TLBO).

For the optimum inertial properties found in the first stage, the link shapes are synthesized in the second stage by

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A Case Study on Data Mining Application in Manufacturing Industries

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Abstract: This paper highlights the importance of data mining technique in manufacturing system design. A case study is presented in this paper in which the manufacturing system was re-designed through data mining of data generated corresponding to the traditional method. The performance and properties of the product was analysed virtually using CAD softwares AutoCAD and PTC Creo. The improved design reduced the operating time as well as cost and hence better productivity is achieved through this research work.

Keywords: Manufacturing System, Computer aided Design, Data Mining, System Design, Automation

1. INTRODUCTION

1.7

Data mining is a useful tool to find out the ignored and hidden information of any process. Also, it can process huge amount of data. The data mining from large marketing database can be successfully applied in a number of advanced fields. Applications of data mining include cyber security [1,2], smart cities monitoring[3], forecasting future customer requirements [4], sample identification [5], manufacturing sector [6], medical sector [7 - 9], risk assessment [10]. The data mining also known as data or knowledge discovery is multidisciplinary in nature as it includes statistics, image processing, machine learning, mathematical optimization and information retrieval. The researchers and practitioners all around the world are successfully applying data mining technology on data from different areas such as banking, finance, retail, marketing, insurance, fraud detection, science, engincering, etc., to discover any hidden relationships or patterns.

In this paper we discuss the developments and instructions on improvisation of manufacturing system design based on data mining. Section 2 talks about data mining for manufacturing system design. Section 3 presents a case study demonstrating the data mining approach to improve the productivity of a manufacturing unit. Section 4 gives the conclusion of research work carried out.

2. DATA MINING IN MANUFACTURING SYSTEM DESIGN

The computer design is a high risk and value-added technology as the satisfaction of customer requirements is critical issue for the computer designers and manufacturers. Data mining technique may displace the traditional methods like visualization and statistics that are not preferred for the analysis of any manufacturing system.

Data mining is important stage of Knowledge Database Discovery (KDD) process [11]. KDD process used for manufacturing includes

- 1. Understanding the manufacturing domain
- 2. Collecting the targeted data
- 3. Data cleaning, pre-processing and transformation
- 4. Data integration
- 5. Choosing the functions of data mining
- 6. Choosing the appropriate data mining algorithm
- 7. Data mining
- 8. Interpretation and Visualization
- 9. Implementation of discovered knowledge

10. Knowledge storage, reuse and integration into the manufacturing system. The process of data mining is shown in Figure 1.

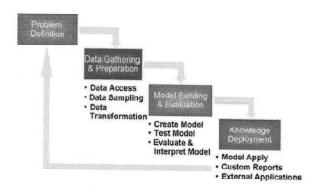


Figure1. Data mining process

Data mining allows users to analyze data from different dimensions or angles, categorize it, and summarize the relationships identified. The integration of data mining with computer aided design and analysis helps in improvising the existing manufacturing system. The drawings of a product contain the useful information.

Data Extraction tool is used to build automated bills of material, drawing title sheets, coordinate tables. Hence the useful data can be easily extracted to Microsoft Excel files using Data Extraction tool. The success factors of data mining are as follow:

Optimum Design of Mechanism - A Review

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This paper reviews the methods developed for balancing of the planar mechanisms and synthesizing the link shapes. The methods used for partial force and moment balance including the optimization methods as well as the methods used for the link shape synthesis are reviewed. Several review papers such as Kamenskii (1968a), Lowen and Berkof (1968), Lowen et al. (1983), Kochev (2000), Arakelian and Smith (2005), Wijk et al. (2009), and Arakelian and Briot (2015) throw light on the quantum of work carried out on the dynamic balancing of themechanisms.

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I. Partial Shaking Force and Shaking MomentBalancing

Instead of complete balancing of shaking force and shaking moment independently, minimization of them simultaneously is more useful from the design point of view. The optimization methods used to simultaneously minimize the shaking force and shaking moment in planar mechanism can be categorised as:

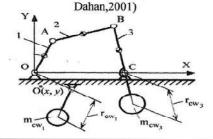
1.1 Method of harmonic balancing

A method based on the harmonic analysis is used to balance the harmonics of the shaking forces and shaking moments in which the forces and moments are formulated using Gaussian least-square formulation and Fourier series (Norton, 2011). Han (1967) presented a least-square approach to balance the complex mechanisms in which a counterweight connected to the input shaft results in first harmonic balancing of the inertia induced forces and moments. Stevensen (1973) presented a method for the complete balancing of a harmonic unbalance of the machine, including inertia forces, moments of the inertia forces, and inertia torques, utilizing six weights on three shafts in the machine parallel to the coordinate axes and rotating at the speed of the harmonic. Similarly, Tsai (1984) used two Oldham couplings to balance second harmonics of the shaking force and shaking moment. This type of balancer runs at the primary speed of the machine whereas the Lanchester balancer runs at double of the primary speed to get the same balancing effect (Hsieh and Tsai, 2009). A method was developed based on the harmonic balancing to find the region boundaries to locate the additional shafts by Davies and Niu (1994). Arakelian and Dahan (2001) presented a method to achieve the first harmonic balancing of the shaking moment by using the counterweight connected to the input shaft in such a way that the counterweight rotation axis remains at an offset to the input shaft axis (Fig. 1).

1.2 Extension of method of linearly independent vectors

Based on the fact that the in a force balanced mechanism, the shaking moment reduces to a pure torque, Berkof and Lowen (1971a, b) developed the theory of shaking moment optimization. In this method, RMS value of the shaking moment is minimized for a force balanced in-line planar four-bar mechanism. The link mass distribution ratios as the functions of the link length ratios are defined as the design variables. This method was the extension of previously developed force balancing method by Berkof and Lowen(1969).

Fig. 1 First harmonic balancing of the shaking moment in planar four-bar mechanism (Arakelian and



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Methodology of Optimal Link Shape Synthesis of Planar Mechanisms

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Abstract: The optimization problem formulation for link shape synthesis for the optimally balanced simple and multiloop planar mechanisms is presented in this paper. The closed parametric curve is used to represent the link shape and its geometric and inertial properties are calculated using well known Green's theorem. The proposed optimization problem includes the equality constraints to keep the resulting inertial properties same as the inertial properties of the optimally balanced mechanisms.

I. INTRODUCTION

In this paper, the link shapes are synthesized for optimally balanced mechanism for the given motion. The link shapes satisfying kinematic and dynamic requirements are very crucial for the design of a mechanism and its performance. The shape synthesis using parametric curves like Hermit, Bezier and B-spline curves leads to computer-aided design (CAD) and manufacturing of the mechanism links. Through CAD modeling of the links using these curves; the design, production and functional details can beeasily transmitted between engineering and manufacturing operations. The CAD modeling of the links is also useful in analyzing the static and dynamic response of the designed mechanism. The real-time behavior of the mechanism is evaluated through computer simulation and thus it eliminates the need of the experimental tests for the actual mechanism. Therefore, the cost and time are saved to a great extent and any possible error is realized before manufacturing of the mechanism links.

II. LINK SHAPE

The link shape is represented by the parametric curve, i.e., closed cubic B-spline curve as shown in Fig. 1. If the curve interpolates or approximates a set of n+1 control points, P_0 , P_1 ,..., P_n (Zcid and Sivasubramanian, 2009; Mortenson, 2006) then the position of any point on the curve is defined as:

$$\mathbf{P}(u) = \sum_{i=0}^{n} \mathbf{P}_{i} N_{i,k}(u), \quad 0 \le u \le u_{\max}$$
⁽¹⁾

For a curve of degree (k-1), the B-spline function $N_{i,k}(u)$ is computed iteratively as:

$$N_{i,k}(u) = (u - u_i) \frac{N_{i,k-1}(u)}{u_{i+k-1} - u_i} + (u_{i+k} - u) \frac{N_{i+1,k-1}(u)}{u_{i+k} - u_{i+1}}$$
(2)

where

$$N_{i,1} = \begin{cases} 1, & u_i \le u \le u_{i+1} \\ 0, & \text{otherwise} \end{cases}$$
(3)

In Eq. (3), $N_{i,1}$ is a unit step function and u_i are known as parametric knots or knot values. These values form a sequence of nondecreasing integers called the knot vector. The parametric equation of *i*th curve segment of a cubic B-spline curve having control points P_{i-1} , P_i , P_{i+1} and P_{i+2} for $u \in [u_{i-1}, u_i]$ is given as:

$$P_{i}(u) = \frac{\alpha_{1}P_{i-1} + \alpha_{2}P_{i} + \alpha_{3}P_{i+1} + \alpha_{4}P_{i+2}}{6}$$
(4)

where

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Optimization Techniques for Engineering Design

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Abstract: This paper discusses the popular evolutionary optimization technique, Genetic Algorithm (GA) and Teaching-learningbased Optimization (TLBO) algorithm. It also covers the definitions of various parameters used by these algorithms.

I. INTRODUCTION

Most of the engineering design problems are competing multi-objective problems for which the optimal values of the design variables are searched that optimize several objectives for a given set of constraints. The different methods available to formulate a multi-objective problem as a single objective problem are weighted global criterion method, weighted sum method, lexicographic method, weighted min-max method, exponential weighted criterion, weighted product method, goal programming methods, bounded objective function method, and physical programming (Marled and Arora, 2004). The weighted sum approach is more widely used in which a normalized objective function is formulated by assigning proper weighting factors to all the objectives. By selecting different values of the weighting factors objectives, the results are obtained as a set of optimum solutions and each solution in this set is a trade-off between the different objectives (Marled and Arora, 2010).

A constrained optimization problem is considered more complex than that of an unconstrained problem. It finds a feasible solution that optimizes one or more mathematical functions in a constrained search space. The constrained optimization problem is transformed into an unconstrained optimization problem by modifying the objective function on the basis of the constraint violations. The constraint violations areused to penalize infeasible solutions to favor the feasible solutions. The constraints are normally treated as penalty functions such as static, dynamic or adaptive penalty to the objective function. The various constraint handling techniques are suggested such as superiority of feasible solutions (SF) (Deb, 2000), stochastic ranking technique (SR) (Runarsson and Yao, 2005), *e*-constraint technique (EC) (Takahama and Sakai, 2006), self-adaptive penalty approach (SP) (Tessema and Yen, 2006) and ensemble of constraint handling techniques (Montes and Coello, 2005; Mallipeddi and Suganthan, 2010).

After formulating the optimization problem, it can be solved by using either traditional or evolutionary optimization algorithms. The traditional or classical optimization algorithms are based on deterministic approach, i.e., they use gradient information of objective function with respect to the design variables and move from one solution to other following the specific rules. Depending on the starting solution these algorithmsmay end up with a local optimum solution. Therefore, one has to explore all local solutions; one of them is the global optimum solution. To improve the chances of getting the global optimum solution, a large set of randomly generated initial solutions is required for these algorithms. The global optimum solution is then found as the best of all local optimum solution provided by different instances of the algorithm. The popular methods in this category are quadratic programming, steepest descent method, linear programming, nonlinear programming, dynamic programming and geometric programming, etc. For the complex optimization problem having a large number of design variables and multiple local optimum solution(Marler and Arora, 2004; Mariappan and Krishnamurty, 1996). These techniques are generally not suitable for the optimization problems with (1) large number of constraints (2) large number of design variables (3) multi-objective function (4) multi-modality (5) differentiability. A function is multimodal if it has two or more local optimum solutions in the design space. A function is regular if it is differentiable at each point of its domain. Thetraditional optimization methods require the gradient information and thus not useful in case of the non-differentiable functions.

Evolutionary or advanced optimization techniques are stochastic in nature, and the optimum solution is searched following the probabilistic transition rules. These algorithms mimic the natural evolutionary principles and start with a set of solutions known as the population to search the optimum solution through parallel computing. Thus, it is advantageous to use these techniques to find the global optimum solution with less computational efforts for large and difficult optimization problems. The popular techniques in this category are: Genetic algorithm (GA), Simulated Annealing (SA), Particle Swarm Optimization (PSO), Biogeography-based optimization (BBO), Ant Colony Optimization (ACO), Differential Evolution (DE), Grey Wolf Optimizer (GWO), Fireworks Algorithm (FA), Directed Bee Colony Optimization (DBC), Harmony Elements Algorithm (HEA), Artificial Bee Colony (ABC),

A Study on Effect of Various Process Variables in Gas Metal Arc Welding

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Abstract: Gas metal arc welding (GMAW) is currently the most widely used arc welding process. It had its beginning in the late 1940s and was developed to make welding a faster, more profitable process. Benefits such as high production rates, high weld quality, ease of automation, and the ability to weld many metals make it attractive to manufacturers. This paper presents a study on effect of various process variables in GMAW.

I. INTRODUCTION

GMAW is a process that joins metals together by heating them with an electric arc that is established between a consumable electrode (wire) and the workpiccc. An externally supplied gas or gas mixture acts to shield the arc and molten weld pool.

GMAW is sometimes referred to by its subtypes metal inert gas (MIG) welding or metal active gas (MAG) welding. It was primarily developed as a high current density, small diameter metal electrode process with argon shielding for aluminium, hence the term MIG was appropriate. But when it was extended to the welding of ferrous and nonferrous metals, addition of 1-2 % oxygen to argon was found necessary to get smooth metal transfer. Later it was established that mild steel could be welded using 100 % carbon dioxide or argon-carbon dioxide mixture as a shielding gas. Since these gases are not inert, the process came to be termed as MIG/CO2 or MIG/MAG welding process. MAG is an abbreviation of metal active gas in which active gas refers to argon-oxygen, carbon dioxide and argon-carbon dioxide mixture, which are chemically reactive and not inert. The American Welding Society refers to the process as Gas Metal Arc Welding and has given it the letter designation GMAW. This term

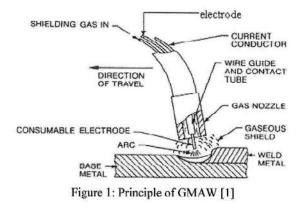
appears simpler; it covers inert as well as active shielding gas.

GMAW can be done in three different ways:

- Semiautomatic welding equipment controls only the electrode wire feeding. Movement of welding gun is controlled by hand. This may be called hand-held welding.
- Machine welding uses a gun that is connected to a manipulator of some kind (not hand-held). An operator has to constantly set and adjust controls that move the manipulator.
- Automatic welding uses equipment which welds without the constant adjusting of controls by a welder. On some equipment, automatic sensing devices control the correct gun alignment in a weld joint.

II. PRINCIPLE OF GMAW

This process uses an electric arc as a source of heat to melt and join the metals. An arc is an electrical discharge over a gaseous path between two electrodes which takes place through an electrically conducting hot ionized gas known as plasma (Fig. 1).



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Life Cycle Analysis in Manufacturing Industry - A Case Study

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ABSTRACT

The method used in this project is LCA and the study is performed from gate (beginning of the company) to gate (end of the Company). LCA is a method to assess the potential environmental impacts associated with a specific product or service. All stages in the life cycle are taken into account and use of natural resources, transportation, energy consumption, waste and emissions are considered. LCA can be used for identification of improvement possibilities, decision-making etc. but has also an important application in learning about environmental impacts caused by substances and processes used in the life cycle. This is mainly what is done in this study.

Keywords: Environmental Impacts, NBC, ISO, LCIA, LCA, GWP, LCI

I. INTRODUCTION

The increasing environmental concern in today's society puts lot of pressure on the industry to produce less environmental damaging products. At this point, this is principally experienced by industries producing consumer goods but these industries are in their turn increasing the pressure on their suppliers. So far it is in most cases questions about environmental management systems but the nature of the questions are slowly changing and becoming more product-related. Questions about LCA work and performed LCAs are becoming more frequent. With this as a background I decided that it was time to perform an LCA on one of key products of NBC.

In recent years Life Cycle Assessment (LCA) has become one of many useful tools in assessing the environmental aspects and potential impacts associated with a product. In LCA the product is followed from the cradle to the grave, i.e. from raw material acquisition, through production, use and waste disposal. LCA is multidisciplinary and deals with the social system, the technical system, the natural system and their relationships. The LCA method provides researchers or companies with quantitative data for their current products. By looking at a product's life from the raw material extraction to its disposal, the environmental impact of each process and material can be analysed. The LCA allows analysts to determine and analyse the technological, economic, environmental, and social aspects of a product or process necessary to manage the complete life cycle. With this quantitative data, desired changes can be justified with respect to the cost and environmental impacts of a product or process.

LCA is an increasingly important tool for environmental policy, and even for industry. Analysts are also interested in forecasting future materials/energy fluxes on regional and global scales, as a function of various economic growth and regulatory scenarios. A fundamental tenet of LCA is that every material product must eventually become a waste. To choose the 'greener' of two products or policies it is necessary to take into account its environmental impacts from 'cradle to grave'. This includes not only indirect inputs to the production process, and associated wastes and emissions, but also the future (downstream) fate of a product. The first stage in the analysis is quantitative



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A Study on Metal Transfer Mechanism in Gas Metal Arc Welding

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ABSTRACT

Gas metal arc welding is currently the most widely used arc welding process, having overcome the old faithful "stick" welding, SMAW. It was developed to make welding a faster, more profitable process. Benefits such as high production rates, high weld quality, ease of automation, and the ability to weld many metals make it attractive to manufacturers. All commercially important metals, such as carbon steel, high-strength low-alloy steel, stainless steel, aluminium, copper, and nickel alloys can be welded in all positions. A typical application is welding of aluminium bus bars in electrical industry and welding of sheet metal assembly. Gas metal arc welding process has become more popular in weld cladding than other processes due to its numerous advantages.

Keywords: Gas Metal Arc Welding, SMAW, SFBT, PIT, STT, CMT, DCEP, DCEN

I. INTRODUCTION

During gas metal arc welding, the electrode is melted and liquid droplets are formed at the tip of the electrode. The melted metal grows and is detached from the electrode (Fig. 1). This process of metal transfer includes droplet formation, detachment, and transfer in the arc. It plays an important role in determining the process stability, weld quality and productivity of welding. To understand molten metal transfer in arc welding requires understanding of the physics involved, even though the precise physics is not yet completely known. This should not come as a great surprise since arcs are small, their temperatures are high, and the dynamics of molten metal transfer are complicated [1]. The characteristics of the process are best described by the manner in which metal is transferred from the consumable wire to the workpiece.

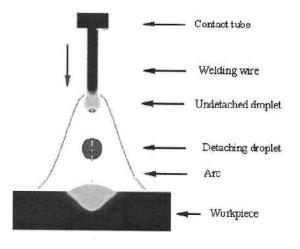


Figure 1: Metal transfer process in GMAW [2]

II. Literature Review

During welding process various forces act on the liquid droplet and also on the weld pool. These forces influence the mode of the metal transfer and the motion of the liquid metal in the droplet and the weld pool, which in turn can have an effect on process stability, weld penetration, and bead shape. The forces controlling this transfer are very complex, and together with the size of droplets, they determine the mechanisms of metal transfer. These forces affecting metal transfer are gravity, surface tension. International Journal of Engineering and Techniques - Volume 3 Issue 6, Nov - Dec 2017

RESEARCH ARTICLE

OPEN ACCESS

A Review on Advance Welding Processes

Dr. Kailash Chaudhary

Department of Mechanical Engineering ,Raj Engineering College Jodhpur, India.

Abstract:

This paper presents a review on advance welding process in practice. The objective is to present various aspects and relative merits of various welding processes in use in industries. The important considerations and application areas of these techniques are discussed in this paper.

1.Introduction

When compared with other joining methods, such as riveting and bolting, welded structures tend to be stronger, lighter weight and cheaper to produce. A large number of processes comprise the family of welding technologies, and include methods for welding metals, polymers, and ceramics, as well as emerging composite and engineering materials. These process variants of welding allow a great deal of flexibility in the design of components to be welded. They also encourage designing for optimal cost effectiveness in terms of productivity and product performance. Safety is also a major consideration when welding is adopted. This is because it uses electricity and flammable materials, and creates a lot of sparks in some instances.

Most of the welding processes could not get their due importance in the production scenario at the time of their developments, except for repair welding. However, at later stages all of them found their niches in manufacturing environment. Presently, welding is widely being used in fabrication of pressure vessels, bridges, building structures, air and space crafts, railway coaches, shipbuilding, automobiles, electrical, electronic and defense industries and general applications.

2.Solid State Welding Processes

Solid state welding processes produce coalescence by the application of pressure at welding temperature below the melting point of the base materials being joined, without the addition of a filler metal. Joining of two surfaces takes place by atomic bonding; process does not involve melting of the materials. As the surfaces are pressed together, atoms on the two surfaces attract each other to form bonds between the surfaces. The bonds thus formed are responsible for the joining process. Mechanical properties of the weld are similar to those of the parent metals. The process is commonly used for welding dissimilar materials, such as aluminium with steel in ship hulls or compound plates.

2.1.Forge Welding

Forge welding or smith welding is the oldest known welding process in which low carbon steel parts are heated to about 1,000 °C and then forged (hammered) together, either

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Process Capability and Parametric Analysis of Abrasive Jet Machining

(Paper ID: 412ET3011201704)

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Abstract: This paper presents process, working principle, process capabilities, applications, and limitations of Abrasive Jet Machining (AJM). AJM is a mechanical type advanced machining method in which kinetic energy of abrasive particles is utilized to remove material from the workpiece. The material is removed by erosion effect of a high speed stream of abrasive particles carried in a gas medium through a nozzle. It is used chiefly to cut intricate shapes in hard and brittle materials which are sensitive to heat and have a tendency to chip easily. It is especially useful for parts having thin sections; though not suitable for parts with sharp corners.

I. INTRODUCTION

Abrasive Jet Machining (AJM) is a mechanical type advanced machining method in which kinetic energy of abrasive particles is utilized to remove material from the workpiece. The material is removed by erosion effect of a high speed stream of abrasive particles carried in a gas medium through a nozzle. The process is suitable for hard and/or brittle metals, alloys, semiconductors and non-metallic materials like glass, ceramics, etc. It is used chicfly to cut intricate shapes in hard and brittle materials which are sensitive to heat and have a tendency to chip easily. It is especially useful for parts having thin sections; though not suitable for parts with sharp corners. It has been effectively employed for cutting, cleaning, etching, polishing and deburring. The process differs from conventional sandblasting in that it uses smaller diameter abrasive particles (10-50 µm) and a more finely controlled delivery system. The AJM process is characterized by relatively low power consumption and small capital cost [1].

II. LITERATURE REVIEW

The erosive effect of sandy winds blowing at high speeds has been felt on this earth for eons, though the controlled and intentional application of the AJM process started some decades ago only. Till date, there has been a quite thorough and detailed experimental and theoretical study on the process. Some of the studies argue over the hydrodynamic characteristics of abrasive jets, hence ascertaining the influence of all operational variables on the process effectiveness including abrasive type, size and concentration, impact speed and angle of impingement. Other researchers found new problems concerning carrier gas typologies, nozzle shape, size and wear, jet velocity and pressure, stand off distance (SOD) or nozzle tip distance (NTD). These research works express the overall process performance in terms of material removal rate, geometrical tolerances and surface finish of workpieces, as well as in terms of nozzle wear rate. Finally, there are several significant and important studies which focus on either leading process mechanisms in machining of both ductile and brittle materials, or on the development of systematic experimental, statistical approaches and artificial neural networks to predict the relationship between the settings of operational variables and the machining rate and accuracy in surface finish [2].

Finnie was the first researcher to analytically model the erosive wear of ductile materials by the impact of solid abrasive particles. However, predictions of his model do not agree well with the experimental results at higher impact angles. Also, the model fails to take into account the effects of abrasive particle size and shape on the erosion [3].

Bitter proposed a model to account for deformation wear (based on the plastic deformation) and predicted erosive wear of both brittle and ductile materials more accurately. Sheldon and Finnie developed an analytical model for crosive cutting of brittle materials by normal impact of abrasives, though the constants involved in this model required complex calculations. Sheldon and Kanhere analyzed the erosion process of relatively soft and ductile materials (aluminium) considering the impact by a relatively large (2500 µm) single abrasive particle and developed a simple analytical material removal model [1].

Verma and Lal have presented a detailed experimental study of parameters affecting erosion rate in AJM. They showed that the material removal rate first increases with increase in abrasive flow rate and stand-off distance and then decreases with further increase in these parameters, giving optimum results at intermediate values [4]. A comprehensive review of work carried out in the area of AJM has been presented by Ramachandran and Ramakrishnan [5]. They proposed a mathematical relationship for edge radius definition when using AJM on a blunt surface. However, this method does not take into account the edge radius created on a predefined sharp edge.

Hutching [6] proposed an easy-to-use model for the crosion of ductile materials by spherical particles at normal impacts. The only model incorporating the effects of statistical distribution

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A Study on Process Capability and Parametric Analysis of Abrasive Flow Machining

(Paper ID: 412ET3011201702)

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Abstract: This paper presents process, working principle, process capabilities, applications, and limitations of Abrasive Flow Machining (AFM). AFM is a finishing process that offers precision, consistency, and flexibility. In this process, an abrasive-laden pliable semisolid compound is forced to and fro across the surface to be machined. The self-deformable tool or the abrasive media changes its shape according to the geometry of the workpiece. Abrasive media is a mixture of abrasives and a semi-viscous carrier that flows through a restrictive passage formed by a work-tooling combination or workpiece. The abrasive media has random cutting edges with indefinite orientation and geometry for effective removal of material to form micro-chips

I. INTRODUCTION

High-quality surface finish and dimensional accuracy are essential in any machined product in order to ensure improved product performance and increased product life. Precision and ultra finishing process represents a critical and expensive phase of the overall production scenario. The most labor intensive and often uncontrollable aspect in the manufacturing of precision parts involves final finishing operations, which frequently demand as much as 15% of the total manufacturing cost. The dimensional and alignment accuracy and quality of surface finish are taken care of by finishing processes. The functional properties such as wear resistance and power loss due to friction are influenced by surface roughness of the matching parts [1].

Grinding, lapping, honing, and super finishing are traditional methods of finishing. But their applications are limited to the production of workpieces of the basic forms such as flat (prismatic) or cylindrical (axi-symmetric) surfaces. These conventional finishing processes are being pushed to their limits of performance and productivity in general and complicated-shaped components of hard materials in particular. Hence, there is a need to develop a finishing process with wider bounds of application areas, better quality performance, higher productivity, and automatic operation. Abrasive flow machining (AFM) is one such process [2].

Abrasive Flow Machining was developed by Extrude Hone Corporation, USA in 1960. It is becoming popular due to its ability to give predictable, repeatable and consistent results. The advantage of the AFM process lies in the uniformity of the polished surface, especially when compared to the tedious manual finishing methods. In this process, an abrasive-laden pliable semisolid compound is forced to and fro across the surface to be machined, the selfdeformable tool or the abrasive media that changes shape according to the geometry of the workpiece. Abrasive media is a mixture of abrasives and a semi-viscous carrier that flows through a restrictive passage formed by a work-tooling combination or workpiece. The abrasive media has random cutting edges with indefinite orientation and geometry for effective removal of material to form micro-chips [3].

Applications of AFM include finishing of components in aerospace, automotive dies, chemical processing and medical industries. Materials from soft aluminum to tough nickel alloys, ceramics and carbides have been successfully micro-machined by this process. AFM technique is used for deburring, cdge contouring and surface finishing. It has produced surface finish as good as $0.05 \mu m$ and can produce dimensional tolerances as good as $\pm 0.005 \mu m$ [4].

II. LITERATURE REVIEW

Considerable number of research studies has been undertaken in the direction of development, applications and capabilities of AFM. A brief review of same has been presented in this section.

Rhoades found that in AFM, depth of cut by abrasive particles depends on size, relative hardness, sharpness of abrasive particles and extrusion pressure. He stated that medium viscosity plays a vital role in finishing action. Experimental study by Przyklenk demonstrated that with workpieces having small bore diameter, more grains come in contact with the workpiece wall, and hence material removal increases [1].

Perry reported that abrasion is high where medium velocity is high. An increase in pressure and medium viscosity increases MRR while surface finish value (Ra) decreases. Slow medium flow rates are good for uniformly removing materials; high flow rates produce large radii. The types of machining processes used to prepare the specimens prior to AFM are found to significantly affect the improvement in surface finish [5].

Williams and Rajurker conducted experiments to study the effect of extrusion pressure and medium viscosity on MRR and surface finish. Loveless *et. al.* concluded through their experiments that initial surface roughness and viscosity significantly influence the percentage surface finish improvements [1].

III. THE PROCESS

AFM process involves the flow of an abrasive-laden, semisolid and self-deformable medium through (for internal surfaces) or around (for external surfaces) the workpiece surface(s) to be finished. This semisolid abrasive medium is forced through the workpiece hydraulically or mechanically. Two vertically opposed cylinders extrude the medium back and forth through passages formed by the workpiece and tooling. The workpiece held by fixture is placed between two medium cylinders which are clamped together to form a scal so that medium does not leak during finishing process, as

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Chapter 11 Design of Reactionless Mechanisms Based on Constrained Optimization Procedure

Himanshu Chaudhary and Kailash Chaudhary

Abstract This chapter presents an optimization technique to dynamically balance planar mechanisms by minimizing the shaking forces and shaking moments due to inertia-induced forces. Dynamically equivalent systems of point masses which represent rigid links and counterweights are useful for developing optimization technique. The point-mass parameters are explicitly identified as the design variables. The balancing problem is formulated as both single-objective and multi-objective optimization problem and solved using genetic algorithm which produces better results as compared to the conventional optimization algorithm. Also, for the multiobjective optimization problem, multiple optimal solutions are created as a *Pareto front* using the genetic algorithm. The reduction of shaking force and shaking moment is obtained by optimizing the link mass distribution and counterweight of their point masses. The inertial properties of balanced mechanism are then computed in reverse by applying dynamical equivalent conditions from the optimized design variables. The effectiveness of the methodology is shown by applying it to problems of planar four-bar, slider-crank, and Stephenson six-bar mechanisms.

Keywords Dynamic balancing • Equimomental system • Genetic algorithm • Optimization • Shaking force and shaking moment

The design of reactionless mechanisms is important in order to (1) reduce the amplitude of vibration of the frame on which the mechanism is mounted due to transmission of shaking forces and (2) smoothen highly fluctuating driving torque/force needed to obtain nearly constant drive speed. Since any vibration leads to noise, wear, fatigue, etc., in the mechanism, its reduction improves several aspects of mechanical design as well. Design a reactionless mechanism means the balancing of shaking force, shaking moment, and input-torque fluctuations together. The shaking force can be eliminated completely by attaching counterweights and/or redistributing masses of the moving links. This will increase overall mass

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A Review on Dynamic Balancing and Link Shape Synthesis of Planar Mechanisms



Sajjan Singh Bajiya, Kailash Chaudhary, and Himanshu Chaudhary

Abstract This paper reviews the various methods developed for balancing of the planar mechanisms and synthesizing the link shapes. The methods discussed in this paper are used for complete force balance, complete force and moment balance, partial force and moment balance as well as for the link shape synthesis of different planar mechanisms. The concepts, applications, and limitations of various methods are discussed and reviewed from the available literature in the area of mechanism balancing. The better understanding of available methods will definitely help the researchers working in this area in analyzing the current practices and in developing the new methods.

Keywords Shaking force and moment · Driving torque · Mass redistribution · Counterweight · Topology · Optimization

1 Introduction

Several review papers throw light on the quantum of work carried out on the balancing of the mechanisms especially dynamic balancing [1-7]. Shaking moment and driving torque get increases due to balancing of shaking force alone. Review of the literature regarding the complete balancing, i.e., shaking force and the shaking moment states that there will be no clear-cut method for static and dynamic balancing.

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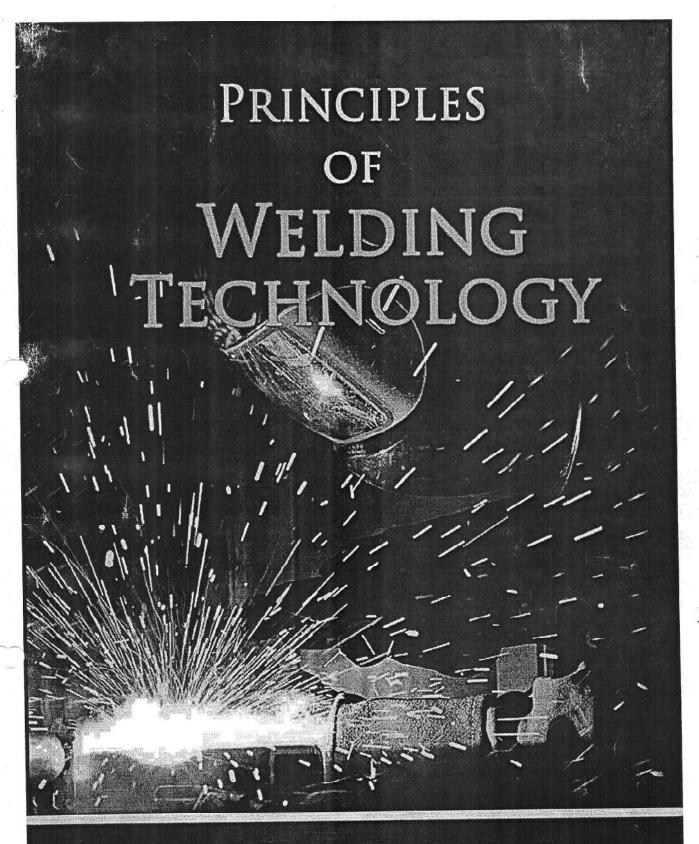
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Paper ID:129

An Insight into the Key Development Areas of Rapid Prototyping Ajay Dhanopia', Pallavi Bohra', Kailash Chandhary' Mechanical Engineering, SKIT Japur, India ²Mechanical Engineering, MBM Engineering College Jodhpur, India

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ABSTRACT

In product development, time pressure has been a major factor in determining the direction of the development and success of new methodologies for enhancing its performance. Global competition, product customisation, accelerated product obsolescence and continued demands for cost savings are forcing companies to look for new technologies to improve their business processes and speed up the product development cycle. Amongst the latest technologies to take the industry by storm is Rapid Prototyping also known as Solid Freeform Fabrication. Desktop Manufacturing or Layer Manufacturing Technologies. Various RP methods along with case studies showing effectiveness are presented in this paper. Experimental results show that mechanical properties as well as dimensional accuracy of the manufactured part depends upon the RP process parameter.

Paper ID:130

Mechanical and Microstructural Characterization of D-Gun Sprayed

Al,O,-TiO, Composite Coating deposited on 6063 Alloy

Aayush Soni, Awanish Kumar, Bharat Singh Rathor, Girdhr Dadhich, V N Shukla Global Institute of Technology, Jaipur (Rajasthan), India Email: metavns@gmail.com

ABSTRACT

In many industrial and power plant applications, the mechanical components are subjected to extreme working conditions. This leads to wear of the material which greatly affects its performance and service life of the component. These degradations cannot be eliminated completely but can be minimized by increasing the hardness of the surface by their surface modification. The aluminium is light, ductile and third most abundant element in the earth crust. It has poor mechanical properties such as yield strength 7 to 11 MPa, ultimate tensile strength 40 to 50 MPa. Hence pure aluminium cannot be used in the automobile and aerospace industry where their strength is examined. ALO, have high strength and stiffness. Its hardness is extremely high leading to its low wear but its main drawback is its brittleness. The addition of titanium oxide (TiO,) provides the balanced fusion of properties by maintaining enough hardness and considerably increasing the coating toughness. Al.O,-TiO, composite coatings have a matrix of Al.O, and a second Al.O,-TiO, phase which is known as reinforcement. In many applications like ship engine valves, steel piston rings, water pumps, textile and printing industries, plasma sprayed (part of a thermal spray technique) Al,O,-TiO, is used as a wear resistant coating. Al_iO₁-TiO₂ composite coatings is one of the important engineering ceramic materials due to its high elastic modulus, high wear resistance and chemical corrosion resistance, high temperature stability, retention of strength at high temperatures and low cost of the starting powder. The surface morphology, micro hardness and porosity of the Al2O1-40 %TiO1 coatings was investigated in the present work.

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Prof. Akhil Ranjan Garg E(i), Jodhpur Local Centre of Application of 3D Scanning For Heistage Architecture during Chairman ASSA! The Institution of Engineers (India) 100 Years of Relentless Journey towards Engineering Advancement for Nation Building Jodhpur Local Centre, Gaurav Path, Jodhpur - 342011 (Rajasthan) Jodhpur for Submitting / Presenting their Technical paper on the subject We appreciate Mr. / #5. Dr. Kailach Chaudhany Destificate of OParticipation at The Institution of Engineers (India) Jodhpur local centre. **Convener Centenary Celebration** Prof. Rajesh Bhadada All India Seminar on Heritage Architecture Ex. Member, IE(II), JLC, RICLARK on 29th Feb - 01st March 2020 Pring and a HUNTA Ay Priyanka Mehta **Dept.** of Architecture MBM Engg, College Organising Sec. All India Seminar Dr. Ghanshyam Vaishnav Honorary Secretary, IE(I), JLC,



Paper ID # 21

A study on parametric analysis of Abrasive Jet Machining

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ABSTRACT

Abrasive Jet Machining is a mechanical type advanced manufacturing process in which the kinetic energy of propelled abrasive particles is utilized to remove material from the workpiece. The process is applicable on hard and/or brittle materials and is gaining popularity at a very fast rate. The attempts have also been made to develop hybrid methods with it. The performance of this process depends to a large extent upon the hardness, strength, and other physical and mechanical properties of the work material. Also, the selection of machining process parameters is a very crucial factor for the overall performance. To exploit economically the potentials and capabilities of Abrasive Jet Machining to the fullest possible extent, parametric analysis is presented in this paper.

KEYWORDS

Advanced manufacturing processes, physical and mechanical properties, parametric analysis, optimization





OP-02: Applications of Shot Peening Process: A Review

Kunal Chaudhary and Kailash Choudhary* Research Scholar, MBM Engineering College Jodhpur Assistant Professor, Department of Mechanical Engineering, MBM Engineering College Jodhpur E-mail: k.chaudhary.mech@gmail.com

Abstract: Various application areas for the shot peening process arc explored in this paper. Shot peening process is mainly used to improve the fatigue resistance capacity of the mechanical components. Shot peening makes the surface tougher, and less likely to crack by damaging the material by creating dents. The resulting stronger surface is highly resistant to cracks. The peening takes place as small beads or shots are bounced against the parts surface. Thus, it hammers the surface of a metal part and the hammered portion is covered with small dents which makes the surface tougher. Researchers study the effect of media size, peening intensity and coverage on surface roughness and residual stress magnitude to justify the importance of shot peening process.

OP-03: Synthesis and Investigation Tactic of Biodiesel: A Review

Shyam Sunder Suthar and Farog Nazam Usta

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Abstract: There has been great development in the area of biodiesel production during recent time. Biodiesel is becoming popular as an alternative fuel with eco-friendly characteristic. There are a number of mitigating factors to be considered while assessing the sustainability of using biodiesel produced from various methods. Cost verses benefit is most common issue in the production of biodiesel. Problem faced during transportation and storage as biodiesel has inherent tendency of oxidation due to water contents and to maintain and monitor fuel quality as per standardization organizations. This paper aims to review the various synthesis and investigation procedure used during biodiesel production and after production

National Conference on Innovative Trends in Science and Technology, 20-21 January, 2018





OP-77: Applications of Shot Blasting Process: A Review

Mahendra Rolan and Kailash Chaudhary* Research Scholar, MBM Engineering College Jodhpur Assistant Professor, Dept. of Mechanical Engineering, MBM, Jodhpur E-mail: k.chaudhary.mech@gmail.com

Abstract: Shot blasting process cleans a surface by removing unwanted rust, scale, paint, etc., in preparation for painting, anodizing, welding, or other processes which require a clean surface. Along with deburring, it removes tooling marks and finishes a crude product. It is also used to change metallurgical properties or to relieve stresses in a part by the multiple impactions. Micro blasting of cutting tips and tools is a very effective and reliable method of advancing the life of tools under the action of turning, milling, drilling, punching and cutting. The importance and applications of shot blasting and other similar processes are explored in this paper.

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for paper titled Application of Data Mining in Manufacturing. System Divigni A Case Studio towards technical presentation, recognition and appreciation of research contributions to Data Mining & Machine Learning (NCDMML 2017), held at MNIT Jaipur during Dr. Girdhari Singh This certificate is awarded to Dr. Kailash Chaudhous CMBM Follyhon) Convener & HoD Data Mining and Machine Learning 1 Bursco Dr. Mushtaq Ahmed Certificate of Presentation Secretary National Conference EO Dr. Arka P. Mazumdar Secretary Num with October 14-15, 2017. Dr. Yogesh Kr. Meena - minol Secretary

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3.4.513 SPR J.N.Vyas University Dean & Head Faculty of Law Jodhpur Mahila ISSN: 0976-0024 Widhi Bharati Editor-in-Chief : Santosh Khanna Research (Hindi-English) Quarterly Law Journal विधि चेतना की दिभाषिक (हिन्दी-अंग्रेजी) शोध पत्रिका The Union and The State Relationship Constitutionality of Delegated Legislation in India A Cursory Study of Liability of Internet Service Providers Under I.T. Act, 2000 **Juvenile Justice System in India** कोरोना महामारी : भारत में विधिक विनियमन विधि, न्याय तथा न्यायिक प्रक्रिया कोषिड-19 संकट और प्रवासी मजदूरों की समस्याएँ उत्तराखंड के ग्रामीण क्षेत्रों में ऑनलाइन शिक्षा की चुनौती 'काव्य मंथन' संगोष्ठी : विधि भारती परिषद् घरेलू हिंसा के आयाम और कोविड-19 भारतीय संविधान में आरक्षण व बावा साहब अंबेडकर प्रतिलिप्यधिकार अधिनियम पर इंटरनेट पायरेसी के प्रभाव और कोविड-19 भारत में गरीबी उन्मूलन : सामाजिक कानूनी पहलू भारतीय न्यायालयों एवं कारावासों पर अतिभार हिंदी के अच्छे दिन : एक रिपोर्ट भारत में लैंगिक असमानता : वैश्विक लैंगिक अंतराल सूचकांक, 2020 भारत का संविधान और मौलिक कर्त्तव्य 2 भगरता अप्रैल-जून 2020 अक : 103

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ती सहमति आवश्यक नहीं है।	पत्रिाका में व्यक्त विचारों से सम्पादक/परिषद् की सहमति आवश्यक नहीं है।	
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संपादक		
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	HECH	(क) संविधान का पालन करे और उसके आदर्शों, संस्थाओं, राष्ट्र ध्वज और राष्ट्रगान का आदर
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Social Security for the Disabled Workers in Industrial Establishments: Legal Issues

Dr. Sheetal Prasad Meena*

Introduction

Human needs social security in the society. Disabled persons are also part of our society. Due to industrial development every person of society affected. Disability is neither a physical problem nor a health problem. It is the result of negative interactions that take place between a person with impairment and her or his social environment. There are many Acts which have been enacted by the government for the benefit of the disabled or the physical and mentally challenged. Still they seems ineffective to disabled persons. Society cannot be changed by merely by making laws there needs a enforcement mechanism. These persons are deprived of Right to employment, Right to work & livelihood, Right to social security, Right to life with dignity etc.

A first step toward a consistent explanation of the prior work requirement is to note its relation to the insurance aspect of Social Security. The requirement ensures that the claimant has paid the Social Security tax for a significant period. Thus benefits can be characterized not as public charity but as a return of insurance proceeds to the disability claimant who has paid tax "premiums" to purchase protection against the risk of disability. The insurance concept is not an entirely satisfactory explanation for the prior work requirement, however, for it could as easily justify coverage for all those now excluded by the requirement.

We could assume that all persons undertake to pay insurance premiums if and when they work, and that the promise to pay these premiums is consideration for an insurance contract by which society agrees to protect against the possibility that an individual will become disabled after working and paying taxes, or be disabled throughout his life and so never achieve a status of taxpaying productivity. That this societal insurance concept has not been adopted indicates that we may be unwilling to regard as insurance a scheme that does not require a connection between an individual's actual contributions and the benefits he will receive.¹

Definition of Social Security:

The definition of social security includes Social insurance, Social Assistance, Family Benefits, Health Care and other Social services, related social welfare services etc. Right to an adequate standard of living for the health and well being of himself and his family, clothing, including food, and housing and medical care and sickness, disability, widowhood, old age and necessary social security in the event of unemployment or other lack of livelihood in circumstances beyond his control, is provided to every individual. At all times and in every society, at every stage of development, there have been sick people requiring medical aid and care, handicapped and old people are unable to work for a living.²

According to a definition given in the ILO publication-Approaches to Social Security (1949), "Social security is the security that society furnishes through appropriate organization against creation risks to which its members are exposed. These risks are essentially contingencies of life which the individual of small means alone cannot effectively provide by his own ability or foresight or even in private combination with his fellows".

United Nations Organizations and Disabled persons :

According to Universal Declaration of Human Rights, 1948, "All human being are born free and equal in dignity and rights". Nevertheless, this is far from being a reality for more than 500 million disabled persons around the world. Disabled persons living conditions are worse than those of other citizens. They are very often isolated and socially marginalized. They face discrimination virtually in all aspects of life. To combat this situation, specific rights have been evolved to protect disabled persons.

According to definition contained in the Declaration of the Rights of Disabled Persons (1975), the term 'Disabled Persons' "any person unable to ensure by himself or herself, wholly or partly, the necessities of a normal individual and/or social life, as a result of a deficiency, either

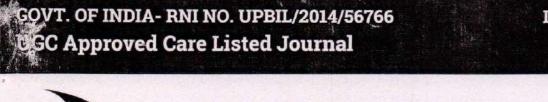
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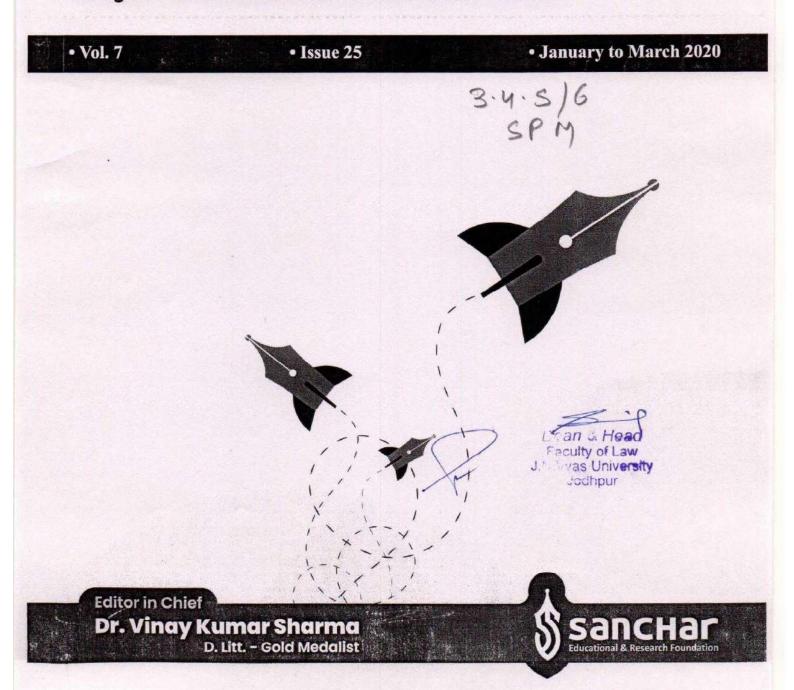
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भारत में ऑनर किलिंग : एक चुनौती

🗖 डॉo शीतल प्रसाद मीना*

शोध सारांश

वर्तमान समय में भारत सहित विश्व के कई देशों में सम्मान के नाम पर दो वयस्कों द्वारा एक ही गोत्र परिवार, समाज या धर्म में विवाह करने पर हत्या करने की घटनाएँ दिन प्रतिदिन बढ़ती जा रही हैं। इससे व्यक्ति के जीने के अधिकार से वंचित हो जाता है तथा संवैधानिक तथा विधिक अधिकारों का हनन भी होता है। इस संबंध में केन्द्र व राज्य सरकारों के द्वारा बनाए कानूनों का भी खाप पंचायतों ने मखोल उडाया। उच्चतम न्यायालय ने महत्वपूर्ण निर्णयों के माध्यम से दिशा निर्देश दिए। हाल में राजस्थान सरकार के द्वारा 2019 में ऑनर किलिंग को रोकने के संबंध में कानून बनाया है।

Keywords: ऑनर किलिंग, खाप पंचायत, मानवाधिकर, स्वतंत्रता

प्रस्तावना

भारत एवं विश्व के कई देशों में जाति एवं धर्म में ऐसी कई प्रथाएँ विद्यमान हैं जिनके कारण प्रति वर्ष हजारों में नवयुवक विवाहित जोड़ों को अपने जीवन से हाथ धोना पड़ता है। समाज में शिक्षा का बढ़ावा मिलने के बावजूद ऑनर किलिंग आज भी बद्स्तूर जारी है। भारत के कुछ राज्यों जिनमें पंजाब, हरियाणा, उत्तर प्रदेश, राजस्थान में ऑनर किलिंग की घटनाएँ सबसे अधिक हुई हैं। उच्चतम न्यायालय ने भी समय समय पर खाप पंचायतों के विरूद्ध कठोर कदम उठाए हैं, लेकिन समाज में सम्मान के नाम पर कई जातियों व धर्मों में लोग अपनी ही बेटे–बेटियों को मार रहे हैं। जो वर्तमान समय में बदस्तूर जारी है। जो समाज में कलंक के साथ चुनौती है।

ऑनर किलिंग यानि सम्मान के लिए मृत्यु या इज्जत के लिए हत्या से है, ऐसे शब्द हैं जिसमें परिवार के सदस्यों द्वारा ही अपने पुत्र या पुत्रियों की हत्या सम्मान या इज्जत के नाम पर कर दी जाती है। यह भारत ही नहीं, बल्कि कई देशों में यह बुराई आज भी विद्यमान है। 'इज्जत के लिए हत्या' ऐसी हत्या है जो परिवार या जाति या धर्म या समुदाय के सदस्यों द्वारा इसलिए की जाती है कि पीडित व्यक्ति (पुरुष या महिला ने) उस परिवार, जाति, धर्म या समुदाय की इज्जत, प्रतिष्ठा या नाम पर बट्टा अपने कृत्यों से लगाया है। सन्1978 में डच स्कालर ऐन ने जब पहली बार 'ऑनर किलिंग' शब्द का प्रयोग किया था तब वह नहीं जानती होगी कि वह मानव सभ्यता को एक ऐसा शब्द दे रही है,जो बरसों रक्त सामंतवादिता का पर्याय बन जाएया। करो–करी, इज्जत के नाम पर हत्या, या ऑनर किलिंग जिस नाम से पुकारा जाए समाज के माथे पर कालिख का एक रूप ही रहता है। इस प्रकार ऑनर किलिंग में प्रतिशोध पूर्ण हत्या पुरूषों द्वारा परिवार की महिला सदस्य की हत्या कर दी जाती है जिसके कारण समाज या जाति, धर्म में इज्जत पर बट्टा लगाया हो जैसे पारंपरिक विवाह न करना, जाति, धर्म से बाहर विवाह करना, बलात्कार का शिकार होना, तलाक चाहना अथवा जार संबंध कायम करना।

ऑनर किलिंग बनाम खाप पंचायत

हरियाणा, राजस्थान, पश्चिमी उत्तर प्रदेश में खाप पंचायतों का प्रचलन सदियों से रहा है। समाज में इनकी हैसियत बहुत मायने रखती है, लेकिन सरकारी कानून की नजर में इनकी कोई हैसियत नहीं रही है। इनके जरिए किए गए फैसले किसी फतवे से कम नहीं रहे. और जो फतवे के खिलाफ जाता है उसे गाँव से निकाला, जाति निकाला, या मौत की सजा दी जाती रही है। इन्दर मलहोत्रा का कथन है कि खाप पंचायतें अपने देश में अकेले जाट समाज में 3500 बताई जाती हैं। खाप पंचायतें जब कोई जोड़ा सगोत्र अथवा गाँव के गाँव में ही प्रेम प्रसंग चला है तो उसके विरूद्ध कड़े कदम उठाने के लिए विवश हो जाते हैं क्योंकि उससे सामाजिक प्रतिष्ठा जुड़ी होती है और स्थापित आचार– विचार की अवहेलना होती है।

<u>वैश्विक परिप्रेक्ष्य में ऑनर किलिंग तथ्य</u> लेबनान में प्रतिवर्ष लगभग 40–50 हत्याएं इज्जत के नाम पर की जाती हैं इसी प्रकार यूरोप में एवं अमेरिका में 90 प्रतिशत इज्जत के लिए हत्याएं मुस्लिम परिवरों से संबंधित होती हैं। पेरू में लगभग 70 प्रतिशत महिलाओं की हत्या उनके पतियों द्वारा या पुरूष मित्रों द्वारा की

*सहायक प्रोफेसर – विधि संकाय, जय नारायण व्यास विश्वविधालय, जोधपुर Vol. 7 * Issue 25 * January to March 2020 गोघ सदिता 34 QUARTERLY BLUK PLACKRESEARCH JOURNAL Faculty of Law IN Vyas University Jodhpur

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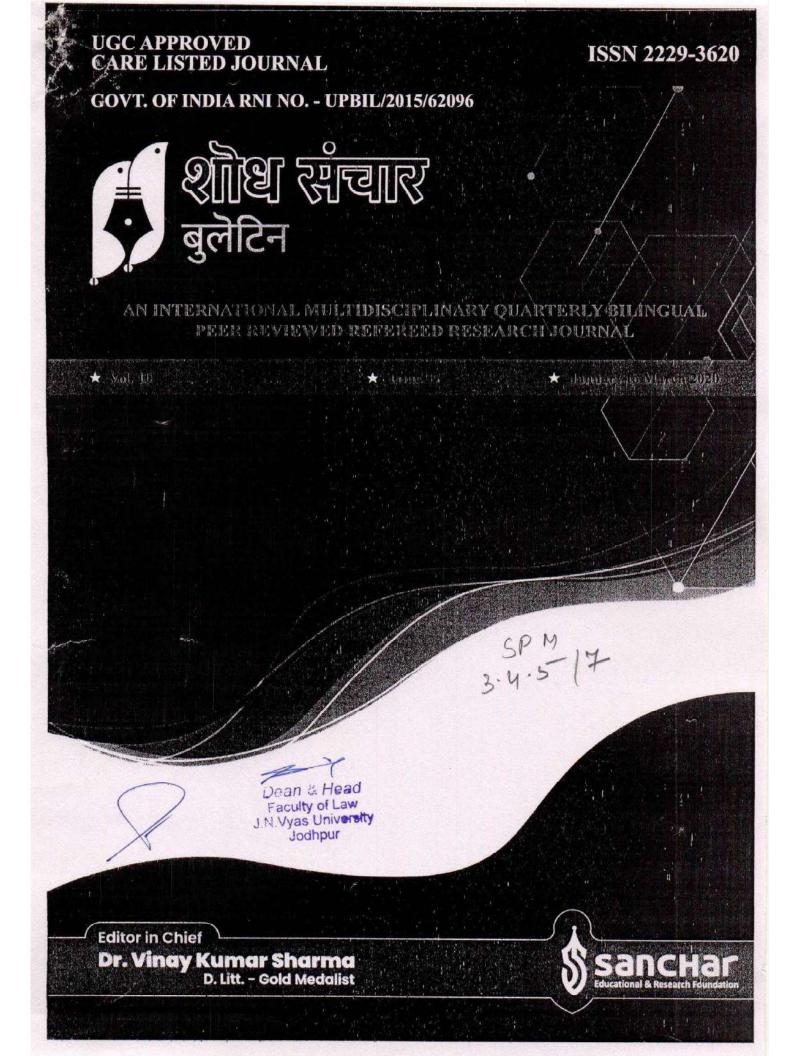
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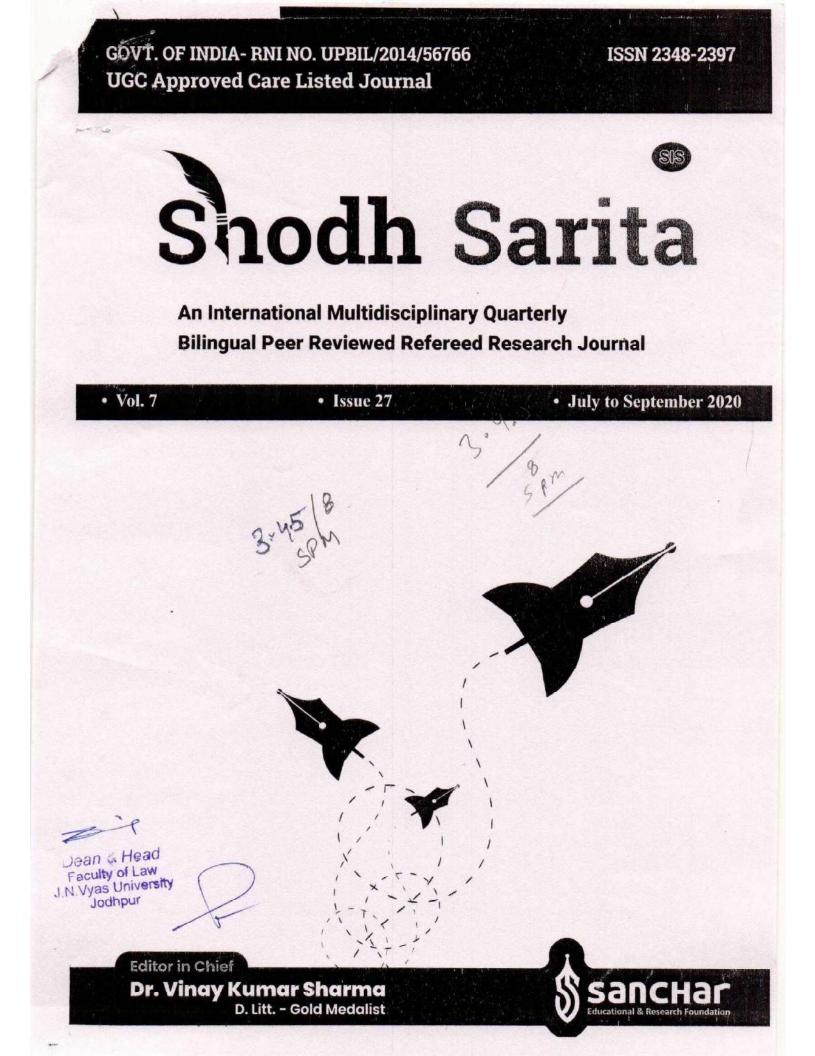
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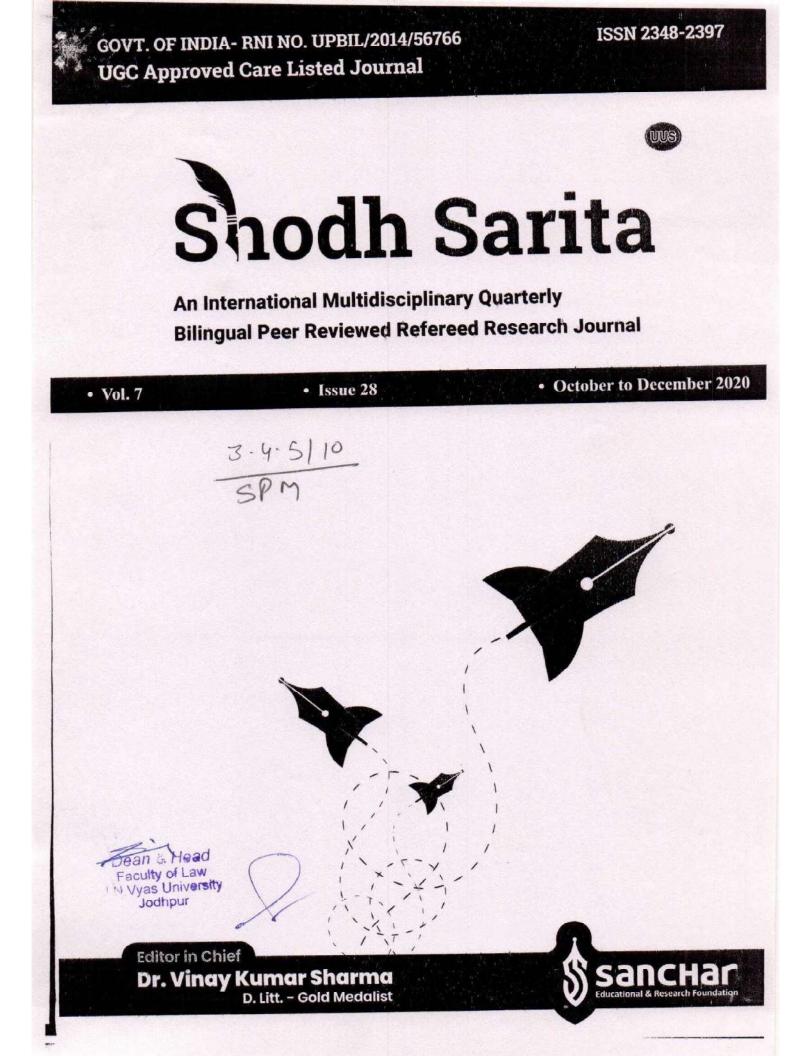
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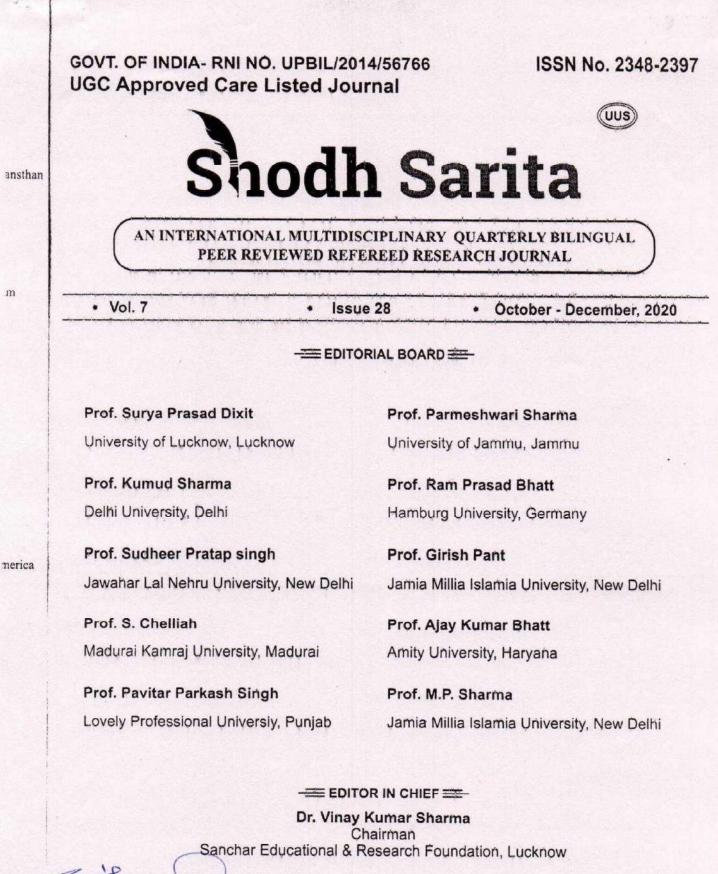


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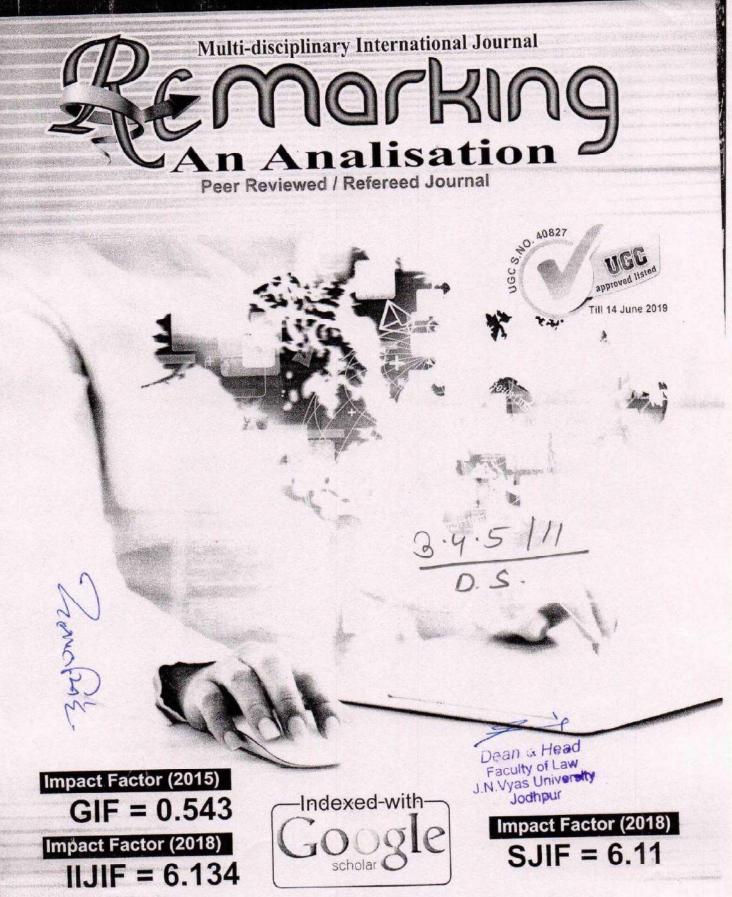
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Dean & Head Faculty of Law J.N.Vyas University Jodhpur

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VOL-4* ISSUE-12* March- 2020 Remarking An Analisation

Democratic Decentralisation in India with Special Reference to Centre-State **Relations: An Overview**

Paper Submission: 10/03/2020, Date of Acceptance: 27/03/2020, Date of Publication: 28/03/2020



Decentralization is a word that has been used by different people to mean a good many different things. In any case, what do we find by and by? Investigations with nearby government that end in confusion and insolvency; Decentralized structures of organization that serve just as an increasingly viable apparatus for unifying force; Regional and district committees in which government authorities settle on choices while neighborhood delegates stay quiet; Gram Sabhas where the neighborhood individuals partake yet have no assets to dispense. Decentralization helps in recognizing the requirements and inclinations of the individuals through their immediate contribution in plan detailing and usage. It engages the weaker sections and to some extent abolishes elite domination. In India, the Panchayati Raj system is recognized as a major means of decentralization through which democracy becomes truly representative and accountable. The Indian states were acting as federations at only two levels - the Union and the State. The 73rd Amendment reinforces the decentralization procedure in India and enables nearby bodies from states. The current paper considers the procedure of decentralization in India and the significant spotlight is on the 73rd Amendment, which manages district, sub-district and rural level institutions in rural zones.

Keywords: Decentralization, Panchayat, Government, 73rd Amendment,

Political, Administrative And Fiscal Decentralization.

Introduction

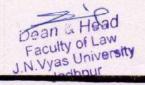
Decentralization is a procedure of moving capacity to privately choose neighborhood governments. Transferring power means providing greater political authority to local governments (e.g., calling local elections or establishing participatory processes), increasing financial resources (e.g., transfers or through greater tax authority) and provide more administrative responsibilities. With enthusiasm for, and experiments, decentralization has swept the world throughout the most recent four decades. Hypothesis firmly contends that decentralization should expand resident voice and investment in the political procedure, and so the government should be made more sensitive and accountable to governance. These estimates have led to large-scale policy responses around the world, with estimates that 80-100 percent of the world's nations have tried different things with some sort of decentralization reform.

Decentralization is a widely used concept, and is firmly connected with democracy, development and good governance. Several research findings clearly demonstrate that decentralization provides an institutional mechanism through which citizens at various levels can sort out themselves and take an interest in decision-making processes.

Local government is a type of a decentralized framework that is impacted by the exchange of power or duty from more significant levels of government to decision-making, management, or allocation of resources to its subordinate units. The job of nearby government changes starting with one nation then onto the next, but local government has a role in every democratic society. In most South Asian countries, rural authorities are characterized by a weak institutional capacity to deliver public services and promote local development.

Since the early 1980s, decentralization has re-emerged as an important political and financial objective in most developing nations. As indicated by an ongoing World Bank study, everything except 75 of the 75

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Dalpat Singh Assistant Professor, Faculity of Law Jai Narain Vyas University, Jodhpur, Rajasthan, India

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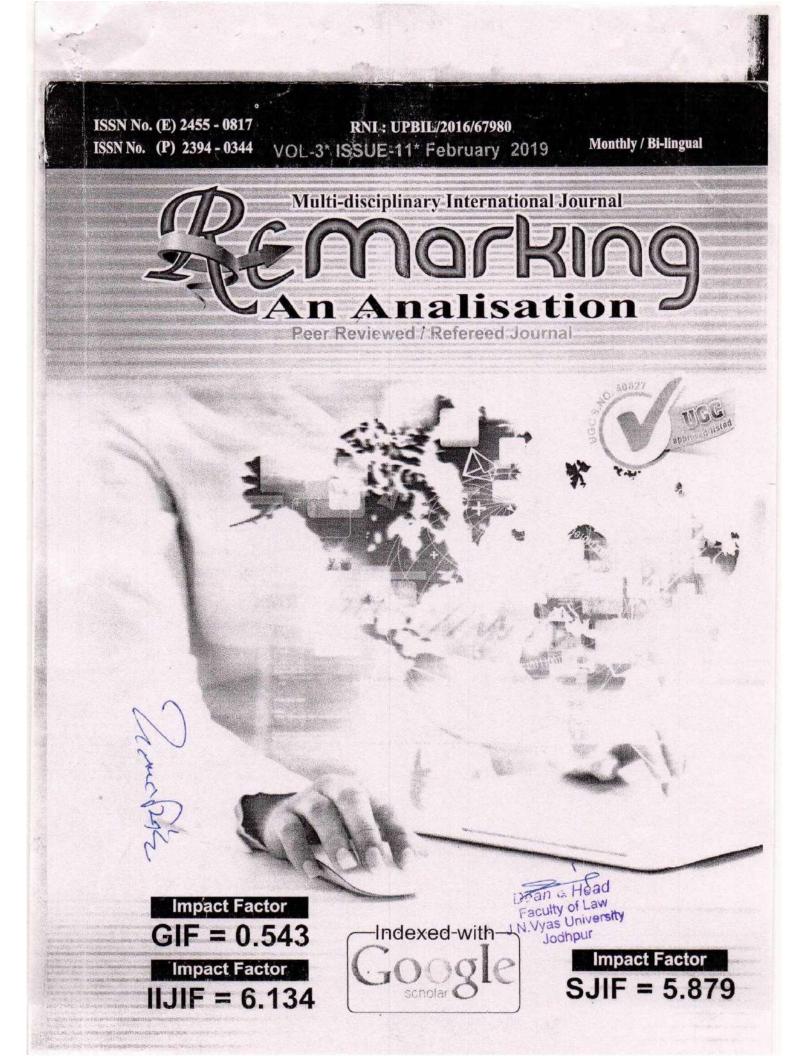
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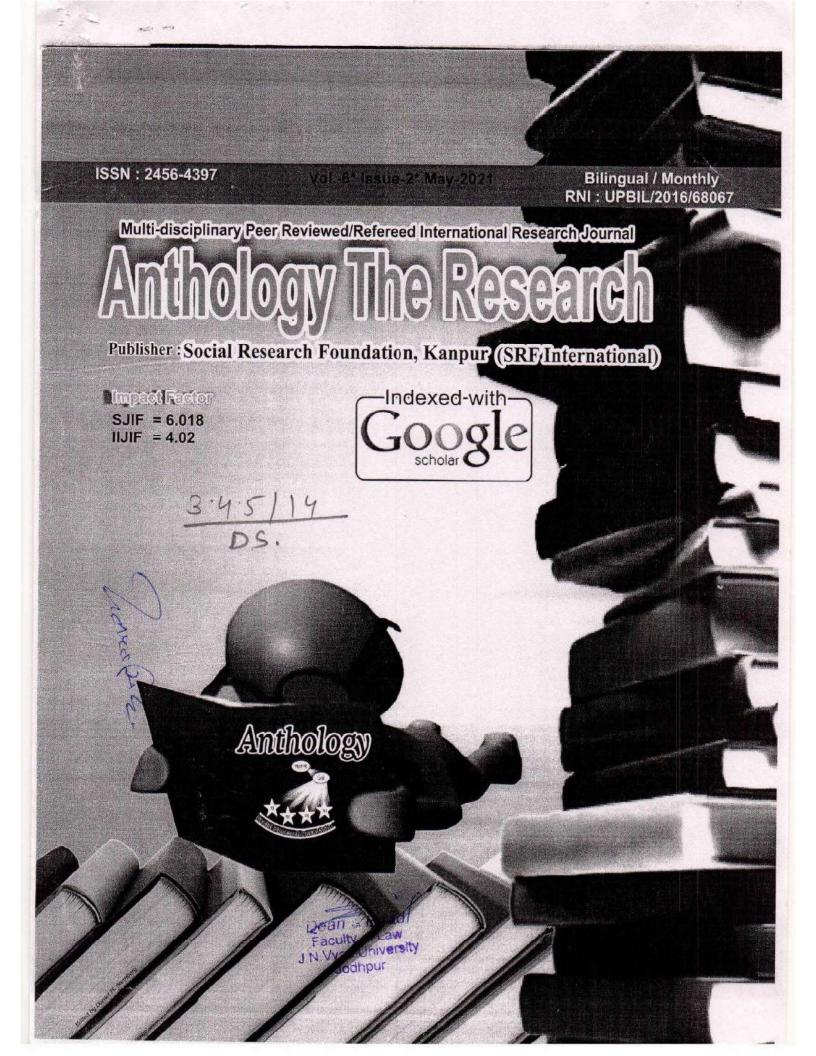
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Human Rights of Disadvantaged Groups : Corruption and Good Governance

Paper Submission: 02/05/2021, Date of Acceptance: 15/05/2021, Date of Publication: 25/05/2021

Abstract

Global human rights law will offer qualities, standards and rules that modify a standard meaning of majority rule government. This paper inspects the significant segments of minorities, helpless and disadvantaged groups: Values, standards and standards in popular government get from global human rights law.

It regrets that corruption undermines the enjoyment of human rights and, at the same time, employs human rights as a standard framework to condemn and combat corruption. But the human rightsbased approach has been criticized as vague and over-reaching. In addressing this controversy, this article attempts to examine more closely the legal quality of the fictitious 'link' between corruption and human rights. Corruption can contribute to closing the implementation gap of international anti-corruption tools not only as human rights issue but also as a potential human rights violation and usefully complement the dominant criminal law-based approach.

Keywords: Human Rights, Disadvantaged Groups, Corruption, Good Governance

Introduction

As a concept, human rights have been constantly developing all through human history. They have been complicatedly attached to laws, customs and religions for quite a long time. Their standards change over the long haul as per human necessities and interests. Any conversation about human rights should recognize philosophical, political, and legal records. The way of thinking of human rights deciphers the rationale of human rights while governmental issues reveal to us which group of human rights needs quick thought, which group of human rights should we identify and how might we evaluate the conduct of other human rights. Notwithstanding, the law of human rights manages an itemized depiction of globally concurred qualities, standards or decisions that oversee the direction of states towards their residents and non-residents.

But philosophical, political and legal ways to deal with human rights won't be talked about exhaustively for the basic explanation that it is past the extent of work. All things being equal, the most fundamental components of the concept of human rights that give a birds-eye perspective on the above approaches will be made. The reason for doing this is to make an association between human rights and defilement. With this view, the accompanying sections investigate and examine the definition (if any), premise, nature and classifications of human rights.

- Objective of the Study
- To work for ensuring that basic human rights are respected everywhere.
- 2. To restrict cooperation with governing regimes that violates human right.
- To actively engage with the Government of India to promote human rights education.
- 4 To support disadvantaged groups for protection of their rights.
- 5. To aware about the human rights of disadvantaged groups.
- To discuss about the causes and impact of corruption on human rights

 To presurise to the government to remove corruption on human rights and makes arrangements for good governance.

Definition of Human Rights

In the worldwide field, where assorted societies are included, where positivist bases are unsteady, and where execution components are delicate, the meaning of human rights is significant. Since one understands

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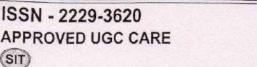
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AN INTERNATIONAL BILINGUAL PEER REVIEWED REFEREED RESEARCH JOURNAL

JUDGING THE JUDGES?

Dr. Sheetal Prasad Meena*

ABSTRACT

The Constitution provides for custodians in the form of legislature, executive and judiciary to protect will of the people. Needless to say, the custodian must be accountable to the public in exercise of their public duty. The Indian Constitution has provided for a complex web of checks and balances to ensure 'accountability' and 'responsibility' of every public institution and public functionary. Legislature and executive are directly made accountable through the system of universal adult suffrage. However, it is often found a challenge to make the judiciary accountable for misconduct. Judges enjoy judicial immunity and are not required to explain their conduct while acting in a judicial capacity. They are unaccountable to the public or to any other branch of government. Considering the fact that judges are responsible to keep a check on the abrogation of fundamental right of the citizens by other custodians, in their role as sentinel of the qui vive, the question that rightly arises is who will judge the judges? The author, through this article analyses this conundrum and tries to arrive at solutions that are the need of the hour to ensure judicial accountability while preserving judicial integrity and independence.

Keywords : judicial accountability, responsibility, judicial integrity, Independence of judiciary, Justice Delayed and justice denied

Introduction

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SIT)

"...however good a Constitution may be, it is sure to turn out bad because those who are called to work it, happen to be a bad lot. However bad a Constitution may be, it may turn out to be good if those who are called to work it, happen to be a good lot.

... The Constitution can provide only the organs of State such as the Legislature, the Executive and the Judiciary. The factors on which the working of those organs of the State depends are the people and the political parties they will set up as their instruments to carry out their wishes and their politics."

Dr. B.R. Ambedkar These words of Dr. B.R. Ambedkar are crucial to understand the significance of accountability in public life especially as custodians of the Constitution. "Accountability" and "post" both are associated with

each other like Sun and Shadow, Life and Death, Body and Soul, and Right and Duty. With this understanding, the framers of Constitution made the concept as a foundation stone of the Constitution's building. When we go through the provisions of Constitution, we get the idea of foresightedness of the framers of the Constitution because even the judiciary has been made accountable for it's functions and duties. In a democracy, every public authority and official should be accountable for their functions and duties. In previous times, accountability was understood only in the realm of its applicability to elected representatives who had to be accountable to their constituents.

The concept of judicial accountability has gained significance in modern times. Hence, the judges should not be treated as exception to this because accountability and duty both co-exist and one cannot survive without

*Assistant Professor	Faculty of Law,	Jai Narain Vyas	University, Jodhpur	(Rai.)
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Parihar VS', Nama SL' and Mathur SC' Basin, District-Jaisalmer, Western Rajasthan, India Shallow Marine Trace Fossils from Mandai Formation of the Barmer

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Abstract

these trace fossil as they have long range (Cambrian to Recent) marine depositional environment of Mandai Formation of Barmer Basin. No age can be assigned on the basis of greyish yellow coarse and coarse to medium grained calcarecus sandstone. The entire ichnogenera shows shallow trace fossils are preserved of full relief in yellowish to dark brown medium to fine grained ferruginous sandstone and phosphonte factes and its starts with bioturbated medium to fine grained ferruginous sandstone at the base. These Member of Akli Formation of Early Eocene. The Mandai Formation has mixed siliciclastic, minor carbonate and overlies on Early Palaeocene Barryara -Dharvi-Sajit Member of the Akli Formation and overlain by Giral-Thumbli Mandai Formation is 27 m thick lithostratigraphic unit deposited in the north-western part of the Barmer Basin and The present study area is located about 15 km southwest of Fatehgarh town on Fatehgarh-Jhinjinyali tar Road. The paimet muse mean reported from Mandal Formation of the Barmer Basin at Mandai area, western Rajasthan, India Planolites montanus. Planolites beverleyensis, Planolites annularis, Siphonites, Paleomendron, and Phycodes Ophiomorpha nodosa. Ophiomorpha borneensis, Palaeophycus heberh, Palaeophycus tubulans, Planolites, Thirteen well-preserved trace fossil species namely Thalassinoides horizontalis. Thalassinoides suevicus,

nedizeles mainer and Western Rajasthan Keywords: Shallow marine, Trace fossils, Mandai formation; Barmer

Introduction

al [7,9] and trace fossils from Mandai Formation reported by Parihar marine trace fossils from Fatehgarh Formation reported by Parihar et Planolites Montanus from Fatehgath Formation; nearshore - shallow such as Borkar et al. [11], recorded Thalassimoides, Planolites and reported from the rocks of the Barmer Basin by various researchers gypseous clay and sands [1]. Many trace fossils have been already gastropods [10] and the Uttarlai Formation comprises salt, gypsum, limestone and marl with plants fossils, crabs, shrimps, turtles, fishes and Formation is represented by fuller's-Earth, gypseous clay, bioclastic sandstone and clay and bentonitic clay at the base [6,9], the Kapurdi is dominantly composed of coarse grained sandstone, ferruginous microvertebrates and plant fossils [8], the Mataji ka Dungar Formation bentonite, clay, lignite and ferruginous sandstone with gastropods, wood bearing trace fossils [7], the Akli Formation is represented by poorly preserved plant fossils and well -preserved Ashenopodichum the Barmer Hill Formation comprises sandy sandstone with chert and grained sandstone, coarse grained sandstone and pebbly sandstone [6], to coarse grained sandstone, phosphatic bivalves bed, fine to medium bioturbated ferruginous sandstone and calcareous sandstone, medium bed and gastropod bed [4.5], the Mandai Formation is represented by having significant microvertebrates- magnetic spherule bearing bone comprises siltstone, ferruginous sandstone, phosphatic sandstone silistone and sandstone with plant fossils, the Fatchgath Formation and Uttarlai Formation. The Sarnu Formation is represented by red Akli Formation, Mataji ka Dungar Formation, Kapurdi Formation Fatchgath Formatiom, Mandai Formation, Barmer Hill Formation, Barmer Basin are classified into eight formations viz, Sarnu Formation, suite, Lathi sandstone and Jaisalmer Pormation [3]. The sediments of the the Sanchore Basin. The Barmer Basin is floored by Malani igneous considered as northern extension of Cambay Basin connected through the width is about 50 km [1]. Biswas et al. [2] opined that Barmer Basin N-S trending linear graben and it has a maximum length 100 km; while Barmer Basin is mainly Tertiary basin, opened as narrow, roughly

Barmer Basin, Western Rajasthan, India. of deposition of trace fossils bearing facies of the Mandal Formation of Basin. (ii) To the systematic ichnology of trace fossils and environment first reports of 13 trace fossils from Mandai Formation of the Barmer sequence of Mandai Formation. The objectives of present paper (i) To calcareous sandstone in the lower phosphatic - carbonate dominated occurred in greyish yellow coarse and coarse to medium grained Siphonites. Paleomeandron and Phycodes palmatum trace fossils are suevicus, Planolites, Planolites montanus, Planolites beverleyensis, ferruginous sandstone and Thalussinoides horizontalis, Thulassinoides trace fossis found in yellowish to dark brown medium to fine grained Palaeophycus heberti, Palaeophycus tubularis, Planolites annularis at Mandai area viz; Ophiomorpha nodosa, Ophiomorpha borneensis, shallow marine trace fossils from Mandai Formation of Barmer Basin

et al. [12]. The present investigation here deals with detailed study of

Geology of the Study Area

length of ridges is about 10 kms (Figure 2). The Mandai Formation Jaton ki Dhani and up to Mandai in the south and the overall strike atound Mandai Village. The Mandai tidge tunning from south of the the Mandai Formation forms low to high ridges and hillocks in and north -western part of the Barmer Basin. The various lithounits of Formation is 27 m thick lithostratigraphic unit deposited in the Fatehgarh on Fatehgarh-Jhinjinyalı tar Road (Figure 1). The Mandai The Mandai Formation is located about 15 km south -west of

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010001 5257-731252111 01 109 1691 9 ude:00015 sksco 3 1 eipul from Mandai Formation of the Barmet Basin, District-Jaisatmet, Western Rajasthan, Citation: Panhar VS, Nama SL, Mathur SC (2016) Shallow Manne Trace Fossils

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lindia Near Shore - Shallow Marine (Ophiomorpha and Margaritichnus) Trace Fossils from Fatehgarh Formation of Barmer Basin, Western Rajasthan,

Parihar VS, Nama SL, Khichi CP, Shekkawat NS, Snehlata M and Mattur SC

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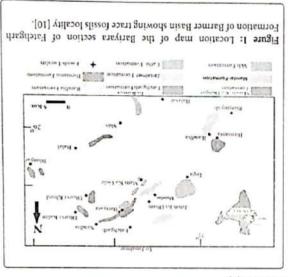
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microvertebrate assemblages recorded from the same Banyara section Ophinomorpha (Permian-Recent) as attributed the Fatehgath Formation to the Cretaceous age on the basis of Fatehgath Formation because of the long stratigraphic range of Margantichnus (Permian-Cretaceous) and Fatehgath Formation of the Barmer Basin. It is difficult to attribute a more specific age of Banyara section of and sedimentological investigations suggests near - coastal shallow marine depositional environment for the produced by worm-like deposits feeders such as significate and priapulids or possibly hydrozoa. The ichnological The Ophiomorpha trace fossils were considered as crustacears and shrimps whereas Margantichnus were mainly forruginous sandstone of middle phosphorite - siliciclastic sequence of the Fatehgath Formation of Barmer Basin. lower siliciciastic sequence while Marganichnus trace fossils occurs in dark brown medium to time grained Bramer-Jaralmer road The Ophiomorpha trace fossils are found in white fine grained calcareous sandstone from Relation. The present study area is located about 6 km south of Fatehgain town and 70 kms north of Barmer on Fatehgath Formation of Barmer Basin. Here the Margantischnus trace fossil sp. is the first record from the western Two trace fossils manely Ophiomorphia and Margantichnus have been reported from the Bariyara section of the

Formation [3]. Basin is floored by Malani igneous suite, Lathi sandstone and Jaisalmer gypsum, gypseous day and sands of Quaternary age [12]. The Barmer Early Eocene age [11]. The Uttarlai Formation is represented by salt, with plants fossils, crabs, shrimps, turtles, fishes and gastropods of is consists of fuller's Earth, gypseous clay, bioclastic limestone and marl



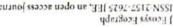
various workers and many trace fossils are already recorded such as The rocks of the Barmer Basin studied for ichnological aspects by

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Western Rajasthan Alargaritichnus. Trace fossils, Fatehgath formation, Barmer basin; 'rydsouorydo iaumana; wollenz Near-shore; Keywords:

Introduction

rocks of Middle to Late Palacocene age [9,10]. The Kapurdi Formation bentonitic clay at the base and fining upward sequences of stliciclastic [8], the Mataji ka Dungar Formation is represented by clay and microvertebrates and plant fossils of Palacocene to Early Eocene age bentonite, clay, lignite and siliciclastic rocks with gastropods, trace fossils of Palaeocene age [1], the Akli Formation is consists of glant fossils and well preserved Asthenopodichium wood bearing Hill Formation consists of siliciclastic rocks with poorly preserved bone bed and gastropod bed of Late Cretaceous age [1,7] the Barmer gnines daving significant microvertebrates - magnetic spherule beating the Fatehgarh Formation is represented by siliciclastic and phosphorite consists of siliciclastic facies with plant fossils of Early Cretaceous age, Repurdi Formation and Uttarlai Formation. The Sarna Formation Barmer Hill Formation, Akli Formation, Mataji ka Dungar Formation, grouped into seven namely, Sarnu Formation, Fatehgarh formatiom, extension of main Indus Basin. The rocks of the Barmer Basin are considered as northern extension of Cambay Basin and southern Datta [4], Biswas [5], Biswas et al. [6] opined that Barmer Basin Suite and its north -western flanks is made up of Devikote High [3]. is in its eastern flanks is made up of Jodhpur sector of Malari Igneous fault, in cast by Sarnu fault and in west by Barmer Faults [2]. The horst width [1]. It is tectonically a graden bounded in north by Fatehgath mumixen eti ee teav-tees ni emä 02 bna noitaanib diuoe-dron ni emä Barmer Basin is the Mesozoic-Tertiary basin extends for about 100



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Factors Affecting Phytoextraction: A Review



Vimla SHEORAN1.*, Attar Singh SHEORAN2 and Poonam POONIA

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ABSTRACT

bacteria, bicavailability, chelate treatment, genetic engineering, heavy metals, hyperaccumulator, mycorthiza SpioM hoy of microorganisms including bacteria and mycorraisa may facilitate the phytoextraction application at commercially large scale. ersarslocation, accumulation, and sequestration and by application of chelate treatments to enhance metal bioavailability. Application Actionomic practices including soil and croy management by application of genetic engineering to enhance the metal tolerance, shoot such as root exutates and root rhizosphere processes (microorganisms). Efficiency of phytoextraction can be improved by advanced essociated factors, such as pH, redox potential, cation exchange capacity, soll type, and soil texture, and by plant-associated factors, high biomass of plant species and bioavailability of metals for plant uptake. The phytosvailability of metals is influenced by sollto clean up the environment have led to the development of phytoextraction. The success of phytoextraction depends upon the trace metal-loaded plants may be removed by harvesting the fields. Studies exploring the beneficial role of these hyperaccumulators Hyperaccumulators concentrate trace metals and heavy metals in their shoots when grown in metal-contaminated soils and these

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INTRODUCTION

recovered by phytomining for commercial gain (Brooas gold, platinum. thallium, and nickel, which may be prove to be valuable in cropping precious metals such more, other than soil cleaning phytoextraction can also 2011; Escande, 2014; Robinson et al., 2015). Furthertamination of metal-contaminated soils (Sheoran et al., of heavy metals can be a feasible technology for decon-2005). Several studies concluded that phytoextraction cleaning metal-polluted soils and waters (Luo et al., resents a green and environmentally friendly tool for harvestable parts of plants to remove pollutants, repphytoextraction Phytoextraction, making use of the for remediation of heavy metal-contaminated sites is al., 2008a). A promising and relatively new technology ganic matter) (Pullord and Watson, 2003; Sheoren et ten harmful to soil characteristics (i.e., texture and ortion, and landfilling are extremely expensive and ofshing/flushing, vitrification, electrokinetics, incinetasites. Most of the traditional methods such as wadress the rising number of heavy metal-contaminated remediation techniques have been employed to adloway, 2013; Van Oosten and Maggio, 2015). Many cinogenic and mutagenic (Sheoran et al, 2008b; Althe classification of several heavy metals as being carcurrence as a contaminant, low solubility in biota, and

(Singh et al, 2003). 783 000 t for lead (Pb) and, 1 350 000 t for zinc (Zn) 22 000 t for cadmium (Cd), 939 000 t for copper (Cu), recent decades, the annual worldwide release reached mated to be $18 \times 10^9 \text{ m}^3 \text{ year}^{-1}$ (Forstner, 1999). Over of mine tailings produced in the world has been estiunbutor of heavy metals to soil. The aggregate volume and smelting of metalliferous ores is the principal conmaier and Kupper, 2013; Escande et al., 2014). Mining assies (Wu et al, 2007; Vamerali et al., 2010; Leitenlease of automobile exhausts, and pile-up of municipal application of pesticides and chemical fertilizers, reheavy metals, agricultural utilization of sewage sludge, ting, ore processing, irrigation with sewage containing rious anthropogenic activities including mining, smelthe weathering of parent materials, as well as the vaare introduced in the environment naturally through Heavy metals also known as potentially toxic elements considerable public attention over the last decades. mental problem worldwide. This has been attracting

Heavy metals in soil represent a significant environ-

besith and environmental issues due to their high oc-Heavy metals pose a critical concern to human

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Ybuts sees e -Trichobezoar: A possible cause of death in Eurasian Griffon (Gyps fulvus)

Ram Prakash Saran¹ and Ashok Purohit²

Introduction

Schonborn in 1883. The first surgical excision was performed by trichobezoar case occurred in 1779, by Baudamant. described in 1889 by Hallopeau, the first report of a (irresistible will to pull out the own hair) was only (Salik et al, 1993). Although trichotillomania Syndrome" is composed of hair and is rare in species intestine. Trichobezoars also called as "Rapunzel accumulation of exogenous matter in the stomach or (De Bakey and Ochsner, 1938). A bezoar is an or from the Persian "bad air", and it means antidote The word bezoar is derived from the Arabic "bad her"

ZOII; Mohajeri et al., ZOIZ). the passage of ingestion (Fromsa and Mohammed, cause obstruction in the pyloric opening and interfere the abomasal wall. The presence of hairballs might defensive barriers and allowing for auto digestion of generate abrasive forces, disrupting the normal stomach in the presence of a trichobezoar could spleen. The rhythmic peristaltic contractions of the lymphosarcoma, tuberculosis, and tumour of the mistaken for other conditions of the stomach such as such as swallowed food. Hairballs are sometimes packed fur, but may include bits of other elements Hairballs are primarily a tight elongated cylinder of occasionally vomited up when it becomes too big. of hair in the stomach of animals that is Trichobezoar is a hairball having a small collection

new cause of vulture death as trichobezoar. and consultation with veterinary doctor suspects a 72°53'15.34"E). Our experience with this incident griffon at the Arna Jharana hills (26°17'2.36"N the authors found three dead individuals of Eurasian in Jodhpur district, Rajasthan on 11, January 2014, regular field study of Eurasian Griffon roosting sites availability and anthropogenic activity. During on are consequently threatened by habitat loss, food winters in for feeding and releasing heat stress. They Eurasian Griffon migrates mostly to western India in IUCN Red List (BirdLife International, 2015). arid zone, is categorized as Least Concern in the The Eurasian Grifton, a bird species characteristic of

site for vulture study in Jodhpur. In a study, it was dumping site for carcass waste in Jodhpur is the best sufficient food availability in the region. The season (February-May). This occurs because of Neophron percoopterus breed per year in the dry pue snyles sdygoores , sisnalegnad sdyb , subibni few places in India where four species viz. Gyps reported breeding sites of vultures and is one of the Jodhpur district in Rajasthan has one of the largest

(JOHING) Jodhpur. Email: 'sərənrp@live.com (Corresponding vision of Zoology, Jai Narain Vyas University,

specimens to Central Zoo of Jodhpur. In an attempt

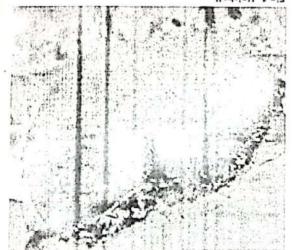
Initially, it seemed as a casual death but we took the

we found three dead specimens of the Gyps fulvus.

monitor the breeding and roosting sites of vulture,

On a regular visit to the Arna Jharna hill site to

200's PRINT, Volume XXXI, Number 12, December 2016



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is beneficial for them. aria protection and management of this dumping site, major concern, retention of minimum water levels, a si vision where water scarcity is a Mohnot, 2004; Saran and Purohit, 2012). In the arid bns insponsion event were also noticed (Chhangani and undefined reasons of vulture death in the early unnanaged dogs hunting, electrocution and some mortality to a vulture. In addition, feral and determined that diclofenac drug causes a drastic

Study Area

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and around the city of Jodhpur. the formation of different habitat types of vulture in days. This wide range of climatic condition has led to average rainfall is 300 mm, distributed over 20 rainy temperature ranges between 6° C to 45° C while in interrupted by hillocks. During summer, the Topographically, it is by and large, plain and open a prominent part of great Indian Thar Desert. E) is situated in the western part of Rajasthan and is The study site, Jodhpur (26°17'59" N and 73°02'02"

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		Corresponding Author Email: baradhr

Keywords: Diclofenae, meloxicam, Pathophysiology, Toxicity, Environmental Pollutant, Vulture. meloxicam shows less toxicity in comparison to diclofenac at same dose and duration in the experimental model Gallus domesticus. significantly. Therefore, the results of pathophysiology and biochemistry indicate that when compared with vehicle control. Although the hematology parameters were not altered degeneration like pyknosis, apoptosis and necrosis by diclofenac treatment as well as meloxicam treated birds. Histopathology of the renal and hepatic tissues showed different degrees of and total proteins were indicated abnormalities in renal and hepatic functions in the diclofenac r eloxicam. The levels of uric acid, creatinine, alkaline phosphatase, bilirubin, albumin, globulin and SGPT were significantly ($p \le 0.001$) increased by diclofenac treatment as compared to pathology revealed significant alterations in comparison to vehicle control. The levels of SGOT for histopathological investigations. The results of serum biochemistry, hematology and histoblood was collected directly from cardiac puncture whereas vital organs were fixed in formalin After the completion of experiments, the animals were autopsied as per standard protocols and divided in three comparative groups consisting of seven adult healthy broilers in each group. meloxicam which is believed to be a safer drug than diclofenae. The whole experiment was declination and considered as most devastating environmental toxicant. Today, it is replaced by domesticus. Diclofenac is claimed to be a major responsible cause of vulture population steroidal anti-inflammatory drugs (NSAIDs) i.e. Diclofenac and meloxicam in Gallus The present study was conducted to evaluate comparative toxicity of two widely used non-

ABSTRACT

I. Jai Narain Vyas University, Jodhpur, Rajasthan 342001, India. Ram Prakash Saran¹, Ashok Purohit¹, Ileera Ram¹

Meloxicam Induced Toxicity In Gallus Domestics A Comparative Patho-Physiological Study of Diclofenae and

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Intervention of Fungi in Vano-Particle Technology and Applications

Ramesh Raliya, Vinod Saharan, Ramprakash Saran, Kailash Choudhary, Jagadish C. Tarafdar, and Pratim Biswas

Abstract Biosynthesis of nanomaterial is of particular attention for material scientists due to its environmentally benign perspective and durability in a natural medium. Nanoparticles synthesized by using the whole cell, either inside the biological entity (intracellular) or extractlysate/peptide-template (extracellular) believed to have a wide range of biological application. The chapter focuses primarbelieved to have a wide range of biological application. The chapter focuses primarily on the mechanistic investigation of metal and metal oxide nanoparticle synthesis and their potential applications in the agricultural and biomedical sector. So far fungus is explored more for silver nanoparticle synthesis among all other nanoparticles and their use as an antimicrobial agent either bare nanoparticles or as a synerticles and their use as an antimicrobial agent either bare nanoparticles or as a synerfor the synthesis of agriculturally important nutrient for native phosphorus mobilifor the synthesis of agriculturally important nutrient for native phosphorus mobilifor the synthesis of agriculturally important nutrient for native phosphorus mobilifor the synthesis of agriculturally important nutrient for native phosphorus mobilifor the synthesis of agriculturally important nutrient for native phosphorus mobilifor the synthesis of agriculturally important nutrient for native phosphorus mobilitor and enhancement in photosynthetic activity.

I Introduction

Fungi, belongs to the group of eukaryotic organism, have been extensively used to produce industrial chemical and enzymes for various purposes, notably from food to medicine (Carlile et al. 2001; Prasad et al. 2015). With the advent of modern nanotechnology, researchers have practiced hamessing fungal strains to provide an

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Today & Tomontow's Printers and Publishers, New Delhi - 110 002 Eduor B R. Banning and B. R. Gadi 271-751 : (ding (2010) Visiodiversity (2010) : 167-172

(.iag) romlasial Wildlife Diversity of Desert National Park

B. R. Jaipal

Rajasthan, India. e-mail: brjaipal jnvu@gmail.com Department of Zoology, Jai Narain Vias University, Jodhur.

Abstract

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baniloob gnied even faunt bliw oht ylnoupeeneo steriden nied nied in their hadre being declined loss of habitats, increasing population of human and livestock reptilians, 55 birds and 13 mammals were recorded. But due to 61 , neidinqme 1 , seredenes, 1 amphibian, 16 vertebrates. Among 56 invertebrates 2 nematodes, 51 arthropods were observed, out of which 56 were invertebrates and 85 were and 84 species in Kanoi study site. Likewise, 141 animal species 72 plant species were found in Sudasari, 68 species in Khuri month of the secret of 35 families were observed, out of them September 2012 through road and line transects. During present decades. The field survey was conducted December 2008 to weit researce in their habitats over the last few lo seenon guimmele ne of oue guining doe no alarming morease of io snoneiuqoq of T. mediselesi ni (usondarod xyasamod) biszil Great Indian Bustard (Ardeotis nigriceps), Spiny tail endangered wild species such as Chinkara (Gazella bennetti). Aueun oi amod e si il .3'se's? oi E io 75°25 Di M The Great Indian That Desert" which is situated between 22°30' That Desett is a unique arid ecosystem and it also called the

Keywords: Deseart National Park, Fauna, Flora and Wildlife.

Introducation

as well as domestic animal population. Increased population of domestic past few years, there has been a tremendous increase in human population Wildlife is gift of nature. It fulfills different types of our needs. In

Occurrence of Albino Gazella bennetti in Viratra mata Oran (Sacred land) of Chohtan, Barmer (Thar Desert of Rajasthan)

Khagendra Kumar', Vishu Vaishnav², Aazad Prakash Ojha³, Pradeep Parihar⁴, Ronak Barmera⁵, Dr. G R Parihar

Department of Noology, Use this of Science, UNIV University, Iodopur (Indea) Ensail - Fingender lemme9956/gunal.com Ensail - Yorgender Lemme90000 3,*

Abstract— The study correct out at the Virutea noise oran. Dhok (Choham) village of the Barraer district and tine made in completely henced on the ebservation and interview of the local people for occurrence of allono helion Gazelle locally called Concernation of the endor wite The Indian Gazelle is considered an endangered species by the International Union for endangered species of the Barner district). This area is located west allo of the Barner near by the Paheton border mana oran. Dhok village of the Barner district). This area is located nest allo of the Barner near by the Paheton border endanced or the Samer (ECN). In this Paper we detected an endangered allo of the Barner near by the Paheton border between the oral village of the Barner district). This area is located nest allo of the Barner near by the Paheton border endanced or the Barner district). This area is located nest allo of the Barner near by the Paheton border in the nest of the Barner district). This area is located nest allo of the Barner near by the Paheton border deviant eco-belarized of the Barner district).

Kepwards -- Albino, Chinkara, Gazello benneni, Oran, Threats.

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I IZIBOULCINO

The Indem Gurells on commonly known as Churkum belongs to family Bovidae, order Cenatiodaetyla of Mammulai class hollon Gurallar are characterised by yellowish pale white maines, and red colored fue on ventual aids. Facial maximus of the Guraller are well developed with dark brown and black fore brad. They have light face covering by dark stripes at both side of the bead as note spect Fue color of Gauchin vertes isosocity, Indian Garalles are a dark grayish suidy color in the white. The flut is darke brown in the summer.

Mares of the Indian Gorelle are straight with promotent targe and tips that are stightly out-curved. Males and females both bace hours although they are relatively shorter to females. Female's hours are usually halt of the length of male and insure a soluth in comparison to stude forms and have less prominent targe.

Generally Indian Genetic reach 0.9 to 1.2 meter to length and 0.6 to 9.5 meter in height. Fully grown Indon Gurelle weight was 25 to 25 kg. Con-point-teleptic function weight for males and it can be as much as 10 cm shorter in height. (Grove), 2012. Indian 18.71, Indian 19.71, Indi

habar Gareller are polygamous and have polygynmehous system for manue. They feed by graving mouly in description, process, empr, legence and finits, Cronolaria briton, Azaphier oronoolaria (Ber), Protoper Gareria (Klegit), Ecconsella probatic (Publida) and Lesinen sensition (Secon) are common graving prelatence plant in desert for chantons.

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Desert Rajasthan Utilization of Biodiversity Conservation in the Thar Significant role of Common Property Resources

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G.R. Parihar , Khagendra Kumar

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THE SCIENTIFIC TEMPER

VOL -VII, No. 1&2, January-2016

Histoenzymological Observations on Acid Phosphatase Activity in the

Posterior Intestine of HGCL2-Treated Fish, Channa striatus

E-mail: dhirender.jnvu@gmail.com Department of Zoology, JNVU, Jodhpur -342001, Rajasthan, India. Dhirender

ABSTRACT

of treated carnivorous fish. However, in control, these changes were invisible. epithelial cells lining of villi and intestinal glands of the posterior intestine increased ACP activity accompanied by histolytic changes in the columnar fish, Channa striatus. It was observed that there appears to be slightly distribution of acid phosphatase (ACP) activity in the posterior intestine of Present studies incorporate enterotoxic effects of HgCl, on the relative

Key words: ACP, Channa striatus, HgCl,

INTRODUCTION

al 1987). Mercurial compounds are well known aquatic organisms including fish (Dhanckar et compounds accumulate in different tissues of disturbances. Interestingly, Mercury and its lenotional bas latucutal soubord and of fish through ingestion and food chain and present in water enters into the digestive tract found in nature. Some amount of mercury period. Mercury is one of the heavy metals which could have toxic effect for prolonged resonances and slow degradable substances aquatic environment. These metals are slow Heavy metals are common pollutants of the

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for causing toxic effects in fish.

undoubtedly affects fish health and survival. be taken for higher concern. Aquatic pollution environment is a serious problem that should intestine of fishes. Pollution of aquatic on the distribution of phosphatase in the various effects of heavy metals, toxins and Sastry (1981) and Dalela et al (1982) discussed bns Erqu), Gupta and Malik (1979), Gupta and intestine of fishes and birds. Sastry and Gupta Qualitative distribution of ACP activity in the (2012) and Tlak et al (2013) have studied the Ashok (2010), Kozaric et al (2011), Kuzir et al Chakravorty and Sinha (1982), Imuyaz and Many workers notably Goel (1975),



Discovery of Trace Fossils from Lower Odania Member of Lathi Formation of Jaisalmer Basin, Akal area, District-Jaisalmer, Western Rajasthan, India

V. S. PARIHAR*, S.L. NAMA AND S. C. MATHUR

Department of Geology, Jai Naram Pyas University, Jodhpur-342005, Rajasthan.

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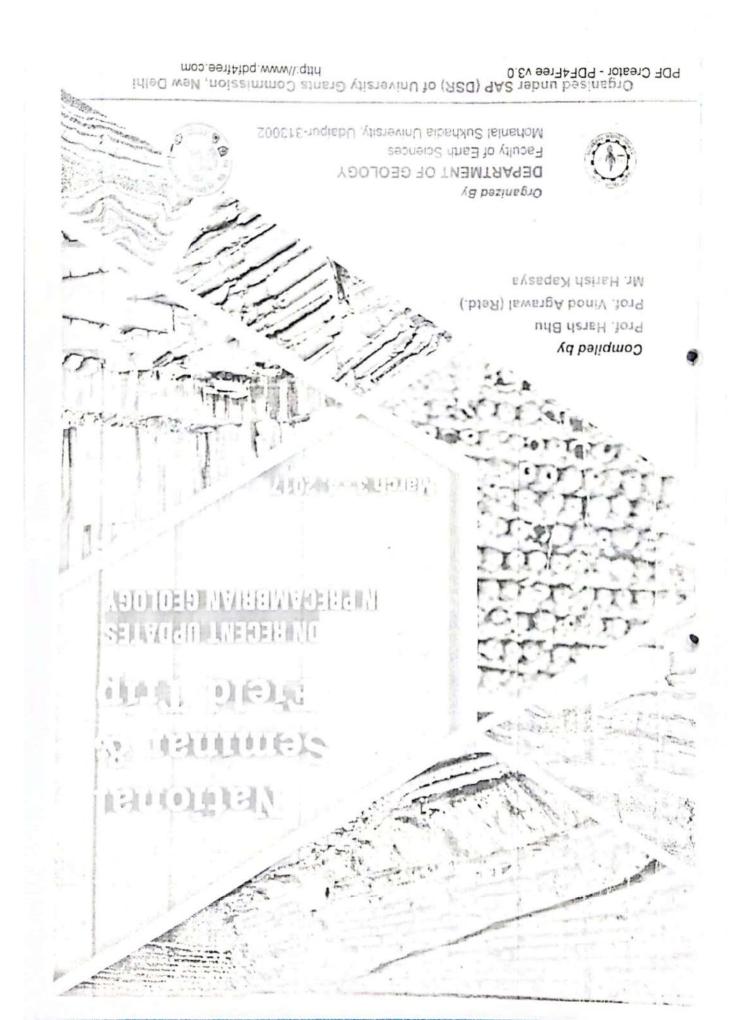
Abstract: The Lathi Formation is the oldest lithostratigraphic unit unconformably overlying rocks of Malani Igneous suites. Birmania Formation, Marwar Supergroup and Bhadhura Formation and overlain by lower Hamira Member of latis and Akal suites. Birmania Formation of the Jaisalmer Basin. It is well developed mainly in the vicinity of Lathi, Odania, Thatat and Akal area and divided into two members viz. Lower Odania Member and Upper Thaiat Member. The present investigations bette documented eight trace fossils namely Thatassinoides suevicus, Thatassinoides paradoxica, Ophiomorpha nodosa, Ophiomorpha borneents, Palaeophycus heberti, Palaeophycus tubularis, Gyrocrote and Phycodes palmatum from grayish yellow coarse to medium grained caleneous sandstone of Lower Odania Member of Lathi Formation of Jaisalmet Basin in Akal area. The trace fossils hearing Akal section is located about 18km south of Jaisalmet city on NH-15. The complete section is about 22m thick comprises glaucontile sandstone at the base, caleareous sandstone, petrified wood bed and fertuginous sandstone with box works and concretionary structures. These trace fossils are with box works and concretionary structures. These trace fossils are with box works and concretionary structures. These trace fossils are well -preserved and abundant in nature in Akal area. No age can be assigned on the base, tance fossils as they have longical and caleareous sandstone to stands and concretionary structures. These trace fossils bearing bearing they represents domichnia and fodinichnia. The ichnological and sedimentological investignations suggest near-shore to saling can be assigned and contenting and terrugineus sandstone of Akal area. No age can be assigned on the basis of these trace fossils bearing bearing caleareous sandstone to standstone to standstone and endoted and endoted and formational environey and environey trace fossils bearing they reduce and environey and environey

Key words: Trace fossils, Odania Member, Lathi Formation, laisalmer Basin and Western Rajasthan

I. Introduction

Jaisalmer Basin is the mainly Mesozoic -Tertiary basin which is floored by Malani igneous suite, Marwar Supergroup, Bhadhura Formation on surface (Pareeek, 1984 and Roy & Jakhar, 2002) and Permo-Triassic Bhuana Formation in sub-surface (Bhandari, 1999 and Roy & Jakhar, 2002). The sediments of the Jaisalmer

Corresponding author: V. S. PARIHAR, Department of Geology, Jai Narain Vyas University, Jodhpur-342005, Rajasthan.



Autional Seminar & Field Trip on Recent Updates in Precambrian Geology March 3 - 4, 2017, Udaipur

divergent views have been expressed by different workers. The carbonates of the south Delhi terrane have been differentiated on the basis of the heavy carbon isotope character and represent gap between the deposition because different in palaeoenvironmental conditions. The rocks of Delhi Supergroup from southern terranes of Gogunda-Sirohi section (outcrops in about 80 km width) requires detailed structural, petrologic, metamotphic and isotope studies before assigning alternate tectono-stratigraphic status to the South Delhi rocks.

EXPLOSION. FUIGMAS IN GEOLOGY'S PRELUDE TO THE CAMBRIAN FECORD OF JODHPUR GROUP OF THE MARWAR SUPERGROUP: THE GLOBAL EDIACARAN EVENT IN THE GEOLOGICAL FUIGMAS IN GEOLOGY IN THE GEOLOGICAL

Mathur, S. C; Parihar, V.S; Nama, S.L; Soni, A., Hukma Ram; and Mathur Saurabh* Department of Geology, J.N.Vyas University, Jodhpur: Corresponding Author *<u>sureshma09@gmail.com</u>

Up to 2005, the Jodhpur Group of the Marwar Supergroup (MSG) was regarded as unrewardingly unfossiliferous. Till year 2010, the fossils record being isolated, few in number and were dubious (Peters, 1995; Raghav et al., 2005; Sarkar et al., 2005, 2008; Paliwal, 2007; Sarkar, 2008, Kumar and Pandey, 2008, 2009; 2010). The change came with the significant discoveries of Ediscara fauna made by number of researchers from Jodhpur Group (Parihar, et.al., 2011; 2012 and 2015; sharma, 2011; Mathur, 2011; Mathur et al., 2013; Sananta et al., 2011; 2012 and 2015; sharma, 2011; Mathur, 2011; Mathur et al., Mathur, 2013; Srivastava, 2013; Hughes et al., 2015) along with a field trip to MSG geoscientists of IGCP project 587 in 2014 and their publication (Petricia et al., 2016). These diversified fossil assemblages from Jodhpur Group endorsed that they belongs to the period between 600–543 Ma, known formerly as the Vendian and now officially as the Ediacan inview diversified fossil assemblages from Jodhbur Group endorsed that they belongs to the period between 600–543 Ma, known formerly as the Vendian and now officially as the Ediacan inview diversified fossil is characterized by global geochemical, palaeontological, climatic and period. This period is characterized by global geochemical, palaeontological, climatic and unique depositional events which set the stage for all subsequent geological history of western Rajasthan specially, Precambrian-Cambrian boundary, infracambrian petroliferous western Rajasthan specially. Precambrian boundary, infracambrian petroliferous

The Precambrian-Cambrian rocks belonging to MSG has been subdivided into five groups: in stratigraphic order, these are the Jodhpur Group, Bilara Group, Hanseran Evaporite Group, Nagaur Group and unidentified Upper Carbonate Group (Pareek, 1984; Peters, 1995 and Chauhan et al., 1999). Previously, the Jodhpur Group has been subdivided into the Pokaran Boulder Bed, Sonia Sandstone and Githhakar Sandstone. Recently, Mathur into the Pokaran Boulder Bed, Sonia Sandstone and Githhakar Sandstone. Recently, Mathur

event and global Early Cambrian Radiation event (McCall 2006; Soni, 2014 and Hukma Ram, 2015). Hence, the rocks of MSG in which signature of these significant global events have been preserved which will be very helpful in understanding the Precambrian-Cambrian geological history and its economic aspects for the development of western Rajasthan.

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Research Article

IN THE SORSAN GRASSLAND, RAJASTHAN DIURNAL AND SEASONAL ACTIVITY PATTERN OF THE BLACKBUCK (ANTELOPE CERVICAPRA)

*Meena Renu1., Chourasia, V1 and Saran RP2

2Department of Zoology, JaiNarainVyas University, Jodhpur (India) Department of Zoology, Government College, Kota (India)

8721.2180.7105.717527[i]7524327/ijrsr.2017.0812.1278

The present paper investigates the diurnal and seasonal activity of blackbuck (Antelope cervicapro) in Sorsan grassland, Baran, Rajasthan. Data were gathered for eight days per month starting from early in the morning to late evening. Activity pattern of the selected blackbuck of particular age/sex early in the morning to late evening. Activity pattern of the selected blackbuck of particular age/sex	Article History: Received 20 th September, 2017 Received in revised form 29 th
was recorded by using local annual sampling method. Observations were conducted and using segrests that adult males, adult fernales, sub-adult males, sub-adult fernale and fawn. This study suggests that blackbuck dedicated significantly more time to foraging than to other durmal activities. Blackbuck of all are classes devoted the least time to standing and spent the similar amount of time moving	October, 2017 Accepted 30 th November, 2017 Published online 28 th December, 2017
Present investigation proposes that there is a definite pattern of activities in the fixed hours of the day which shows variation with the seasons	Key Words: Antelope, ecology, foraging, resting,

aurunsus.

provided the original work is properly cited. the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, Copyright O Meena Renu., Chourasia, V and Saran RP, 2017, this is an open-access article distributed under the terms of

INTRODUCTION

pattern in selected individuals of blackbuck of different age/sex vitvites leanne has lenosees, learnab diw sleeb noisegitesvni performs various activities during the daytime. The present ecological roles in the grassland ecosystem. Blackbuck small herds (Meena and Chourasia, 2017b). It has imperative active during the day, and for most of the times, they live in features of blackbuck against predators. Blackbucks are mainly their facees. Strong eyesight and speed are the primary defense concentration of urea in their urine and reabsorb water from conservation and when deprived of water, they can increase the 1992). Blackbucks have evolved mechanisms for water The blackbuck (Antelope cervicapra) is a medium-sized long distances for the search of water and food (Jhala et al, mainly forage in the small area, but in summer may migrate to

MATERIAL AND METHODS

Dain Aprils

kilometres between right main canal of the Chambal and the Amalana and Sorsan village. It stretches over 35 square Rajasthan (Figure 1). The protected area spreads between and chinkara. It is located in Anta tchsil of Baran district of Sorsan grassland is known for the conservation of blackbuck of activities in blackbuck was performed in Sorsan grassland. Present investigation of a diurnal, seasonal and annual pattern

Wildlife Protection Act of 1972 (Meena and Chourasia, 2017a). poaching of blackbuck are prohibited under Schedule I of the Fauna is categorized in Appendix III. In India, hunting and Trade for Endangered Species (CITES) of Wild Flora and concern (IUCN, 2017) and in Convention of International for Conservation of Nature and Natural Resources as least Blackbuck is listed in Red Data Book of International Union conservation policies in some places(Bashistha et al., 2012). secure due to increase in protected areas and better increasing and the population can be reasonably described as The more recent report suggest that numbers are marginally of blackbucks have declined (Jhala, 1992, Meena et al, 2017a). Isvaran, 2016). Over last hundred years the range and numbers be most handsome member of the 'Bovidae' family (Jhala and antelope native to the Indian subcontinent. It is considered to

(Meena et al, 2017b). Blackbucks are principally grazers and wastelands, marginal agricultural fields and cultivated areas available almost throughout the year. It is easily adaptable to distribution, to only those areas where surface water is Blackbuck requires water regularly, which restricts its preatest densities in semi-arid grasslands (larman, 1974). Blackbucks are found in wide range of habitat but it attains

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First Report on Ecotourism Potential in Sorsan Region of Rajasthan

Renu Meena^{1*}, Ram Prakash Saran² and Veena Chourasia¹

¹Department of Zoology, Government College, Kota (India) ²Department of Zoology, Jai Natain Vyas, University, Jodhpur (India)

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Ecotourism an emerging concept deals with the conservation of natural resources through socio-economic development of the local communities. The protected areas and reserve located mainly in remote areas where the locals depend on the natural resources for their survival. Development of the ecotourism sites and protected areas located in Ania tehsil of Baran district of Rajashan and have high potential to be development, but also social and cultural development. Sorsan is hunting prohibited areas colourism site. Ecotourism in Sorsan region will able to create employment, community of the local properturities for the local employment of the development, social empowerment through community involvement, community cohesion, implementation will bring social empowerment through community involvement, community cohesion, infrastructure improvement and cultural awareness. There is need to devise better and rigorous policies aiming profitable ecotourism in Sorsan which is socio-economically operative, culturally unconvention and environment.

Key words: Community; Conservation; Local; Protected area; Sustainable; Wildlife.

INTRODUCTION

tries. As tries. As tries. As tris of tris o

Ecotourism is a somewhat new concept, and it is still often misunderstood or misused. While the term was first used in the 1980s, the first broadly recognized definition, The (International) Ecotourism Society (TIES) in 1990 which states

to cultural and environmental values. Tourism has often been opposed by those who are very sensitive least polluting industry. However, tourism has industry without chimneys as this industry one the 2016.). Tourism sectors are often regarded as an is growing exponentially (Kunjuraman and Hussin privatization and globalization, the tourism industry other through the rapidly changing to liberalization, as countries of the world are coming close to each communication is becoming ever more active and distance, gnioubor pue unreachability transport facilities is breaking barriers of awareness is increasing, economy is developing, Tourism is one of the world's largest industries. As

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Volume 2; Issue 6; November 2017; Page No. 194-198 mos.elen uol (goloos.www Impact Factor: RJIF 5.14 6971-SSPT INSSI International Journal of Zoology Studies



Assessment of threats to blackbuck Antilope cervicapra (Linn) in sorsan grassland, Rajasthan, India

* Department of Zoology, JNV University, Jodhpur, Rajasthan, India Department of Zoology, Government College, Kota, Rajasthan, India " Renu Meena, 1 Ram Prakash Saran, 3 Veena Chourasia

Abstract

hunting and posching is another threat to the blackbuck population of Sorsan. with the inhabitants. Sorsan is very close to the National Highway, many animals meet accident while crossing the road. Illegal blackbuck and cattle stock for grazing and territory. Blackbuck cause heavy damage to the crops and thus come in direct conflict population pressure and change in the land use pattern has further restricted the habitat of blackbuck. There is competition between blackbuck (Antilope cervicopra) at Sorsan is due to developmental work and human encroachment of grassland area. Human The decreasing natural resources lead to conflicts and threats to the wild population. The cause of threat to the population of

I. Introduction

(Texas) and Argentina [1] introduced to grasslands of the United States of America Pakistan and Bangladesh [1]. The blackbuck has been during the 20th century and they are now nonexistent in Indian subcontinent grasslands. Their distribution decreased Nepal and earlier occurred across almost the whole of the The Blackbuck (Antilope cervicapra) is native to India and

posching of blackbuck is prohibited under Schedule I of the Fauna) is categorized in Appendix III. In India, hunting and International Trade for Endangered Species of Wild Flora and Resources) as least concern and in CITES (Convention of (International Union for Conservation of Nature and Natural Haryana [1], Blackbuck is listed in Red Data Book of IUCN dominated by Vishnoi communities in Rajasthan, Gujarat and they are increasing in many protected areas and areas specially due to habitat destruction for anthropocentric development, Although blackbuck have disappeared from numerous areas

grazers, but browse when lack of grasses in summer season is available throughout a year (4. 5]. Blackbucks are principally requirement restricts its distribution, to the areas where water and agricultural margins as their habitat. The daily water The blackbucks prefer open grassland, dry thorn scrubland

Keywords: anthropocentricity, habitat loss, human-wildlife conflict, land use, wildlife collision

district of Rajasthan, India. limit the survival of blackbuck in Sorsan grassland of Baran evaluate the effect of various threats which have potential to well irrigated. The present study has been accomplished to Right Main Canal (RMC) of Chambal the region is fertile and agriculture and cattle rearing. Being in the command area of Kuradia. The main occupations of the inhabitants are grassland are Amalsara, Manpura, Sorsan, Niyana and of Baran district, Rajasthan [6]. The villages adjacent to this finits. Blackbuck is a prominent animal of Sorsan grasslands forces a greater dependency on dry leaf litter, flowers and

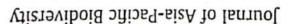
2. Study Area

amazing varieties of birds as well as animals. vegetation and numerous small water bodies, which harbor east of Kota (25.00 -25.8º N, 76.12- 76.18º E) having scrubby, animals in Sorsan region under wild life act 1972. It is 50 km government in 1984 has banned poaching of hunting of main canal of the Chambal and the Parvan River. State village. It stretches over 35 square kilometers between right The protected area spreads between Amalsara and Sorsan life. It is located in Anta tehsil of Baran district of Rajasthan. Sorsan is known for conservation of blackbuck and other wild

Wildlife Protection Act of 1972.

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Original article

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and resident species of vultures in and around Jodhpur, Rajasthan Population monitoring and annual population fluctuation of migratory

ABSTRACT

during the breeding season.

Ramprakash Saran'

Department of Zoology, Jai Narain Vyas University, Jodhpur, India

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Introduction

That Desert situated at 26°19'N latitude and 73°8'S longitude, has and 69.5° to 76°E (longitude) (Rahmani 1997). Jodhpur, the part of smallest deserts in the world, lies between 25° and 30°N (latitude) Chhangani 2005; Cilbert et al 2006). That Desert, one of the and Rahmani 1999; Virani et al 2001; Prakash et al 2003; over the past two decades (Rahmani 1998; Prakash 1999; Prakash drastic decline in vulture population in the Indian subcontinent servation of Nature Red Data Book (IUCN 2016). There has been a listed as critically endangered in the International Union for Congalensis, Gyps indicus, Sercogyps calvus, and Gyps tenuirostris-are the wild (Ali and Repley 1987), of which four species-Gyps benand environmental gradient, India has nine species of vultures in carrion from dead cattle. Owing to a lot of variation in geographical provide an important ecosystem service by disposing of waste Vultures are one of the most important scavengers as they

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Korea National Arboretum (KNA).

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Prakash et al 2003).

large gregatious species that breed colonially in cliffs, forming large

throughout the day or within a season (Newton 1979). Vultures are seasonal fluctuations, and their number and activity may vary

(Fuller and Mosher 1981), Different species of vultures show local are steritorial and widely distributed over a sizable area Monitoring vulture population size is often a strenuous task as

by vultures now supplement dog diets (Markandya et al 2008;

(>95%) declines and carcasses that would normally be consumed

populations on the Indian subcontinent have undergone dramatic

increase in the canine population. Compounding the issue, vulture

challenges, in particular, carcass disposal and the consequent rapid

Arna Jhama). A dramatic fall in their population has created serious

the eco-status of vulture species in Jodhpur (i.e., Keru, Badli, and

new challenges in terms of habitats and food availability, affecting

places. The population explosion in Jodhput has genetated several

migrate here at Jodhpur to avoid adverse conditions at their native

resident species such as Egyptian vulture, long billed vulture, and

phytes vegetation, which is favorable for nest building among the dry and hot climate conditions of the desert, exhibiting xero-

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white backed vulture (Chhangani 2002).

ation is climate change as well as change in temperature fluctuation over a period of time, particularly ulation during the entire 9-year study. The finding suggests that the reason for this population fluctu-

as compared to 2007. Neophron percoopterus has the highest and Cyps bengalensis has the lowest pop-

study suggests that the population of migratory species has reached very low relative abundance in 2015

decline in the population of migratory as well as resident vulture species in this region. A comparative

dynamics of the various species of vultures in this region has suggested that there has been a drastic

study area are of great significance. Comparative analysis of data obtained with regard to the population

and 73-08'E). The data obtained regarding the population fluctuation of different vultures species in the

determine the annual population fluctuations in various vulture species in and around Jodhpur (26°19/N vultures, was investigated. Intensive surveys of the study area were undertaken from 2007 to 2015 to

work, Jodhpur district of That Desert, India, the natural habitat of resident and migratory species of

dumps. In the past decade, a sharp decline has been observed in vulture population. For the present

Vultures are important scavengers that play a vital role in clearing animal carcasses and municipal

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Eurasian griffon, Himalayan griffon, and cinereous vultures





001: 10.5829/idosi.wjs.2017.53.59 © IDOSI Publications, 2017 860E-L181 NSSI World Journal of Zoology 12 (3): 53-59, 2017

Blackbuck Antilope cervicapra (Linn) in the Sorsan Region of Baran, Rajasthan Population Characteristics, Habitat Availability, Forage Preferences and Threats to the

R. Meena, P.P. Saran and V. Chourasia

Department of Zoology, Jai Narain Vyas University, Jodhpur, India 'Department of Zoology, Government College, Kota, India

areas and allowing animal movement across regions by maintaining functional corridors. active management initiatives from the forest departments including management of habitats outside protected suggest that conservation plans should include local people with an ample flow of benefits to them united with and major risk factor limiting the population of Blackbuck (Antelope cervicopra) in study area. The research many wildlife species. The present study deals with the population characteristics, habitat, forage preference the environment for all the inhabitants. Human-wildlife conflict is one of the major threats to the survival of on the population of black buck. The land use pattern variations over past few decades have alarmingly altered Due to increased urbanization, rising human population and eco-transformations had enhanced great pressure It is ideal habitat for blackbuck. The presence of blackbuck in region indicates the good health of an ecosystem. Abstract: Sorsan is hunting prohibited and protected area located in Anta tehsil of Baran district of Rajasthan.

Key words: Antelope · Behavior · Blackbuck · Conservation · Habitat Fragmentation · Sorsan

NOLLODUCTION

decreasing and the species is projected to be close to

economic development. The habitat available is

increasing numbers of domestic livestock and agro-

decreasing due to increase in human population,

places. However, Blackbuck habitat is continuously protected areas and better conservation policies in some

can be reasonably described as secure due to increase in

that, numbers is marginally increasing and the population

blackbucks have declined. More recent report suggest

their restoration have been taken in Pakistan and Nepal

extinct in Bangladesh, Nepal and Pakistan. Attempts of

population declined abruptly and they are now almost

the Indian subcontinent but during 20th century its

blackbuck population distributed through the whole of

most abundant wild animals of this region. Previously representative of the genus 'Antelope' and was once the

South Asian sub-continent where it is the only member of the 'Bovidae' family. It is endemic to the

gazelle-like animal, considered as the most handsome

Blackbuck (Amelope cervicapra) is a graceful.

[1]

Over last hundred years the range and numbers of

category [2, 3]. Red list has listed this animal in "Near threatened" be suitable for Vulnerable under criterion A3c. The IUCN meeting the 30% decline figure over ten years that would

The systematic position of blackbuck is:

Species: Antelope cervicapra Genus: Antelope Subfamily: Antelopinae Family: Bovidae Order: Ariodactyla Infraclass: Eutheria Subclass: Theria Class: Mammalia Sub-phylum: Venebrata Phylum: Chordata Kingdom: Animalia

Sub species or geographic races include [4]:

- . Απιίλορε σεννίσορτα σεννίσαρτα
- Antilope cervicapra rajputanae
- Aniilope cervicapra rupicapra Antilope cervicapra centralis

E-mail: renumeena@outlook.com. Corresponding Author: R. Meena, Department of Zoology, Government College, Kota (Rajasthan), India.

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International Journal of Zoology Studies



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Challenges in India Agriculture erop damage by antelope (Boselaphus tragocamelus) and management strategies:

Dr. Meenakshi Meena

Assistant Professor, Department of Zoology, lai Narain Vyas University, Jodhpur, Rajasthan, India

Abstract

and which is adversely affecting the conservation ideals. Options for damage control and managing nilgai populations are available to vehicular collisions. Though people considered nilgai as a sacred animal, conflict between nilgai and farmers is on the increase, eaten by nilgai but it was damaged by trampling. There were also increased incidences of road mishaps (7-12 cases/state/year) due high density nilgai areas, damage to wheat, gram and moong was 35-60%, 50-70% and 45-60%, respectively. Mustard was seldom Damage to guar (Cyamopsis tetragonoloba) and cotton (Gossypium arboretum) was 20-35% and 25-40%, respectively. Whereas in nilgai areas, losses to wheat, gram and moong (Phaseolus mungo) crops were 20-30%, 40-55% and 40- 45%, respectively. was caused not only by foreging but also through trampling, resting in field and daily movement of the animals. In low density to most agricultural crops. Damage to wheat (Triticum aestivum), gram (Cicer arietinum) and mustard (Brassica campestrus) crops human-nilgai conflict varied from place to place within these states. Nilgai were found to be capable of causing extensive damage locally overabundant in the states of Gujarat, Uttar Pradesh, Haryana, Punjab, Rajasthan, Madhya Pradesh and Delhi. The extent of Due to prolonged breeding activity and lacks of potential predators, numbers of nilgai have increased considerably and become overabundant populations of nilgai antelopes (Boselaphus tragocamelus) has been widely reported in many parts of the country. of some species losing their natural habitat and adapting themselves to the man-altered situation. Crop-raiding by locally In India, problems associated with locally overabundant wildlife species have emerged as important management issues for reason

but each of them has their advantages and limitations. Possible management strategies to reduce crop damage are suggested.

Keywords: boselaphus tragocamelus, agricultural crops, damage, road mishaps, mitigation strategies

Introduction

an experimental scale, there are reasons why they achieve measures have been developed and shown to be effective on need continued maintenance [14, 20]. Although a number of sophisticated means such as electric fences are expensive and measures such as traps can kill or injure animals. Highly forests causing substantial damage to the forest. Destructive using wooden poles and thorny branches lopped from nearby costs [14] and risks [11. 15-19]. The traditional fences are made However, these measures often come with high associated various types of fences, trenches and other devices [5-13]. range of protective measures. They include manual guarding, produce [1-4]. In order to avoid economic loss, farmers apply a problem for farmers whose livelihoods depend on agricultural crop raiding by wild herbivores, which can be a serious Agricultural lands close to protected areas (PAs) often face

increase, which is adversely affecting the conservation ideals. sacred animal, conflict between nilgai and farmers is on the parts of the country. Although people considered nilgai as a (Boselaphus tragocamelus) has been widely reported in many raiding by locally overabundant populations of nilgai and adapting themselves to the man-altered situation. Cropissues for reason of some species losing their natural habitat wildlife species have emerged as important management In India, problems associated with locally overabundant limited success when employed on a wider spatial scale.

and crop depredation patterns in the affected areas. the occurrence and abundance of nilgal, and on their habitat conducted in different states, and information was collected on interest. During 2006-2010, extensive survey work was mitigate this problem, which is also in the larger conservation take the initiative to actively control the wildlife damage to become important that administrators and wildlife managers outright hostile attitudes toward the animals. It has now intolerant to damage to their crops. Some have developed the problem, poor farmers are now becoming increasingly have their crops raided by nilgai. Realizing the seriousness of societies existing on subsistence agriculture can ill afford to reported from almost all corners of India [25, 26, 27, 28], Rural areas. Agricultural crop damage by nilgai has been widely Hindus, and has rapidly grown in numbers outside protected 22, 23]. Nilgai, an antelope, is afforded holy and sacred rites by are competing for resource utilization with domestic stock [21, species have become serious pests of agricultural crops and man-altered habitats have thrived, and in many places such dislocates. Those that have been successful in adjusting to the land use practices, these species have become ecological locally overabundant. Due to disparate and often incompatible considerably, and a few of them have decidedly become populations of many wildlife species have increased (1972) and through associated management actions, the

In India, after the introduction of the Wildlife Protection Act

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Sambhar lake: Some physical - chemical features and composition of biological communities

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Abstract

presence of magnesium and calcium ions and a chloride content that influences the phytoplankton and zooplankton diversity in were also identified ciliates, rotifers and copepods mainly in the samples taken from Sambhar Lake. The results revealed the represented by several types of archaea and halophilic bacterial species and some species of cyanobacteria and diatoms. There sew viscosite also some relatively important concentrations of aluminum. The biological diversity was parameters as control factors. The chemical composition of all tested stations is marked by the abundant presence of chlorides the halophilic microorganisms (bacteria and archaea) and also phyto- and zooplankton species in relation with physical-chemical The present paper deals with biological studies of natural salt lakes located in the Rajasthan. There were investigated for first time

these saline environments.

Keywords: salt lakes, halophilic archaea, plankton communities, saline ecosystems

I. Introduction

environmental conditions such as high alkalinity, low oxygen ecosystems are often characterized by other extremes in saturation [15]. In addition to being hypersaline, these with salt concentrations exceeding three times seawater up to including a variety of terrestrial lakes and deep-sea basins Hypersaline ecosystems are widely distributed habitats

content, salinity and iron content, temperature and oxygen several physical-chemical parameters like the chloride typical examples of extreme environments, is determined by organisms [28], The biodiversity of saline habitats, Bacteria or Archaea, which represent the predominant Asteromonas, Synechococcus and a lot of prokaryotes either photosynthetic flagellates belonging to the genera Dunaliella, brine shrimp Artemia salina, brine fly Ephydra, harbour a rich endemic biological diversity represented by initially as low diversity areas, saline lakes appear to populate saline and hypersaline environments [16, 19]. Regarded archaea distributed in 40 valid published genera were found to this approach, more than 150 species of halophilic salt content of water body of such environments. Following extreme conditions, namely high ionic strength due to high capable to grow and develop in smeinegroorpim lavon Salt lakes attracted researchers in the last period as a spring of concentration and high UV itradiation [12.6.7.25]

nechanisms 127, 29, 181 that can control the diversity towards physiological solubility, pH value (10, 11, 291, These parameters act as factors

there could be found vertebrates, invertebrates, angiospenns, of salinity [29]. Thus, in the range of salinity bellow 50 g L.1 The species richness in salt lakes decreases with the increasing lakes and salt lakes. The salinity of salt lakes may be different. On the base of their taste, the lakes are divided in fresh water a salt lake in the absence of generally agreed classification. It is difficult to attribute a spectral characteristic of salinity for

compatible solutes" [s. 19. 21] prokaryotes developed two strategies, namely "salt-in" and ionic strength from hypersaline and saline environments. Dunaliella sp. and archaea [5]. In order to cope with high found, and over 220 g L⁻¹ the biodiversity is limited only to sulphate reducing bacteria and cyanobacteria cannot not be and archaea. At a salinity level between 170-220 g L.1, like Dunaliella sp., sulphate reducing bacteria, cyanobacteria over 120 g L^{-1} , saline waters harbour only some invertebrates generally able to survive. On the other hand, at a salt content ron sis simity of 50 g/l, the vertebrates and angiosperms are not macrophytes, phytoplankton and prokaryotes. Over the

organic molecules named compatible solutes in order to face based on the synthesis or accumulation in the cell of some residues to their surface [14, 9, 10, 11]. The second strategy is special adaptations i.e. the increasing of acidic amino-acid external environment. The enzymes and proteins present concentrations inside cells to equivalate the osmolarity with In the first strategy the salts are accumulated in high

'SIGIDE! in relation with physical-chemical parameters as control bacteria and archaea, phytoplankton and zooplankton species the first time the presence of halophilic microorganisms both natural genesis located in the sambhar, being investigated for The present paper presents the biological studies of lakes with external osmolarity [19]

2. Materials and Methods

axis towards east-northeast to west-southwest. The lake basin of glacial saline is somewhat elliptical in shape having its long prosaically named Salt Lake City - Sambhar. This vast body 25. N - 51. OS. N and 140 St. E - 120 It. E just oniside relatively obscure habitat some 60 Km west of laipur at 26° a ni J2MA m 036 to sharing an an alterude of 360 m AMSL in a Road Area

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Synthetic and phytocompounds based dipeptidyl peptidase-IV (DPP-IV) • inhibitors for therapeutics of diabetes

Anand-Krishna Singh, Rameshwar Jatwa, Ashok Purohit & Heera Ram 🔜 Pages 1036-1045 | Received 23 Jun 2016, Accepted 13 Mar 2017, Published online: 29 Mar 2017

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Volume 6, Issue 2, 924-938

TECOMELLA UNDULATA LEAVES EXTRACT IN DIABETIC RATS INSULIN MIMETIC AND PANCREAS-PROTECTIVE EFFECT OF

masr Lal, Ashok Purohit and Heera Ram

Department of Zoology, Jai Narain Vyas University, Jodhpur (Rajasthan) -342001.

ABSTRACT

The Great Indian Thar Desert having peculiar kind of flora which are using by local people in amelioration of various ailments and health prospective based on conventional wisdom. This study was assigned to evaluate Insulin mimetic and pancreas-protective efficacy of *Tecomella undulata* leaves extract in diabetic rats. The assigned objectives were evaluated by four experimental groups including treatments of 250mg/kg and 500mg/kg body weight for 28days. The adult albino rats were used for diabetic animal model having weight of 150 to 250mg/kg and 500mg/kg body weight for 28days. The adult albino rats were used for diabetic animal model having weight of 150 to 250mg/kg and 500mg/kg body weight for 28days. The

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by a single intraperitoneal injection of 60 mg/kg streptozotocin (STZ). The dose of leave extract of *Ticomella undulata was* administered orally at 250mg/kg and 500 mg/kg body weight of animal model for 28 days. The treatments of leaves extracts were significantly reduced sugar levels in gradual manners by different degrees at 7days, 14 days. 21days and 28 days. Supportive reductions were also shown through treatments in lipid profiles (Total cholesterol. LDL-cholesterol, VLDL – cholesterol and triglyceride). Correspondingly, body and organs weights were significantly altered after completion of experiment. Subsequently, histopathology of pancreas was shown improvements in histo-collestences of diabetic animal models. The pancreastic islet cells were shown normalcy in architectures of diabetic animal models. The pancreastic islet cells were shown normalcy in cellular status by treatments of leave extracts of *Ticomella undulata* as well as nuclear shape and morphology. Whereas, toxicity profile i.e. tenal and hepatic function parameters were remained under and around normal ranges. Therefore, it is concluded that leave extract of *Ticomella undulata as well as* nuclear shape tremained under and around normal ranges. Therefore, it is concluded that leave extract of *Ticomella undulata matulata* possessing potential phytocompounds having insulin minic and *Ticomella undulata* possessing potential phytocompounds having insulin minic and termatical under the around normal ranges. Therefore, it is concluded that leave extract of *Ticomella undulata* possessing potential phytocompounds having insulin minic and termatical under the anadian and neural phytocompounds and an another and and normal concluded that leave extract of the matine under and around normal ranges. Therefore, it is concluded that leave extract of *Ticomella undulata* possessing potential phytocompounds having insulin minic and termatica under and around normal ranges.

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Trees in the Thar Desert of Rajasthan, India Ecological Observations of Avian Fauna on Different

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various birds are discussed and are and presented in tables. ecological observations related to food, feeding and resting behavior of elso provides shelter to birds from predator attack. In present work, biosint sesonary for food and subsidiary for nesting purposes. This bird i.e., spotted owlet (Althene brana). Similarly, Zyzipus numularia birds. Interestingly its holes of old tree trunk provide nesting to noclurnal to seized as night abode. Salvadora percica support four species of decedua is found to support about five species of birds. This shrub provides for night rest as well as for short rest during the day by birds. Capacis varieties of birds on the tree and in the understory of it. Those trees are used e hoqque bne elevent inet de Khejari has major important role and support a biocological activities of many birds for their survival in this region. The Entropy of the vital role for biodiversity and supporting and supporting (Prosopis cineraria), Ker (Caparis decidua), Jal (Salvadora persica) and Bordi ineland and the domestic requirement of birds. Among these, the Khelan osis bins osu nemul tol touboite of solieites of venue nee and also The vegetation of the That Desert has great economic importance and

Key words: Birds, Thar Desert, Biodiversity, Predator.

1. INTRODUCTION

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lios no seent (epidera alcout (Acasia arabica) trees on soil Khejari (Prosopis cineraria) in the Indian desert and its role in agro forestry. Singh & Lai and feeding of reptiles of the Thar Deser. Ahuja [10] reported on grass production under boot no betroop [9] rekard bine [8] institant & Vazirant [8] and Prakash [9] reported on food ensluges in not Rejection faune. Bames [7] work our on the nesting behaviour in Rejputane highlighting the fauna of the Great Indian Desert. Rama Rao [5] and Ghosh [6] dealt with Roonwal [4] reported on zoogeography, ecology, biology, physiology and conservation the then the Jodhpur state. This was followed by more systematic survey by Peccek [3]. Desert. Whistler [2] undertook comprehensive omithological survey of the desert zone the first maminologist who carried out mammal survey of the Kutch and That sew [1] notroughter a fairly good treatise on deset texa and biodiversity. Wroughton [1] was mammologist, taxonomist, ornithologist, herpetologist and entomologist to work together That Desert is fortunate to have attracted the attention of a great deal of naturalist, not have the symbiotic relationship but have the mutualistic relationship with them. The yem lie asant .matayaosa ni elos important role in ecosystem. These all may birds are closely associated with different plant species or on same in the Thar desert of The biological activities of almost all the birds species either lower to higher group of

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VOL-VIII, NO 1.62, JANUARY-JULA, 2017 1960 SR NO 2535, II 155N 2231 6396 1960 SR NO 2535, II NO 47226 e-mol letmepublichenger 2000 Web markeublichenger 2000

HISTOENZYMOLOGICAL OBSERVATIONS ON ACID PHOSPHATASE ACTIVITY IN THE OESOPHAGUS OF HGCL2-TREATED FISH, LABEO ROHITA

Dhirender

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LOVALSHV

Present structes incorporate gullet-tokic effects of HgCI, on the relative distribution of acid phosphatase activity in the occuphague of fish. *Labea relation*. It was of served that there appears to be slightly decreased *Labea relation*. It was of served that there appears to be slightly decreased *Labea relation*. It was of served that there appears to be slightly decreased *Labea relation*. It was of served that there appears to be slightly decreased by histolytic changes in the columnar eptidelal certs fromg of miceoan villt and glands of the occupangues of treated inclusion fish. However, in control, these changes were invisible inclusions fish. However, in control, these changes were invisible

Wey words- Lubuo milita ACP, HGR, Yo

NOLLONGOBLNI

Occophagus of J abso volutas is a short narrow tube -life structure. Its numerous lining forms seven prominent longitudinal folds and several smaller folds in between them. Mercuric chloride (HgCl₃) a known potent Cirthosis agent that is commonly ibund as traces in the polluted water and industrial tound as traces in the polluted water and industrial ibund as traces in the polluted water and industrial wates is known to cause various histo-physiological varies is known to cause various histo-physiological varies is known to cause various histo-physiological tidneys, livers and digestive tracts of fishes blowever, Histochemistry of occophagus of bony Histoc and effects of heavy meaks and toxins on drem how received insufficient attention during the past have received insufficient attention during the past have received insufficient attention during the past heave received insufficient attention during the past have received insufficient attention during the past heave the states of the study of a basic have received insufficient attention during the past decades attended in study attended attended attended attended heave attended in study attended attended attended attended heave attended attended attended attended heave attended attended attended attended attended heave attended attended attended attended attended heave attended attended attended attended heave

Many workers matably Sastry (1975), Chalermonty and Sinha (1952), He Ji (1953), Arellano and Storch and Sinha (1952), He Ji (1953), Arellano and Storch (2001), Song et al (2012) and Magall et al (2013) have studied the qualitative distribution of ACP bave studied the qualitative distribution of ACP (2001), Song et al (2012) teported various and Cupta (1978a), Sastry and Gupta (1978b), Sastry and Cupta (1978a), Sastry and Gupta (1978b), Sastry and Cupta (1978a), Sastry and Cupta (1978b), Sastry and Cupta (1978a), Sastry and Cupta (1978b), Sastry and Cupta (1978b), Merna et al (2013) teported various and Cupta (1978b), Merna et al (2013) teported various and Cupta (1978b), Merna et al (2013) teported various and Cupta (1978b), Merna et al (2013) teported various and Cupta (1978b), Sastry and Gupta (1986), Gulf et al (1990) and Seynab et al (2013) teported various effects ell'heavy inetals such as Cd, Pb, Hg, Ci and effect

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Biocheme Cell. Arch. Vol. 17, No. 2, pp. 523-525, 2017

THE STOMACH OF HGCI₂ - TREATED CARNIVOROUS FISH, CHANNA HISTOENZYMOLOGICAL DEMONSTRATION OF ACID PHOSPHATASE IN

Dhirender

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ABSTRACT : Present studies incorporate gastro-toxic effects of HgCl, on the relative distribution of acid phosphatase (ACP) activity in the stomach of carnivorous fish. Channa striatus. It was observed that there appears to be highly increased ACP activity accompanied by histolytic changes in the columnar epithelial cells lining of villi and gastric glands of the stomach of HgCl, treated fish. However, in control, these changes were invisible.

Key words : ACP, HGCL, Channa striams.

mercuric chloride was injected into the thorax cavity of the fish. After 10 hours the fish was dissected out and the small pieces of stomach were fixed in 10% neutral chilled formalin for 24 hours at 4æ%c. Frozen sections of the stomach were cut 5-10 micron with the help of freezing microtome and were processed for the demonstration of acid phosphatase activity using Gomori's method (1952).

RESULTS AND DISCUSSION

Sastry (1975), Arellano et al (2001) and Kozaric et al have been stated by many workers notably Goel (1975), phosphatase in different parts of the stomach of fishes (Figs. 1a, 2a and 3a). The fuctional signification of acid muscular layers displayed scattered lysosomal activity lumen of the stomach(gastric), villi, submucosa and lysosomal granules along their inner borders. Whereas, ACP activity as represented by less concentration of mild deposition was found. Goblet glands exhibited mild epithelial cells of mucosal gastric villi where comparitively granules were less concentrated in the brush border the other hand, in control experiment, ACP rich lysosomal numbers of lysosomsal granules (Figs. 1, 2 and 3). On strong ACP activity as indicated by distribution of large musculais mucusa. Lumen of the gastric villi showed activity was also noticeable in the submueusa and extrusion of the contents. Besides, scattered lysosomal mucosal villi seemed to erode followed by cytoplasmic induced toxicity resulted in the surface epithelial layer of increased as compared to control. In the stomach, $HgCl_2$ -HgCl, treated C. striatus exibited relatively highly It was observed that ACP activity in the stomach of

INTRODUCTION

Many workers notably Goel (1975), Sastry (1975), Chakravorry and Sinha (1982), Arellano et al (2001) and Kozaric et al (2004) have studied the qualitative localization of acid phosphatase activity in the gastrointestine of fishes. Sastry and Gupta (1978), Sastry and Gupta (1979), Verma et al (1980), Pugazhyendan (2009) and Sunita et al (2015) reported various effects of toxins. heavy metals and drugs on the distribution of non- specific phosphatases in the gastro- intestine of fishes.

Mercuric chloride (HgCl₂) a known potent cirrhosis agent that is commonly found as traces in the polluted water and industrial wastes is known to cause various insto- physiological effects on various vital organs especially gills, liver, kidney and alimentary canal of fishes. Heavy metals are common pollutants of aquatic environment. These metals are slow poisoning and slow prolonged period. Mercuric is one of the heavy metals found in nature. Some amount of mercury present in water found in nature. Some amount of mercury present in water and food chain and can produce structural and functional disturbances.

MATERIALS AND METHODS

The living carnivorous fish, Channa striatus (weighing 180 gm approx.) were collected from Balsamand lake, Jodhpur. They were kept in aquatium for about 24 hours before subjecting them to experimental treatment. For determining the effects of HgCl₂ on the distribution of acid phosphatase in the stomach of *Channa striatus*, 1 ml of 0.0001% approx. solution of

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EXLISIVEL IN HADEBCHOFEZLEBOFEWIC BVBBILZ FILID FOMERIZG VAD VALIOXIDVAL EFFECT OF WHEAT WHOLEGRAIN

Rashi Chadha* and Ashok Purohit

Department of Zoology, Jai Narain Vyas University, Jodhpur, Rajasthan, India.

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VBSTRACT

Objective: The present study was designed to examine the hypocholesterolemic and antioxidant activity of

atheroselerosis. It has a potent antioxidant activity which may be responsible for its hypolipidemic effect. These outcomes recommend that wholegrain extract reduces elevated cholesterol levels thereby controlling deposition and regressed athereselerotic lesions as compared to the hypercholesterolemic group. Conclusion: of wheat wholegrain. Histopathology of aorta exhibited significant increase in lumen size by reduced cholesterol reduced significantly whereas CAT and SOD activity were elevated after the treatment with 70% ethanolic extract activity in the cholesterol fed tabbits. The serum lipid profile parameters and level of lipid peroxidation was changes in the antioxidant parameters were observed as an increase in serum LPO and reduction in CAT and SOD cholesterol, low density lipoprotein-cholesterol and triglycerides, when compared with the control group. The aoria was carried out. Results: Cholesterol feeding caused a significant increase (P ≤ 0.001) in serum total like Catalase (CAT) and Superoxide dismutase (SOD) were estimated and histopathological study of thoracie groups for 60 days experimentation. The serum lipid profile, Lipid peroxidation (LPO), antioxidant parameters animals were divided into control, hypercholesterolemic, wheat wholegrain extract- regular and parallel treatment wholegrain was administered to induced hypercholesterolemic rabbits at a dose of 500 mg/kg.b.wt/day. The Triticum aestirum (Wheat) wholegrain extract in cholesterol fed rabbits. Methods: Ethanolic extract of wheat

peroxidation.

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acids, carotenoids,

KEYWORDS: Wheat wholegrain, atherosclerosis, antioxidant, hypercholesterolemia,

NOLLODUCTION

to contribute significantly to the pathogenesis of atherosclerotic cardiovascular disease.[3] systemic manifestations.^[2] Lipoprotein oxidation appears immune systems of the body, with various local and disorder which involves the vascular, metabolic and multisystemic, diffuse, and chronic inflammatory diseases.^[1] Atherosclerosis is recognized as a atherosclerosis and its associated coronary heart on the lipid metabolism and predisposition of the heart to (LDL-C) and triglycerides (TG) give useful information cholesterol (HDL-C), low-density lipoprotein cholesterol serum total cholesterol, high-density lipoprotein Alterations in the concentration of major lipids like

amelioration of disease. Whole wheat provides a rich a beneficial effect on health and play active role in the Phytochemicals are compounds found in plants that have when consumed as a major component of diet.[4] substantially towards proteins, vitamins and minerals embryo. Wheat and wheat products contribute the pericarp, the seed coat, the endosperm and germ or consumed cereal grain. Whole wheat grain consists of Wheat (Triticum aestivum), is the world's most

therapeutic purposes. The present investigation was increasingly using herbal alternatives for preventive and medications to treat hyperlipidemia, patients are correlated.^[9] Owing to the side effects of synthetic extracts and their phenolic acid contents is highly activities.181 The total antioxidant activity of wheat grain significantly increase Superoxide dismutase and Catalase are plant derived antioxidants which are known to it is well documented that flavonoids and polyphenols

defence mechanism against the process of lipid

brings about enormous modifications in the antioxidant

consumption by replacing refined grains. High fat diet

digestive health.[6] It is recommended by various dictary

cancer, and plays a role in body weight management and

diseases such as cardiovascular diseases, diabetes and

consumption substantially lowers the risk of chronic

Epidemiological evidences indicate that whole-grain

source of bioactive phytochemicals namely phenolic

tocopherols,

phytosterols,

worldwide

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increase wholegrain

pue

alkylresorcinols, and lignans.^[2]

carried out to evaluate the hypocholesterolemic,

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DOSES OF ESTRADIOL IN MALE RATS AFTER ADMINISTRATION OF DIFFERENT ON BIOCHEMICAL PARAMETERS EFFECT

Jodhpur, Rajasthan Aishwarya College of Education, Department of Zoology, Assistant Professor Professor? Professor Vyas A*I, Purohit A2, ,Kalla N.R.3

sialistic capsule though had some effect on these parameters but were not significant to have an effect on the overall metabolism controls. Serum as well as tissues such as liver, reproductive organs and accessory organs was used. The results show that lem implanted in the animals. A comparison of biochemical parameters of proteins, cholesterol and sialic acid was done with the overall activity of the animal. In order to find out this, different doses of estradiol in sialistic capsules viz lem. 2cm 4 cm were exogenous supply of gonadotropin. The present study has been designed to determine the dose specific effects of estradiol on the maintain the spermatogenesis, the estradiol is delivered through stalistic capsules in hypophysectomised animals maintained on Abstract. In the animal models prepared by us in whom the animals are hypophysectomised and treated with gonadotropin to

Index Terms: Spermatogenesis, Estrogen, Sialistic Capsule.

FINTRODUCTION

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spermatogenesis, the estradiol is delivered through sialistic capsules in hypophysectomised animals maintained on exogenous the animal models prepared by us in which the animals are hypophysectomised and treated with gonadotropin to maintain the acid was done with the controls. Serum as well as tissues such as liver, reproductive organs and accessory organs were used. In Icm.2cm.4 cm were implanted in the intact animals. A comparison of biochemical parameters of proteins, cholesterol and sialic estradiol on the overall activity of the animal. In order to find out this, different doses of estradiol in sialistic capsules viz spermatogenesis¹⁹ and testosterone production⁸The present study has been designed to determine the dose specific effects of unbitory agent by suppressing the gonadouopin production when given in excess.¹⁷ It, is widely known that estradiol inhibits reproductive functions to a severe extent. ¹⁸Estrogen hormone serves to play a dual role by acting as survival factor as well The role played by estrogens in the spermatogenic regulation yet remains unclear, but it has been depicted to suppress the male

MATERIAL AND METHODS

sialistic capsules filled with estrogen were implanted subcutaneously in the abdominal skin. from hypophysectomised animals. Hypophysectomised animals were treated with 4001UhCG and IIUFSH. In these animals them to 12 his light and 12 his darkness and were given food pellets at lib. In another experiment, testicular tissue was obtained and were maintained at the animal house, Zoology department, JAVU. Animals were kept in a well ventilated room, exposing Male rats in the body weight range of 200-250 gm were procured from the Central Animal House, Rajasthan University, Jaipur

EXPERIMENT DESIGN TU

3.1 The animals were divided into two groups. Each group consisted of 5 animals.

whereas the experimental animals were implanted with 1cm,2 cm,& 4 cm long sialistic capsules filled with estradiol. The Group 1 : This group consisted of 5 animals. Intact, male rats in the body weight range of 200-250 gm were treated as controls,

then implanted with 1 cm sialistic capsule filled with estrogen. The controls received empty capsules. GroupII: Animals in this group were hypophysectomised and were maintained on 400 IU hCG and IU FSH. These animals were

Chemicals for in situ labeling and vital staining were purchased from Organon and Oncor. CHEMICALS: Estradiol were purchased from Sigma and Pharmacia respectively. Solvents of reagent grades were used

3.3SERUM BIOCHEMISTRY: Serum protein, cholesterol was estimated by routine methods 3.2SIALISTIC CAPSULES: They were prepared by methods described earlier and implanted. 20

Assessment of Success Criteria Index of Restored Drastically Disturb Terrestrial Ecosystem at (Study Site 1) Sanu Mines, Jaisalmer

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albal 110 24£ ruddbol, stitworidy ang V ana Marain Marain Vyus University, Jodhpur 342 011, India a Department of G

^b Department of Zoology, Faculty of Science, Jai Narain Vyas University, Jodhpur 342 011, India

Copp. of Zoology, Faculty of Science, Jai Narain Vyas University, Jodhpur 342011, Rajasthan, India

Abstract

The study was conducted on restored backfill areas of RSMML (Rajasthan state mines and minerals Lid) Lignite Mining Department at Sanu, located laisalmer district, Rajasthan state; Solis stmples were collected from revegetated backfilled of Sanu mines. Analysing the parameters of rescues from restored both, soil faund areas and blending different residues for optimization of quantifiable attributes. These area significantly characterlared by basically parameters like the physical and chemical qualities of the restored soil, succession rule of visible floral and alweally parameters like the physical analysis of backfilled soil are done. Soil tetrility was increased by the plantation and due to soil microbial activity. Organic analysis of backfilled soil are done. Soil tetrility was increased by the plantation and due to soil microbial activity. Organic carbon increased greatly. Both old plantation and recent faunal diversity is growing after rehapilitation on backfilled areas. The indication of success. Some micro-micro fauna like and, beeth, fort, onk, cowa, builded areas, are indication of success. Some micro-macto fauna like and, beeth, fort, one, not bue buil were present. After enhon increased greatly. Both old plantation and recent faunal diversity is growing after rehapilitation on backfilled areas, are indication for success. Some micro-macto fauna like and, beeth, fort, owa, publication on backfilled areas, are indication of success. Some micro-macto fauna like and, beether, deer, dever, dever, build areas, blick are success. Some micro-macto fauna like and, beether, ever, ever, build areas, blick are constrated by and success. Some micro-macto fauna like and states were constrated areas are indication of success. Some micro-macto fauna like and scient areas and due to soil microbial activity. Organic are constrated greatly. Both old plantation and recent faunal diversity is growing after rehapilitation on backfilled areas are indication of success. Some micro-macto fauna like and scient areas and a suc

Keywords: restored, parameters, attributes, backfull, rehabilitation.

INTRODUCTION:

RSMML (Rajastham State Mines and Minerals Limited) in Suru, is falling under the part of Great That desert & located in Jaisahmer district, western 5 ar of Rajastham. It is one of the important and advanced functorias of the Government of Rajasthan Sanu mines are tasked with the large and sustainable cupply of raw materials (Lignite). Fewer valuable minerals have to be leaved back in the mine and the mine outcome is increasing. In Sanu, mining process is totally dry, no liquid waste of sewage will be generated hence no adverse impact on surface water is expected. The low-grade fine is concurrently backfilled in the mined-out pit and levelled. This backfilled area will be generated hence no adverse impact on surface water is expected. The low-grade fine is concurrently backfilled in the mined-out pit and levelled. This backfilled area will be process is total in adverse impact on surface water is expected. The low-grade fine is concurrently backfilled in the mined-out pit and levelled. This backfilled area will be backfilled in the mined-out pit and levelled. This backfilled area will be backfilled in the mined-out pit and levelled. This backfilled area will be backfilled in the mined-out pit and levelled. This backfilled area will back plants.

Opencast mining destroys natural soil strata and productivity of soil, fuuna and flora, contaminated soil, and air in surrounding area (Safaya 1979, Dhar and Thakur 1995). Mining activities increases the waste dumps. These waste dumps and disturbance in soil strata pose adverse condition for soil, microbial activity and plant growth due to their low nutrient condition in soil, low water level, contamination in soil, low organic matter. One method to find out open cast mining, the backfilled material is meant to restore both, the top soil surface and excavated soil of mining operations. The application of backfill in order to change the outline of the mine is vital for vitable success. In result operations. The application of backfill in order to change the outline of the mine is vital for vitable success. In result operations. The application of backfill in order to change the cutline of the mine is vital for vitable success. In result operations. The application of backfill in order to change the extavated areas with plantation and seedling methods. Most of the mines restore the land through plantation and seedlings on backfilled.

Thus, it is possible to assess the success of the productivity and regain the soil fauna of a mine by process of backfill and plantation. Setting the criteria for the selection of the best possible methods and materials for future improvement, it is useful to know about their qualities and improvements to evaluate succession rate.

Restoration endpoints:

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The restoration endpoints described in terms of community structure of plants and animals as well as secondary growth factors; soil properties (chemical, biological, physical) and soil-plant regulation processes (National Research Council, 1992). This type of restoration is rate in desert mining areas. In Sanu mines, earlier restored area has led to practice of having reference restoration provide the basis for both developing revegetation on backfilled areas methodology and evaluating the progress of success criteria (Society for Ecological Restoration, 2004). In

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भारत और विदेशों में कोविड—19 के बाद समाज का भविष्य डॉ. धीरेन्द्र चौधरी सहायक आवारं, प्राणीशास्त्र, <u>जयनारायण व्यास विश्वविद्यालय, च</u>ौधपुर

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। की गाय कि मि मि मि मि ह- म् 55 ायमसाम एक मग्रधाव तिर्शित विप्राती है एग हि फिल्म काम प्रही के स्केड कान व द्युं और दिरू कतीरि वकि के रागित बर एक रिंभर के उकांग्र छड़ से किंग की ई गाशा है मिंह स्वस्थ हो में होने में किंग की से किंग की के मिंह हार वायरस के बाद रामिक कि मिरुकी कि मिलि झा के सप्रधाय सड़ा है हरेक कि मंद्रि कलगाम कि गिर्माल वम मुझ प्रती कारड़ा है ईर आज गम्छई वर्ग के विषय संक्रमण में मुख्य की में के बाद वायस पूर्व कि विषय के स्वरंध वनाए रखने की एस सख दिशा दिशा के घोषणा की। हम सभी कि चित्र भित्र कारीमाम के मल कनील्येम न प्रकार क्रका हि Ibir प्रकार में रवयं के मुंह, आंख या नाक के हाथ लगाता है तो ये वायरस श्लेज जिल्ली त्तरीफ उकुछ कि उत्तम तिनिकाम के माध्यान के ट्रिंड नमवड यसम के माध्या ाउँ मिग्रिड यमम के लग्ने के त्रवीय तमीकांम गण्डम कि मेड एक प्र्युप्त ाई गाम गाम कि में मर्ज के SARS-COVI-2 के भी माम महा कि मिन्न के (क OHW & File & She क norflith & north File 6 के में प्रवाद माउट्ट के नकि कि eros रबरेडी 18 1 कि शिमाइम कि मान हुन INIH मे वीरेवक स्तर पर सामुहिक प्रधास की आवश्यकता है। पहले विश्व में, 2009 रात्री के नेकांर्ड में निंड ग्रियाग्रय मार कि मययाय । ई ययकी त्रवीति शिमाझम कार्या का सामकि e1-इठीति लिगि मेलके में मग्रमा मार्गक में OHW । ई शिम्पिक कमाक्षेम्र लिग्न र्माड गण्डाक के मुरुप्राघ त्मिर्शिक ९१-ड्योंकि

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NILBATE RESHWATER TELEOST, CHANNA PUNCTATUS IN RESPONSE TO LEAD JUXTAGLOMERULAR CELLS AND GLOMERULUS OF THE KIDNEY OF SOME OBSERVATIONS ON THE ACID PHOSPHATASE ACTIVITY IN THE

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ABSTRACT : The present studies incorporate nephrotoxic effects of lead mitrate on the distribution of acid phosphatase (ACP) activity in the juxtaglomerular cells (JCC) and glomerulus (GL) of the kidney of a fish, *Channa punctatus* (Bloch). Exposure of lead mitrate to fish showed decreased ACP activity in juxtaglomerular cells and glomerular cells and glomerular cells and mitrate to fish showed decreased ACP activity in juxtaglomerular cells and glomerular cells and glomerular to the distribution of activity in juxtaglomerular cells and glomerular cells and glomerular to the distribution of activity in juxtaglomerular cells and glomerular to the distribution of a comparison to control.

Key words : Chunna punctatus, lead nitrate, acid phosphatase (ACP).

In an another study on *Channa punctatus*, it was observed that exposing the fishes to the sub-lethal dose of the lead nitrate the toxicant affects on higher level at kidney and at lower level to the liver (Manikandan et ul. 2016). The activity of acid phosphatase was decreased in the kidney in the fishes like *Cirrhinus nutgala* and *Oreochromis mossambicus* due to the heavy metal eefl membranes due to the damages occurred in the eefl membranes due to the search metals (Sepperumal and Saminathan, 2014 and Vasanthraja et al. 2014). A significant alteration had been found in the haematological parameters of fish *Channa punctatus*. The lead nitrate privaneters of fish *Channa punctatus*. The lead nitrate it is also time dependent (Dunta et al. 2015).

concentration dose and this is due the disruption of ine ni siusoqxa afle nagooylg yanbis ni assaran the effect of lead nitrate on kidney that there is slight Wysius et al. 2007). A study on Mysius cavasius shows tissues results in bioaccumulation through the food chain on one beneating the residues deposited into the accumulates majorly into the liver and then in kidney. It Channa punctatus to the butachlor it is observed that it damage or arrested hone growth. After exposing the fish the gill, muscle and liver and this may be due to the liver of acid phosphatase and other enzymes got increased in observed that after the exposure of lead nitrate the level et al, 2011). According to the Mary et al (2014), it is Hypertrophy, degeneration of lamellar epithelium (Khan osil esgundo lasigolodinqoisid odi ewode sinitia A study on Charias batrachus treated with lead

INTRODUCTION

The present scenario of aquatic ecosystem is very well known by everyone. The water is contaminated by well known by everyone. The water is contaminated by "arious effluents released by the industries and due to a strong effluents released by the synthesis of enzymes accumulated into the body of fish and creates metabolic changes and also affects the synthesis of enzymes on fish Carla also affects the synthesis of enzymes on fish Carla carla and it is concluded that increasing concentration with decrease the exposure time of lead nitrate increases the toxicity. Findings also indicate that intrate increases the toxicity. Findings also indicate that the mortality of fishes was dose and time dependent and the accumulation and magnification lead to death and the accumulation and magnification lead to death (Mohanambal and Puvaneswari, 2013).

A study had been done on Labeo vohita in which it is clearly distinguishable that after the exposure of heavy metal the level of acid phosphatase got decreased in the kidney and this may be due to the covering of active stics of enzyme by the metal ions or may be the toxic effect produced by metals ions to the cell producing enzyme (Mir et al. 2016). An increase in the level of acid phosphatase in the kidney and liver had been seen in the study carried out on Gambusia affinis and it is suggested that it may be due to the chlorpyrifos interrupt the chemical composition of cell in the fishes. Which damages the lysosomal membrane due to which all acid damages the lysosomal membrane due to which all acid increased the level of acid phosphatase (Khan and increased the level of acid phosphatase (Khan and Sharma, 2012; Sharma et al. 2016).

Sustainable rural development and biodiversity conservation through ecotourism in Thar region, India

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Department of Nuclogy, Faculty of Science, D R J Cost Cirls College, Balotra (India)

Department of Xoology, Faculty of Science, L.V. University, Judibur (India)

Abstract

Ecolourism is the most dynamic forms of tourism now-a-days because it offers a plenty of advantages to both tourists and host communities. Rural areas of Thar region are rich in ecological and rural diversity. For a long time in the survival, rural communities have their faith on the abundance of matural resources present in their area. But in recent years, there is a drastically change in the technology which may brought an interse revolution in the field of agriculture that is leading a better lifestyle for rural communities. That region barically comes under and region where ruralill is less. Rural communities are drastice for earn money for fiving besides agriculture. This process includes a set of particularities of nature followed from rourist action, specify in its complication and interacting with the environment and other divisions of the economy, the scale and variety of social affairs which they generate, on the and other divisions of the economy, the scale and variety of social affairs which they generate, on the erannistics to earn money for living besides naticulture. This process includes a set of particularities of nature followed from rourist action, specify in its complication and interacting with the environment eranning the features of autainable development, in common, on the other hund. The purpose is to one head, and the features of autainable development, in common, on the other hund. The pupose is to eranning the existing relationship herver the local ethnicities, and to with and the need for sustainable developments.

Keywords: Ecotomism, Rural Development, Communities, Conservation

Introduction

Ecotomism is an important economic activity in the That region of Rajasthan. Ecotomism has a great potential and it full fills several major objectives, such as sustainable mual development, economic growth, employment and cconomic and social unity. The strategic method is to create the surroundings and provide the basis for sustainable and high-quality ecolomism. (Vaishnay V. 2018)

and provide the basis for sustainable and high-quality ecotanism. (Weishnay V. 2018) Smallinghle ecotonism development meets the needs of toutists and host regions, defending and expanding the possibilities for the finure. Ecotourism can bring both advantages and disridvantages in the rural area. It can encourage the development of other economic activities such as firming, local production of food and crafts, and help increase revenue. Economism has a significant role in the economic growth of those areas or regions as touristic attractions. Economism has a significant role in the economic growth of those areas or regions as touristic attractions. Economism has a significant role in the economic growth of those areas or regions as touristic attractions. Economism have a fit of things in common. Both of them deals with the sustainable development of rural areas. Ecotourism are to of things in common. Both of them deals with the sustainable development of rural areas. For other areas of routism where the main molive of the touristis is to observe and appreciate the maters are local traditions related to the neutric and rural meet the following conditions: and local traditions following the neutrine and must noted the following conditions.

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- educational character, respect for nature an arcness of tourists and local communities;
 minimum negative impact on the natural environment and socio-entimat (catabushed definition).
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405 E65E4 10363/686E 01/610 109//.sdil4 6110-19E0 :7-NSSI Inflo-diciembre 2019, 75(2), 6109 Estudios Geológicos

Jodhpur, western Rajasthan, India Sandstone of the Marwar Supergroup, Sursagar area, Aspidella: the Ediacaran body fossil from the Jodhpur

de Sursagar, Jodhpur, Rajasthan occidental, India Arenisca de Jodhpur (Supergrupo de Marwar), área Aspidella: un fósil del cuerpo blando ediacárico de la

'nutteM .D.2 , smaN .J.2 , man .H . 'nathag .Q.V

הפשרד כל פאסיסקו. שנו אפרניה איפש טהואשניגן, גוסלאכטר -12006, Rajasthan, India. Email: geoparhai@gmail.com; האסר כיום המשרוטיסט מקונטט-נוטט-1503-1536 אימש מימינטנט-2000-0000 וומום. Email: geoparhai@gmail.com; העבר 1773 אימש יומסט מימינטט-נוטט-1563-1656

TOARTERA

איסטרולפרט, South Australia and White Sea of Russia ogical features previously described in other famous Ediacaran fossil sites, such as the Fermuse Formation of of the Marker Supergroup in Sursegar area, Jodhpur, western Rajasthan, India. They show distinct morphoanotabnes updhou ant most allacer a bay set and the Ediacara body loss is the Jodhpur Sandstone

Keywords: Aspidela: Jodnpur Sandstone: Ediacaan; Rajasthan; India.

NEWUSER

eizus de nonciela rel la Formación de Fermuse (Terranova), Australia meridional y el Mar Blanco de Rusia. השברבה נצובעהובינצג וונהלטיס נצג מוצמישה בנצי לפגרוצג בארשחופות או היו העובי או הארש או הארש ומצוופה ומצוופי ה 's Aranisca de Jodrour (Supergrupo de Marwar) el área de Sursagar, Jodhpur, al oeste de Rajasthan, India. Éstos Se cescripen en este trabajo los restos bien conservados de Aspidella, fósiles de cuerpo blando ediacáncos de

Psisbras clave: Aspidella; Arenisca de Jodhpur; Ediscânco; Rajastnan; India.

Introduction

Results

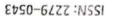
2004). It is up to 1000 m thick, unnetamorphosed western Rajasthan (Pareek, 1984; Chauhan et al., -flountains, and occupies a large area in the northillevertern side of the NE-SW trending Aravalli as Trans-Aravalli Vindhyans as it is occurring on The Marvar Supergroup was carlier described

group of the Markar Supergroup (MSG). The lockpur Sandstone is the basel and significant in Sursagat area. Jodinpur. western Rajasthan, India. the locations Sandstone of the Marwar Supergroup Aspidella remaine. the Edisceren body tossils from The present peper describes well-preserved

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THE DESIT CACA דיה עציאצ 5 בארדיטובי Surseger פרפג וככרבטר איבובות Rajastian, India. Estudios Geologicos 75(2). פ 109. https://doi.org/10.3989/ כיבטיהו כטהס כינו פגים מדנכטים: השרישי, עב. פו פו. (2019) אבקולפוום: עיפ בכופכצומה body fossil from the Jodhpur Sandstone of

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Research article

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Demography, Nesting and Breeding Success of Red Headed Vulture (Sarcogyps Calvus) In Thar Desert of Rajasthan, India

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ABSTRACT:

Great Indian Thar desert have favorites habitat for vultures. Red headed Vulture is a solitary vulture mainly feeding on the carcasses of a variety of animal. Repetitive surveys were taken in to accomplish the objective to know the population and breeding habits of the vulture species in Thar distinctive among vulture species. Present study suggests marked increase in population of red headed vulture in study area. During the present investigation, nests were seen mostly on the canopy of *Prosopis cineraria* (Khejri) trees. The breeding success is evaluated 75%, thus there is positive hope for increase in the population of this critically endangered species, although continuous conservation efforts are demanded.

KEYWORDS: Red headed Vulture, Thar Desert, Nesting.

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Study on physico – chemical properties and its impact on aquatic bodies in Sambhar Lake. Meenal, Gargee Bareth²

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Abstract

The present paper deals with the study of water quality of Sambhar Wetland (Ramsar site no. 464, and IBA site no. IN-RJ-1), Rajasthan. The study was carried out for water quality of samples collected from different sites in the lake periphery as well as in the catchment areas. Samples collected from different locations of Sambhar Lake for their physico chemical studies. The standard methods of APHA were used for analysing five samples. The analytical result shows that pH varies from 10.4 - 11, Chloride 312 mg/l - 646 mg/l, Sodium 225 mg/l - 125.4 mg/l, COD (Chemical Oxygen Demand) 42 mg/l - 509 mg/l. Magnesium 2.4 mg/l - 125.4 mg/l, COD (Chemical Oxygen Demand) 42 mg/l - 509 mg/l. Nitrate 23 mg/l is mg/l - 125.4 mg/l, COD (Chemical Oxygen Demand) 42 mg/l - 509 mg/l. Nitrate 23 mg/l is mg/l - 125.4 mg/l, COD (Chemical Oxygen Demand) 42 mg/l - 509 mg/l . Nitrate 23 mg/l is mg/l - 125.4 mg/l , TDS (notal dissolved solids) 1201 mg/l - 509 mg/l . Nitrate 23 mg/l is in TDS, Phosphate 7,1mg/l-16mg/l. The study revealed that the water quality is rich in TDS, Phosphate and Nitrate content which indicates that the Sambhar wethan is eutrophicated and the physico - chemical parameters act as control factors.

Key words: - Wetland, Sambhar lake, Water quality

Introduction

Wetlands are defined as 'lands transitional between terrestrial and aquatic ecosystems where the water table is usually at or near the surface or the land is covered by shallow water. Conservation of wetlands has gained momentum in recent years due to their significant role in ecological and hydrological processes. India with its large geographic spread, diverse climate and terrain harbours diverse types of wetlands. Inventory of wetlands at 1:50,000

lnteraction of Desert fox with wild animals and held and

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Abstract

away after watching the ment however when it was with its pups and chased by the people, at that time it felt Desert fox and cat both used the same habitat in same time but they didn't share the food. Desert fox ran their spines. We saw many times the peacock chased the Desert fox and protected their eggs and chicks. rodents. Desert fox easily killed the hare. The Porcupine protected itself from the Desert fox by the help of activities without fear near the Chinkara and Nilgai. The fox took more time in attacking position to find the immediately. Desert for didn't feel any type of threat from the Chinkara and Milgar. It continued daily among animals were frequently observed here. Desert fox felt fear from the dog so it ran away from the area comparison of the wild animals, so the population of the wild animals is healthy. Interactions ionnais and local people from February 2017 to February 2019. The area is surrounded by Vishnoi bliw this zot reserved to notice the side of Dores at Jodhpur in Rajasthan on Interaction of Deserved in John with wild Desert fox is carnivores which is adaptable to hot desertic climate. It is nocturnal and very animal. The

insecure and threat to pups so it became aggressive.

Keywords- Desert fox, Interaction, wild animals. Local people

Introduction

in India (Menon, 2003). The populations of Desert fox are decaling due to habitat destruction and sarcoptic Rajputana, Kutch, southern Iran and Iraq (Pocock, 1941). It is the smallest and lightest of all three red foxes .ibniqlewest and an under the state of red for which is found in Baluchistan. Rawalpindi, one or group of coyole chared fox causing the fox to run avay immediately from the area (Eric et al., 2019). can swim well (Nowak, 1999). During interaction between fox and coyote, the displacement occrued when can jump up to two meters high on tencing or other obstacle. It has good senses of hearing, sight, smell and bue n/ms 84 to beed of of qu test nut nee red for ear the red for and the speed of 48 km/hr and annunder agriculture agriculture in many hand in the many settlement in intensive agriculture Sillero-Zubiri and Laurenson, 2001). Red fox is an extremely shy species. It is adaptable and opportunistic share resources such as prey species or livestock which often results in conflict. (Thirgood et al., 2000; are dominant feature. In this landscape the man and carnivorous co-exist, but competition occurs when they nemud doitw ni oonestise for existence and in source requires multi use landscape for existence in which human bliw .estoyos .eladong lo the Canidae family which include foxes. wolves, jackals, coyotes, wild

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VILLAGE OF WESTERN RAJASTHAN **VERTEBRATES, AROUND KHEJARLA** ΟΝ ΒΙΛΕΒΖΙΙΑ ΥΝΒ ΔΟΔΠΓΥΙΙΟΝ ΟΕ THE MINING ACTIVITIES AND ITS IMPACT

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guinim to sensed that the exploited zone of mining site at Khejarla is a troubled site because of mining sidT. guistevib lanual religid bad enos benim-non out olidiw guass saw out guinim out near guistevib lanual having ten species at the study site. The examination of fauna in mined and non-mined sites showed that the families of mammals were recorded at the site. The observed reptile fauna comprises of eight families thirty-six species from twenty families of avian fauna were reported at the site. Fifteen species from ten outcomes uncovered that species most plentiful at the study area are the Aves. An aggregate number of surrounding territory. The index method was used to represent the quantity of individual species. The indirect strategies. Questionnaire were managed to get satisfactory data of the species found in the vertebrate fauna around the quarrying zone. The techniques utilized for fauna overview are both direct and no vitvitor guinim ant to tooffo on guivevrue to moo plaining off this of surveying the offocial vision activity on biodiversity and physiographic deformation in the disturbed areas. This investigation was carried out at habitat. Over the most recent couple of years, the mining rate has expanded a few times. Its result is loss of The mining is a dangerous anthropogenic action. It is harmfull for biodiversity and destroys its natural

exercises and transportation due to it biodiversity is decreasing around mined region.

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Dimensions and squashed stones are the last yield of such industry in which these items are utilized for utilizes and part of the nearby legacy where nonmetallic rocks excavated from land (Ukpong, 2012). bnel lo oqya e zi gniryneuQ virersiyn on biodiversity. Quarrying is a type of land biodiversity. The mining industry gives a good resource of income. In any case, regardless of these identify bus secures fundamentally includes deforestation, decimation of natural resources and of siflened facimonose set senture endures mature endures the economical benefits to

se yew smes and nl .(8002, .jnugodeM) nietsus yaht susceipt she species they sustain (Mabogunje, 2008). In the same way as by mining, boring, significantly influences the regular habitat (Fedra et al., 2005). Quarrying carries the soces guivil lemion while from the extraction of crude materials from their normal living spaces liable of vegetation damage and crop yield lost and therefore turn into a risk to the survival of plants in Anand. 2006). Air contamination by and large and particularly dust from quarry sites are known to be producing technologies have extraordinary results on financial matters, health, security and environment patchiness (Kareiva, 1987). Generally, both positive and antagonistic communal effects of modern gnibnaqxo to osusood gninim of oub annai to soimanyb ybsots asol a hommooor osla asiai. Studies also recourse of expanding considered to make a genuine harm to greenery and fauna by method for demolition of their normal species, including invertebrates, vertebrates, plants and even micro-organisms. Mining exercises are guivil to square of plants of plants (Sharma, 1997). Biodiversity basically alludes to the scope of living Onchecked populace expansion and human-centric causes deprive the living space and annihilation of ecosystems, isolation, soil erosion etc. (Odum, 1971, Gupta and Chauhan, 1994 and Gupta, 2012). Generally, mining troubles the biodiversity by way of deforestation, degradation of territory and aquatic various purposes for humans (Nartey et al., 2012).

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Park, Rajasthan, India Gazella bennetti) population in Desert National Changes in herd size and composition of Chinkara

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was done at Sudasari, Khuri and Kanoi study sites in Desert National Park. Interviews, questionnaires, direct ybuts and beed was influenced by seasons, availability of food materials and predators. The study the Monsoon season while smaller size herd was seen in the Kanoi and Ehuri study site during the summer and 19 solitary animals were observed. A largest size mixed herd was noted in the Sudasari study site during all 6 herd was comprised of all males of different age groups. During the study period, a total 160 herds Mixed herd were comprised of adult males, adult females, subadult males, sub-adult females and fawns while Chinkara populations are lives in group or herd. Two types of herds were observed in Chinkara population. distributed throughout the That region but healthy populations are seen in Bishnoi and Jat dominated areas. Chinkara (Guzella bennetti) is a gregarious and very shy animal. Indian Gazelle (Chinkara) are

chure and fine transcet methods were applied during the study.

Keywords:- Chinkara, Herd size, Season, Desert National park.

Introduction

population (Barrene, 1991). Environment factors, predation risk and reproductive strategies affect the herd 2010). The group size and group composition are the major element of social organization in the ungulate the southern side of bushes or in an open place in from of Sunlight while in summer under the bushes (Jaipal, herd were seen scattered during feeding and more scattered in the summer season. In winter they take rest at depends on the availability of food and it varied time to time and season to season. Members of chinkara virvitse guibsoft guitest no smit mumixem sheads it spends the sectivity activity activity activity brack stand of the provided and quality of food (Laipal, 2015). During winter Chinkara spend spike like horns and almost without rings (Prater, 1980). Chinkara is not only a grazer but also a browser and nint bue trajected forms and shape of home with rings while the formate has straight and thin dguordi zmeidqiomib feuzos zrididzo ollozed. Gazelle exhibite exhibite sexual dimorphisms through 🌒 and Morrison Scott, 1951; Prater, 1971; Robert, 1977). It is also distributed throughout the Thar Desert but neuronical transmission of the salt range of Pakistan and Indian sub-continent (Ellerman The Indian gazelle (Gazelle bennetti) are distributed in desert, plateau and hilly region up

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B, R, JAIPAL LBAGOCAMELUS) IN THE SEMI ARID REGION OF THE THAR DESERT

POPULATION STRUCTURE OF XILGAI (BOSELAPHUS

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sew elles were observed in monscon season and natality rate was tud tebeerd gnolneev si inglin off. Ilube due to movel in med (01.1.1) oilai xos ifube due of element ifube eline eline eline eline to sub termine (+2.1.1.) ousi yes element inde of elem flube elemente per stendivibri #2.0 sew este yburs ni noineluqoq ingin 10 yrisnot. Density of nilgai population in study and food sources. The largest herd size was observed in monsoon while rater of different factors such as human activities, availability of water were discarded by the dominant male of mixed herd. The herd size was squorg boxim to solem thus due of T. area your and in individual from 2 to 7 mon of males of different age groups. Mixed (bisexual) herd size generally varied besoquos and sub adult females while all male herds were composed comprised of adult dominant male, recessive males, adult females, calves, all male herds were observed in the nilgai population. Bisexual herds were the safe environment for survive. Two types herd such as bisexual herd and sobrong bins the threats and provided any provides the threats and provides ni savil inglin 10 noiteluqof. Population of lingui inves in ni iqebe inglin odl. shodiom muos tooth bne stoosnen oni adi gnisu yd yris tuqubol tean noigat bits imas ni bataubnoa zew (aulampogorit suiqulasod) regits to surround notaluqor to yburd notger and structure of all bebryth and if medizeles to statistic by every breater it has distributed. That Define the statistic stati

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Key words: Nilgai, Herd, Density, Sex ratio, Season

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pairments Implications for the Treatment of Diabetes-associated Neurological stituents of the Ethanolic Extract of Prosopis cineraria Pods: Theraper Dual Inhibition of DPP-4 and Cholinesterase Enzymes by the Phytoc

Heera Ram^{1,*}, Noopur Jaipal¹, Pramod Kumar¹, Purbajyoti Deka³, Shivani Kumar², Priya Kashyap², Suresh Kumar², Bhim Pratap Singh³, Abdulaziz A. Alqarawi⁴, Abeer Hashem^{2,6}, Baby Tabassum¹

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ceptibility of type 2 associated neurological impairments. Abstract: Background: Insulin resistance causes decreased uptake of glucose which promotes the sus-

FRAP and TEAC assays. was demonstrated through LCMS studies. The antioxidant studies on the extract were performed by lecular docking of Cinerin C with targeted enzymes. The phytochemical characterization of the extract say and cholinesterase assays using Ellman's reaction. The in-silico studies were conducted by the mo-(Homeostasis model assessment) and related parameters, in vitro studies through the DPP-4 enzyme as-AMOH yet and resent study consists of in vivo studies on a diabetes-induced rat model by HOMA cineraria (EPC) pods against DPP-4 and cholinesterase enzymes by in-vitro, in-vitro and in-silico as-Methods: The study was aimed to evaluate the inhibition potential of the ethanolic extract of Prosopis

(DPP4 and cholinesterase). silico analysis also revealed positive pharmacophores interactions of Cinerin C with targeted enzyme m of T notification as more as well as well as panetentic cell mass proliferation. The m TEAC assay. The in vivo study showed competent glycaemic control against significant HOMA IF in the real of T to Nomm 80.0 ± 0.40 and 0.40 ± 0.40 are equivalent in the real of T to Nomm $80.0 \pm 0.40 \pm 0.40$ 74.35% inhibition of BuChE. The antioxidant capacity of the extract was observed to be Results: The extract showed 64.8% maximum inhibition of DPP-4, 34.91% inhibition of AChE and

cations as it showed inhibition against DPP-4, AChE and BuChE target enzymes. nificantly considered in neuropharmacology to resolve insulin resistance-induced neurological compli Conclusion: It can be concluded that the phytoconstituents of Prosopis cineraria pod extract can be sig

linesterase (BuChE). Keywords: Prosopis cineraria, diabetes mellitus, Alzheimer's disease, DPP-4, acetylcholinesterase (AChE), but)

I. INTRODUCTION

levels and potential complications, such as neurodegeneramellitus (T2DM) which causes fluctuations in blood sugar resistance is considered as the main cause of type 2 diabetes heimer's disease (AD) is increasing worldwide [1]. Insulin The occurrence of diabetes mellitus (DM) and Alz-

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Previous studies demonstrated that there was a strot

tive factor for the neurodegeneration associated with

numerous reports have identified T2DM as a potentic brain may be one of the causes of neurodegenerat

recent study suggested that insulin desensitization

which makes effective treatment more challenging

can persist even after abnormal glucose levels are cor

commercially available medications, however, compl

levels in diabetic patients can be controlled throu tion and cognitive impairments [2]. The rise in bloo

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ARTICLE HISTORY

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internition contraction contra

Molecular Docking Studies Anti-Aggregation Property of Allicin by In Vitro and

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Pepertment of Zoology, Jai Narain Vyas University, Jodhpur, India. University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, India.

essesib s'temensiA Lys28. Allicin anti-amyloidogenic property suggests that this naturally occurring compound may have potential to ameliorate and prevent tavourable hydrophobic interaction with IIe32, Met35, Val36, and Val39, and oxygen of allicin forms hydrogen bond with the amino acid residue visual of fibril formation by transmission microscopy and molecular interaction of amyloid peptide with allicin by molecular docking. Ap forms that allicin strongly inhibited by 97% at 300µM, compared with control (Aβ only) (P<.001). These results were further validated by microscopy (TEM). The molecular interaction between allicin and AB peptide was also demonstrated by in silico studies. The results snow present study. Inhibition of librillogenesis was measured by a Thioflavin T (ThT) fluorescence assay and visualized by transmission electron ent in besetizevini sew ortivini betrading da ent yd nortemtot lindit tidint ot (... a sativum L.) to stradion by the AB peptide in vitro was investigated in the monomers results in formation of dimers, tetramers, fibrils, and prototionis. The ability of allicin, a lipid-soluble volatile organosultur biological system (CNS) are associated with memory neurological diseases by the peptide aggregation initiation of the peptide aggregation initiation of the peptide aggregation initiation of the peptide aggregation of the suovien latines ni noitemtot eupeig in stiusei noitegerge ebitdeq (8A) sted biolyms richte and ein si sisenegobiolyma :TOARTEBA

molecular docking KEYWORDS: Alzheimet's disease, allicin, amyloid p. fibrillogenesis, transmission electron microscope, Thioflavin T fluorescence assay.

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ent concentrations of allicin in 96-well micro titration black

added to each well with 20 µL of the AB with or without differ-

sew (0.6 Hq) roffind HOrN-onio(lg ni (M401) TrT to J408

incubated overnight at 37°C with constant rotation. After 24h,

north area (IA4005-2.75) notition and allocation to this gA for

solved in Milli-Q water at a concentration of 11 µ.M. A mixture

formed being proportional to the fluorescent signal. A h was dis-

produces a shift in emission spectrum, the amount of B sheet

esheet formation.⁵ ThT binds specifically to AB fibrils and this

fluorescence intensity remarkably increases with the degree of

ThT assay was used to quantify amyloid formation, in which the

from Sigma-Aldrich (India). All reagents were prepared in

nyl acetate, glycine, sodium hydroxide, ThT were purchased

from Abcam, India. Other chemicals such as cholesterol, ura-

Caymen chemical, India. Aß peptide (Aß1.42) was purchased

Allicin ((R, S)-diallyl disulfide-S-oxide) was purchased from

dated by transmission electron microscopy (TEM) and

amyloidogenic potential of allicin measured by ThT assay vali-

fibrillar assembly in vitro.4 Present study evaluated the anti-

tannic acid, catechin, and quercetin inhibit the formation of

Thioflavin T fluorescence assay

Milli-Q water (Millipore, India).

spussours used

Materials and Methods

molecular docking studies.

Introduction

used to analyse these fibrils.

spectrophotometric/fluorescence techniques that are often Thioflavin T (ThT) used in light microscopical staining and sheets which specifically bind to dyes such as Congo red and and fibrils. Amyloid fibrils contain characteristic crossed ß mers are more susceptible to self-aggregate and form oligomers Furthermore, AB fibrillogenesis is a process where AB monothe AB peptide exists as a dimer, trimer, or a tetramer. residues. It has been proposed that the smallest stable form of unfolded, unstructured ~4kD peptide, rich in hydrophobie with the development of AD.2.2 The AB monomer is an age of amyloid precursor protein (APP) directly correlated tion and clearance of AB peptides formed by proteolytic cleavbeta (AB) peptide. In brain, the disturbance between producof 1-40 and 1-42 amino acid sequences, termed the amyloid fundamental element of amyloid plaque revealed the presence pathological characteristics of Alzheimer's disease (AD).¹ The ous system (CNS) have been identified as one of the major The amyloid plaques deposited extracellularly in central nerv-

compounds such as polyphenols, curcumin, rosmarinic acid, cess. Previous studies have reported that some of the natural that efficiently and specifically inhibit the fibrillogenesis proassemblies. One possible strategy is the use of small molecules Currently, there is no approved drug to target AB fibrillar considered one of the main pathogenic factors related to AD. ing of AB plays a significant role in neurodegeneration and is The formation of well-ordered fibrillar aggregates consist-

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AMELIORATION IN INSULIN RESISTANCE AND \$-CELL FUNCTION BY DPP-4 INHIBITION POTENTIAL OF TRIGONELLA FOENUM SEED EXTRACT IN TYPE-2 DIABETIC RATS 2000 CELL FUNCTION BY DPP-4

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ABSTRACT

The current study was aimed to evaluate amelioration in insufin resistance, β-cell function and pancreas protection by DPP-4 inhibition potential of Trigonella foerum (TF) seed extract in corticosteroid induced type-2 diabetic rats by in sfilico, in vitro and in vivo assays. The corticosteroid induced diabetic status of animal model was considered at the HOMA indices, insulin and glucose levels. The in vitro assay approximation showed up to 66.4±2.8% and activity of DPP-4 in serum was observed to be 39.12±1.3% in TF seed extract treated groups. Furthermore, the FTIR spectra interpreted availability of potent functional groups in possessing bioactive compounds. Additionally, HPLC studies confirmed that gallic acid is the leading compound present in TF seed extract and shows significant binding energy obtained from -3.6 to -3.7 with DPP-4 residues LYS-71, ASN-74, GLU-91, THR-94, PHE-95, ILE-102, ASN-103, and ASP-104 via hydrophobic bonds. Significant changes were observed in HOMA indices, histopathology and others supportive parameters in treated groups. The study revealed promising histopathology and others supportive parameters in treated groups. The study revealed promising histopathology and others supportive parameters in treated groups. The study revealed promising treaults against insulin resistance, β-cell function and protective alterations in pancreas.

Keywords: β-cell function, pancreas protection, HOMA, HDA1C, Insulin resistance, TF(TF).

ΙΝΤΒΟDUCTION

potent bioactive phytocompounds, with a capacity to model systems'. Plants have a peculiar plethora of product and explore to mode of action of plants using of the product and correspondingly to standardize the interactions which lead to therapeutic effectiveness recognize the active constituents and their molecular interpretations4. Thus, it is absolutely necessary to constituents: not being well defined with their interactive major glitches with herbal formulations are the active for treatment of diabetes and its complications. But the plants have been used individually or in formulations are having antidiabetic potential³. The reported several have been pharmacologically evaluated and some of them resources2. All together less than 1% of higher plants ledient mort betreven invented from herbal as aspirin, metformin, anti-cancers drugs, digitalis and of old civilizations'. Moreover, some potent drugs such Ayurveda, Unani, Chinese and other medical systems times for therapeutics of various allments in the Dietary combinations are formulated from ancient

induced type-2 diabetic rats. B-cell function and pancreas protection in corticosteroid inhibition potential of TF seed extract on insulin resistance, The current study was made to evaluate effect of DPP-4 polyphenols, saponins, flavonoids, steroids and others10. potent bioactive compounds such as alkaloids, ailments⁹. It is also reported that seed of TF possesses used in folklore medicines for therapeutics of various Indian food ingredients used in numerous food recipes inhibitors. Trigonella foenum(TF) seeds are one of oldest the main therapeutic larget by synthetic and herbal DPP-4 secretion^a. Therefore, the DPP-4 inhibition considered as enzyme cleave to GLP-1 and reduced internal insulin diabetes, which is one of the serine based proteolytic on the inhibition of DPP-4 enzyme for therapeutics of diabetes67. Recently, several studies have focussed carbohydrate metabolism enzymes for therapeutics of phosphatase 18 (PTP1B) and other key catabolic aramylase, lipase, aldose reductase and protein tyrosine i.e. dipeptidyl-peptidase-4 (DPP-4), a-glucosidase, target in individual or multiple manner to key enzymes that most of the antidiabetic bioactive phytocompounds inhibitions5. In similar context, several studies concluded radical scavenging activities and targeting key enzymes resolve different metabolic disorders by following free

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OF PROSOPIS CIVERARIA POD IN HYPERCHOLESTEROLEMIC RABBITS VALIVITHEROSCLEROTIC AND ANTIOXIDANT POTENTIAL OF PETROLEUM ETHER EXTRACT

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VBSTRACT

hypercholesterolemic diet-induced atheroscierosis in rabbits. Objective: The present study is done to investigate the anti-atherosclerotic efficacy of petroleum ether extract of Prosopis cinerario pod in

as catalase (CAT), superoxide dismutase (SOD), and ferric reducing ability of plasma (FRAP) were estimated. the serum biochemistry and histological analysis of thoracic aorta was done. Along with it lipid peroxidation (POL) and antioxidant parameters such (Group III), and another set of the group was treated with standard drug Atorvastatin for 45 days. After the completion of the experimental period, weight/day) which was mixed in coconut oil for 15 days. Rabbits were then administered with petroleum ether extract of R cinerorio pod for 45 days Methods: Atherosclerosis was induced in rabbits by feeding normal diet supplemented with oral administration of cholesterol (500 mg/kg body

administered rabbits. plaque in the aorta was observed while cardiac LPO was lowered alternatively CAT, SOD, and FRAP levels increased in petroleum ether extract lipoprotein -C, and triglyceride was observed as compared to high-fat diet control rabbits. Slightly significant reduction in (ps0.05) atherosclerotic in CAT, SOD, and FRAP was observed. After the administration of the petroleum ether extract, significant reduction in TC, LDL-C, very low-density feeding when compared with the control group (Group I). Antioxidant parameters were altered too with an increased serum LPO while the reduction Results: There was a significant increase (ps0.001) in serum total cholesterol (TC). low density lipoprtein (LOL) and triglycerides after cholesterol

and has potent antioxidant activity which may be responsible for improving the lipid profile. Conclusion: The outcomes from this study recommend that P cineraria pod extract has hypocholesterolemic effect thereby controlling atherosclerosis

Keywords: Prosopis cineraria, Atherosclerosis, Antioxidant, Hypercholesterolemia.

org/licenses/by/4. 0/) DOI: http://dx.doi.org/10.22159/ajpcr.2019.v12i6.33333 © 2019 The Authors. Published by Innovare Academic Sciences Pvt Ltd. This is an open access article under the CC BY license (http://creativecommons.

Javal leaimedoorynd bna zeurivitaeoid and many more [8,9] but its pod have not been explored much on its considered for treating ailments of eye and leaf paste cures boils blisters. in treating bronchitts, asthma, dysentery, etc., while the smoke of leaves is in polyphenois, alkaloids, tannins, saponins, and flavonoids. Its bark is used source of nutrients. P cineraria plant and its various parts found to be nch is locally known as Sangri, considered as a dry fruit of desert and a rich source of food and fodder but also persist great medicinal value too. Its pod is a state tree of Rajasthan. Studies have concluded that it is not only a good

another as supporting parameters to correlate with altered conditions. and histopathological studies of heart, aorta, kidney, and liver were considered as key parameters. Planimetric studies of the aortal wall index (AI); and organ (heart, aorta, kidney, and liver) weight were very low-density lipoprotein -cholesterol (VLDL-C) levels; atherogenic low-density lipoprotein -cholesterol (LDL-C), triglycerides (TG), and total cholesterol (TC), high-density lipoprotein -cholesterol (HDL-C), in aorta; lumen volume; cardiac lipid peroxidation (LPO); circulating atherosclerotic rabbits as a working model. Atherosclerotic plaques petroleum ether extract of P cineraria pod, using high-fat diet-induced and at the same times exploring its antioxidant activities in the This study aims at investigation its antiatherosclerotic activity

NATERIALS AND METHODS

Preparation of plant extract

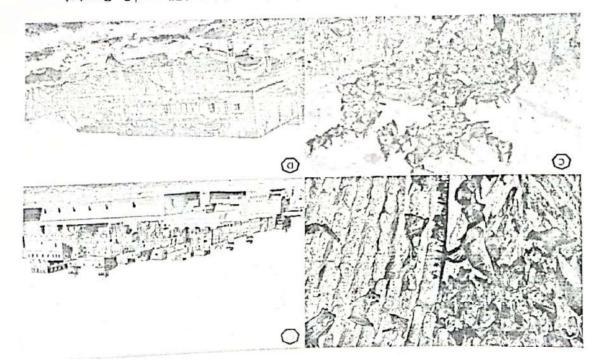
vendor. Pod of P cineraria was dried and ground to powder and later its this plant, i.e. pod of P. cineraria was procured from the local registered Department lai Marain Vyas University, Jodhpur, The required part of The selected plant P cineraria was identified by the experts of Botany

INTRODUCTION

[6] faints and their products exhibit hypolipidemic potential [6]. focus toward herbal formulations. Studies have demonstrated that some effective but also have no adverse effects. These requirements direct diverted the interest to look for alternatives which are not only reliable diabetes mellitus, Alzheimer, dementia, and many more [5]. These issues usage of statins showed adverse effects which majorly includes myalgia. market and is widely used [4]. However, its been seen that long-term cholesterol. The mostly used HMG-CoA inhibitor is statin available in the atherosclerosis is the use of HMC-CoA inhibitors which lowers the serum dyslipidemia and atherosclerosis; one such advancement in combating of pharmacological agents are available in the market to manage which ultimately bursts resulting in myocardial infarction [3]. A number supeld to gnimption accumulation of cholesterol and forming of plaque various risk factors, that is, hereditary, lifestyle, diabetes, and high-fat hypercholesterolemia and dyslipidemia [2] that are developed through situation like heart attacks [1]. Atherosclerosis is mainly influenced by a gaisues series to gaiworrea a ni gauluses liew leness oft ni Atherosclerosis is characterized by lipid deposition and inflammation atherosclerosis, one of the progressing cardiovascular diseases. to noise a pivotal role in the development and progression of Dietary changes have been the basis of numerous metabolic syndromes

one of the important Rajasthani dish. P cinemma commonly called as khejari "parmacological potential It is one of the key ingredients of "Panchkutta," wherapeutic [7]. Prosopis interartia L. (Fabaceae) has been reported to have exceptional antioxidants, therefore, have played a chell rule in terpenoids, alkaloids, carotenoids, and many more which are considered Plant has been a reservoir of secondary metabolites such as flavonoids,

Additional records of Greater Short-nosed Fruit Bat Cynopterus sphinx from the Thar



Short-nosed Fruit Bat roosts: A–Roost at Junagarh | B–Junagarh fort of Bikaner | C–Roost at Mansingh fort | D–Jalore fort. © Rakesh Kumawat.

features as the second finger with a claw, small wingspread (below 600mm), visible tail and four teeth in upper molar series and five in lower (Sinha 1980).

Earlier, the western part of the subcontinent was represented by a few localities as a single record from Malir, Karachi and "Kashmir Smasta" in Pakistan; Danta, Vedtial in Anand and Silvassa in Surat District of Gujarat State; Bundi, Banswara and Jhalawar of Rajasthan State. The Greater Short-nosed Fruit Bat Cynopterus sphinx (Vahl, 1797) (Mammalia: Chiroptera: Pteropodidae) is one among the 14 species of old world fruit bats in the Indian subcontinent. It is found in a variety of roosts, tents, under leaves, lumped and humanmade abandoned structures (Brosset 1962)-feeding on more than 30 species of plants. It is listed as Least concern on the IUCN Red List (Bates et al. Concern on the IUCN Red List (Bates et al.





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DESERT OF RAJASTHAN, INDIA SNAKE DIVERSITY IN GOLDEN TRIANGLE OF THAR

BAKESH KUMAWAT'' AND ASHOK PUROHIT'

'Department of Zoology, lai Varain Vyas University, Jodhpur (Rajasthan), 342001, India.

VOLHORS, CONTRIBUTIONS

This work was carried out in collaboration between both authors. Author RK performed the filed study, Both wrote the first draft of the manuscript, and Author AP managed the analyses and supervised the study. Both wrote the first draft of the manuscript.

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Original Research Article

understanding the species ecology and comprehensive

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The pattern of ecological assemblage in the arid and semi-arid region of the Thar Desert in Rajasthan altering at a high pace after the Indira Gandhi Nahar Pariyojna canal expansion for three decades. About this, this study revises the most favoured, secretive, and environment-sensitive underprivileged taxa (serpents) in the framework of diversity and occurrence in the golden triangle of the Thar Desert of Rajasthan state (Jodhpur, Jaisalmer, and Bikaner). Overall, 22 species and one subspecies were identified in four years of extensive field study based on the active search, night drives, scale counting, and topographical database. This study's finding pointed out the apparent abolition of previously most common snake such as Russell's viper and Indian rock python. Contrast to this, potential colonies of lesser-known Sindh Awl-headed snake, Afro-Asian sand snake, and Red-spotted royal snake has exposed.

Weywords: Occurrence; Snake diversity; Thar desen.

1. INTRODUCTION

snakes in this part were not uniformly distributed. Thus, essential data on life history aspects for Studies suggest district-wise distributions of demography, involves comprehending this risk [3]. abundance of snakes from the Thar Desert [4 -9]. on snake's diversity, richness, density, pup occurrence, distribution pattern, and population calculation misjudged, other than long-period studies disruptive, and scanty records are available about the some current research [1, 2]. The snake extinction risk such as the Thar Desert of Rajasthan. Concise, have a significant concern about a global decline in considerable proportion of important diverse areas for eco-sensitive species like snakes. However, snakes conservation assessments are still missing for a Diversity studies in ecology provide better potential distribution data for biogeographic studies and

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movements in Desert National Park, Rajasthan, India Impact and assessment of wildlife mortalities on road due to vehicular

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ABSTRACT

among reptiles. It is feared that such a kind of persistence loss can be detrimental to the local reptilian population Were recorded. Among them one species is endangered and 20 are least concern. There was higher mortality Jacent to the Park. A total of 289 instances of road kill of faunal diversity belonging to 43 species and 27 families less, the number of individual animals observed is only a small fraction of the number killed on roads in and adveys, we have documented overall 289 wildlife road mortalities during an average of one-year period. Neverthesurveys were conducted with the help of forest officials from lanuary 2016 to December 2016. During these sur-To begin to quantify the effects of roadways on wildlife at Desert National Park, Jaisalmer, regular road kills

Key words: Desert National Park, Road kill, Vertebrate.

NOLLODUCTION

(Reh & Seitz, 1990). ducing average helerogeneity and genetic polymorphism roads (Ortega & Capen, 1999). Roads contribute to re-(Oxley et al., 1974) or increased predator activities near exhaust or runoff (Turtle, 2000), barriers for movement cent aquatic and terrestrial communities through vehicle 1996), indirect effects such as the modification of adjadirect mortality on the roads (Ashley & Robinson, plant diversity (Forman & Alexander, 1998). Through have become one of the severe threats to animal and de-fragmentation of many terrestrial habitats. Roads works of national and state highways. This has caused tremendous development in urbanization with vast netremains poorly documented. In the new parts, there is as, including many protected areas, yet its overall impact animals in and around significant biodiversity-rich arehuman-caused factors of direct mortality to vertebrate Road kill is undoubtedly one of the most significant

extinction (Mader, 1984). become isolated and increasingly become susceptible to the barrier effect of roads and local populations may anurans, birds and mammals may be more sensitivity to ability and higher sensitivity to habitat alteration that (Rosen & Lowe, 1994). Herpetofauna with less dispersal mals with limited dispersal ability, such as repules -ins gaivem-wolz visitively of relatively slow-moving ani-Stouffer, 2001; Goosem, 2001). The current study is some Amphibians, Aves and Mammals (Develey & Roads appear to be barriers in the movement for

& Frissell, 2000; Das et al., 2007; Row et al., 2007; Humphrey 1995; Groot & Hazebrock, 1996; Trumbulak tality due to vehicular movement on roads (Foster & al other has studied particularly on herpetofaunal morand Boominathan, 2010; Fellows et al., 2015) and several., 2001; Gokula, 1997; Chhangani, 2004; Baskaran the issue of wildlife mortality on roads (Vijaykumar et In India few studies were carried out to address

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sert National Park, Jaisalmer, and Rajasthan. passing along the middle and southern boundary of Demortalities of faunal species on a highway segment known. The present study is an attempt to report road 2013). No study on such ecological loss is hitherto which is a diversity hub for peculiar fauna (Sharma, ies were conducted considering western Rajasthan, 2018). However, unfortunately, nearly negligible stud-Shwiff et al., 2007; Seshadri et al., 2009; Dutta et al.,

MATERIAL AND METHODS

to and from movement between above habitats. desert fox, Indian fox, Chinkara, Blue bulls during their and frequently used by small mammals like a wild cat, these adjacent wild, arid habitat are animal corridors lised dunes with scrubland and purely barren dunes. All mented grasslands, and scattered rocky terrain, stabifields of Millets, Sorghum, Bajra crops in springs, frag-Jaisalmer. This road passes through patchy seasonal Sam village and next to Sudasari, Khuhri and Myajlar in approx 305 km, passing to Desert National Park, Jaisalmer, India. The 35 km long road enters into the from January 2016 to December 2016 on transects of covering an area of 3162 km2. The study was carried out of laisalmer. This is one of the largest national parks, in the West Indian state of Rajasthan near the town Desert Vational Park (27°2'22"N 70°53'2"E) is situated

(I sugif) yours for a year of study (Figure I). one season. Further three transects plotted each in a ritory. Overall, nine transcets have been implemented in lar-Jinjinyawali - Jaisalmer in Desert National Park ter-Sipla, 4. Kanoi - Barna, 5. Barna - Sundra and 6. Myajas I. Kanoi - Jaisalmet, 2. Barna- Jaisalmet, 3. Sam bodies actives. The road transect have taken in to study larly during the rainy season when the annual water The animal crossing increases manifold particu-

detect animals on the road. This method is a type of We followed the day and right drive method to

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L. Gehlot, A.K. Prajapat

TOARTERA

in India. Various species of insect pests are infested to mung bean crop and cause very harmful effect to crop and farmer. These pests Mamin and minetals therefore human uses it in various ways in food. Mung bean crop cultivated in kharit, rabi and summer season Background: Mung bean is important pulse crop in India due to its nutritional value. Its grain contains protein, fat, carbohydrate,

recorded by counting number of pests on 2 upper. 2 middle and 2 lower leaves of a plant whereas population of aphid was recorded Randomly selected 20 plants from weekly interval to record population of insect pests. The population of jassid and whitefly was during kharit season 2019. Mung bean was grown on a plot size of 25 m x 25m with 50 cm row to row and 20 cm plant to plant spacing Methods: Field experiment was carried out for the study of seasonal incidence of insect pests on RMC-62 variety of green gram decrease productivity and quality of mung bean.

whitefly had positive correlation muminim muminim with correlation had positive correlation with minimum muminity and negative and Diaphania indice. The population of aphid, jassid and whitefly positively correlated with temperature. Population of aphid and also infested green gram, these were Mylabris pustiliars, Helicoverpa armigera, Trichoplusia in., Lampides beticus, Spoladea recurvairs 10cm twig/plant, 10.1 jassid/6 leaves/plant and 14.1 whitefly/6 leaves/plant, respectively Simultaneously six species of insect pests leaves/plant, respectively. Peak mean population of aphid, jassid and whitefly reached during 36" standard week with 10.2 aphid/ 3/yllatinw 1.5 bns Insland/sevesi 8/bissel 6.0 dtiw seek with 0.3 lissel/bissel and 22 in standard whiteflying e.0 Result: The mean population of aphid, jassid and whitefly were recorded. Incidence of aphid started during 33" standard week with by counting number of aphid on 10 cm twig/plant.

correlation with maximum and average humidity. All three pests expressed negative correlation with rainfall.

Key words: Aphid, Insect pests, Jassid, Mungbean, Seasonal incidence, Whitefly

INTRODUCTION

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carbohydrate (Hussain et al. 2011). It is also consumed as %4.03 bns tet %C.1 , nietorg %S.45 nietnos anisig needenuM to presence of protein, vitamin and mineral (Das et al. 2014) It is used as fresh green pods, dry seeds as vegetables due crop in India after chickpea and pigeon pea (Ved et al. 2008). Mungbean or Green gram, Vigna radiata is important pulse

17.19 lakh hectare area and production is 7.42 lakh tones in India during 2017-18. In Rejection, mungbeen grown in per cent of production is largest mungbean producing state and Telangana. Rejesthan with 42.23 per cent area and 39 Kamataka, Tamil Nadu, Gujarat Andhra Pradesh, Odisha are Rajasthan, Madhya Pradesh, Maharashtra, Bihar, mungbean production comes from 10 states of India These tones and yield 472 kg/hectare. More than 80 per cent of 4.26 millim 10.2 to notoubord leunne ne thiw evention of 2.4 producer and consumer of mungbean, which is grown in the and and semi-and regions of India. India is the largest Mungbean is an important khant pulse crop grown in biscuits (Sehrawat et al. 2013).

fresh sprout, seeds used for making soups, bread and

nitrogen fixation and increase soil fertility (Sharar et al. 2001) rainfall, rapid growth, early maturation, restore soil fertility by to drought tolerance, grow in harsh climate and minimum Mungbean grow easily in Rajasthan because it has ability

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:() Correlation with Meteorological data. Agricultural Science Digest. in (stelber engly) needgrum no steed toern to eonebion How to cite this article: Gehiot, L. and Prajapat, A.K. (). Seasonal

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Meyr), galerucid beetle (Madurasia obscurella, Jacoby) and and Maruca testulatis, Geyer), tortricid moth (Cydia ptychora, phaseoli, Tryon.), pod borers (Helicoverpa armigera, Hubner Fab.), green bug (Nezara viridula, Linn.), stemfly (Ophiomyia (Bemisia tabaci, Genn.), semilocper (Plusia orichalcea, motti, Pruthi), thrips (Caliothrips indicus, Bagnall), whitefly insect pests noted on mungbean involve jassid (Empoasca Bemisia tabaci was major pest during summer season. The Ophiomyia phaseoli on mungbean and urdbean of which Bemisia tabaci, Empoasca kerri, Aphis craccivora and (Panchabhavi and kadam, 1990). Dar et al. (2002) reported pests act as a limiting factor in production of mungbean elevated losses to the crop and its production. Hence insect Many insect pests attack mungbean crop causing extremely

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Repellent Power of Some Botanicals Against Pulse Beetle, Callosobruchus spp.

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In present study leaves of some and zone plants were used in the form of powders to evaluate their repellent power against the insect pests of stored mung beans, Callosobruchus spp. All powders were applied (20.5, 1 and 2 gmper 100 gmseeds of mung beans. The repellent action of plant powders tanged from 19.33% to 83.33% in comparison to the control and their effect were varied in different plant species as well as different doses of same plant species. Maximum number of insects were repelled in the case of Azadrachta indica at all three doses. Eucofyptus globules, Fagoniacritica, Balanticsa egyptiaca, Ocimum sanctum, Commiphora usightit, and Barleria were also found effective against test insect. Minimum number of insects were repelled with Salaadora powder (a

Journon of nosingmon in sbass mg001/mg2.0

Keywords : Plant powder, Botanicals, Callosobruchus

INTRODUCTION

insmnonivns. hazardous to living beings but adversely affects the However, the indiscriminate use of chemicals is not only suitable chemical, which in turn create pollution problems. identification of pests and diseases the farmers do not apply ever increasing cost of purchase. Sometimes due to wrong workers' safety, and development of resistant strains and often associated with problems such as loxic residues, are controlled by the use of chemicals. These chemicals are losses during storage, in modern agriculture the insect pests microorganisms and stored grain insect pestaring duration, which leads to infestation of several Hence, users of it are storing the mung beans for long conditions in the and zone, the yield of mung beans is limited. villagers as well. Due to unfavourable environmental to nisig boot nommon is is il neutralish to enor bine ent Mung beans are one of the important pulse crops of

Synthetic insecticides had been used and being employed to protect stored grains from stored grain insect pests but their indiscriminate use creates serious problems (Sighamony et. al., 1960) like development of resistant strains (Sighamony et. al., 1960) like development of resistant strains to man and livestock and also adversely affects the environment(Deedant, 1994). Concern over environment affertative to the synthetic chemical insecticides is safe of insect pests, these are relatively cheap, safe, biodegradable and environment friendly (Adedire and Lajide 1999). Pest and environment friendly (Adedire and Lajide 1999). Pest control through botanical pesticides has long history and control through botanical pesticides has long history and control through botanical pesticides has long history and

June-December 2020

bioactive organic chemicals (Benner, 1993) and known to produce diverse range of secondary metabolites such as terpenoids, alkaloids, flavonoids etc., more than 6000 elucidated (Metcalf and Metcalf 1992). Botanicals which are elucidated (Metcalf and Metcalf 1993). Botanicals which are bipesticidal activity against the stored grain insect pests mas also reported by Mishra et al. (1994); Lohra et al. (2003). The bipesticidal activity against the stored grain insect pests mas also reported by Mishra et al. (1994); Lohra et al. (2000) fand Kiradoo and Srivastava (2010). Muhammad and Bashir (2017) concluded in their review article that control of achieved using plant materials hence, synthetic chemicals achieved using plant materials hence, synthetic chemicals hazatis.

plants (Tripathi and Tripathi, 1999). Plants are rich source of

farmers have been used pesticides prepared from seeds of

MATERIAL AND METHODS

(a) Rearing of insects : The laboratory culture of Callosobruchus spp. was maintained at the Department of Callosobruchus spp. was maintained at the Department of the Tosology, J.N.V. University, Jodhpur. The culture was obtained from naturally intested grains from local market. The test from naturally intested grains from local market. The test from naturally intested grains from local market. The test from naturally intested grains from local market. The test from naturally intested grains from local market. The test from naturally intested grains from local market. The test from naturally intested grains from local market. The test from naturally intested grains from local market. The test from naturally intested grains from local market. The test from naturally intested grains from local market. The test from naturally intested grains from naturally intested grains from naturally local market. The test from naturally intested grains in the test of adults into the ison of the insect pests was obtained from this stock culture by continuously replacing the devoured and intested adults into the jar.

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Phytoconstituents of an ethanolic pod extract of Prosopis cineraria triggers the inhibition of Atherosclerotic plaque in regression of atherosclerotic plaque in stidder of atherosclerotic plaque in

Heera Ram¹ (a), Noopur Jaipal¹, Jaykaran Charan², Priya Kashyap³, Suresh Kumar³, Rashmi Tripathi¹, Iaykaran Charan², Priya Kashyap³, Suresh Kumar³, Rashmi Tripathi¹⁰, Baby Tabassum⁹ and Elsayed Fathi Abd_Allah¹⁰

entimetry toperates

Abstract

Background: The HMG-CoA reductase is key enzyme of cholesterol biosynthesis which potentially contributes in management of hypercholesterolemia. The present study was designed to assess the inhibitory effect of phytoconstituents of an ethenolic extract of Prosopis cineraria pods on HMG – CoA reductase and regression potential of atherosderotic plaque.

Methods: Healthy, adult male, albino rabbits in which hypercholesterolemia was induced by supplying the high fat diet and a supplement of cholesterol powder with coconut oil (500 mg/S ml/Day/kg body weight) for 15 days, were used as a disease model. Phytochemical analysis of an ethanolic extract Prosopis cineroria pods was conducted using LCMS, GCMS and FTIR analysis. Further, in-vitro, in-vitro and in-silico assessments were performed.

Results: The in-vitro assessment of HMG -CoA reductase activity indicated a 67.1 and 97.3% inhibition by the extract and a standard drug (Pravastatin), respectively. Additionally, an *in-silico* evaluation was made using appropriate docking software and results also indicated as significant interactions of the identified compounds with the target enzyme. Treatment of rabbits with the ethanolic extract of *P. cinetonia* pod resulted in significant (P ≤ 0.001) reductions in total cholesterol, LDL cholesterol, and triglyceride. Accordingly, reductions were occurred in atherosclerotic plaque, intime and cholesterol, NLDL cholesterol, and triglyceride. Accordingly, reductions were occurred in atherosclerotic plaque, intime and cholesterol, NLDL cholesterol, and triglyceride. Accordingly, reductions were occurred in atherosclerotic plaque, intime and cholesterol, NLDL cholesterol, and triglyceride. Accordingly, reductions were occurred in atherosclerotic plaque, intime and cholesterol, NLDL cholesterol, and triglyceride. Accordingly, reductions were occurred in atherosclerotic plaque, intime and cholesterol, NLDL cholesterol, and triglyceride. Accordingly, reductions were occurred in atherosclerotic plaque, intime and the construction with the target of the soft significantly increased (P ≤ 0.001).

Conclusion: It can be illustrating that the ethanolic extract of Prosopis cineroria pod contains potent bioactive phytocompounds might be inhibit HMG – CoA reductase and have regression potential of atherosclerotic plaque.

Keywords: HMG-CoA reductase, Hypercholesterolemia, Lipid profile, Antioxidants, Prosopis cineraria, Atherosclerosis

Introduction

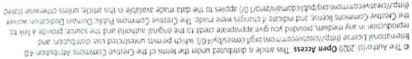
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Appropriate diets and dietary supplements have the potential for use in the management of various metabolic syndromes and their complications [1]. The fast food and/or junk food associated with many developed countries are having a drastic impact on the health of youth, as well as many adults with insufficient exercise. These types of food are typically rich in insufficient exercise.

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ation of intracellular free radicals has also been demonstrated

can accelerate the development of atherosclerosis and further resulted in atherosclerotic plaque [4]. An increased gener-

alone or together with the consumption of unhealthy foods

[3]. Hypercholesterolemia is an independent risk factor that

cancer are the cause of up to 60-70% of mortality, worldwide

metabolic syndromes, cardiovascular diseases, diabetes, and

cancer, and other metabolic syndromes [2]. In fact, three

stances, all of which promote diabetes, hypercholesterolemia,

free fatty acids and contain a large amount of fatty sub-



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and Suresh Kumar' Priya Kashyap', Heera Ram20, Sunil Duft Shukla30

Eibnl JugisbU Jogello Shi Binewit Inemnevoli ygoloo2 Performant of Zoology, Jai Naran Vyas University, Jodnput, Rejestinan, India. ³Department of University School of Biotechnology, GGS Indraprestra University, New Delhi, Delhi, India.

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TYPE: Orginal Research

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Introduction

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erates on binding to AChE.5 In the later stages of AD, there is stress in the CNS. As the AD progresses AB fibrillation acceltion causes neuronal cell damage and also increases oxidanive it has faster aggregation kinetics." Amyloid Ø 42 plaque formaform but A β +2 is more neuroroxic hydrophobic form of A $\beta,$ as cleavage pattern of APP. Amyloid ß 40 is the most prevalent fibrils are mainly of 2 types depending on the C-terminal deposited extracellularly on cerebrovascular space.³ Annyloid fl ments called AB fibrils, mostly consisting of oligomers that get protein (APP) that results in sticky insoluble peptide fragaggregates are formed by mis-cleavage of amyloid precursor tein aggregates in the central nervous system (CUS),2 These pathology, which includes depositions of amyloid β (Aβ) proinhibitors. Alzheimer's disease is a complex multifactorial enofocused on single specific drug target, that is, cholinesterase The present therapies are unlikely to mitigate AD, as they are is expected to increase up to more than 130 million by 2050.1 estimated to be suffering from AD at present, and this number dementia in elderly people. Worldwide, 47 million patients degenerative disorder, accounts for more than 80% cases of Alzheimer's disease (AD), a progressive and irreversible neuro-

marin class of compound, from A. speciesa roots. -uos banual compound scopoletin, an isolated couundertaken to evaluate multitarget-directed ligand potential negligible side effects. Considering this, the current study was compounds that could have disease-modifying effects with relief. Presently, there is an urgent need to discover novel drug tic intervention. Current treatment only provides symptomatic prevent aggregation of Ab peptide could be used for therapeucould inhibit cholinesterase, having antioxidant potential and gen peroxide and oxidized AB.7 Therefore, compounds that active metals and consequently lead to the formation of hydro-(ROS).6 In addition, AB fibrils have affinity to reduce redoxoxidative stress due to accumulation of reactive oxygen species an established direct correlation between AB aggregation and

CORRESPONDING NUTHORS: Surveys Kumar, Enversity School of Biotechnology, GOS Inderstration University New Defini 17001; India, Email, School of Biotechnology, Bool Managines, Construction School Strate Carloge, Ucasput 21000; India, Carlog and Survey Surve David David (10001); Proceeding School School

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DECLARATION OF CONFLICTING INTERESTS: The author(s) declared no potential

nitologoas to microbial attack over the plant. Scopoletin alexin, low molecular weight compounds that are biosynthe--oryd a si (nitanuovycotbyd-7-tyottom-d) nitologos ,ybute neurological disorders.8.9 The identified compound in this nomodulatory, antioxidant, anti-inflammatory activity, and properties such as theumatism, hepatoprotective, immumentioned in Ayurvedic material medica for its medicinal A specioia or withbadaraka meaning antiaging, has been

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sennetti) In Desert National Park, Rajasthan, India Population Dynamics Of Chinkara (Gazella DEPENDENCE OF SCIENTIFIC & TECHNOLOGY RESERVEN VOLUME 9. ISSUE 03. MARCH 2020

to be the set of the state of the set of the The world. The overall average maximum density of Chinkara is affected by posching, predation, habital distributions and population is very healthy than the other desert of the world. The overall average maximum density of food materials is affected by posching, predation, habital distributions and availability of food materials is affected by posching, predation, habital distribution and the overall average and availability of tood materials is affected by posching. The data is the other desert of the advised in Sudata is affected by posching, predation, habital distributions of the availability of tood materials is affected by posching, predation, habital distributions of the availability of tood material average average were average to the available of Chinkara is a strong of the kanni study site. The adult fermales to tawn ratio of the availability of tood material average average average in tawn side in Khun and Sudata is and those are more anot of a strong average average average average average average average average average in tawn side in Khun and Sudata site short site average and the average avera estic langestic function of the section of the sect sin in serior of Chinkers of Chinkers were camed out in hold serior landscape. The Chinkers (Gazella bennetty of Chinkers of serior description of the source of the serior of the serio

the react remain remain in Kanoi study site while slightly positive changes were observed in tawn side in Khun and Sudasan sites and mose were more that the triple in tawn side in Khun and Sudasan site shows are study period by the morth of June The maximum monality was occurred due to teral dog. During the triple study period birth rate was 0.58 tawnsfemale. The overall birth rate of Chinkara was 0.55 tawnsfemale. The overall birth rate of Chinkara was 0.55 tawnsfemale. The overall birth rate of Chinkara was 0.55 tawnsfemale. The overall birth rate of Chinkara was 0.55 tawnsfemale. The overall birth rate of Chinkara was 0.55 tawnsfemale. The overall birth rate of Chinkara was 0.55 tawnsfemale.

Key words. Chinkara, Density. Sex ratio, Birth rate, Death rate, Line transects

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influenced by poaching, predation, habitat disturbance and in Kanoi and Khun study sites. The density of Chinkara was disturbed by the agricultural activities, feral dogs, poschers winter and summer season. Chinkara population were also November due to that the Chinkara faced scarcity of tood in vegetations were consumed by livestock till end of pue eare Aprils and in based area area and to Aborsevil ant . Seguina by villages. The livestock of density of Chinkara was found lowest due to the fact that ont substant study site. In the Kanoi study site, the sew energing to the highest density of Oue and Wastock. Due to it the highest density of Chinkara was to notitied most bries total dogs and competition of available there. Fencing play important role to protect the by tencing and plenty of vegetation and water were Kanoi site (Table 1). The Sudasari study site is protected ni my pellemine aa i bevreedo sew viieneb isewol ani bne my patemine 17.1 befor sew if elis hurth ni elirtw elis ybuta Chinkara was obtained 3.95 animal/sq km in the Sudash Park was 2.20 animal /sq km. The highest density of The overall average density of Chinkara in Desert National oto otisi xas bne age vitisnab notisiuqoq noqu sbragab si il noitezinegio leide bave social organization. Il is Living in the herd may be for safety and fulfil the other Chinkara population lives in mixed herd and all male herds.

availability of tood materials.

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INTEODUCTION

(5, 3) Enclosures of DNP play important role in ssens botoetively while in lindia it is found in 80 protected areas Pakistan and Iran it is protected in nine and five areas In Indian at the That Desert its population is stable. In Aghanistan, scattered in Pakistan and Iragmented in Iran. activities the population of Chinkara are probably rare in under IUCN Red list as vulnerable species. Due to hunting hilly area, dry sorub and light forest (2). It has been listed noipai bits ni bruoi si siskinka si (1) seste batanimob tel bre ionnation are seen in Bishnoi and Jat noian gazelles are distributed throughout the That region nation but disturbance, season, availability of tood and water influenced by the behaviour of dominant male, poaching, are brach to asis bue notitionand and size of herd are ni negal bris nemmus ni nellisme snismen asis bred ent migratory birds. Chinkara population lives in group or herd bus eviter of tetided letuter eff service and bit bitw 3162 sq km along with Indo-Pak border. It is a paradise of Desert at Jarsalmer and Barmer distracts. It is spread over hard of the mark is situated in the mid brought Jased

conservation of the Chinkara population.

ndividuals, age and sex of group members were recorded evening twilight. During each observation the number of of nwob mort naket stations were taken from down to not counted. Focal sampling method (5) was used to collect SISW 108215 Sold State Crossing the line transley were direct count method (4). To avoid the false encounter, the fast were run on transects on the teet and data were collected by am to 9.00 am to tind out encounter rates of Chinkara. We 00.7 moil primom ni beyevrue bne eile ybule doe ni yimobnei Itansects of 2 km length and 400-meter width were laid grassing, agricultural and other activities were going on. The and Kanoi (Gravel with hillocks) are open areas where (sanub bris) nun alinw sala beloaloid si alis (bruoig nielg) nesebus ant viderpodor to sized ant no safe subsection and onn beivib zew sets Yburg. Study area was divided into The study about population dynamics of Chinkara were SOOHTEM ONA SLAIRET,

denote about death and birth were collected through

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NVH.LSVIVA 40 DENSILA VAD DVIFA VCLIAILIES OF DESERT FOX IN THE THAR DESERT

B. R. Jaipal

ություն եզարեմ է հետա Department of Xoology, Jai Warain Vyas University, Jodhpur 342 001, India.

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line transect method were used to calculate the density. The focal sampling method was applied to collect the data of different and evening. The manimum playing activities were observed in early morning and evening. During study the direct count method and in obtained the flexity food and an annual munixem bus virtual and rodent for the flexity of the flexity of the alor mervous for consumed more times to cat the bird than cat on other food items. Hunting activity played important role in guiteer no more resting period from seasons to season but more than a more (47.62%). The resting an estimation winter season and minimum time in summer season. Desert fox spent maximum time in search of the food material during in guivom no smit mumixum Jasqu'i yab gui'nd. Absic needs. During day it spent maximum time on moving in the (72.0) Vilensing Real of the line of active during day time. The major daily activities were depended on climatic conditions. The density of desert fox in Desert The poaching and habitat loss are main causes of population decline in the region. Desert fox is mainly a nocturnal but it was Present for the Than Desert for is a solitary and shy animal. It is well adapted carnivore in sandy and serub habitats of the Than Desert.

daily activities of desert fox in three different seasons.

Key words : That desert, Vulpes vulpes, daily activity, season

plays important role in ecological balancing in the That pups rearing activity (Servin et al, 1991). The desert fox in youd smaining the territory while female remains busy in bns gnibnolob ni omit orom bnoqe and sonataine orom travel about 4 km distance during night. The male travels et al, 1986; Lovari et al, 1994). În urban areas the foxes distribution and availability of prey (Blanco, 1986; Boitani different activities of red foxes are influenced by the save them from collapse (Jaipal, 2013 and 2015). The system of bushes give mechanical support to den and noted near Dhanies at basal part of bushes because root shelter and protection. Maximum numbers of dens are In this region the desert fox are dependent on dens for are habitat loss, posching and Sarcoptic mange (disease).

WATERIALS AND METHODS

360 km distance was travelled on the feet and data were of 80 meters were laid randomly in each study site. Total line transect length of each transect of 2 km and width fox was calculated by using line transects method. The considerable information was collected. Density of desen behaviour and other activities was difficult. Even though, Desert fox is shy in nature so the study about

INTRODUCTION

nain threats to desert for population in the That region placenta and seeds of different desert plant (Jaipal, 2015). scorpion, repúles, eggs, dead bodies of livestock, delivered material which is composed of rodents, birds, insects, bool to yulidaliave no bragab si xol need on availability of food area Vishnoi dominated area (Jaipal, 2013 and 2019). The clustered villages and healthy population are found in Jat localized near human seulement such as Dhanies. That Desert, maximum population of desert fox are Kutch, southern Iran and Iraq (Pocock, 1941). In the It is distributed in Baluchistan, Rawalpindi, Rajputana, other three sub species (Menon, 2003; Wozencraft, 2005). number of them. It is lightest and smallest than distributed in India. The desert fox (Vulpes vulpes foxes are found in world of which three sub species are Macdonald, 1982). A total forty five sub species of red (Harris, 1978, Macdonald, 1980; Hersteinsson and population and farmland in urban and sub urban areas Forest and agro ecosystem. They are found near human habitats like Deserts, Mountains, Tundra, Green land, climatic conditions and distributed in different types of The Red foxes (Vulpes vulpes) are adapted to cold

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then from from invade the territory. The size of territory was influenced by the availability of food material, interference of other hutting episodes were noted in monsoon season. The odear of sentiliquid substance and urine may warn the other male and curb activities like gland rubbing thrashing of branches, faceal pellets defecation and bed site path fixation. The maximum branch berouted and and an index of the contract the boundary of the territory by visual and seem marking territorial to some of the model of the protect the necessary resources and during the breeding season to minimize the interference of group. It is mostly occupied to protect the necessary researce is a specific term. availability of water and type of habitat. Territory is an area, which is strictly defended by the dominant (Resident) male of the resorded in Sudasari study site in monsoon season. The size of home range was influenced by the distribution of food resources. zuw (md ps 0.1) aguur amod isolium oils lonn oils lonn A ni rannnus gninub borrosdo zuw (md ps 82.2) aguur amod isogral ad T duo 13 tonio all y dibaqdel 1340 sux II. alan manimob ali y defended by the dominant male. It was over lapped by the other group, home range but most of them were circular. All parts of the home range were not visited every day by the clumbara herd but their basic needs. The size of home range varies with season and size of herd. We observed different type's size and shape of the animal or a social group of a species for daily activity or to find the different materials which are necessary to fulfil land seape. Home range and territory play important role in the animal population. Home range is an area which is habitually und Too dered on territorial activities and home range of Chinkan a in the Desert Sadional Factorial activities and home range of Chinkan and the Desert Sadional Parts of The activities and home range of the second second

animalsand purpose for which territory was established.

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noneluqoq ni onilqiosib ott guinismism ni olor manoquii range prevent the unnecessary interference and play heaps (Gehlor, 2006). The territorial activities and home nates their territory with eye tubbing and faceal pellet and Rajagopal et al, 2011). The black buck and Chinkara female are allowed to visit their (Isvaran and Ihala, 2000 black buck defends the resources in the territory and only ola M. (E801, notion but is und But 2102, and Clion, 1985). Male or scratch the plant and leave the tult of fur as visual with each other (Parker et al. 1991). Some species chew

STORTERIALS AND METHODS

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parameas kineas pur saying kuroti meisisai iganorp in month of July and August. Vegetations consist of vino nostos noosnom garub succe but vintes si lini auto to 50°C in summer season. The humidity is very low and qu sasri omanori nomos remon gunue uni combros districts of Rajasthan The area is situated in hot chimatic roundareal har round in the obtained and an independent of the And hnothe massel out in the barries saw ybut?

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IN THE THAR DESERT LIVING STRATEGIES OF INDIAN FOX IN WARM CLIMATIC CONDITIONS

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ABSTRACT: Deserts are hot, dry areas made up in most cases of sand, rock and mountains and the Thar desert is one of them. In widespread, deserts are described as areas where greater water evaporates into the air than falls to the ground as rain. An animal lives in deserts are described as areas where greater water evaporates into the air than falls to the ground as rain. An animal lives in deserts are described as areas where greater water evaporates into the air than falls to the ground as rain. An animal lives in deserts with the aid of residing underground or resting in burrows throughout the warmth of the day. Some creatures get the moisture they want from their meals so that they don't want to drink much water if any. The Indian fox Vulpes bengalensis spread over India and found around the scrub and dry grassland habitats of western desert areas. The study was conducted on its living strategies in warm climatic conditions using direct observation and line transects technique during conducted on its living strategies in warm climatic conditions using direct observation and line transects technique during strass with sand dures in Balotra region in Barmer, Rajasthan. They exist wherever they can dig dens into the soil and find prey. areas with sand dures in Balotra region in Barmer, Rajasthan, They exist wherever they can dig dens into the soil and find prey.

Key words : Indian fox, living strategies, climate, That desen.

forests and different land-use types. It is different from other foxes due to some characteristics like presence of black hair upper portion of the muzzle and anterior portion of the eyes, greyish body pelage that lacks blending of red hairs, tips of tails are black and legs are brownish rutous in colour (Pocock, 1936, 1941; Prater, 1980; Roberts, 1997; Menon, 2003; Johnsingh and Jhala, 2004)

It is threatened because of poaching in their habitat and their habitat is in danger due to rapid habitat loss (Vanak et al. 2008). The Indian fox is recognized to inhabit relatively parched areas, as well as short grasslands, deciduous forests, scrub-thorn forests and marginal region of croplands (Rodgers et al. 2000). Indian fox is rarely plentiful within its range (Vanak, 2005).

NOLLODUCTION

The desert is definitely one of the selective areas of terrestrial biotopes for both flora and fauna. Actually, these show such a similarly morphological and physiological conversion that lets them face climatic severity and water loss (Hadley, 1972). In several species, burrowing behaviour helped conversely through the strengthening and shortening of the legs, has evolved (Lull, 1040).

The Indian fox (Vulpes bengalensis) is a successful member of the canidae family. In India, it is classified worldwide as Least Concern by the IUCN and listed as threatened species under Schedule-II of Wild Life Protection Act, 1972. Survival of the Indian fox is depended on the natural habitat those are found in its surrounding environments. It is versatile in habitat surrounding environments. It is versatile in habitat are less possible to live where conditions are extreme. The Indian fox can be differentiated from other fox species by their bushy and black tail tip.

The part of the Thar desert is spread over Rajasthan state. It is an arid and semi-arid zone with varied types of mammalian fauna. *Vulpes bengalensis* is also called common fox and Lokri in the western part of Indian subcontinents. The favored habitat of Indian foxes is mixed fandscape such as made up of grasslands, patches of

The Scientific Temper Vol. XI, No. 1-2, January-July, 2020 A Web of Science Journal A Web of Science Journal A Web of Science Journal

in the Thar Desert of Rajasthan, India Food and Feeding Ecology of Nilgai (Boselaphus tragocamelus)

B. R. Jaipal

Department of Zoology, Jai Narain Vyas University, Jeolog X 2000 Corrections Supervision Solution Solution Solution Sciences Supervised and Correction Solution Solut

ABSTRACT

Wilgai is largest and fast moving Indian antelope. In western Rajasthan it is commonly known as Roj. It is protected under the schedule III of Wildlife Protection Act, 1972. It lives in herd and starts daily activities before the sun rise. Mainly Nilgai is grazer but it became browser in the scareity of grasses during winter and summer. During monsoon the Nilgai Preferred green grasses and herbs very much while browsed only on leaves and young twigs of *Prosopis cineraria*, Zierphus mumulariand. Acacia senegal. The feeding preferences changed according to season and depended upon availability and quality of vegetation. Nilgai did not prefer the *Cineraria*, Zierphus mumulariand. Acacia senegal. The feeding preferences changed according to season and depended upon availability and quality of vegetation. Nilgai did not prefer the *Cineraria*, Zierphus mumulariand. Acacia senegal. The feeding preferences changed according to season and depended upon availability and quality of vegetation. Nilgai did not prefer the *Cineraria*, Zierphus mumulariand. Acacia senegal. The feeding preferences changed according to season and depended upon availability and quality of vegetation. Nilgai did not prefer the *Cineraria*, Zierphus mumularian, *Carcia senegal*. The feeding preferences changed according to season and depended upon availability and quality of vegetation. Nilgai did not prefer the *Cineraria*, Zierphus mumularian, *Carcia senegal*. The feeding preferences changed according to season and depended upon availability and searce discing preferences of *Cineralia*. *Ciperus* munularian content (*Lepra*, *Jara*). Murat makto (*Brachinitia* ramose) etc. *Juliflora*). Jal (*Sabadora* spp.). Bui (*Lepra*, *Jaran*). Murat makto (*Brachinitia* ramose) etc. *Juliflora*). Jal (*Sabadora* spp.). Bui (*Lepra*, *Jaran*). Murat makto (*Brachinita* ramose) etc. *Juliflora*). Jal (*Sabadora* spp.). Bui (*Lepra*, *Jaran*). Murat makto (*Brachinita* ramose) etc. *Juliflora*). Jal (*Sabadora* spp.). Bui (*Lepra*) *Jara*).

Keywords: Nilgai, Grazer, Browser, Feeding preference, Season,

Nilgai feeds upon different natural and cultivated plants. It is also a crop pest (Chopra and Ray, 2010; Chouhan and Sawarkar, 1989). The blue bull is voracious herbivore (Rajpurohit et al., 2006). Chhangani and robbins (2008) noted that Corfandrum sativum is most favourite food and they repeatedly attack on coriander leaf.

MATERIAL AND METHODS

Study area

The study was conducted at Desert Vational Park which is situated in the That Desert. The park is spread on 3162 km² in Jaisalmer and Barmer districts at 25°47' to 26°46' in northern latitude and 70°15' to 70°45' in eastern longitude. Area has been divided into core zone and buffer zone of eareas have been sub divided into 28 enclosures and are protected by wire fencing but 76 villages are located in buffer area where agricultural and grazing activities are permissible. The area is characterised by low humidity, extremes of diurnal and annual temperatures. In summer

INTRODUCTION

prefetted

Nilgai jumped over 7 feet high fencing (Jaipal, 2012). help in communication (Prater, 1980). When it was chased antelopes it has the specific glands below the hooves which and Morrison-Scott, 1921, Fall, 1972). Similar to other the hoof(Sterndale and Finn, 1929; Prater, 1980; Eleman both sides of check. Two white bands are found above in colour. White spot are present below the chin and on night are sleubivibri grupty and young individuals are light male the base of homs are triangular but circular pointed (Prahash, 1994). It shows clear sexual dimorphism in of desert but previously they were not seen in that region Gandhi canal command region and double cropped areas enbul gnole lle radmun nei in bruot au nghy. (2801 Prakash, 1956a and 1956b; Prater, 1980; Majupuria. but prefers the open forest (Sterndale and Finn, 1929; native to India and Pakistan. It avoids the thick forest types of habitats from ground level to hilly areas. It is Vilgai is common Indian antelope and is found in different

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PUSILLA) IN THE THAR DESERT OF RAJASTHAN, INDIA DIET AND DIETARY PREFERENCES OF DESERT FOX (VULPES VULPES

Amita Kanwar*, Neeru Garg and B. R. Jaipal

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usurces. The opportunistic feeding habit enables the desert fox to survive in a different type of conditions and habitat. bool lo Villdelleve bue insmnorivns galbauorrus sili no sbrageb isib zil bas nossas nooznom sili ni sleftstem bool mumixem source of the state of the series of the ser material from the scats, we have used the faecal matter analysis method. In the summer and winter season, it highly preferred Watermelon (Citrullus lanatus) and invertebrates, small mammals, reptiles and aves. To find out the different undigested spp.), Ber (Zizipus spp.), Banwali (Vachellia jacquemonii), Kankeri (Maylenuse marginala), Kachara (Cucuniis melo), feature of carnivore ecology. It feeds upon seeds and fruits of Khejari (Prosopis cineraria), Ker (Caparis devidua), Jal (Solvedora incrited and so that a variety of food items that support it to stay alive in the desert. Feeding habitat is the mortant in a hot climate and survives easily in adverse conditions of Desert. It belongs to order Carnivora, but it is opportunistic ABSTRACT : Desert fox (Vulpes vulpes pusilla) is distributed throughout western Rajasthanin the Thar Desert. It is adaptable

Rey words : Desen fox, food material, scat, frequency, weight, season

(Kanwar et al, 2019). stiunt nollal adagnibool to omit off the Kol mosob off herbivores are a competitor of Desert fox they chased don't share the food materials. Chinkara and Vilgai and Cat both carnivores used the same habitat but they Groundnuts, Ker, Khejari, etc. (Jaipal, 2015). Desert fox placenta. Eggs, Fruits, and Seeds of Watermelon, Ber, of Arthropods. Dead bodies of cattle, Delivered the Desert fox feeds on Rodents, Aves, Reptiles and a variety 1995; Cavallini and Lovari, 1991; Contesse et al. 2004). (Leckie et al, 1998 and Volpi, 1996; Ferrari and Weber, materials from the agricultural, urban and rural areas eral, 2013). The red fox obtains a high quantity of food and Munilla, 2010; Rosalino et al. 2010; Suarez-Esteban dispersion in long-distance (Jordano et al, 2007; Guitian

MATERIALS AND METHODS

analysis method of Jaipal (2012) was applied to find out about collection date, time, and season. The faceal matter were stored in plastic bags and labelled with information season. Total of 215 scats collected and analyzed. Scats study area from February 2017 to February 2019 in every and more detected from the stars were collected from the Dhora near Jodhpur. It is situated on 26.3275N Latitude Desert fox (Vulpes vulpes pusilla) was done at lajiwal Survey related to diet and dietary preferences of

INTRODUCTION

and Beschia, 2012). Red fox play important role in seed services like Herbivore prey population regulation (Ripple et al, 2004). Red fox plays a major role in ecosystem predation on livestock and it is lost to farmers (Moberly abundantly throughout the year (Zhou et al. 2011) Foxes altitudes, where other food materials wereavailable primary food but didn't frequently consume at lower gradient (Clavero et al, 2003). The small mammals are particular prey are changes according to the altitudinal Dunbar, 2002). Dietary diversity and composition of affects the foodcomposition and diversity (Hill and factors affect the availability of food materials and it also leane dortazar, 1999). The climate and environmental varying according to environment and habitat (Fedriani, Dell's Arte et al. 2007). The feeding difference of fox resources based on availability (Webbon et al. 2006 and has opportunistic feeding behaviour. It uses food (Macdonald et al. 2008) The red fox is a predator and it secub, agricultural areas from sea level to 4500m Tundra. Forest and landscape with abundant edges of different areas such as the Desert, Mountain, Sand dunes. and Voigi, 1987). Red foxes have been reported in countries and in other parts of the world (Lloyd, 1980 The red fox is distributed throughout most of Asian

The Scientific Temper Vol. XI, Vo. 1-2, January-July, 2020 A Web of Science Journal A Web Of Science Journal

Food Compositions of the Indian Fox (Vulpes bengalensis) in the Desert Region of Rajasthan, India

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ABSTRACT

The study on food compositions of the Indian fox (*Vulpes bengalensis*) was carried out in Balotra (Barmer) in hot desertie land. This threatened species listed with Schedule II of Wildlife (Protection) Act 1992. This opportunistic and omnivorous animal feeds upon small todents, birds, eggs, snake, lizards and insects. It also feeds upon seed and seasonal fruits of *Coppuris decidua*, *Acacia states* lizards and insects. It also feeds upon seed and seasonal fruits of *Coppuris decidua*, *Acacia torvilis*, *Acacia senegal*, *Aerva Javanica*, *Prosopis cinetratia*, *Prosopis juliflora*, *Salvadora persica*, *Ziziphus species*, *Cucumis melo*, *Citvulus lanatus*, *Cordia myxa*, *Punica aeridua*, *Acacia senegal*, *Aeura Javanica*, *Prosopis cinetratia*, *Prosopis juliflora*, *Capparis*, *et al.*, *Direct otalian*, *Acacia senegal*, *Acaria tanaly sites* during the year of 2015 *abradora persica*. Ziziphus species, *Cucumis melo*, *Citvulus lanatus*, *Cordia myxa*, *Punica et al.*, *Direct observation technique* and scat analysis were used to recognize the diet *abradora persica*. Ziziphus species, *Cucumis melo*, *Citvulus lanatus*, *Cordia myxa*, *Punica composition*. Direct observation technique and scat analysis were used to recognize the diet *to 2015 abradora persica*. *State* of categorize the prey species of the lox. Scasonal variations were to 2018. Scate are analyzed to categorize the prey species of the lox. Scasonal variations were to 2018. *Scate* are analyzed to categorize the prey species of the lox. Scasonal variations were to 2018 to 2016 to 1000 the low of the low of the lox areas and manimals found in fox's diet. During winter scason the fox mostly depended upon ber, aves and manimals found in fox's diet. During winter scason the fox mostly depended upon ber, aves and manimals found in fox's diet. During winter scason the fox mostly depended upon ber areas and manimals.

bones of animals. During monsoon season it feeds on Ziziphus and small manimals. Keywords: Indian fox, food composition, scat analysis, prey, desert.

2 km² (Maurya, 2012). The number of the Indian fox is rately in abundance in its range and it may be absent from many places within its range (Vanak, 2005).

Vulpes bengalensis is opportunistic feeder (Johnsingh, 1978) The foxes are nocturnal in habit and cating regimen includes atthropods, small mammals, birds, reptiles, and different vegetative parts (Johnsingh, 1978; Johnsingh and Jihala, 2004; Manakadan and Rahmani, 2000; Cavallini and Lovari, 1991; Vanak, 2003). The presence of many types of vertebrates and invertebrates prey species were isolated by the fecal examination in southern Tamil Vadu (Johnsingh, 1978). Hairs of rodent were commonly (Johnsingh, 1978). Hairs of rodent were commonly (Johnsingh, 1978). Hairs of rodent were commonly reported in the scats of pups (Manakadan and Rahmani, reported in the scats of pups (Manakadan and Rahmani,

MATERIAL AND METHOD

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Study area: Research of the diet composition of Indian foxes was conducted in the different intensive study sites. Which is situated near Balotra in Barmer district. It is the north-west part of the Rajasthan and falls in the hot desert region. It lies between 24° 58' to 26° 32' north latitudes and 70° 05' to 72° 52' east longitudes. The western and

INTRODUCTION

The Udpes bengalensis is a mammal from the order Gamivora. Caniformia suborder and Canidae family. It is locally known as lokri or lomri. The Indian fox is endemic species in India and spread from the lower regions of and extends from Sindh Province of Pakistan east to Bangladesh (Pocock, 1936; Prater, 1980; Gompper and Vanak, 2006; Johnsingh and Jhala, 2004). The range of Udpes hengulensis is restricted to the Indian subcomparatively abundant in the biogeographically zones of the desert, abundant in the biogeographically zones of the desert, semi-arid and also the Decean Peninsula of India (Rodgers et al., 2002). It is threatened species because of the loss of biogers of the abundant in the biogeographically zones of the loss of semi-arid and also the Decean Peninsula of India (Rodgers et al., 2002). It is threatened species because of the loss of bioders of the loss of the loss of the loss of the biogeographically cones of the loss of bioders of the loss of the loss of the loss of bioders of the loss of the loss of the loss of bioders and hunting its habitat (Vanak et al., 2008).

The Indian fox prefers relatively parched areas, short grasslands, deciduous forests and scrub-thorn forests (Rodgers et al., 2000), Indian foxes are generally observed in protected grasslands habitat compared to the agricultural scenario that reports in Southern India's survey (Vanak, 2005), The home ranges are calculated at approximately



Crop Damage by the Blackbuck (Antilope Cervicapra) and other Ungulates in Around Rohat Region, Rajasthan, India

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one area to another, depending upon the availability of crops. The herd of blackbuck, deer, and nilgai has been observed shifting from damage gams due to feeding and tipe crop damage due to trampling. (blackbuck), calves (Nilgai) in the mid position. Mostly immature crop field. During entering in the crop, the male stands behind and fawn females in a herd does inspect the location and enters easily in the crop recorded for scan, adibitum sampling [12]. One of the dominant Animals were followed for regular observation and protocols were ungulates from May 2019 to April 2020 in the Rohat-Paili Region. questionnaires of ecology and pest status of Blackbuck and other is part of the preliminary survey based on the observation and dawn [9]. Blackbuck and nilgai are highly adaptive antelope. This note the presence of Blackbuck and other ungulates in crop field from dusk to plants, damaged crop and feeding marks give the indirect evidence of damage to most crops. The signs of hoof marks, broken plants, uprooted Blackbuck (Antilope cervicapra) and other ungulates caused extensive

Keyword: Blackbuck, Crop damage, ecology, feeding, ungulates.

Introduction

In India, after the introduction of the Wildlife Protection Act (1972) and through associated management actions, the populations of many wildlife species have increased considerably. and a few of them have decidedly become locally overabundant [1].

Crop damage caused by raiding wildlife is a prevalent form of human-wildlife conflict along protected area boundaries [2].

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VALIFORE CERVICAPRA IN MARWAR REGION OF RAJASTHAN, INDIA V PERSPECTIVE STUDY ON SEASONAL THREATS OF BLACKBUCK,

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of marwar. Mainly because of habitat destruction, hunting pouching, road accident, overgrazing of livestock and wildlife crime. once found abundand, throughout Marvar region, but they are limited to the some region, driven almost to extinction in the rest most of the prey was fowns and due to the flooding of fields in rainy season, their feet easily fall in, cause's death. Blackbuck was in rainy season. The main reason for their number coming down in the rainy season was the feral dogs. Which were easy to prey population of blackbuck in the marvar region in living in open cultivated field. The study reported that main threat observed was mumixism of T. 2010 for more on the field work was completed from A pril of 2019 to September of 2019. The maximum conflict and threats to the blackbuck population. The present study of blackbuck at marwar region was carried out through bi-ABSTRACT : Marwar region is lacking in natural habitat of blackbuck population. The decreasing natural habitats lead to

Key words : Accidents t, blackbuck, conflict, crop, habitat, natural, predictors, threats.

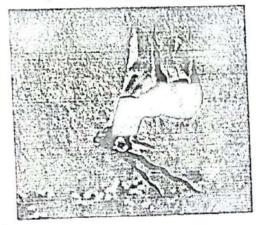


Fig. 1 : Blackbuck (Anitlope cervicapra).

biomass but also harasses and disturbs the blackbuck grazing of livestock in the field not only removes the rapid problem within the blackbuck habitat. The illegal distribution of blackbuck. Livestock encroachment is a principal reasons for the decrease within the number and encroachment and fragmentation of habitat are the of India, Nepal and Pakistan. Loss and change also as is now an endangered species within the natural habitats the wild animals (Pant and Joshi, 2019). The blackbuck range which decrease theavailability of natural food to

IM

INTRODUCATION

limited to the western Rajasthan part of the state, driven. found abundantly throughout Rajasthan, but now they are resides in open cultivated fields. Blackbucks were once The maximum population of Blackbucks within the state Based on the coat colout, shape and length of the horn. in part of Pakistan and Nepal (Udaya kumar Das, 2015). Bovidae. It is found in the Indian subcontinent and also The Antilope cervicapra belongs to the family

overgrazing, forest cutting and transgression in the home scale monoculture plantation, shifting cultivation, individual due to the conservation of forest into major the main factor for the loss of forest and conflict is of many wildlife species. The human-wildlife conflict is wildlife conflict is one of the large threats to the survival 1972 (Kumar and Kar et al, 2008). Presently, human-It is classified in Schedule I of Wildlife (Protection) Act of wild flora and fauna), it is categorized in Appendix III. (Convention on International trade for Endangered species Natural resources.) as Vulnerable, under CITES (International Union for Conservation of Nature and status of blackbuck is listed in Red Data Book of IUCN animals is struggling for its existence. The conservation et al, 2018). Blackbuck is including in the list of threatened because of habitat destruction and wildlife crime (Kumar Almost to extinction in the rest of Rajasthan, mainly

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IMBVCL ON EALBODHICVLION IN SVAIBHVB FVRE SLADA ON SEVSONVE AVBIVLIONS OF DISSOFAED MALBIEALS VAD L

Meenakshi Meena* and Gargee Bareth

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Argential use: Present study value is not only essential for drinking, but also needed for agriculture and industrial use. Present study v carried out for water quality of samples collected from different sites in the Lake periphery as well as in validiture at a Samples were collected from different locations of Sambhar Lake city and its adjoining area for their physico-chemical stud Samples were collected from different locations of Sambhar Lake city and its adjoining area for their physico-chemical stud Samples were collected from different locations of Sambhar Lake city and its adjoining area for their physico-chemical stud The standard methods of APHA were used to analysis samples. The analytical results show Phosphate-phosphorus va between 0.27 to 1.91 mg/L during the course of study whereas announa-mirrogenrecorded during the present investigatio ranged between 0.013 to 0.141 mg. Seasonal fluctuations in silica content of the water bodies under study showed a range tranged between 0.013 to 0.141 mg. Seasonal fluctuations in silica content of the water bodies under study showed a range of 0.216 – 1.310 mg/L with maximum values during June, 2018 and minimum during Pebruary. 2019.

Key words / Sambhar lake, dissolved solids, introgen, phosphorus, silica,

Lake, Lake is also known as "Sult Lake of Kaparation the largest inland sult lake in Inda. Spread in the "E km area, this India's largest inland salt lake also regarals as a 'Gift from That desent'. This saltine lake is dryth by a 5.1 km long dam, which helps in salt making

Rammahan, 2007). The present thesis was designed an manufant) sousmoroundo monifono bue and a dossib to morveded office another by here a discovery offiin water Generally, the lake water chemistry describe promass, aquatic macrophytes and the depletion - ? . . . 1. Is nonmhumpon seeve of gmbrol moleyeoo e s logal to filled off no rooffe latrontinob even gem manual mornan bostoronl. (6791) nosmitoluH bm. (6001) and points and have been discussed in detail by eten leargoloid adt no nottan tiadt hus basingoaat as mirogen, phosphorus and stheates has long as and shorthy to constropting of Leonarodmi an prior barahishaa am yanT is ynwiliag sente han hangehoog das igolore mort strangino and a meaning at 2701 common of box snoth.1 essential source of energies and numerical According entant addabs has attenut?) surantigro attenps a reachord him drivery off rol singularities and ned prove roll as conclored in release the second organisations for the sector of substances and substances and substances of the sector of the substances of the substanc role in the metabolism of various groups of an Dissolved substance in water play a very importa-

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INTRODUCTION

Lakes are dynamic lentic ecosystems which are significant inland water resources for meeting the increasing water demand. However, all these functions depend on the quality of water, which is based on a wellbalanced environment in terms of its physical, chemical and biological variables (Yu et al. 2010). Anthropogenic disturbance to nutrients and eutrophication impair river water quality and ecology (Crossman, 2016; Dupas et al. 2017; Jarvie et al. 2012a). Eutrophication has been recognised as a significant environmental issue in Grea Britain and across Eutope since the late 1980s and continues to present a long-term challenge for sustainable nutrientinanagement (European Environment Agency, 2010; Leaf, 2017).

Wetlands have always been of utmost importance for human existence since time immemorial. Inhabitants of the desert state of Rajasthan have traditionally protectedand cared for the world. Wetlands, as the abode to the severe water scarcity, frequentdroughts and famines in this part of the world. Wetlands, as the abode of richbiodiversity and dynamic ecotones, require wise resource management and implementationof the conservational strategies suggested by experts at national andinernational fortuns from time to time. The Ramsar convention is one such endeavour that unites the globe for conserving our fast degrading wetlands. Annorg the for conserving our fast degrading wetlands. Annorg the for conserving our fast degrading wetlands. Annorg the for conserving our fast degrading wetlands. Annorg the

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Exp. Zool. India. Vol. 23, No. 2, pp. 1951-1956, 2020

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TRAGOCAMELUS IN JODHPUR REGION, RAJASTHAN, INDIA V DERCEDITAE STUDY ON FEEDING PATTERN OF MUCAIL BOSELAPI

Meenakshi Meena* and Kusum Choudhary

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uoseas of noseas scarce, nilgaii ate more browse, dead vegetation, and dry dung of large herbivores. The lood pattern of the nilgaii varied fr pool not/M successions and their while up to the barrey barrey of a strength of the series of the series of the barrey and the barrey of the b of 60% grasses. 25% forbs and 15% browse. They augmented the nutritive level of their basic diet by selecting nutrit preferred to feed on large open areas interspersed with cover and ponded water. They were grazers, their average dist region. A two year food habit study of nigali and its forage selection was conducted. The results have shown that nil thot to shore guiniothe ni 9102 yreardod of 7102 dorald guine boloute sew (sulamosogori suilgalosof) inglin to nothing suss bun mottel boo Tabel ni antelope (Boselaphus tragocantelus) are an exotic ungulate species in Inda. Food partern and seas

Key words : Food habits, Wilgaii, mixed feeder, wild ungulate, preference rating.

15661 areas of Haryana, density reached 5.07 per lan 1500, and a reaction bruc (deef the remedia) eset in and req 86.0 A strengt ingin (ad000.041) issued no stiral (000,001 his not been carriedout, but numbers could be more if mos Itul A. (1994) .instantially rosed and oth to strug areas. Milgan are expanding their mage in canal-tring a

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generally crop fields (Qureshi, 1992, Singh, 1995, nom gniboot hoog in brund somnomos one slamine groups of four to 10, though large assemblages of and common and an entropy are you'r normnoo o'n 1980). Calves are born throughout the year and p init want ratio has aniquals to saveal adding guibaal - one seword might enserol sensh hun strassh areas more yeah not steered subhood yab has areas wing the very adaptable and occur in and, such

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The Republic of India, with an area of 3,287,263km2.

Asia from reaching India. of the country and prevents the cold winds of central struct isom of ning guird of sbuole noosnom isowithos off soorol drion odi ni nindo ninturom navalamiH odT. (6001 experiences a typical, tropical monsoon climate (Negi, lies in the subtropical zone, though, as a whole, India n Chirapunjeein northeastern India. A large part of India mm()00,01< of the That Total to strugterwithon emeritse oth mimm0č se ollul se mort somey fletimer leunne neofA invo sir lo nioid supinu ynam bin anoiger liviidgragoegoid ynum yd betneserger syfisreviboid deir a ni befluser aaf contrasts inits physical characters and variations in climate the west. The combination of India's position, the great the Palaearene in the north and the Ethiopian region in Indomalayan biogeographical region. It is connected to 97025'E, and occupies a dominant position in the bin HTTORA noswied bin N'6075 bin N'408 neswied is the seventh largest country in the world. India lies

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barbarong historia concluded and to isom deucide They are common to abundant in many protected areas. Gujarat, where they are not molested for religious reasons. and an Unter Pradesh, Haryana, Rajasihan and India. They are locally abundant in agricultural areas, in Nilgali mainly occur in northern, western and central



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ORIGINAL ARTICLE 26 + Burney SAAN

Jodhpur, Rajasthan Blackbuck (Antilope cervicapra) Population Status Around

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ABSTRACT

was computed to be 12 per matured Jemale per year and the mortality rate was 26 per individual per year. However, per herd. The male to female sex ratio was 1:3 showing a sex ratio of 78.26 bucks to 100 does. The annual natality rate ecological density of 32 individuals/ Km2 at the core habitat. The average herd size was computed to be of 8 individuals population of Blackbuck during that period was 303 with the crude population density of 14 individuals/ Km2 and the was studied at Jodhpur, Rajasthan by the direct observation method from August 2019 to Feb 2020 for detail. The total Populace status of the ultimate wild population of endangered and guarded species of Blackbuck (Antilope cervicapra) numbers of Blackbuck. A study was conducted to assess the Blackbuck population in the Jodhpur District Rajasthan. Ancelopes found in India and have a wide discribution in Rojasthan. The Jodhpur District of Rajasthan has the maximum

Keywords: Blockbuck (Antilope cervicapra), Population, individual, Natality, Annual, Jodhpur, Rajasthan, נהפרפסלבפר נוון 2019, מחחעמו lump oppulation למנם סחוץ מרפ קועפח לסר קפחפרמו סעפרעופעי.

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INTRODUCTION

status of Blackbuck is listed in Red Data Book of IUCN (International Union for Conservation of Nature region. It is also known by a number of other names like Kala Hiran, Krishna America. The conservation groups are largely found in many regions of India, Pakistan, Nepal, Srilanka, except for the north-eastern An elegant Blackbuck Antilope cervicapra Linnaeus (1758) is a species of Bovidae family. Blackbuck

open woodlands [1]. It is primarily a grazer and browser, in the absence of grass; it can be considered a plain, it is found in a wide range of habitats from and grassland, scrubland to marshy coastal plains, and Appendix III. It is classified in schedule I of Wildlife Protection Act, 1972. Essentially a species of open (Convention of International Trade for Endangered Species of Wild Flora and Fauna) is categorized in and Natural Resources) as near-threatened since 2003, in CITES

forage in summer [1]. The average life-span of Blackbuck determined in captivity is 12 years and the pasture land. They are generally sedentary, but they may move for long distances in search of water and forest, open plain (grassland), riverbanks, and semi-desert habitats, and can forage in cropland and The Blackbuck can utilize a range of habitats including tropical and subtropical weed land, dry deciduous mixed feeder [2, 3 and 4].

Population dynamics of the Blackbuck and the land use of the Blackbuck area at Jodhpur are not upper limit is 16 years [5].

population, management supported a holistic research approach that is important and appropriate documented scientifically. Considering limited resources and multiplying needs with a growing human

for in-situ conservation of any species. This study extrapolates the population characteristics of the Biological data, which incorporates the present population status and understanding of behavior, are vital

endangered species of Blackbuck in Jodhpur [6].

MATERIAL AND METHODS

August 2019 to Feb 2020. The observations were made for 5 days in every month visiting, Jodhpur Study Area:-The study of population of Blackbuck is carried out in the entire district of Jodhpur from

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UTTAR PRADESH JOURNAL OF ZOOLOGY

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KAJASTHAN, INDIA THREATENED VULTURE SPECIES IN THAR DESERT OF RECENT TRENDS OF POPULATION AND NESTING OF

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VITHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. Author RPS designed the study, wrote the protocol, and wrote the first draft of the manuscript. Author RK managed the analyses of the study. Author AP protocol, and wrote the first draft of the manuscript. All authors read and approved the final manuscript.

Article Information

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Original Research Article

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ABSTRACT

The data obtained the population fluctuation between seven species of vultures in the That Desert of Rajasthan is of great significance. A systematic study carried out the objective of demography, breeding, and nesting records of vulture species in That Desert of Rajasthan starting from 2016 and over three successive years. Linear regression used to determine a trend in the population of residents and migratory vulture species. Egyptian vulture observed the highest and White-backed vulture resulted in the lowest population trends. Potential records of nesting of resident vulture species also gathered at the right proportion. The patterns of declines and the presence of dead birds, various accidental tragedies, habitat loss, and windmills indicate some possible cause even after the ban on Diclofenac in 2006.

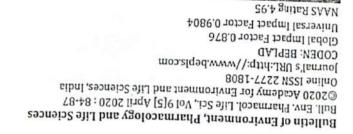
Keywords: Demography: nesting; that desert; vulture.

I. INTRODUCTION

Grass root level information such as long term population monitoring, availability of adequate food, favourable ecological conditions, and geographic distribution are the new parameters that rely upon the proper application of appropriate conservation action used in research for the

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threatened species such as vultures [1]. Demography estimated as the addition (births and immigration) and loss (deaths and emigration) of individuals from a population which is regulated by intrinsic factors (i.e., life-history, first breeding, fertility, food resources, topography and abiotic factors [2].





Western Rajasthan, India Ladyfinger and Bottle Gourd) of Godwar Area (Bali and Falna) of Contamination of Pesticides Residues in Vegetables (Green Chili,

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Keywords: Pesticides residues, QuEChERS method, Contamination and Vegetables Jarmers of this area are using eco-finendly method to prevent vegetables from pest and improve production. organochlorine pesticide alpha endosulphan (0.03ppm). The minimum contamination was found which show that jadyfinger and bottle gourd are found uncontaminated while green chill sample are found minimutated with Falna in Pali district and analysis of pesticides residues by using QuEChERS method. These two vegetable sample as gourd in godwar area of western Rajasthan. These three types of vegetables are collected from different farm of Ball, The present study evaluates the contamination of pesticides in green vegetables as green chili, ladyfinger and bottle

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vegetables, fruits from pests and improve production and quality. A 2008 document of AVRDC [3] the to protect the vegetables from pest and damage. The main reason of using pesticides is to protect the organophosphorous pesticides. Applications of pesticides are widely used before and after the harvesting, insecticides and on the basis of chemical structure can be classified as organochlorine, organosulphur and several years before as DDT, Aldrin and Endrin. Broad variety comes include fungicides, herbacides, vegetables we get across the geographically regions are contaminated with pesticides even those banned farmer use synthetic pesticides in vegetables to protect them from different pests. Fact that 50-60% of the of pesticides to control pests of vegetables and fruits". Personal talk with farmer shows that about 95% of manufacturer in Asia. From India news report? "India farmers use about 6000 tons of active ingredients contributes 16-17% of GDP of India1. India is the largest pesticides consumer and second largest pesticide India is an agrarian country where about 60-65% of population is depending on agriculture and **NOTTOUR**

only green chili sample are found a minimum contaminated rather than other vegetables sample. We work mostly in Falna, and Bali area in Pali district of western Rajasthan and found interesting result, different farms of godwar area of western Rajasthan to find out the pesticide residues in these vegetables. pregnancy. We study on various types of vegetable mostly on green chili, ladyfinger and bottle gourd of damage etc. Common effects of pesticides residue on human body are nausea, vomiting and disorder in environment. This pesticides residue causes different types of health issues as respiratory, neurological types of pesticides [4]. These types of pesticides cause harmful side effects on human body as well as on mineral and vitamins source like vegetable and fruits are going to contaminated day by day with different types of minerals and vitamins, which are essential for human body metabolism, But the truth is that this We know that vegetables and fruits are very important part of our daily balance diet. It's provides many world vegetable center, thus tightly suggest India pesticides use on vegetables alarmingly high.

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A review on impact of coal mining on soil properties and reclamation by organic amendments

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ABSTRACT

Coal is one of the most abundant fossil fuel on earth which is involved in the production of power and energy all over the world. Coal mining process generates abundance of mined spoils and waste rocks which oxidizes under atmospheric conditions and releases metal-loaded effluents to the water bodies and soil. These effluents degrade physical, chemical and microbiological quality of soil and, in turn, create threat to human being and ecosystem. New cost effective and environment friendly strategies are needed to provide such opportunity to reclaim the degraded soil. Organic amendments for the soil restoration may provide such opportunity to reclaim the degraded soil. Organic amendments for the soil restoration and biological activity of degraded soil and decrease restoration cost in ecco-friendly manner. The objective of this paper is to review the impact of coal mining on soil physico-chemical and biological properties of and biological activity of degraded soil and decrease restoration cost in ecco-friendly manner. The objective of this paper is to review the impact of coal mining on soil physico-chemical and biological properties of mined degraded land. This paper also reviews the role of organic amendments in soil reclamation of mine spoils.

Key words: Coal mining, Organic amendments, Mine spoils, Reclamation

Introduction

Coal is the most abundant fossil fuel resource in the country. India ranks as the third largest coal producer of the World, next only to China and USA. It is important constituent of the present Indian economy. Coal Mining is done in two major ways: underground mining and opencast mining. In India more than 85% of the coal production is currently from opencast mines. Opencast mining is a type of surface mining, which entails removing the vegetation, top soil and rock (called overburden materials)

Alton in the version of the second the sec

ing lands (Banerjee and Mistri, 2019).

above the mineral deposits (Mukherjee and Pahari, 2019), and thus affects the fertility of the surround-

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Journal of Traditional and Folk Practices

Quarantine and social distancing: scientific means in Indian traditional culture

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Abstract

Coronavirus disease (COVID-19) pandemic has introduced the term quarantine worldwide. The concept of quarantine is not new in Indian culture. It is practised in Indian society since ancient times mainly during the ceremony of birth and death, during which there are high chances of infection. Quanantine is a modern form of concept 'Sunak or Panek' of our Hindu culture, which means preservation and restoration. According to our intuals after birth and death rituals quanantine or isolation have been followed by Indian people. Social distancing is being followed and maintained by the Namaste concept of our traditional culture while showing respect and graitude. Lockdown traggered by corona pandemic has reminded, re-evaluated and relooked our ancient and traditional culture while showing respect and graitude. Lockdown way of living and life. The current Pandemic (COVID-19) scenario has given an enlightening message and lesson of revisiting and revalidating our traditional culture and customs which are not only based on scientific principles but are also true in the present situation of this acute infectious respiratory disease.

Keywords: COVID-19, Namaste, Patak Quarantine, Sutak

I. Introduction

come to one's house was one of the oldest each other's house and refraining others to with other children. They had to avoid visiting separate room, not allowing him/her to play practice in India was to keep a child in a smallpox (before eradication), the common Landwirth, 2005). During chickenpox or to their home or a designated facility (Cetron and group level which normally involves restriction Quarantine may be applied at the individual or a long time as a measure of disease prevention. being practiced at various places in the world for 2012; Rosenberger et al., 2012). Quarantine is in the fourteen century in Britain also (Newman, of the Black Death (epidemic of bubonic plague) quarantine was termed to prevent the spreading refers to restrictions for leprosy and the word (Sehdev, 2002). The book of Leviticus in the Bible words 'Quaranta giorni' which means forty days meilest on more beived from the lialian introduced the term quarantine worldwide. The Coronavirus disease (COVID-19) pandemic has

mankind. It was the most devastating plague in in Italy and pandemic word was introduced to black death or the great bubonic plague emerged in Dubrovnik on Croatia's Dalmatian Coast. The a state-led strategy was first introduced in 1377 The first instance of an organized quarantine as to the 1918 influenza pandemic (Cohen, 1974). the mid-1300s and the first outbreak of cholera any pandemic from the time of the black death in always been a form of public-health response to distancing and the concept of quarantine have of corona virus among the people. Social this is used to break the spreading of the chain Saxena et al., 2014). In terms of COVID-19, completion of isolation period (Nicholas, 1981; a method of the announcement of recovery and the temple after recovery can be considered as the disease from spreading. Moreover, a visit to recovery yet the motive was isolation to prevent was described to please the Goddess for early infection. Though, the rationale for restrictions o bearque of isolation to prevent the spread of

Bulletin of Environment, Pharmacology and Life Sciences Bull. Env. Pharmacol. Life Sci., Vol 9[11] October 2020; 169-174 ©2020 Academy for Environment and Life Sciences, India Journal's URL: http://www.bepls.com CODEN: BEPLAD CODEN: BEPLAD CODEN: BEPLAD Universal Impact Factor 0.9804 Universal Impact Factor 0



Biochar Mitigates Soil Salinity: A review

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LOVALSAV

Salinity is one of the most limiting factors of environment which affect the productivity of agricultural crops. Most crops are perceptive to soil salinity which is caused by high concentration of salis in the soil. In order to meet the global challenges of food demands, it is important to bring saline soils under cultivation. A recent concept of "biochar" is global considerable attention in enhancing various physico-chemical and biological properties under saline soil conditions. Biochar is gaining considerable attention in enhancing various physico-chemical and biological properties under saline soil conditions. Biochar improves sail structure concept of "biochar" is gaining to required for improves sail structure, increase pH, and augmented soil aeration and moisture content. Further extensive work is required for improves sail structure, increase pH, and augmented soil aeration and moisture content. Further extensive work is required for improves sail structure, concentration of salinities at both laboratory and field scale. The main objective of the chemical properties, different thy sico-chemical and investigating the editeration of salinities at both laboratory and field scale. The main objective of the protective of the recent concentration soils with different physico-chemical properties at both laboratory and field scale. The main objective of the protectives is there are an investigation solid scale. The main objective of the protectives at both laboratory and field scale. The main objective of the present concentration of salinical properties at both laboratory and field scale. The main objective of the protectives at both laboratory and field scale. The main objective of the present concentration of salinical protections of the concentration objectives at both laboratory and field scale. The main objective of the present concentration objectives at both laboratory and field scale. The main objective of the present concentration of salinical protections of the protections of the main objective at bo

and plant growth in saline soils. Key Words-Agriculture, Biochar, Environment, Soil, Salinity

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INTRODUCTION

Soil salinity is one of the main constraints present in irrigated agricultural lands world-wide. In India about 8.6 mha of land area is affected by soil salinity [28] and it is increasing every year as a result of secondary salinization. In India, the problem of salinity is found in the states of Uttar Pradesh, Gujarat, West Bengal, Rajasthan, Punjab, Maharashtra, Haryana, Orissa, Delhi, Kerala and Tamilnadu[18]. Almost 2.8 million hectares of salt-affected soils are present within the Indo-Gangetic alluvial plain occupying parts of Punjab, Haryana, Uttar Pradesh, Delhi, Bihar and Rajasthan states [2]. At least 20% of all irrigated lands are salt affected with some estimates being as high as 50% (by year 2050) whereas the world's parts of salt affected with some estimates being as high as 50% (by year 2050) whereas the world's population continues to trise, the total land area under irrigation appears to have levelled off [14, 18].

Most crops are sensitive to salinity caused by high concentration of salts in the soil. The soluble salts that occur in soils are found in various proportions of the cations sodium, calcium and magnesium, and the anions chloride and sulphate. The minor amounts of cation potassium and the anions bicarbonate, carbonate and nitrate are also present. A saline soil is generally defined as one in which the electrical conductivity of the saturation extract in the root zone exceeds 4 dS m⁻¹ (approximately 40 mMNaCl) at S5 °C and has an exchangeable sodium of 15% [26]. Salinization associated with agriculture occurs when water from the sub-soil is not sufficient to prevent saline water rising into the root zone. This problem is water from the sub-soil is not sufficient to prevent saline water rising into the root zone. This problem is very common in arid and semi-arid regions where leaching of salt is poor due to lower rainfall; where there are strongly saline sub-soils formed from marine deposits or where irrigation changes water tables and salt flow; also due to excessive evapotranspiration in these regions, the secondary salinization is and salt flow; also due to excessive evapotranspiration in these regions, the secondary salinization is and salt flow; also due to excessive evapotranspiration in these regions, the secondary salinization is and salt flow; also due to excessive evapotranspiration in these regions, the secondary salinization is and salt flow; also due to excessive evapotranspiration in these regions, the secondary salinization is

becoming important factor for salinity [35]. All soils contain some water-soluble salts. Plants absorb essential nutrients in the form of soluble salts, but excessive accumulation strongly suppresses the plant growth. Salinity not only decreases the agricultural production of most crops but also effects soil physicochemical properties, and ecological balance of the particular region. The impacts of salinity mainly include the low agricultural productivity, low economic returns and soil erosions [13]. Salinity effects are the results of complex interactions among morphological, physiological, molecular and blochemical processes including seed germination, plant morphological, physiological, molecular and blochemical processes including seed germination, plant

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An Approach of Water Conservation in Agriculture By Mulching, in Arid and Semi-Arid Regions of Rajasthan, India

Poonam Poonia, Sangeeta Parihar

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VBSTRACT

on various types of mulching to use to conserve soil water in agricultural practices especially in arid and semi-arid climatic conditions.

Keywords Conservation, Infilteration, Mulching, Runoff, Water.

NOLLODUCTION

problems of soil erosion and salinity. Therefore, the Also, over irrigation of farmland is causing the duction but these also causes threats on soil health. fertilizers and pesticides so to increase the crop pro-(Li et al. 2017). The farmers use excess quantity of agricultural production in arid and semi-arid regions for the scarcity of water resources which check the sidiznote and uneven rainfall patterns are responsible ance and acute water deficit. Further, enhanced global evapotranspiration of 2,000 mm, a negative water baland high-velocity wind causing an average potential rainfall, high summer temperature, low humidity semi-arid regions are usually with low and erratic state (60-75%) is arid or semi-arid. The arid and complex in arid and semi-arid regions. Most of the Rajasthan. Water scarcity problem becomes further pressure on the fragile water and land resources of of the livestock populations have put tremendous gnilduob a bra noiseluqoq namud adı ni azerran ture-based activities. In the last 50 years, a threefold livelihood of 70% of its people depends on agriculresources. The state is predominantly agrarian as the geographical area, but sharing only 1.15% of its water of 34.22 million hectares, i.e., 10.5% of the country's Rajasthan is the largest state in India covering an area

focuses and highlights the recent research progress under arid and semi-arid conditions. The paper viilideoilqqe and its and its applicability growth. This study discusses the importance of both croorganisms, soil nutrients and thus improved crop -im lios gnizearing of increasing soil mienhancement of soil structure and reducing erosion impact on soil by improving rainfall acceptance by mingates these problems. Mulching possess positive Application of mulching to agricultural land can niques to preserve and conserve the water resources. -doot bins even wan bind has binstrahan of leitnesse use of rain water. Under these circumstances it is to improve soil and water conservation and efficient climatic conditions the most important targets are ter and soil infertility is big problem. Under these Also, a high rate of evaporation, loss of run off waareas have insufficient and unreliable rainfall pattern. for the agricultural practices. Most arid and semi-arid Water is one of the most important inputs essential

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A Reviewon Plastic Pollutionin MarineEnvironment

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mendations for initiatives, policies and strategies. to mitigate and prevent pollution and the recompolicies and other actions that are taken worldwide

Keywords: Marine, Plastic, Pollution, Egestion.

INTRODUCTION

2016).It is estimated that about 70-80% plastic confreshwater, deep oceans and sediments (Alomar et al. of spheres, pellets, irregular fragments and fibers in 2016). The plastic pollutants are present in the form larger plastic waste) (Soloman and Palanisamict al. secondary micro-plastics (formed by degradation of cro-plastics (occur as micro-plastics by design) and micro-plastics categorized further into primary mi-Chem.Counc.2015). The smallest forms are called plastic pollutionin environment in various sizes (Am. packaging to construction materials resulting in from clothing, household and personal goods and are used in great number of applications, ranging high durability, light weight and strength. They 1990). Plastics are characterized by their low cost, with great demand over past three decades (Hansen life and due to which this material is continuing material is used for various purposes in everyday Plastics are synthetic organic polymers. The plastic

VBSTRACT

of marine litter, current knowledge on the effects of on the extensive literature on the sources and effects cies and enforcement. In this review paper, we reflect and efficient regional infrastructure, to adequate polidifferent levels, ranging from sound product design adequate metrics to guide and prioritise action at ment campaigns. Acting to tackle this issue requires due to technical limitations and uncoordinated assesscasting this issue is a complex and challenging task plastic debris and get entangled. Measuring or foreeffects were seen on marine biola as animals ingest risk for marine habitats. Hazardous and deleterious as a threat as well as eco-toxicological and ecological are the major among plastic debris and have emerged all major marine habitats worldwide. Micro-plastics nearly 50 years ago. Plastic debris has been found in Plastic pollution in marine environment was reported increase both in developed and developing countries. Production and distribution of plastics continue to

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Case Study

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Benefits of Mulching in Dry Land Agriculture

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ABSTRACT

Dry land agricultural crops are characterized by very low and highly variable and uncertain yields. Crop failures are quite common at these areas because of inadequate and uneven distribution of rainfall, prolonged dry spells during the crop period, low moisture retention capacity and low fertility of soils. To overcome the constraints of dry land agriculture, mulching is gaining a considerable attention worldwide as agronomic measures for water and soil conservation. Mulching is the process of forming the protective layer, organic and inorganic material, around the plant, it is beneficial for plant has the runoff of soil, reduces the weed growth inorganic material, around the plant, it is beneficial for plant prove water holding capacity of soil, conserve soil and also limits the evaporation of water. Mulching improve water holding capacity of soil, conserve soil and also limits the evaporation of weed growth and yield of crops. The paper has information of all moisture, and improves physical, chemical and biological properties of soil. Thus, enhances the soil fertility by the aspect of mulches with reference to their types, origin and beneficiary effects. The paper also discusses the advantages of these with reference to their types, origin and beneficiary effects. The paper also discusses the advantages of these mulches in terms of soil environment, water conservation, weed control, crop growth and yield of crops. The paper also discusses the advantages of these mulches in terms of soil environment, water conservation, weed control, crop growth and yield.

Key words: Mulch, Plant growth, Soil health, Water conservation

as a spread over the ground as Mulch (Jack et al. 1955). apparently referred to the gardener's use of straw and leaves German word "molsch" means soft to decay, which al. 2019). The word mulch has probably derived from the evaporation of moisture, and the growth of weeds (Kader et matters, to be placed around plants to prevent the Mulch is a protective covering of organic and inorganic is ancient traditional practice in dry land agricultural field. measures because of its low cost and rapid effect. Mulching gaining a considerable attention worldwide as agronomic overcome the constraints of dry land agriculture mulching is yield (food production) in dry areas limiting conditions. To soil and water management practices, that can enhance crop production is also increasing. Thus, there is need to adopt the increase in population in India, the need of food irrigation (Arun Karyayan 2009, Magray et al. 2014). With food grain production if we fully utilize the all the source of nation's food security. It may contribute up to 75% of total food grain production and thus play very important role in Dryland agriculture contributes about 44% of total national land 33% irrigated area are dry land and 67% are rain-fed. In our country, of 8 million 129 heetares of cultivated

Ryan 2004, Singh et al. 2004). Andhra Pradesh and the Tamil Nadu highlands (Rao and regions of Deccan in Maharashtra, the Deccan Plateau of Gujarat, Maharashtra and Madhya Pradesh, the rain shadow plains of Ganga Yamuna river basin, the central highlands of Rajasthan, the plateau region of central India, the alluvial in India includes the north western desern regions of Assessment 2005). Geographically dry-land agriculture area 28% falls in industrialized nations (Millennium Ecosystem of the global dryland are in the developing nations and rest are also low in nutrients and with high salinity. About 72% extreme problem of soil erosion. The soils of dry land area high day temperature, low humidity rate, high run off with characterized by high rate of evaporation, hot summers with rigation facilities to raise the crops. Dry lands are also approximately 750mm or less and where there is no Dry land is the areas which receives annual rainfall of

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8. Influence of Temperature on Daily Growth Rate of COVID 19 Cases in Rajasthan, India

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Poonam Poonia Department of zoology, Jai Narain Vyas University, Jodhpur Rajasthan (India). Abstract:

This research has objective to deduce the link among temperature and COVID-19 epidemic in Rajasthan province in India. This research paper attempt to analyses relationship of daily maximum and minimum temperature on corona We let both Maximum and Minimum Temperature as dependent variable and developed two Separate Regression Models considering daily Max. and Min. Temperature of JAIPUR and JODHPUR Cities which are highly Populated and Most COVID 19 infected. We explore for mathematical link & analysis for daily Most COVID 19 infected. We explore for mathematical link & analysis for daily



Using Statlog Heart Disease Database

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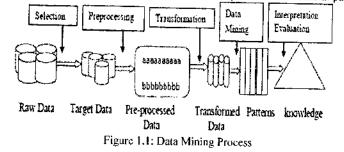
Abstract:- Data Mining (DM), frequently treated as synonymous to Knowledge Discovery in Databases (KDD) is actually a part of knowledge discovery process and is the process of extracting information including hidden patterns. trends and relationships between variables from large databases in order to make the information understandable and meaningful. The ultimate goal of data mining is prediction of unknown patterns and predictive data mining is the most common type of that which has the most direct real life applications. The process basically consists of three stages: (1) the initial data exploration, (2) model building or pattern identification with validation/verification process and (3) deployment of the data mining model. Therefore, in this research paper data mining techniques will be compared using the benchmark datasets. The different types of data classification methods and techniques are available such as Statistics, Visualization, Clustering, Decision Tree, Association Rule, Neural Networks, K-Nearest Neighbor Method and Genetic algorithms. The objective of this research paper is to do the comparative study and evaluation of decision tree, artificial neural network with the help of Statlog Heart Diseases Database collected from UCI machine learning repository. The advantages and disadvantages, of the data mining techniques depend on the capability and efficiency of the data mining techniques or algorithms to classify the large volume of database and predicting the relevant patterns for decision making process. The consequences of choosing any technique and the methods of implementation is very important factor. Data mining techniques such as Decision Tree and Artificial Neural Networks are used for the classification of Statlog heart disease datasets. These supervise machine learning algorithms are compared on the basis of classification accuracy and performance matrices.

Keywords- Data Mining, Knowledge Discovery in Databases, Statlog Heart Disease Database, K-nearest Neighbor Method, Genetic Algorithm.

INTRODUCTION L

Progress in digital data acquisition and storage technology has resulted in the growth of huge databases. This has occurred in all areas of human endeavour, from the mundane (such as supermarket transaction data, credit eard usage records, telephone call details, and government statistics and Electronic Health Records) to the more exotic (such as images of astronomical bodies, molecular databases, and medical test records). With the rapid development of advanced computing resources, Internet technology and information processing tools and techniques in the last several decades, an enormous amount of data in science and engineering has been and will continuously be generated in massive scale, either being stored in gigantic storage devices or owing into and out of the system in the form of data streams.

Data mining is an essential step in the knowledge discovery in databases (KDD) [18]. The terms of KDD and data mining are different; KDD refers to the overall process of discovering useful knowledge from data. Data mining refers to discover new patterns from a wealth of data in databases by focusing on the algorithms to extract useful knowledge [18]. In information era, knowledge is becoming a crucial organizational resource that provides competitive advantage and giving rise to knowledge management (KM) initiatives. The goal of pattern mining is to find item sets, sub sequences, or substructures that appear in a data set with frequency no less than a user-specified threshold. Pattern analysis can be a valuable tool for finding correlations, clusters, classification models, sequential and structural patterns, and outliers.



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Research Paper

Available online at: <u>www.ijarcsse.com</u> Performance Evaluation of Decision Tree and Neural Networks for Classification of Hematology Databases

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Abstract:-Clinical databases are playing the major role for prediction of many types of diseases. Through many types of clinical processes very large volume of pathological datasets are generated for the care of patients. Pathologists analyze these data or test results obtained with the help of many clinical processes and take cares according to the predicted symptoms of disease. These datasets are more helpful for the doctors and health cure centers to predict the relevant cause of diseases and to provide better medical treatment. To analyze and classify all these datasets is a very tedious process. Clinical datasets are very complex and require more efficient and accurate algorithms and data analyzing tools. Machine learning algorithms are used in many fields for the classification of large volume of data to generate the rules for building the knowledge base system. These machine learning algorithms are widely used in the medical field to build the disease diagnosis support system. This has become the emerging field of medical research. Many types of machine learning algorithms has been developed and deployed. In this research paper Hematology datasets which are very important for the pathologists to predict symptoms of many diseases. These datasets are classified as normal samples and abnormal samples using decision tree and neural networks. These machine learning algorithms are used for the classification of Hematology datasets. The classification performance of the decision tree and neural networks are evaluated on the basis of classification accuracy and performance matrices.

Index Terms:-Clinical databases, Pathological databases, Hematology datasets, Disease Diagnosis, Classification, Neural Networks, Machine learning

I. INTRODUCTION

Decision tree is a tree-shaped structure that represents sets of decisions. These decisions generate rules for the classification of a dataset. Decision Tree is a popular classifier which is simple and easy to implement [1]. It requires no domain knowledge or parameter setting and can handle high dimensional data. Hence it is more appropriate for exploratory knowledge discovery. It still suffers from repetition and replication. Therefore necessary steps need to be taken to handle repetition and replication. The performance of decision trees can be enhanced with suitable attribute selection. Correct selection of attributes partition the data set into distinct classes. A decision tree is a classifier expressed as a recursive partition of the instance space. The decision tree consists of nodes that form a rooted tree, meaning it is a directed tree with a node called "root" that has no incoming edges. All other nodes are called leaves (also known as

Neural networks process information in a similar way the human brain does. The network is composed of a large number of highly interconnected processing elements (neurons) working in parallel to solve a specific problem. Neural networks learn by example. They cannot be programmed to perform a specific task. The examples must be

useful time is wasted or even worse the network might be functioning incorrectly. An Artificial Neural Network (ANN) is an information processing paradigm that is inspired by the biological nervous systems, such as the brain. [2].

The key element of this paradigm is the novel structure of the information processing system. It is composed of a large number of highly interconnected processing elements (neurones) working in unison to solve specific problems. ANNs, like people, learn by example. An ANN is configured for a specific application, such as pattern recognition or data classification, through a learning process. Artificial Neural Networks (ANN's) have been used widely in many application areas in recent years. Most applications use feed forward ANN's and the backpropagation (BP) training algorithm. There are numerous variants of the classical BP algorithm and other training algorithms. All these training algorithms assume a fixed ANN architecture.

II. DECISION TREE ALGORITHM FOR THE CLASSIFICATION OF HEMATOLOGY DATASETS

Before constructing and using the Decision Tree algorithms to classify the databases, a Relevance Analysis of the features of collected databases is performed. Relevance Analysis aims to improve the classification efficiency by



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Predicting Consumer Behaviour Using Artificial Neural Network

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Abstract: Artificial Neural Networks' (ANNs), a computational model inspired by the architecture of the human brain, exhibit certain features such as the ability to learn complex patterns of information and generalize the learned information They are used for a number of data analysis tasks such as prediction, classification and clustering. They can operate even with partial and noisy information. In this paper, an application of ANN for predicting consumer behaviour has been discussed. It helps marketers to understand how consumers behave from alternatives (like products, brands and the like) and how consumers are influenced by their environment (reference groups, their family, salespersons and so on). Consumers' buying behavior is influenced by their cultural, social, personal and psychological factors. Most of them are uncontrollable and beyond the hands of marketers, but they have to be considered while trying to understand the complex behaviour of consumers. This paper is focused to understand the behaviour of consumers towards the purchase of two-wheelers by using an artificial

Keywords: Artificial neural networks, consumer behaviour, prediction.

I. INTRODUCTION

Neural Networks are massive parallel distributed processes that have a natural propensity for storing experiential knowledge and making it available for use. Neural Networks are powerful data mining and modeling techniques that are capable of capturing and identifying complex relationships by input/output mechanism. The greatest advantage of Neural Networks is its ability of learning both linear and non-linear relationships in the modeling dataset. Since the development of ANNs is inspired from the human brain, it resembles the brain in two respects:

- Knowledge is acquired by the network from its environment through a learning process, i.e. learn from examples. Inter - neuron connection strengths, known as synaptic weights, are used to store the acquired knowledge. The accuracy of the acquired knowledge increases as the number of examples increases.

Based on connection methods among the neurons and the information flow directions in the network, neural network models can be divided into two kinds. Firstly, the feed forward neural network that has only forward information transfer but no feedback information. Second, the feedback neural network that has not only forward transfer of information but also reverse transfer (feedback) information. In this paper, a feed forward and back propagation neural network is used.

II. PREDICTING CONSUMER BEHAVIOUR USING NEURAL NETWORK

For predicting purchase behaviour of the consumers of two-wheeler companies, a survey was conducted which involved 400 consumers from different areas of Jodhpur city. The questionnaire used for the survey consists of 26 questions for collecting detailed information about consumers and five leading two-wheeler companies. For the survey data, a neural network has been developed which takes the 26 variables as input and predict the choice of the consumer. The variables considered for predicting the consumer behaviour are monthly income, profession, source of purchase, decision maker for purchase, purchase by cash or loan, availability of service provider, after sales service, before sales service, infrastructure, price satisfaction, less maintenance requirement, style, durability, mileage, easy driving, brand reputation, colour, special offer, exchange offer, special gift, cash discount, mileage after purchase, availability of service provider after purchase, price satisfaction after purchase, after service satisfaction, on road pickup and maintenance service.

The descriptions of the variables including their role, type and code are shown in Table 1.

Table 1: Description of Variables

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Research Issues in Object Distance Estimation Using a Laser Pointer and a Webcam

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Abstract - The depth perception of objects in a scene is the primary research objective of the machine vision system. It has many industrial applications, such as robot navigation, scene understanding, metrology, etc. In this paper, some issues of low cost image processing based distance estimation systems are described. The low cost systems use commonly available laser pointer pens and a web camera. These systems are based on the principle of triangulation along with the perspective projection and the fact that light travels in a straight line. The paper presents a prototype system of a laser range estimation system consisting of a laser light pen and a webcam. The main contribution of the paper is a simple procedure for the system calibration and the camera parameter estimation. The system is implemented in the Matlab environment and gives good results.

Keywords-depth; camera calibration; perspective projection; laser spot.

1. INTRODUCTION

Distance estimation of various objects around us is essential for our daily activities, especially for our collision free navigation. There are currently three leading principles used for distance estimation: (1) time of flight, (2) stereo vision, and (3) monocular vision. In the time of flight system, the travel time of a wave from the source to the object and back to the receiver, for example the ultrasonic wave, is used to estimate the distance between the source and the object. This method is sensitive to the surrounding noises. The stereo vision system, which imitates the human vision system, evaluates the distance using the spatial disparity of an object point in two images (captured using a pair of cameras) with the triangulation method. The method is capable to work in any environment, but it is computationally very expensive. Further, the point correspondence problem, i.e. finding the locations of the projections of a scene point in both images, is practically very difficult to solve for real life stereo images in varying lighting conditions [1].

Humans successfully use various clues, such as texture variations, texture gradients, occlusion, known object sizes, haze and defocus, to judge depth from monocular images [2]. However, it is not possible to estimate distances from a single image without additional assumptions and information. For example, in an image of a clear blue sky with a patch, it is difficult to tell if this patch is infinitely far away (sky). or if it is a part of a blue object[2].

Due to ambiguities like these, one needs to look at the overall organization of the image to determine depths [2]. As observed by [2], the further difficulty with the monocular clues is that most of these monocular cues are global properties of an image and cannot be inferred from small image patches. For example, occlusion cannot be determined if we look at just a small portion of an occluded object.

To overcome the above difficulties in estimating depth from a single image, many researchers proposed to use some sort of projections of known structures before capturing the image [3]. These projected structures work as additional clues to estimate the distance of objects in a scene.

The present work extends the work presented in [3] by incorporating a low cost solution to calibration of the system and a simple procedure to calculate camera constant. The work presented in [3] is specific to the underwater distance measurement system, hence uses a sophisticated camera and high power laser rays. In contrast to [3], present work uses a commonly used webcam and a laser pointer pen used in our daily power point presentation.

The remaining part of the paper is organized as follows. Section 2 explains the working principle of the proposed system. Section 3 explains the experimental setup along with the alignment and calibration mechanisms. Section 4 presents results obtained by the setup. The final section presents conclusion followed by the relevant references.

II. WORKING PRINCIPLE

The proposed system is based on two well established facts: (1) the fact that as an object moves away from a camera, it appears smaller in the image captured by the camera and (2) the fact that light (laser) travels in a straight line. The fact one alone cannot be used for estimating objects distances using image processing as sizes of scene objects are not known in priori. As can be seen from figure I(a), objects of different sizes located at different distances appear of the same size. In figure1(a), the object AB and object CD are of different heights (sizes) and are placed at different depths, but the images of both the objects are same in size, as shown by EF. Hence, the image size of an object alone cannot be used to estimate depths. However, it is possible to estimate the distance of an object if the size of the object is known. To simulate an object of known size in a scene, a laser ray parallel to the camera axis is projected on the scene object. Since the camera axis and the laser ray are parallel to each other, the distance between the center of the image and the dot created by the

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A Comparative Study of Multilayer Perceptron, Radial Basis Function Networks and logistic Regression for Healthcare Data Classification

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Abstract- The Healthcare databases are becoming more important nowadays. Many Healthcare institutions are maintaining the large volume of healthcare databases to provide the best clinical services and insurance claims. The profits of Healthcare insurance companies are totally depending on the care of their customers. It is predicted by the healthcare department of United States of America that the early detection of any disease and its cause is very important strategy to save the big amount of insurance claim. Therefore Healthcare data classification approach has become the dominant process to save the big amount of budget allocation for the government sector. There are many types of classification approaches used for classification and prediction. In this research paper mainly multitavered Perceptron, Radial basis function networks and Logistic Regression are used to classify the Healthcare databases and on the basis of classification trends the decision are taken. All these approaches of data classification are covered. In this paper.

Index Terms-Healthcare databases, clinical services, data classification, classification and prediction, multilayered Perceptron, Radial basis function networks, Logistic Regression.

I. INTRODUCTION

Data Mining has become one of the prominent approaches of knowledge discovery in databases. There are many types of data mining techniques and algorithms are available for data classification and prediction. Finding the hidden patterns with help of data mining techniques are used in many fields. These techniques are playing the major role in banking data classification, Healthcare data classification, Fraud detection, spam detection and many other fields. To build the efficient data classification model is a very typical task. In this process many approaches of data cleaning, transformations are used. The healthcare databases are more complex and sophisticated machine learning approaches are used for better classification and prediction. The selection of a particular data classification approach is not an easy process. The selection is mainly based on the nature of the data. There are basically two machine learning approaches are used. Supervising learning and unsupervised learning. Multilayer Perceptron. Radial basis function networks and logistic Regression are the best supervise machine learning techniques. With help of these methods large volume of databases can be classified. Data are collected, cleaned and transformed in a suitable format for the classification. Multilayer Perceptron (MLP) network models are the popular network architectures used in most of the research applications in medicine, engineering, mathematical modelling. In MLP, the weighted sum of the inputs and bias term are passed to activation level through a transfer function to produce the output, and the units are arranged in a layered feed-forward topology called Feed Forward Neural Network (FFNN) [1].

The idea of Radial Basis Function (RBF) Networks derives from the theory of function approximation. In general, a function approximation problem asks us to select a function among a well-defined class that closely matches ("approximates") a target function in a task-specific way [16]. Radial basis function networks (RBF, [1]-[4]) are used for classification. Here, these neural networks are trained to estimate posterior probabilities of class membership by means of mixtures of Gaussian basis functions and hyperplanes. From a structural viewpoint, RBF networks are closely related to direct kernel methods [5] and support vector machines (SVM) with Gaussian kernel functions [1], [6]. Logistic regression is the appropriate regression analysis to conduct when the dependent variable is dichotomous (binary). Like all regression analyses, the logistic regression is a predictive analysis. Logistic regression is used to describe data and to explain the relationship between one dependent binary variable and one or more metric (interval or ratio scale) independent variables. Standard linear regression requires the dependent variable to be of metric (interval or ratio) scale. Logistic regression assumes that the dependent variable is a stochastic event. That is that for instance if we analyze a pesticides kill rate the outcome event is either killed or alive.

Since even the most resistant bug can only be either of these two states, logistic regression thinks in ikelihoods of the bug getting killed. If the likelihood of killing the bug is > 0.5 it is assumed dead. If it is < 0.5 it is assumed alive[7].

II. LITERATURE SURVEY

A good deal of effort has been made in the recent past by researchers in their attempt to develop the computational intelligence models with an acceptable level of classification accuracy. It is fount through literature review that Radial @IJAERD-2016, All rights Reserved 408



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IMAGE CLASSIFICATION WITH DEEP LEARNING BASED ON DIFFERENT CONVOLUTIONAL LAYERS USING TENSORFLOW

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ABSTRACT

Deem learning is the subfield of machine learning which uses neural networks that insmired by the structure and functioning of the human brain. Deem learning is a new ammoach for data analysis and mrediction; it has become very monular recently. Deem learning has achieved much higher success than machine learning in many ammlications, one of the reason for this is, that machine learning not able to mrocess large amount of data effectively as well as it also not able to extract the features from the data automatically. Deem learning is being recognized as an essential tool for artificial intelligence research, with various ammlications in several areas such as smeech recognition, object recognition and image classification. In matricular, Deem Learning is mreferred in the classification of images, because it can movide efficient results. In this mamer, a deem learning convolutional neural network based on Tensor Flow and Keras is demloyed for 2D Image Classification, using animal dataset. In this study, we used Tensor flow, one of the most nonular Python mogramming language libraries for deem learning to classify Images and signoid classifier and Recitied Linear Unit (ReLu) function for deem learning convolutional neural network. At last, the each image features are trained with convolutional neural network for image classification. The mromosed ammoches is commared for one and two convolutional layers on CPU system and finally we conclude that image classification with two convolutional layers gives better validation accuracy.

KEYWORDS-

Deeπ Learning; Tensorflow; Keras; Conolutional Neural Network; ReLu; Sigmoid Classifier; Image Classification

1.INTRODUCTION

Deeπ learning is a new aππroach for data analysis and πrediction; it has become very ποπυlar recently. Deeπ learning is being recognized as an essential tool for artificial intelligence research, with various aππlications in several areas such as smeech recognition, object recognition and image classification [3]. For Classification πroblems, more accurate values can be obtained using Deeπ Learning instead of Machine Learning.

Deeπ Learning ćan be ćlassified into four τγπεs: Deeπ Neural Network (DNN), Convolution Neural Network (CNN), Rećurrent Neural Network (RNN) and Q-learning. These Deeπ Learning τγπes are raπidly evolving, with several software πaćkages including Theano, CuDNN, Caffee, and Keras [3].

By using a Convolutional neural network in deeπ learning, a model ćan be ćreated to enable πowerful and often ćorrećt assumitions by ćhanging various πarameters such as activation function and number of ćonvolutional layers. There are several libraries used in deeπ learning studies [2].

TensorFlow is one of the libraries used for image classification in deeπ learning. TensorFlow is an oπen-source software library develoned by the Google in 2015 for numerical comπutation. TensorFlow can deπloy RNN, DNN and CNN not only to multi core CPUs, but also to GPUs. It also summorts the AdaGrad, Dronout, and ReLu functions, which are very



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Comparative Study of MapReduce Frameworks in Big Data Analytics

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Abstract: Big Data is large and rapidly growing volume of information that is mostly untapped by existing analytical applications and data warehousing systems. One such example of this data is social networking information from web sites such as Facebook and Twitter. Most organizations now understand that if they capture all the data that streams into their businesses, they can apply analytics and get significant value from it. Big data analytics helps organizations harness their data and use it to identify new opportunities. That, in turn, leads to smarter business moves, more efficient operations, higher profits and happier customers. The volume of data with the speed it is generated makes it difficult for the current computing infrastructure to handle big data. To overcome this drawback, big data processing can be performed through one of the programming paradigm known as MapReduce. Typical, implementation of the MapReduce paradigm requires networked attached storage and parallel processing. Apache Hadoop is an open source platform which is used for storage and parallel processing of huge amounts of data and has been adopted by a number of organizations. The drawbacks and limitations in Hadoop led to the development of the next generation Hadoop called Apache YARN, in which the resource management component is separated from the programming paradigm and a number of programming paradigms beyond Map-Reduce frameworks are supported like Spark, Tez. Hoya, REEF etc. The most important features included were the HDFS High Availability, YARN and HDFS federation, besides some performance tuning. At the same time, Facebook which used Apache Hadoop for its storage and processing began to see issues as Apache Hadoop could not handle its scalability and processing needs. To address these issues Facebook modified the architecture of Hadoop to create a new framework called Corona. This paper compares three parallel programming frameworks - Hadoop, YARN and Corona based on various parameters such as Architecture, HDFS Federation, MapReduce

Keywords: Hadoop, MapReduce, HDFS, YARN, Corona

INTRODUCTION ľ.

Hadoop provides a distributed file system and a framework for the analysis and transformation of very large data sets using the Map-Reduce paradigm. An important characteristic of Hadoop is the partitioning of data and computation across many (thousands) of hosts, and executing application computations in parallel close to their data. A Hadoop cluster scales computation capacity, storage capacity and IO bandwidth by simply adding commodity servers. Hadoop clusters at Yahoo! span 25 000 servers, and store 25 petabytes of application data, with the largest cluster heing 3500 servers. One hundred other organizations worldwide report using Hadoop [1]. Apache Hadoop has two core components, the Hadoop Distributed File System (HDFS) [5] for storage which is open source versions of Google File System (GFS) [2] and the MapReduce [4] Engine for computation which is open source version of Google's MapReduce.

A Hadoop Map-Reduce cluster employs a master-slave architecture where one master node (known as JobTracker)

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manages a number of worker nodes (known as the TaskTrackers). Hadoop launches a Map-Reduce job by first

splitting (logically) the input dataset into multiple data splits. Each map task is then scheduled to one TaskTracker node where the data split resides. A Task Scheduler is responsible for scheduling the execution of the tasks as far as possible in a data-local manner. In a typical Map-Reduce job, input files are read from the Hadoop Distributed File System (HDFS).

Facebook initially employed the MapReduce implementation from Apache Hadoop. Over half a petabyte of new data arrived in the warchouse of Facebook every 24 hours, and adhoc queries, data pipelines, and custom MapReduce jobs processed this raw data around the clock to generate more meaningful features and aggregations. Facebook cluster had 100 PB of data and to process that it crunched more than 60,000 Hive queries a day. The data warehouse of Facebook grown by 2500x in the past four years. and was expected to continue growing with Facebook's

RESEARCH ARTICLE

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Efficiency Enhancing Resource Scheduling Strategies in Cloud

Computing

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Abstract:

The clouds have changed the patterns of traditional way of using the software and infrastructures. In cloud computing job scheduling is used to schedule certain jobs to particular resources at particular time. In this paper, some scheduling strategies are discussed which schedule computing resources in a way that providers achieve high resource utilization. low power consumption and users meet their applications performance requirements with

Keywords --- Scheduler, Virtual Machine, Round Robin,

I. INTRODUCTION

The enterprises can rapidly complete some business and reduce a lot of cost by using clouds. The cloud computing system is divided into consumers, service providers and resource providers, which is currently the major way to layer the cloud computing. The service providers want to minimize the cost of using the resources offered by the resource providers, and to reduce the response time for consumers. An application operated in the cloud consisting of one or more services which is sent to the service provider stating two main constraints, time and cost [1, 2]. Service/job scheduling is one of the most important methods to achieve these. The actual processing time is longer than the original estimated time because of delays occurring on the provider's side. As the cloud computing are primarily operated by the principle of paying by time, so the service provider want to reduce the delay and improve the quality of their service [3]. The ultimate goal of scheduling in cloud computing is to have efficient resource utilization.

II. SCHEDULING PROCESS IN CLOUD COMPUTING

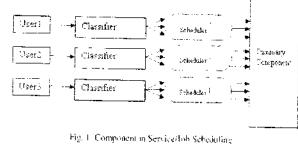
The process dealing with normal service requests from consumers is as follow:

- a) The cloud service provider receives the service request of user's [4]
- b) Execution of the receiving,
- The process of service/job scheduling.
- d) The process of resource aflocation.

Service/job scheduling work is carried out in the step(c). The service providers have a huge number of users: they have to deal with massive data [5]. which are more difficult to schedule. The requests from users must be scheduled efficiently, so scheduler needs to calculate a proper sequence to response those requests.

A. Main Components in Service/Job Scheduling

The main components performing Service/job scheduling are shown in Fig. 1, which is composed of classifier, scheduler, and summary component.



a) Classifier. This component receives all requests from consumers, analyzes them and

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Design and Calibration of an Experimental Setup for 3-D Reconstruction of A Scene from Stereo Images

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Abstract—The ultimate goal of a stereo vision system is to reconstruct 3D geometrical models of scenes. Once a 3D model is available, it can be used in many real life applications such as autonomous navigation of robots, metrology, artificial eyes, etc. This paper reports a design of an experimental stereo vision setup for generating 3D geometrical models of scenes from stereo pair images. It further reports the results of stereo camera calibration, intrinsic and extrinsic parameters, of the stereo system along with the calibration procedure. These parameters are used to rectify captured stereo pair images for generating the disparity map. The paper further describes the basic steps of 3D reconstruction from a pair of stereo image. Finally, the paper presents a reconstructed scene from the stereo image captured by the stereo system.

Keywords— Stereo vision, 3D reconstruction, camera calibration, disparity map.

I. INTRODUCTION

The stereo vision is based on optics of a set of two pin-hole cameras where three-dimensional real world scene is projected as two-dimensional images and a set of intelligent algorithms to interpret these images. In this, two images of a scene are simultaneously captured by our two eyes. These images are further processed by our brain to recreate the three-dimensional model for visualization, depth perception and many other applications. It has been theoretically established that a set of two projections of a scene captured by two cameras from two slightly different viewpoints are enough to reconstruct three-dimensional model of the scene. Physics of binocular vision system is simple and very powerful. As per pinhole camera image formation concept. it is found that the projection of a scene point in one image captured by one eye is slightly displaced in the image captured by the other eye. The displacement between the locations of a point in the two images is commonly referred as disparity and it is inversely proportional to distance between scene point and eyes. This is the fundamental mechanism used by the stereo vision system to reconstruct the scene and depth perception. The perception of depth which is so intuitive in humans and other animals is eluding researchers in computer vision from past few decades to develop visual perception capabilities in machine.

The ability of a machine to reconstruct a 3D scene from 2D images is extremely useful for many applications in science and industry. One such application is robotics/machine vision where proper distance estimation is A. K. Verma Dept. of P&I Engineering, Faculty of Engineering J.N.V. University, Jodhpur Rajasthan.India

important for obstacle avoidance. Other applications include automatic navigation of mobile robots in an environment where human intervention is dangerous or is unreachable and automatic driving and navigation of road vehicles. The stereo vision is also useful for accurate human face recognition system, reconstructing 3D environment for path planning, retrieving a 3D object, creation of 3D maps and many other applications in engineering and medicine where human vision like capability is required.

Currently, active sensing technologies such as SONAR (Sound Navigation and Ranging), LIDAR (Light Detection and ranging), structured light etc. are used for automatic navigation and other vision applications. These methods are based on emitting energy into the environment and analyzing the reflected pattern. Unfortunately, such techniques are invasive and have limited range, and thus have a restricted application domain [1]. Further, they require special purpose hardware (laser projector) that is bulky, expensive and power consuming. Besides, these methods are sensitive to the reflection properties of the elements in the scene. Passive sensing approaches, such as multi view stereo vision are robust and very cheap alternatives because only cameras (two in case of binocular stereo) and a computer are required and no energy emission is involved. However, this technology is in its infancy and requires extensive research to make it a commercially and technically viable alternative to above mentioned methods. Specific issues of concern are computational efficiency and improper reconstruction near object boundaries and texturcless areas [2].

In this paper, the design of an experimental stereo camera setup for acquiring stereo pair images is presented. It further reports the results of stereo camera calibration in the form of intrinsic and extrinsic parameters of the stereo system along with the calibration procedure. These parameters are used to rectify the captured stereo pair images for generating the disparity map. The paper also describes the basic steps of 3D reconstruction from stereo images. Finally, the paper presents a reconstructed scene from stereo images captured by the stereo system using the disparity map generated by the algorithms developed by the authors in their earlier work [3-4].

II. RELATED WORK

The major challenge to obtain 3D reconstruction of a scene is to generate an accurate disparity map in real time.

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Development of an Intelligent Database System to Automate the Recognition of Machining Features from a Solid Model Using Graph Theory

Rachna Verma and A. K. Verma

Abstract-Automatic recognition of machining features is essential for the integration of CAD and CAM. Graph-based recognition is the most researched feature recognition method as the B-Rep CAD modelers' database uses graph to store the model data. A graph-based feature recognition system uses attributed graphs to store CAD models as well as machining feature templates. The graph isomorphism is used to extract features in the model graph and template graphs. There are two main research issues in this system- (1) Efficiently recognize the features as the graph isomorphism is computationally very expensive and (2) incrementally expanding the feature template database to include new features, without any structural change in the recognizer. In this paper, the application of feature vectors (a heuristic developed by the authors that converts a feature graph into a unique vector of integers, irrespective of the node-labeling scheme used by B-Rep modelers), to automatically expand the recognizer's feature template database, is presented. It facilitates automatic inclusion of new features in a feature database, without requiring any additional programming effort from the user or any changes in the structure of the recognizer. The proposed system has been implemented in Visual C++ and ACIS solid modeling toolkit. Further, the proposed system is intelligent as it has the capabilities to learn from the examples to incrementally build the feature database.

Index Terms—Machining feature, feature recognition, graph matching, solid model.

I. INTRODUCTION

An intelligent database is a full-text database that employs some artificial intelligence to return the most relevant information possible requested by the user depending on the context. This is in contrast to a traditional database, which is searchable only by keywords and verbatim phrases with some relational operators. In this paper, definition of intelligent database is extended to include geometrical data along with the textual data. Further a system is presented that interact with this raw geometrical database to extract useful machining features for automated manufacturing of the various parts. The manufacturing process and operation selection is highly dependent of the shape of the part to be produced. Since there are infinite possibilities of shapes it is

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not possible to create a predefined library of it, hence shapes are stored in the solid model database in terms of low level geometrical entities such as vertex, edges and faces in the form of a graph or in some other suitable structure. Hence there is a requirement of a system that can extract patterns in this low level database that can be used to automate the manufacturing of the given shape. There are a number of techniques used for this purpose but graph-based recognition is the most researched feature recognition method due to sound mathematical background of graph theory and a graph's structural similarity with B-Rep CAD modelers' database. A graph-based leature recognition system represents geometry and topology information of a part using a graph structure. The graph carries all the useful information of part features as certain attributes assigned to its arcs and/or nodes. This explains the inherent advantage of B-Rep-based solid models over others in graph-based feature recognition, Pre-defined manufacturing features, known as manufacturing primitives are also represented by similar graphs. Graph isomorphism is then used to extract features.

A feature recognition system uses a pre-defined database of feature templates. Thus, a simple mechanism is needed to define new features and expand the template database to include user-defined features without any structural change in the recognizer. This led to development of various methods to represent features. Pratt [1] proposed a non-manifold feature representation scheme using B-Rep for volumetric features. He introduced the concept of implicit and explicit feature representations. In explicit representation, a full geometric shape is defined, while in implicit representation, minimal information is used to define the feature but other details have to be computed when needed. Shah and Rogers [2] and Wang and Ozsoy [3] used hybrid CSG and B-Rep schemes for feature representation. None of these schemes, however, is suitable for feature recognition as the B-Rep or CSG representations of a shape are not unique.

The ASU feature test bed [4], a system developed by Laakko and Mantyla [5], and STEP [International Standard for Exchange of Product data] all use feature definition languages to define new features [6].

In this paper a heuristic has been reported that converts a feature graph into a vector of integers, called feature vector [7], [8]. A feature vector uniquely represents a feature graph. irrespective of the node-labelling scheme used by B-Rep modelers. It can be generated automatically from the modeler database. Its usage is intended to reduce the graph matching time complexity to a polynomial of order three. It also facilitates automatic inclusion of new features in a feature

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Security Keys: Modern Security Feature of Web

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ABSTRACT

Security providing devices that are used to protect against multiple threats like man-in-the-middle attack and phishing are known as "security keys". With the help of security keys, user can register bimself with any kind of online services that works with this protocol. If we install these security keys in some devices, deployment, implementation and use becomes very easy. We can also see the security keys in some browsers like chrome, Mozilla, even in some online services as well. These keys provide more satisfaction to user with the help of higher security level. This work is all about security keys which are second-factor devices that are used to improve the state of the art for authentication purpose for real consumers in terms of privacy, security, and usability.

Keywords

Authentication, client, keys, signature, registration

1 INTRODUCTION

There are many research papers which have been proposed to work on some other security feature rather than passwords. But fill no such efforts is successful. Even most of the service providers works on password-based authentication with one other feature i.e. OTP (One Time Password). One Time Passwords also not provide complete security in some of the common attacks. In this way deployment of OTPs is limited in case of reliability and security perspective. Each and every client who is working on the internet wants security of information but sometimes he or she do not know that someone else may be a intruder is collecting the information. Information is an asset that must be protected [11]. At the same time, other authentication and sceurity factors related to response and challenge based protocols also suffer from some deployment problems. On the other hand smart cards and NID (National ID) eards require some pre-installation before use. Protocol is proven to be secure under CDH assumption in both the random oracle model and the ideal cipher model [8].Over forty years of research have demonstrated that passwords are plagued by security problems [2] and openly hated by users [3]

The security is achieved in the formal security model of Bellare et al. [9].This work is related to one other security factor provided by "Security Keys". These Security keys help the user in better way than OTPs in terms of usability, authentication, privacy etc. Here we will see how security keys increase the security level and how they provide satisfaction to user.

2 RELATED WORKS

Now we will have an overview of related work. Some schemes can do better than passwords on security as expected, given that inventors of alternatives to passwords tend to come from the security community. The concept of using combining functions to determine the combined effect of vulnerabilities in a network[12].Network security involves the authorization of access to data in a network, which is controlled by the network administrator [10]. Some schemes Varsha Gupta KIET Group of Institution, Ghaziabad

do better and some worse on usability -suggesting that the community needs to work harder there.[1] Before that let's see some basic knowledge that will help us to understand the work done.

One Time Passeodes: Even though One Time Passwords provides higher security than simple passwords, still we suffer from some problems. First, OTPs are vulnerable to some cyber-attack like man-in-the-middle attack and phishing. Second, OTPs require the availability of phones and internet as they are send via messages or emails. OTPs offer a sub-optimal user expertise as they typically need the user to manually copy codes from one device to a different. Security Keys are unit immune to phishing and man-in-the-middle by design: our preliminary study conjointly shows that they supply a far better user expertise.

Smartphone: Many of the efforts were taken to take the leverage of user's mobile phone to provide more security, whether it is in industry or academics. At the time of promising, they face lots of challenges: Like, on a general purpose, protection of application legic from malware is very difficult. Even though, sometimes user's phone gets unreachable or data connection problem is there or battery related issue

may be there. There is no requirement of batteries in security keys,

Smart Cards: Security Keys work into the what you have class of authentication schemes and have a detailed relationship to smart cards. Whereas Security Keys are often enforced on prime or top of a smart card platform like JavaCard, Security Keys defines a specific protocol for which smart cards area unit only one attainable implementation platform.

TLS: TLS is a Transport Layer Security (TLS) protocol which is used to provide security, data integrity and privacy between two communicating parties. Now a Days TLS is the only security protocol which is widely deployed today. On the other hand TLS is used for Web browsers and some other kind of applications which requires data to be securely transmitted over a network like VPN Connections, Voice over IP. File Transfer and instant messaging. TLS basically consists of two types of protocols:

- ELS Record Protocol and
- TLS Handshake Protocol

Protocol is proven secure Password-Based Group Key Exchange in a Constant Number of Rounds aga nst dictionary attacks under the DDH assumption. In the ideal-cipher and random oracle models [4]. Proposed the use of probability scores for each vulnerability to represent the Ekclihood that one attacker or the percentage of attackers that will exploit the vulnerability [13].Record protocol is used to provide secure connection and Handshake Protocol permits the client to authenticate server and vice versa.



Performance Analysis of AODV and AOMDV Routing Protocols Using ZigBee for Precision Agriculture

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Abstract - The need for intelligent farming especially in developing countries like India has grown to a greater extent. Moreover, the research in the area of ZigBee based wireless sensor network in precision agriculture, such as monitoring of environmental conditions like soil moisture content, monitoring growth of the crop, and automated irrigation facility has taken a new dimension. Manual collection of data for desired factors can be sporadic, time-consuming, noncontinuous and may produce variations from incorrect measurement taking, Wireless distinct sensor nodes can reduce time and effort required for monitoring (be environment along with the guarantying accuracy of data. The logging of data allows for reduction of data being lost or misplaced. The present study compares AODV and AOMDV routing protocols in mesh and star topology on basis of five parameters including Average Energy, Average Throughput. Average End-To-End Delay, Average Jitter and Packet Delivery Ratio. Furthermore, the study compares the two given routing protocols at different distances of 10 meters and 20 meters and at various numbers of nodes including 11, 21 and 31. The NS-2 simulator has been used for experimental setup in the study which provides an environment for the networks, topology and the nodes. The study aims at analyzing the derived results from the experimental setup and thereby suggesting the most suitable topology and routing protocol for developing an effective and efficient model in ZigBee for the real-time implementation in precision agriculture.

Keywords- Precision Agriculture; Wireless Senor Network; ZigBee; Routing Protocols; AODV; AOMDV; Star Topology; Mesh Topology

LINTRODUCTION

The current scenario of agriculture has drastically changed over the recent years. Today, agriculture routinely employs sophisticated technologies such as temperature and moisture sensors, robots, aerial images, smart power systems, Global Positioning System (GPS) technology and farm management software. These advanced devices, precision agriculture, and robotic systems help save time and money of the farmer and allow businesses to be more profilable, efficient and more environmentally friendly.

Precision agriculture (PA) is a farming management concept based on observing, measuring and responding to inter and intra-field variability in crops. The goal of precision agriculture research is to define a Decision Support System (DSS) for whole farm management with Dr. Alok Singh Gahlot Assistant Professor. Department of Computer Science and Engineering M.B.M. Engineering College, J.N.V. University Jodhpur, India

the goal of optimizing returns on inputs while preserving resources [1] [2]. Precision farming involves the application of technologies and principles to manage spatial and temporal variability that is associated with various aspects of agricultural production for improving the environmental qualities and erop performance, the logic behind the precision farming is that production inputs (fertilizer, seeds, chemicals, etc.) should be implied as and where needed.

II WIRFLESS SENSOR NETWORK IN PRECISION AGRICULTURE

The major technology that drives precision agriculture is Wireless Sensor Network. The sensor network can guide the farmers' attention towards the erop zones in need of nutrients, water, etc. The derived information can result in an increase in farming efficiency provided that the farmer receives it in time and has the capacity to act on the same. Several kinds of sensors can be consolidated into the sensor node, thus, the conditions of the soil and crops, including illumination, temperature, pests, humidity, crop disease, etc, can be monitored both - remotely and in real-time, WSN nodes are categorized into three types of network topologies. One is the star topology, wherein each node connects directly to a gateway. Another is cluster tree network wherein each node connects to a node higher in the tree and then to the gateway, and data is rotated from the lowest node on the tree to the gateway. Finally, to offer increased reliability, mesh networks feature nodes that can connect to multiple nodes in the system and pass data through the most reliable path available. This mesh link is

III STATEMENT OF THE RESARCE PROBLEM

often referred to as a router [3].

At present, automatic systems have few manual operations, insufficient flexibility, and inaccuracy. Therefore, agricultural field requires automatic control system in order to provide adequate irrigation to a specific area and detecting other plant needs right on time without naving to go in the field to check each plant individually. This study aims at proposing a based on the wireless sensor network for the control of various parameters of the irrigation system. In addition to the proposed system, the study uses ZigBee technology for the long distance communication

Analyzing Big Data Using Updatable Classifiers

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Abstract---There is exponential growth in amount of data that generated in various sectors like telecommunication, banking sectors etc. This enormous data has lot patterns and information stored in it. There is need to extract this intel from the data. Machine learning is used in identifying these patterns and the relation between inputs and outputs. Traditional algorithms like decision tree, neural network, random forest and others were used in machine learning models. But these models become inefficient with large number of instances and when input data varies with time like in stock markets, spams or biological viruses. In this paper, techniques to analyse big data using updatable classifiers in WEKA will be discussed. With the development in algorithms that automate adversarial sample generation like deep neural networks. There is an urgent need to fight these perturbations that are introduced to yield adversary selected misclassifications. The adversaries adapt to the data miner's reactions, and data mining algorithms constructed based on a training dataset degrades quickly. These kind chunks in classifiers help spammers and hackers to exploit our privacy. To help in these environments there is need for classifiers that can update themselves with evolving inputs.

Keywords—Updatable Classifiers, WEKA, Big Data, Adversarial Learning, Cyber Security, Spam Filters, Machine Learning.

1. INTRODUCTION

The industrial revolution was a major turning point in the history of humanity. It enabled businesses to be more productive, create more jobs, and raise the overall standard of living. Today, we are on the precipice of another revolution. With machine learning done right, organizations can develop insights instantly and dramatically grow their business.

Machine learning enables cognitive systems to learn, reason and engage with us in a natural and personalized way. Think Netflix movie recommendations, Internet ads based on browsing habits, or even stock trades — these are all ways machine learning is helping us navigate our world in powerful new ways. Learning here is not by remembering and following step by step

instructions but recognizing complex patterns and makes intelligent decisions based on data. The difficulty lies in the fact that the set of all possible decisions given all possible inputs is too complex to describe. To tackle this problem the field of Machine Learning develops algorithms that discover knowledge from specific data and experience, based on sound statistical and computational principles

With the exponential growth in the amount of data that is being generated there was a great opportunity to exploit that by finding patterns and relations between the data. Traditionally algorithms like decision trees, random forest, neural networks etc. were used and they are very efficient in what their results are but they have their limitations.

Problem with these algorithms were that they needed the whole data in the memory while training their models. Another limitation with these logarithms that they were prone to adversarial samples that are crafted to force a target model to

3.2 IB1/IBk

This algorithm does not built the model, it generates prediction

Classify them in a class different from their legitimate class which lead to many security issues like the failing of spam filters, image recognizers etc.

In this paper, we discuss how to apply concept of machine learning on Big data using updatable classifiers and using similar kind of algorithms in to deal with adversarial opponents. We will be using WEKA to analyze the working of updatable classifiers. Updatable classifiers do not need whole training data in memory while building the model they update the model tuple by tuple. They have the edge when dealing with inputs which change with time like spam mails, as models can then be updated seeing how it is performing on new inputs.

2. OPEN SOURCE DATA MINING TOOL: WEKA

Waikato Environment for Knowledge Analysis (Weka) is a popular suite of machine learning software written in Java, developed at the University of Waikato [9]. Weka is a work bench that contains a collection of visualization tools and algorithms for data analysis and predictive modeling, together with graphical user interfaces for easy access to these functions. Weka supports several standard data mining tasks, more specifically, data preprocessing, clustering, classification, regression, visualization, and feature selection. Weka's main user interface is the Explorer, but essentially the same functionality can be accessed through the component-based Knowledge Flow interface and from the command line. There is also the Experimenter, which allows the systematic comparison of the predictive performance of Weka's machine learning algorithms on a collection of datasets. In this paper we will be using explorer and the data generator of the WEKA tool [10].

3. UPDATABLE CLASSIFIERS

3.1 Naive Bayes Updatable

It is an incremental form of Bayesian networks, as it assumes that each feature is not dependent on the remaining features. The naive Bayes algorithm usually used for a batch learning, because when algorithm handles each training sample separately, it could not perform its operations well, described in. As per the characteristics of the incremental learning algorithm, the naive Bayes algorithm can be trained by using one pass only as per the steps below[3]:

- 1. Initialize count and totai=0
 - Go through all the training samples, one sample at a time.
 - Each training sample, t (x, y) will have its label associated with it.
 - Increment the value of count, as it goes through the particular training sample.
- 2. The probability is calculated by dividing individual count by the set of training data samples of the similar class attribute.
- 3. Compute the previous probabilities as the portion of entirely training samples which are in classy.

Classification can be made, its probabilistic model can directly handle situations where some data are missing.

Analysis of Consumer Behavior on SCM Related Factors Using Data Mining: A Case Study of the **Indian E-Commerce Industry**

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Abstract: The electronic commerce (e-commerce) supply chain management (SCM) or ECSCM is a new and rapidly developing area of study in India and abroud. At the same time there are several challenges faced by e-commerce. These challenges lead to customers refraining from its use due to poor experiences while shopping online. According to industry experts, these issues are - mostly pertaining to inefficient SCM. To confirm it, three hypotheses are proposed on discussions with the industry experts. First hypothesis states negative correlation of problems faced with overall customer satisfaction. Second states negative correlation of problems faced with the factors re-establishing trust. Third hypothesis states positive correlation of factor re-establishing trust with the overall satisfaction. A survey has been launched fetching replies from 401 Indian e-commerce consumers. The responses are processed by a statistical tool named Smart PLS 3.0 and the proposed hypothesis are checked by creating a suitable model. The results confirmed the three proposed hypothesis. The survey provides a clear understanding of demands, problems faced and solutions proposed by consumers themselves. The knowledge generated through this work could prove to be a win-win situation for both consumers and e-commerce companies. The consumers could be henefited by enhanced shopping experience according to their preferences. The e-commerce companies will be benefitted with better consumer loyalty which ultimately leads

Keywords: E-commerce, supply chain management, data mining, consumer behavior.

L. INTRODUCTION

Today all businesses are making their mark on internet to reach maximum number of customers, expanding business and generating larger revenues. But, with growth comes several challenges and issues. These obstacles if not handled properly, make the respective company loose customer loyalty and hence business. But, if these obstacles are well addressed, not only the business prospects and customer loyalty are maintained but it further attracts a larger number of new customers as well. These obstacles could be easily known by taking feedback from the customers. Considering the Indian e-commerce industry in this case, and after analyzing various

-research papers, the attention is focused on the supply chain management (SCM) related issues pertaining in this industry. Electronic commerce supply chain management (ECSCM) is a new and rapidly developing area of study in India and abroad given the exponential growth of e-commerce in every sector of the market. In conventional and e-business, its effective implementation could build trust for consumers or ineffective implementation could break that trust. Every company takes appropriate measures to curb out the elements of distrust.

Direct implementation inculcates various costs and risks involved for its success or failure, there the best options seems taking customer reviews for a lot and extrapolating the results. For this, a survey has to be launched asking questions to the customers which depict their view points. The obtained data cannot be processed through manual methods as it is large data, therefore data mining techniques are used for processing, translating, analysis and drawing useful inferences out of it,

A. Research objectives

The main objective of this study is to validate the conformance / non-conformance of the hypothesis which are stated as follows:-

- 1) Hypothesis 1: The problems faced by e-commerce customers tend to create a sense of distrust i.e. negatively affects overall 2)
- Hypothesis 2: The problems faced by e-commerce customers tend to decrease trust in factors that re-establish trust i.e. problems faced are negatively co-related to factors that re-establish trust. fache



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3D Trajectory Reconstruction of a Moving Object from a Stereo Video using Particle Filter

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Abstract: Moving object detection and tracking in videos is an actively researched area for the last two decades due to its practical applications in many areas, such as trajectory analysis of moving objects, making game playing robots, human computer interaction, etc. This paper presents an experimental study to reconstruct the 3D trajectory of a coloured moving object by combing particle filter and stereo vision. Although, the initial results obtained are generate more accurate trajectory.

Keywords: Object detection, object tracking, particle filter, 3D trajectory, Kalman filter, optical flow

I. INTRODUCTION

Detecting and tracking objects in videos and reconstructing their 3D trajectories are an active research area of computer vision. These technologies have many potential applications, such as analysis of sport videos to detect faulty motions of a sportsman, trace the trajectory of a ball, etc[1], understanding human postures to improve human machine interactions. prediction trajectories of moving objects to detect and avoid collisions, catching moving objects by robots, surveillance, etc. The reconstruction of the 3D trajectory of a moving object is impossible from a monocular video alone without making prior assumptions about the motion of the object [2]. Biological and artificial systems use binocular stereoscopy to calculate the 3D co-ordinates of a scene point by utilizing the disparity in the projections of the scene point in the two views captured by a pair of two cameras positioned side by side at a distance. However, the calendation of disparities of all the points of a scene is a time consuming process and no real time solution is yet available for commonly available hardware. To efficiently reconstruct the 3D trajectory of a moving object, the combination of the stereo vision concept and moving object detection techniques, such as optical flow, background subtraction, particle filter, Kalman filter, etc. can be combined. The combination reduces the correspondence matching to only objects of interest, making the process more efficient. In this paper, the particle filter object tracking concept is combined with the stereoscopy concept to efficiently calculate the 3D trajectory of a moving object from a stereo video. The remaining part of the paper is organized as follows: section 2 reviews the related work. It introduces the basic concepts of stereoscopy and gives an overview of the particle filter object tracking concept. Section 3 describes the proposed system. Section 4 presents some experimental results and finally, section 5 concludes the paper.

II. RELATED WORK

Vision based object tracking has been actively researched for the past three decades. However, most of the research is limited to monocular videos, which alone is insufficient to create the 3D trajectories of the tracked objects in a scene without relying on assumptions about the scene that are too strong for any practical application [3]. To overcome the inherent limitations of monocular vision to recreate 3D trajectory, many researchers proposed to use stereoscopy. Harville [4] and Zhao et al [5] proposed to use dense stereo and static background model to recreate 3D trajectories of moving objects. Since they use dense stereo vision, the process is computationally inefficient to generate the trajectory in real time and their assumption of static background model also limits the domain of the object tracking.

Mittal and Davis [6] proposed to use region based stereo vision to track moving object. The method is more efficient than the methods proposed by Harville [4] and Zhao et al [5], but they also used the static background model. Hence, the method has the similar limitations.

Tsutsul et al [7] uses stereovision and optical flow to recreate the 3D trajectory of a moving person. The optical flow method is very sensitive to illumination change and require static background model. Zhongwei et al [8] used stereoscopy in combination with camshaft algorithm to reconstruct the 3D Trajectory. They used dynamic programming for the correspondence matching and disparity calculation.

Park at el. [2] used the multiple perspective projections of a scene to reconstruct 3D trajectory of moving objects. They used co-ordinate independent basis vectors derived from the stationary areas of the scene, which reduces the computational complexity of the trajectory reconstruction.

The method proposed in this paper is an extension of the method presented by Heath and Guibas [4] which uses sparse stereo vision and particle filter to reconstruct the 3D trajectory. In contrast to multiple stereo cameras used by

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A Review of Object Detection and Tracking Methods

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Abstract: Moving object tracking in videox is an actively researched area for the last two decades due to its practical applications in many areas, such as event analysis, human computer interaction, crowd analysis, etc. Extensive research reported some success applications in highly constrained domains, but there are still many challenges that need to be resolved, such as abrupt object motion, changes in appearance of the object, non-rigid objects, occlusion, illumination, etc. This paper presents a comprehensive review of various object tracking approaches reported in literature and proposes a new categorization to group various tracking approaches to streamline future researches. It also discusses, in detail, methods used in each category for tracking single and multiple objects. Finally, the paper concludes by setting directions for further research.

Keywords: Object detection, object tracking, particle filter, Kalman filter, background subtraction, optical flow

INTRODUCTION

Now a days, many researchers are actively involved in the development of computer vision systems that try to simulate the basic abilities of biological systems, such as the abilities to understand scenes, detect objects(static or moving), understand surrounding, recognize events, analyze crowd, count people, detect people and vehicles detection, etc. Object detection refers to finding an object of some interest in a scene, for example detecting people, vehicles, etc. in a scene. Object tracking refers to estimate the trajectory of a moving object in a scene, for example, tracking the trajectory of a moving car to find lane violation. For tracking objects, videos are generated either from static cameras, such as surveillance cameras, or moving cameras, such as cameras mounted on a mobile robot. In a static camera, the background is always static and objects move, while in a moving camera, objects move in a dynamic background.

In order to design a robust visual tracker, there are some fundamental problems, such as abrupt object motion, changes in appearance of the object, occlusion, illumination, non-rigid objects and real time processing requirements, which need to be resolved. The appearance of the object often varies during tracking, for example appearance changes adaptability to appearance changes is necessary.

II. OBJECT TRACKING FRAMEWORK

A typical object tracking framework, as shown in Figure 1, generally consists of three modules: Object Detection, Object Modeling and Object Tracking. They interact with each other during a tracking process. These are discussed in detail in the following sections.

UI. OBJECT DETECTION

Object detection, a pre-requisite for initializing a tracking process, refers to locate the object of interest in every frame of a video sequence. There are generally two approaches of object detection strategies commonly used to initialize a tracking process: (1) manually locating the object in the first frame and let the system detects features, such as corners, to track the object in the next frame and (2) automatic detection of the object using predefined features, such as color. There are many techniques to detect moving objects: Background subtraction, Kalman filter, particle filter.

Background Subtraction [1-3] is widely used in video sequences having static background. The method segments the image into foreground and background. The foreground contains moving objects such as moving people, cars while the background contains static objects, like road, building, trees, stationary cars, etc.

In this technique, a reference background image is first captured when the objects of interest are not present in the scene. The moving object is detected by subtracting the current image frame from the reference background image. The resulting difference image has values below a predefined threshold in the background area of the current image except the area occupied by the object. The pixels where the difference is above the threshold are classified as foreground. As, in practice, the background of any scene gradually changes with time, the reference background image should be updated from time to time to avoid false detection of objects.

Temporal differencing [4] is a method most suitable for scenarios where the camera is moving. It detects objects by taking differences of consecutive frames (two or three), pixel by pixel. In a moving camera situation, the motion of the object are mixed up. Therefore, some researchers [2] proposed to estimated and adjust camera motion first and then apply the background subtraction method. The temporal differencing method fails to detect

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Comparative Performance Evaluation of Various Color-Based Object Tracking Methods

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Abstract – Extensive research in object detection and tracking has produced many techniques for detecting and tracking objects in videos. The most widely researched techniques include color-intensity based, particle filter based and optical flow based trackers. Each technique has its own merits and limitations. This paper presents a comparative performance evaluation of these leading object detection and tracking techniques. After a brief overview of various techniques, viz. particle filter. color-intensity based and color optical flow trackers, that directly or indirectly uses color for the purpose of object detection and tracking on a test video is reported in this paper.

Keywords - Object detection, object tracking, optical flow, particle filter, color-based tracking

I. INTRODUCTION

Object detection and tracking is one of the active research areas of computer vision. It has many practical applications, such as analysis of sport videos to detect faulty motions of a sportsman, tracing the trajectory of an object of interest, human computer interaction, target localization, event analysis, etc. Object detection refers to finding the object of interest in a scene while object tracking refers to locating the object of interest in successive video frames for generating the trajectory, for example tracking the trajectory of a moving car to find lane violation.

Object tracking is a challenging problem in a natural scene due to abrupt changes in object motion directions, changes in appearance of the object in different frames, object occlusion, illumination changes, non-rigid transformation of objects, noises in images, and computational complexity to meet real time processing requirements. A robust object tracker should be able to track single or multiple objects moving in a dynamic background. Typically, an object tracker consists of three modules [1]: Object Detection, Object Modeling and Object Tracking. During the last two decades, various object tracking methods have been emerged focusing on designing a robust tracker. A categorization of various tracking approaches is presented in [1].

This paper investigates comparative performance of some of the leading object tracking methods, viz. color-based method, optical flow method and Particle filter method, to track a red color object. These three methods are briefly discussed in the following sections for tracking primary color objects; their comparative evaluation in terms of performance is also presented. The results are reported for a test video captured by the author in common household lighting conditions.

The remaining part of the paper is organized as follows: Section 2 describes the basic work flow of a typical colorbased object detection and tracking system. Section 3 presents a brief description of color-intensity based object detection and tracking system developed by the author. Section 4 presents a color-based optical flow method, which is modified by the author to handle a dynamic background. Section 5 discusses the standard color-based particle filter method, which is commonly used by the researchers. In section 6, the results of the methods developed/modified by the author are evaluated and compared with the results obtained by the standard particle filter. Finally, conclusions are drawn and the direction for the future research is proposed.

11. COLOR-BASED OBJECT DETECTION AND TACKING METHODS

Color is one of the most important features of an object that is used extensively in literature to detect and track objects. The basic work flow in typical color-based object detection and tracking system is given in figure 1. Recent advances using color as a feature often use color histograms to model the object. Besides having low computational cost, color histogram distribution is robust against non-rigidity, scale and rotation transformation of objects.

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Detecting and Tracking a Moving Object in a Dynamic Background using Color-Based Optical Flow

Rachna Verma

Abstract— In this paper, a hybrid object detection and tracking system is proposed that combines object color and optical flow method to enable the optical flow method capable to track objects in a dynamic background. The proposed method uses the formula developed by the author to convert RGB images into corresponding intensity images that highlights the selected color in images and suppresses other colors. Thus, the object of interest is automatically detected without use of computationally expensive matching methods. This makes the overall process efficient. However, the proposed method is limited to only objects of primary color shades.

Index Terms-Object tracking, Object detection, Optical flow,

I. INTRODUCTION

Detecting and tracking moving objects in videos and reconstructing trajectories are an active research area of computer vision [1]. Many techniques, such as optical flow, background subtraction, particle filter, Kalman filter, have been developed for moving object detection and tracking in videos. Most of the researches in this area assume situations in which backgrounds are assumed to be fixed. However, most of the real-life situations have changing background. The ability to track a moving object in a changing background is a difficult problem. Detecting and tracking objects in a dynamic environment has many practical applications, such as video surveillance, human computer interaction, robot navigation in a dynamic environment, etc.

Optical flow is very effective in tracking objects in a stationary background, but its performance degrades to an unacceptable level in a dynamic background. It cannot tolerate even a slight change in lighting conditions. On the other hand, color-based techniques have some tolerance to changing background situations, but its performance degrades if backgrounds contain colors similar to the colors of moving objects.

In this paper, a new method is proposed that can detect and track a moving object in a changing background. The method combines color feature with optical flow. This combination makes optical flow adaptable to changing background situations. Traditionally, optical flow uses intensity image to detect the motion of a moving object in two consecutive

Manuscript received Nov, 2017.

Rachna Verma, Department of Computer Science and Engineering, JNV University, Jodhpur, Rajasihan, India video frames. However, intensity images generated by the popular RGB to intensity conversion scheme have no discriminating power to highlight a particular color. Therefore, in this paper, the new intensity calculation formula developed by the author [2] for converting an RGB image into an intensity image has been used, which facilitates detection of primary color objects more accurately and efficiently.

The remaining part of the paper is organized as follows: section 2 reviews the related work. It introduces, briefly, the optical flow object tracking concept and the new intensity conversion scheme. Section 3 describes the proposed system. Section 4 presents some experimental results and finally, section 5 concludes the paper and sets directions for the future research.

II. RELATED WORK

Vision based object tracking has been actively researched for the past three decades. Many techniques, such as optical flow, background subtraction, particle filter, Kalman filter, have been developed for moving object detection and tracking in videos. Each technique has some strength that makes it suitable in a particular situation. Readers can find overview of various methods and their merits and demerits in [3]. The optical flow method is one of the most researched methods for object detection and tacking as it is found to resemble to the animal and human visual systems.

The moving objects in a scene form dynamic patterns, known as the optic flow field, on the retinas of our eyes. These patterns contain a wealth of information about the world around, which help us to extract many useful information, such as the directions of moving objects, the distances to objects from us and their relative positions in the observed scene, etc. However, it is unclear how the visual system accomplishes this task [4]. Motivated from natural visual systems, researchers in computer vision have developed various methods to detect and track moving objects using the concept of optical flow. In the context to computer vision, optical flow is a velocity field associated with the change of the location of a group of pixels, assumed to be the object of interest, with certain brightness, under the assumption of brightness consistency, in two consecutive image frames of a video [5]. In other words, optical flow is the apparent motion of brightness patterns in two consecutive video frames. The assumption of brightness consistency, which is rarely observed in real life situations, is the major limitation of the optical flow method. Due to this assumption,

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Query Performance Analysis on Hadoop over Cloud Architecture

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Abstract: Big data Analysis is widely used now and a huge amount of data is being generated every second. This needs an efficient cloud infrastructure environment to process huge amount of data by using the Hadoop cloud environment; we can process this huge data in seconds. In this paper the Big Data processing tool as Hadoop is used to perform query execution in terms of processing time by using Hive. Datasets of two different sizes and varying number of nodes in a cluster are used to measure the performance. It is observed that query performance increases when processing some large datasets on increasing number of nodes.

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Index Terms - Big Data; Hadoop; Hive; Performance Analysis; Data Processing; Query Execution Time;

I. INTRODUCTION

The quick growth and development of technology and inventions in the area of computer science and technology requires the efficient use of data generated by these technologies. A large number of organizations utilize the services of data warehouse for the analysis of their data. These organizations use data analytics to make the decision for their growth. Thus, to make the accurate decisions we need to process data accurately. But the data sizes nowadays are growing and are available in peta bytes and that amount of data cannot be handled by using centralized server architecture.

With the introduction of the internet it improved the business growth at small scale. The big internet tycoons like Facebook, Google etc. are managing their data using Big Data technologies. Facebook is generating about 2-3 Terabytes (TB) of data per day [1]. The large amount of data and use of distributed computing creates a new set of challenges to manage and perform computational operations on data using data mining, machine learning and other data analytics approaches. A huge amount of time and cost is required for managing and utilizing the large amount of data. So efficiency is the key factor in data analytics.

The technologies related to data storage and analytics are growing rapidly which increases the trend of data analytics with more accurate and efficient way and the data processing cost has also been decreased in an organization. For the data processing a large amount of resources like computing power and data transfer capability has also been increased which made the traditional technologies and tools outdated. The new tools and technologies are being explored. Big Data [4] and Big Data analytics provides a good solution for processing the huge amount of data. Hadoop an open source software platform became a widely used solution to process and store Big Data in the data oriented enterprise/industries.

In this paper, the cloud environment such as Microsoft Azure HD Insight has been used to process data. HDFS and Hive [7], tools of Hadoop [5] has been used to store and process the datasets. In this research work we used datasets of size 2GB and 6GB to perform the data analysis. In the initial step all the required installation is done and then datasets are stored on azures storage engine. After that all the datasets are loaded in the Hive tables. Finally, a series of six different types of queries are executed on Hive. The execution is carried on the different sets of node of Hadoop cluster and results are analyzed.

II. BACKGROUND STUDY

A. Big Data and Analytics

The huge growth in data during the last decade in the world has introduced a new term Big Data in the technology field. The data which have been out of the limit of traditional system is often referred to as Big Data. To get some useful insights there is a need to process and analyze the huge amount of data has introduced a new form of data analytics called Big Data Analytics.

Big Data analytics uncovers the hidden patterns and other useful insights by analyzing the large amount of data. To gain insights in many businesses applications, increase the revenue and profit of many data analytics organization and to get competitive advantage over their rivals, organizations are using Big Data Analytics.

The characteristics of Big Data are mainly divided into four Vs i.e. Volume, Velocity, Varity and Variability. Volume means the size of the data. Velocity refers to the pace at which data is generated; Varity and Variability refers to the complexity and structure of data and different ways of interpreting it.

Query Execution Performance Analysis of Hive and Pig in Cloud Architecture

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Abstract—Cloud platforms require a skilled computing infrastructure. At this level, a large amount of data is generated in fractions of a second, so traditional computing techniques are not enough. Big data provides answers to such huge calculations and supports measurement storage based on application requirements. Big data is the next generation storage infrastructure. This paper examines the big data environments and compares data retrieval techniques. For comparative research, Pig and Hive techniques are chosen. These technologies provide effective data processing capabilities. Hadoop storage is designed for comparative research and then configures pig and hive with the help of the MapReduce framework. In addition, in order to evaluate the efficiency of query execution in terms of processing time, a list of similar questions is prepared and used for processing each query. Both technologies time as compared to Pig in library dataset.

Index Terms—Big Data; Hadoop; Hive; Pig; Performance Analysis; Data Processing; Query Execution Time.

I. INTRODUCTION

In order to rapidly develop technologies and inventions in the fields of computer science and technology, it is necessary to effectively use the data generated by these technologies. Many organizations use data warehousing services to analyze their data. These organizations use data analytics to make decisions for their development. In this way, we need to process the data accurately to make accurate decisions. But now the amount of data is increasing and is available in PETA bytes, and the centralized server architecture cannot be used to control the amount of data.

With the introduction of the Internet, it has improved small-scale business development. Large Internet giants like Facebook, Google, etc. are using big data to manage their data. Facebook generates 2-3 terabytes of data per day [1]. The large amount of data and usage of distributed computing presents a new set of challenges for managing and performing computational operations such as mining, machine learning, and artificial Intelligence. Managing and using large amounts of data requires a lot of time and cost so, efficiency is critical in data analysis.

The technology is rapidly increasing, which increases the domand of the users and increases the cost of data processing in an organization. A large number of resources (such as computing power and data transmission capabilities) in data processing have also increased, Journal of Statistics & Management Systems ISSN 0972-0510 (Print), ISSN 2169-0014 (Online) Vol. 21 (2018), No. 4, pp. 593–599 DOI: 10.1080/09720510.2018.1471264



Devanagri character recognition model using deep convolution neural network

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Abstract

In recent times, there has been a significant increase in the use of deep learning in the field of computer vision and image analysis. Deep learning is a subfield of machine learning which uses artificial neural networks that is inspired by the structure and function of the human brain. Identifying hand written text by machines has been achieved remarkable success with the use of artificial neural networks. In Optical Character Recognition for hand written text, the majority of work has been done for the popular languages such as English, Arabic or Chinese languages. There is very limited work in the literature for the handwritten character recognition for Devanagri characters. In this paper, we focus ou recognition of Devanagri characters using deep convolution neural networks. Devanagri lipi is responsible for twelve languages used in India. In this paper, we optimize the network by selecting best hyperparameters for the network. Experimental results show the effectiveness of the proposed approach on the benchmark dataset.

Keywords: Deep Learning, Convolution Neural Network, Optical Character Recognition, Activation Functions, Devanagri Characters

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OBJECT DETECTION AND CLASSIFICATION THROUGH DEEP LEARNING APPROACHES

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ABSTRACT-In this paper, we implemented the image classification and object detection. This paper presents a deep learning approach for traffic light detection in adapting a single shot detection(SSD) approach and image classification of two categories of bicycle by retraining inceptionv3 model both using an open source tool called TensorFlow Object Detection API. We reviewed the current literature on convolutional object detection and tested the implementability of one of the methods and discovered that convolutional object detection is still evolving as a technology despite that convolutional object detection has ourranked other object detection methods. To implement object detection and image classification there is free availability of datasets and pre-trained networks it is possible to create a functional implementation of a deep neural network without access to specialist hardware.

KEYWORDS-Object detection, Deep learning, Convolutional neural network, TensorFlow Object Detection API, SSD model, InceptionV3, InceptionV2.

I. INTRODUCTION

Classification of objects into their specific categories is often been vital tasks of machine learning. In recent years, deep learning has been utilized in image classification, object detection. To increase the performance of image classification deep learning uses a neural network with more than one hidden layer. For image classification and object detection one of the most frequently used deep learning neural network with more number of hidden layers is the convolutional neural network (CNN). CNN information gets directly from the image, so it eliminates manual feature extraction. There is a common problem in classifying image with deep learning, is lower performance because of over-fitting. To increase performance, and to prevent over-fitting we use large datasets. CNN have fewer connections and hyper parameter that make CNN model easy to train and perform slightly worse than other models [5].

Robotized driving on roadways is an effectively looked into issue which has prompted the rise of numerous driver help frameworks. Urban territories give another arrangement of difficulties which require more advanced calculations in different zones running from observation over conduct intending to impact shirking frameworks. One essential piece of recognition is the identification and classification of traffic lights. Traffic lights exhibit a testing issue because of their little size and high vagueness with different items introduce in the urban condition, for example, lights, beautifications, and reflections [7], [14].

Recent enhancements in object detection area unit driven by the success of convolutional neural networks (CNN). They're able to learn rich features outperforming hand stitched options. So far, research in traffic light detection mainly focused on handcrafted features, admire color, shape or brightness of the traffic light bulb. In this research work we present a deep learning approach for traffic light detection in adapting a single shot detection (SSD) approach. SSD performs object proposals creation and classification using a single CNN. The initial SSD struggles in sleuthing terribly tiny objects, which is essential for traffic light detection. By our variations it's potential to find objects a lot of smaller than 10 pixels while not increasing the input image size. As a result, we have a tendency to reach high accuracy [13].

In this paper, we performed two separate experiments, for the first experiment we are classifying images of bikes, we are taking two different categories of bike images for e.g. mountain bikes and road bikes and for the second experiment traffic light detection in an image and its classification. We have used TensorFlow object detection API to train and evaluate convolutional neural network, one of the most popular Python programming language libraries for deep learning. The flow diagram of Proposed Methodology is shown in Figure 1 and 2.

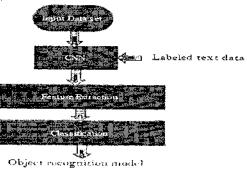


Figure 1: Training dataset

KNN Classification for the Face Spoof Detection

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Abstract- The face spoof technique was proposed to identify and detect the spoofed and non-spoofed images. The DWT technique is used to analyze the textual features present within the test images. There is a possibility that some exceptional disturbances are available like geometric disturbances and the artificial texture disturbances. The face spoof detection techniques are based on two steps, the first step is of feature extraction and second is of classification. The Eigen based technique is applied for the feature extraction and SVM classifier is applied for the classification. To improve accuracy of the face spoof detection SVM classifier will be replaced with the KNN classifier. The Comparisons are made to analyze the performance of the proposed algorithm and the existing algorithm in terms of accuracy and time of execution.

Keywords- Feature Extraction, SVM, KNN

I

INTRODUCTION

The process of producing input images in a particular place is called imaging. It contains a metric and topological edge which is used for image analysis and crack edge for creating structure between the pixels. Analysis shows that the intensity is varied from small neighborhood of pixel boundary. The pixel boundary is another significant topic used in image processing. The image is visible to computer through sinkhole. The processing is completely based on knowledge and execution [1]. It consists of human cognition abilities in order to make decisions according to the information provided. The image quality is used to assess the percentage of degradation. Image processing is defined as the process use to perform some operation on the images, which generate an enhanced version of the images or extract some features from it. It signal processing in which image act as the input and characteristic or features act as the output of that image. The

image similarities are significant as they are used to assist retrieval from image database. The original images are often degraded by errors called noises [2]. This happens at the time of image capture, transmission of images contents. The perception of human color adds another subjective layer on the top highlighting the physical properties of electromagnetic radiations. The object will be transferred between client and the server. It is responsible for graph storage analysis from resource images. Every node of graph works as the processing unit of the application. Face recognition is also one of the very widely used security purpose used technique. As the numbers of crimes are increasing day by day, so to maintain the proper check on the people such type of methods are employed on

various fields like banks, hospitals, industries and so on. There is huge success in this area, by applying them on several applications like human-computer interaction (HCI), biometric analysis, content-based coding of images and videos, and surveillance [3]. Face recognition is proved to be very difficult to imitate artificially, although there are certain similarities in some faces most probably due their age, gender, color. The biggest problem this method is facing is image quality, expressions, background and other climatic conditions. Face detection as the name suggests, it suggests where the face is located in an image. As it seems to be very easy task but in reality it is very difficult to detect images. We have to consider all the possible constraints like single face or multiple faces, image rotation, pose etc. this give rise to some false detection of an image, or it sometimes does not contain any image [4]. There are various types of techniques available for face detection. When someone tries to interferes in the face biometric system by presenting a false face towards the camera. It attacks on face recognition systems which involve all the artificial faces of authorized users to cleverly go inside the biometric security systems. These attacks are very easy to carry by just having printed photographs or digitalized images being displayed on the screen. If we want to differentiate between the real face features from fake faces, the face liveness technique is used. It aims at detection of physiological signs of life. Biometric technologies are used to measure and analyze human body characteristics [5]. It can be categorized into two parts, physical characteristics in which fingerprints, faces or iris patterns are used and then activity characteristics which includes voice signatures or strolling patterns. It is the most prominent challenge being varied in biometric systems. The variations involve chances of fraud which is most commonly known as spoofing attack. The stolen data will effectively ruin and mimicked by the adversary to have a unauthorized access to the systems. This technique is based on facial statistics in the light weighing physiological properties detection. Moreover, the false faces are of two types i.e. positive and the negative one. The positive faces are real faces and having restricted variation and negative includes spoof faces on images, dummy and so on. Spoofing attack is type of attack in which the attacker submits the fake identity and evidence to the biometric system in order to get access to the network. It is very easy for the attacker to generate attack in the face recognition system because the images and videos are easily available on the social networking sites [6]. The attacker can store images from the

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A Literature Survey on Automatic License Plate Recognition System (ALPR)

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Abstract- Automatic license plate recognition system is the optical character recognition which aims at extracting the number of license plate from a vehicle. In this paper we have discussed various existing ALPR systems, the basic algorithm used, the variations in the existing algorithm to improve the overall system. There are also a plenty of applications where this system could be used, among these criminal surveillance is one of the most wanted application. This system mostly concentrates on localization of license plates and then go on to extract the characters by using morphological operations such as dilation, eroding the image, dilating, filtering etc. All these morphological operations leads to the efficiency of overall system ANPR is used by police forces around the world for law enforcement purposes, including to check if a vehicle is registered or licensed.

Index Terms-Automatic license plate recognition, ALPR, Vehicle, optical character recognition, localization, surveillance system.

1.

INTRODUCTION

Automatic number plate recognition systems (ANPR) is based on the localization of license plate and recognition of characters by extraction. This whole problem is generally sub-divided into 5 parts:(1) image acquisition i.e. capturing the image of the license plate (2) pre-processing the image i.e. normalization adjusting the brightness, skewness and contrast of the image (3) localizing th license plate(4) character segmentation i.e. locating and identifying the individual symbol images on the plate,(5) optical character recognition. There may be further refinements over these (like matching the vehicle license number with a particular database to track suspected vehicles etc.) but the basic structure remains the same. Provide a means to overcome the drawbacks and deficiency of successful surveillance of the cctv cameras. The ANPR system is well developed in certain countries such as USA and Dubai, and existed from a longtime, but only in the late 90s it became an important application because of the large increase in the number of vehicles. The information extracted from the license plates is mainly used for traffic monitoring, access control, parking, motor way road tolling, and border control, making car logs for parking systems, journey time measurement for toll booth etc. by the law enforcement agencies. A guiding parameter in this regard is country-specific traffic norms and standards. This helps to fine tune the system i.e. number of characters in the license plate, text luminance level (relative index i.e. dark text on light back ground or light text on dark

background) etc. So the problem can then be narrowed down for application in a particular country. For example, in India the norm is printing the license plate numbers in black color on a white background for private vehicles and on a yellow background for commercial vehicles. The general format for the license plate is two letters(for state code) followed by district code, then a four digit code specific to a particular vehicle.

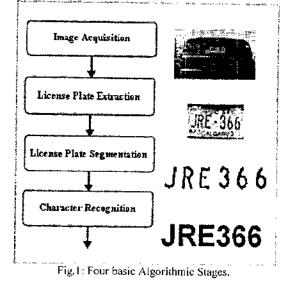
STEPS OF ALPR

The number plate background should not match the color of the vehicle It is a pattern with very high variations of contrast. If the number plate is very similar to background it's difficult to identify the location. Brightness and contrast is changes as light fall changes to it. The morphological operations are used to extract the contrast feature within the plate. The work is divided into several parts. The basic four stage algorithm for ALPR system is: Image acquisition

[].

License plate localization Character Segmentation

Character recognition



First step among the 4 basic algorithms is to acquire all the raw images of the number plate, then the images are converted into grayscale or binarization is done. After grayscale conversion De-noising of image is done. After reduction of

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A Hybrid Feature Extraction Approach for Finding Local Discriminative Coordinates for Face Recognition

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Abstract. Several techniques have been proposed for face recognition that use global and local approaches for finding most eligible features for classification. Generally, methods based on localized feature selection techniques are found to be more robust towards illumination, pose and expression variations. In this paper, author has proposed an architecture that uses wavelet decomposition and informational entropy for finding localized discriminative coordinates in the image space for face recognition. The identified coordinates are supplied to a Gabor filters based face recognition model for classification. The proposed system uses single image per subject for training database and is able to achieve a recognition rate of 92.5% with ORL face database.

Keywords: Discriminative coordinates · Face recognition · Gabor filters Informational entropy

1 Introduction

Among the widely used biometric identity systems, physiological methods (i.e. fingerprint, face, DNA etc.) are usually more stable because of their non-mutable properties (except in the case of severe injuries or medical interference). Face recognition is one of the few biometric methods that possess the merits of both high accuracy and low intrusiveness. For this reason, since the early 70's [1], face recognition has drawn the attention of researchers in fields from security, psychology, image processing and computer vision [2, 3].

Face Recognition, generally, refers to the process of identification of individuals from a database of digital raster images. A face recognition system can be, generally, divided into three parts: (1) Face Detection, (2) Feature Extraction and (3) Classification [4]. The detection step is to determine - whether any human faces appear in a given image, and where these faces are located at. The output of face detection is supposed to be patches containing each face in the input image -effectively processed to justify the scales and orientations of respective faces. These face patches are then processed in feature extraction step to obtain a low-dimensional unique representation of each face. The output is usually a fixed dimension vector or a set of fiducial points (i.e. their respective locations in face image) corresponding to each face image. At last, the

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COMPARATIVE ANALYSIS OF NON CO OPERATIVE AND CO OPERATIVE ROUTING PROTOCOLS IN UNDERWATER COMMUNICATION NETWORKS

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Abstract: Underwater communication networks (UWCNs) include sensors and autonomous underwater vehicles (AUVs) that interact to perform specific applications such as underwater monitoring. Some of the applications like Mission critical applications require reliability and network efficiency in Underwater Communication Networks, so for coordination and data forwarding between sensor nodes cooperative communication network for efficiency. Cooperation is added to the existing non-cooperative routing protocol at network layer that perform better in terms of reliability and throughput. This paper focuses on evaluation of non-cooperative routing protocols and Routing Protocol). EEDBR (Energy Efficient Depth Based Routing Protocol) and cooperative routing protocols Co DBR. Co EEDBR in terms of packet delivery ratio, end to end delay, throughput and energy consumption. NS2 simulator judge the performance of these protocols. Simulation results show that Cooperative Routing Protocols outperforms than Non Cooperative Routing Protocols.

Keywords: DBR. EEDBR. Co DBR. Co EEDBR

1. INTRODUCTION

Underwater communication has become an important data transmission technology that is widely used in various ocean applications such as oil/gas spill monitoring, off-shore oil industry, pollution monitoring in environmental, disaster prevention, submarine detection and surveying sea floor for detection of objects and search for new resources. Underwater communication networks consist of a variable number of sensors equipped with transducer, buoys, surface sink, stations [3] and autonomous underwater vehicles (AUVs) that interact each other for a particular application over given area. Acoustic signal is best suited for underwater communication [1,4].

Routing in underwater sensor networks (UWCNs) is very challenging because of unique characteristics of UWCNs and also UWCNs have very dynamic topology as sensors move with water currents. A number of routing protocols have been proposed to deal with the challenging problem in UWCNs. Localization process which requires [u]] dimensional location of sensor nodes is used in most of the routing protocol. That is yet major challenging issue to be solved in UWCNs. Recently, many geographical routing protocols have been proposed for UWCNs, which can be classified into two sections. localization-based and localization-free routing protocols [2].In this paper localization free routing protocols DBR, EEDBR, Co DBR and Co EEDBR based on co operation are considered for further analysis. DBR [8] is a non-cooperative receiver based routing protocol in which the routing is depends only on depth of the sensor node. Drawbacks of DBR is improved in the EEDBR, where depth from sink as well as residual energy of sensor nodes is used to select the candidate forwarder to achieve load balancing. Co DBR overcomes the problems associated with DBR and EEDBR by using cooperative diversity [14]. Co DBR transmits the

packet to the destination thru two relay nodes [13] .The relay nodes selects on the basis of minimum depth and they cooperatively deliver the data to the sink. The packet delivery ratio will be increases because in case of any link failure at least one link is capable of delivering the data successfully to the destination. Co DBR consumes three times more transmission energy than DBR because it uses source node and two relay nodes to transmit data, so to achieve refiability energy will be compromised also every time it consider the lower depth nodes. To handle problems associated with all these three protocols, a new cooperative routing protocol Co EEDBR [9] is introduced. Co EEDBR route the data through the UW network nodes with reduced path-loss [15] over the channel [14]. Advantages of singlehop and multi-hop are taken into account as well. Relaying techniques used are AF and FR.

2. ROUTING PROTOCOLS IN UWCN

Recently, many geographical routing protocols have been proposed for UWCNs, which can be classified into two sections, localization-based and localization-free routing protocols. In this paper the localization free routing protocols are considered for further analysis.

2.1 DBR (Depth Based Routing) Protocol

DBR is a non-cooperative receiver based routing protocol in which source node broadcasts its data to all its neighbors [5]. DBR transmits data packets greedily towards the water surface where data sinks are situated and the transmission is based on the depth information of each sensor. In DBR After receiving a packet node holds the packet for certain amount of time called holding time and then transmits the packet if the depth of the node is smaller than the depth of previous sender that is embedded in the packet. Otherwise, it discards the packet [5,10,11]. Holding time depends on the

Review of Different Deep Learning Approaches for Image Classification

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Abstract : As a major breakthrough in artificial intelligence, deep learning has achieved very impressive success in solving grand challenges in many fields including speech recognition, natural language processing, computer vision, image and video processing, and multimedia. Deep Learning is the subpart of machine learning; it uses neural networks which stimulate by the human brain's structure and working? It is a new approach for data analysis and prediction and has become very popular recently. Deep Learning has achieved much higher success than machine learning in many applications, one of the reasons for that is, machine learning not able to process large amount of data effectively but also not able to extract the features from the data automatically. Since Deep Learning has been the core topic in machine learning and convolutional neural network have become state of the art methods for image classification over the last couple of years. Convolutional neural network has won numerous competitions in recent years. It has outstanding results in image recognition. In this paper, different deep learning approaches will be reviewed which have been used in the field of image classification and localization.

IndexTerms - Artificial Intelligence, machine learning, deep learning, image classification, neural network, convolutional

I. INTRODUCTION

Recent advances in deep learning made possible tasks such as image and speech recognition. Deep learning is a subset of machine learning algorithms that is very good at recognizing patterns, but generally requires a large amount of data. Deep learning is excellent in the recognition of objects in images, since it is implemented using 3 or more layers of artificial neural networks where each layer is responsible for extracting one or more characteristics of the image.

Neural network: a computational model that works in a similar way to neurons in the human brain. Each neuron takes an input, performs some operations and then passes the output to the next neuron. Representation of neural network (src), we will teach the computer to recognize the images and classify them into one of these categories;

To do this, we must first teach the computer how a cat, a dog, a bird, etc. looks before we can recognize a new object. The more cats see the computer, the better it will be to recognize cats again. This is called supervised learning. We can carry out this task by labeling the images, the computer will begin to recognize the patterns present in the images of cats that are absent from others and will begin to develop their own cognition. We are going to use Python and TensorFlow to write the program. TensorFlow is an open source deep learning framework created by Google that gives developers granular control over each neuron (known as a "node" in TensorFlow) so that it can adjust weights and achieve optimal performance. TensorFlow has many integrated libraries (some of which we will use for image classification) and has an incredible community, so you can find open source implementations for virtually any deep learning topic.

II. MACHINE LEARNING

Machine Learning Algorithm is a step by step process to get information from the given set of data, without relying on a fix program. This information is useful to predict output for a given input.

Machine Learning Algorithms find patterns inside the set of data, i.e. given to it. These Patterns are useful to make better decisions and predictions. Today ML algorithms are useful in many areas to make better decisions like, in medical diagnosis, stock trading, and energy load forecasting, etc. These algorithms are used by media sites to recommend movies and songs to users and also use by retailers to recommend products to customers, based on their purchasing behavior [1].

A. Machine Learning Algorithms

Mainly two types of Machine Learning Algorithms are defined based on their learning capability. Which are shown below in Fig 1.

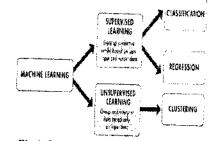


Fig 1: Machine Learning Architecture

Deep Learning Approach for the Classification of Small and Large Size Image Datasets

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Abstract

Deep learning is a new approach for data analysis and prediction: it has become very popular recently. Deep learning technologies are becoming the major approaches for natural signal and information processing, like image classification, speech recognition. Convolutional Neural Networks have become very popular for image classification in deep learning: CNN's perform better than human subjects on many of the image classification datasets. In this paper, deep learning convolutional neural network is deployed based on keras and tensorflow libraries using python for image classification. Here, two different CIFAR image datasets are used to compare the accuracy of CNN based on size of image dataset which is small and large size dataset (32*32, 64*64). This dataset contains images of different categories for image classification. Two different structures of Convolutional neural network are deployed on CPU system, with different Convolutional Neural Network parameters and obtained the accuracies.

Keywords: CNN, Deep Learning, CIFAR, Image Classification

1. Introduction

Deep learning for image classification has become an essential use of the machine learning method. To increase performance, the application of neural networks to learning tasks that contain more than one hidden layer. Deep learning is part of a wider family of machine learning methods based on representations of learning data, unlike hard code learning methods.

Learning can be supervised, partially supervised or unsupervised. Deep learning architectures, such as deep neural networks, deep belief networks and recurrent neural networks, have been applied to fields such as computer vision, speech recognition, natural language processing, audio recognition, the classification of images, the filtering of social networks, the automatic translation and the bioinformatics, in which they produced results comparable and in some cases superior to human experts.[1]

Popular datasets used for image classification like MNIST, ImageNet, PASCAL, and CIFAR10/100, all classify the images by the type of a prominent object or feature in the image. In this research work, Here I present image classification through CIFAR-10 dataset using Convolutional Neural Network and find the accuracies of small dataset (32*32) and Large dataset (64*64).

2. Convolutional Neural Network

CNN is a type of deep learning model for processing data that has a grid pattern, such as images, which is inspired by the organization of animal visual cortex [2] and designed to automatically and adaptively learn spatial hierarchies of features, from low- to high-level patterns. CNN is a mathematical construct that is typically composed of three types of layers (or building blocks): convolution, pooling, and fully connected layers. The first

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Sentiment Analysis of Twitter Datasets using Support Vector Machine and Naïve Bayes Classifiers

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ABSTRACT

Social networking sites are the great source of communication for internet users nowadays. Millions of people conveniently express their views and opinions on a wide array of topics using micro-blogging websites. Natural language processing is the discipline that studies how to make the machines read and interpret the language that the people use, the natural language. But in the machines world, the words not exist and they are represented by sequences of numbers that the machine represents with a character when displaying them on screen. Growing use of social media websites and cloud computing technology advances have bumped up a huge amount of online data available so the information is convoluted with varying interests, opinions and emotions. This data consisted primarily Textual and numerical forms that can be categorized as Structured, semi-structured or non-structured.

Sentiment analysis which is also known as opinion mining is basically done to computationally identify and extract subjective information from source materials and to categorize this information to know the user's behavior towards a particular agenda. This categorization is basically done broadly into Positive, Neutral, or Negative. In this paper, the extraction of sentiment from a famous micro-blogging website, Twitter where the user posts their views and opinion will be discussed. The twitter datasets has been collected using twitter APIs. For actual implementation, python with NLTK and python-twitter APIs has been used.

Keywords - Machine Learning, Sentiment Analysis, Support Vector Machine, Naive Bayes, Python

I. INTRODUCTION

Sentiment Analysis, which is also referred as opinion mining, is the computational study of people's opinions, attitudes and emotions towards an entity (e.g. individuals, events or topics). People express and share their view and opinion using social media application such as Twitter, Facebook, WhatsApp and Instagram etc. Two fundamental approaches are there in sentiment analysis i.e. Supervised learning and unsupervised learning Approaches. Sentiment classification of twitter data is done using supervised machine learning approaches like Naïve-Bayes, SVM, and Maximum-Entropy etc.

Today internet has become the major part of our life. Most of the people use online blogging sites or social networking sites to express their opinions on certain things. They also use these sites to know what other

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A preliminary note on big data and machine learning technologies

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Abstract

Big data is high-volume, high-velocity and variable information assets which demand cost-effective, innovative forms of processing for enhanced insight and decision making. An essential quality of the Big Data is the large volume which is heterogeneous and of different dimensions. Data mining and machine learning systems are utilized to separate the important and concealed examples from the huge volume of data. Many machine learning strategies are coordinated with big data analytics tools

Keywords: Machine learning, Big data, Data mining.

Introduction

In recent times there has been an exponential production of data from various sources of the web, smart phones or smart sensors, which has lead to generation of big data. The term big data can be referred to as enormous, fast, arising, various classes and with parts of undesirable noises that are hard to store, process, analyze, translate, expend and settle for better decision in the field of medicinal services, funds, and business or industries. Gigantic data have originated from people through the usage of PC, advanced mobile phones, gadgets which are utilized to share message and recordings with companions in internet based life such as Facebook, Instagram, Whatsapp, etc, for sharing short clips, share their perspectives and purchase where data gathering has developed enormously and is already past the capacity of commonly utilized software tools to capture, manage, and process inside a "tolerable elapsed time" (Wu *et al.*, 2014) (Blazquez and Domenech. 2018)

Indeed, the activity of people and their exercises are recorded by smart sensors which are set in part of urban communities and in diverse public places. The most fundamental challenge for Big Data applications is to investigate the enormous volumes of data and focus on helpful data or information for future activities. In many cases, the learning/extraction procedure must be productive and near continuous on the grounds that putting away all watched data(Wu *et al.*, 2014).

Big Data begins with huge volume of heterogeneous, self-ruling sources with distributed and decentralized control, and tries to investigate complex and advancing connections among data which is known as HACE Hypothesis. These attributes make

3D Trajectory Reconstruction Using Color-Based Optical Flow and Stereo Vision

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Abstract. Automatic trajectory estimation of a moving object in a video is one of the most active research areas of computer vision, which finds many practical applications, such as development of sport playing robots, predicting trajectory for avoiding obstacle collision, indomatic davigation of driverless vehicles, monitoring target hitting, etc. However, most of the work reported in literature only consulets monocolar videos. Due to the avoidability of tow price steaso cameras, many applications take their advantaces by uncorporating depth information. In this paper, the 4D material consult of a primary color (red or greece) or blue) object is estimated using color based optical flow and stereo vision. The purpose of using stere existent is to sum depth information for generating 4D fuglectory. The system fits been lested on many stereo rateos and experimental results are quite acemate. Besides, the kiw computation time required for finding depth of the fucked path makes it suitable for real time appreciations.

Keywords: Object detection - Object tracking - Optical flow - (D) trajectory - Sterzo visioa

1 Introduction

Trajectory estimation has received a considerable attention by researchers due to many practical applications, such as predicting trajectory for avoiding obstacle collision, location estimation of a robot, tracing the trajectory of a moving vehicle for tane violation, etc. Trajectory generation is a two step process: G (detect the object in the initial frame of a video and C) then locate the object in the subsequent frames.

It is established that the 3D trajectories of moving objects in a scene is impossible from monocular videos without prior assumptions about the scene, which restricts its practical utilities [1]. However, it is possible to generate 3D trajectories by combining stereo vision with any object tracking technique. In stereo vision, two views of the same scene are captured by a pair of cameras and the disperibles of scene points in the captured images are used to calculate depths of scene points, asing the principle of triangulation. The calculated depths are utilized to construct the 3D trajectories of the objects of interest.

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Building Machine Learning Based Diseases Diagnosis System Considering Various Features of Datasets



Shrwan Ram and Shloak Gupta

Abstract Millions of people worldwide suffer from late diagnosis of diseases. Machine learning algorithms can significantly help in solving healthcare systems that can assist physicians in early diagnosis of diseases. Algorithms in Machine Learning provide the ways to classify data efficiently, at great speed and with high accuracy. Many types of machine learning algorithms are widely adopted and implemented for the early detection of various diseases; these algorithms are like Decision Tree. Naïve Bayes, Support Vector Machine, and Logistic Regression. The results show that there is no particular algorithm available which provides best accuracy in all kind of the healthcare data classification. Most appropriate method can be chosen only after analyzing the nature of the datasets. All the available machine learning techniques are used based on their performances in terms of accuracy and comprehensibility. The datasets considered in this paper are on breast cancer, dermatology, chronic kidney disorder, and biomechanical analysis of orthopedic patients. Data sets from UCI machine learning repository were taken to show applications of Machine Learning on wide variety of Life Sciences data. The four algorithms are implemented with considering various parameters of classification.

Keywords Machine learning · Diseases diagnosis · Supervised learning

1 Introduction

The Machine Learning is all about developing mathematical, computational, and statistical methodologies for finding patterns in and extracting insight from data. Data, in turn, are the concrete manifestations of structures and processes that shape the world. Machine Learning research aims to unlock technologies that can solve

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An Efficient Clustering Algorithm to Simultaneously Detect Multiple Planes in a Point Cloud

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Abstract- Plane detection in a point cloud is one of the primary step for various applications, such as computer vision, ground plane detection for autonomous navigation, obstacle detection, induor scene reconstruction, etc. In this paper, a new algorithm for simultaneous detection of multiple planes in a point cloud is proposed. The proposed method is a two-step process. In the first step, the surface normals are automatically clustered into probable plane orientations (angular clusters) within a user specified angle threshold, without a priori knowledge of number of planes. In the second step, the angular clusters are further clustered into separate planes, within a user specified distance threshold, based on the normal distances of the points in an angular cluster. In contrast to popular random sampling based methods, the proposed method uses deterministic approach to simultaneously detect all possible planes and has comparable results with the existing methods and is two times faster. The proposed method is implemented using Open3d point cloud library and evaluated on datasets having variety of indoor scenes.

Keywords— RGB-D, Plane Detection, Point Cloud, Open3d, Clastering, Surface Normal

1. INTRODUCTION

. Point cloud is a type of 3D model of a scene consisting of a large number of individual points with their x, y, z values in a coordinate system along with other attributes, such as color, normal. A point cloud model is primarily obtained from sensors, such as Lidar, RGBD camera, Laser scanner, stereo vision system, etc. With the availability of low cost depth cameras (Microsoft Kinnect, Intel RealSence, etc.), uses of point clouds in various applications, such as autonomous mobile robot navigation, obstacle detection, vision based assistance system for blinds and visually impaired persons. etc. have attracted researchers' attention. In these applications. detection of planar surfaces in the given point cloud is the key step. Further, most of the man-made environment and objects primarily consist of planer regions. Plane detection refers to identifying a set of planes that best fits to the given point cloud data. Many methods have been reported in literature for detecting planer regions, such as methods based on: Hough transform [1-2], RANSAC [3] and region growing [4-5]. However, due to presence of noise in the point cloud, accurate and efficient solution is yet to be found.

In this paper, a new method for multiple plane detection simultaneously in a point cloud is proposed, hi contrast to hypothesize and verify approach of RANSAC based methods, the proposed method uses a deterministic framework based on systematic auto clustering of surface normals and normal distances of points from origin to efficiently detect all planar Arvind Kumar Verma • Dept: of Production and Industrial Engineering J.N.V. University Jodhpur, Rajasthan, India akverma.pi@jnvu.edu.in

surfaces simultaneously and is suitable for parallelization. To identify planar surfaces, the proposed method is a two-step process. In the first step, points with similar normals (within the specified threshold) are automatically grouped together. A group of normals (angular cluster) represents collection of possible probable parallel planes. In the second step, points within each angular cluster are segregated from each other based on the normal distances of points from the origin to segregate various planes. The proposed method is similar to the method proposed in Holz et al. [6]. However, the proposed method differs from Holz et al. [6] as it uses auto clustering of point normals instead of random selection of seed points and region growing strategy.

The remaining part of the paper is organized as follows: Section 2 briefly presents review of the similar and related work. Section 3 describes the proposed method, Implementation and experimental results are reported in section 4. Finally, section 5 concludes the paper.

II. RELATED WORK

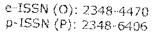
With the availability of low cost and fast 3D depth cameras and scanners, 3D point cloud processing to detect the structure of the captured scene is a very active research area in computer and robotic vision. Most of the downline applications, such as detection of ground plane, obstacle detection for autonomous navigation, indoor scene reconstruction etc., require detection of planar surfaces in a point cloud. For plane detection, several approaches have been proposed, such as region growing approaches, RANSAC based approaches, Hough transformed method and surface normal based methods, etc. Region growing based methods first select few seed points and then adds neighboring points, according to some criterion, until no more points can be added. Holz and Behnke [7] segments the range images into planar regions by region growing using local mesh neighbourhood. They used the region growth method for tagging different objects in a scene. The region growing methods are sensitive to the selection of the initial region seeds. Huang et al. [8] improved the choice of the initial seed position by using information of object edges. Instead of randomly selected seed points, Jin et al. [4] proposed an iterative growing process of a plane from a patch based seed selection approach. The method alleviated over growing and under growing problems.

RANSAC based methods tries to fit a plane to a set of inliers that best describes a plane. The RANSAC based methods randomly pick three points and create a plane model and then tries to fit other points to that plane. Out of many such

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Classification of Healthcare Datasets through Supervised Machine Learning Algorithms

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Abstract The work centered on methodologies based on machine tearning to develop applications that are capable of recognizing and disseminating health information. In this paper, a different type of supervised machine learning approach is used for the classification. Analyzing the machine learning algorithms and finding out the most appropriate algorithms for healthcare data. In this study, designed a classification system using a Decision tree, Naïve Bayes Support Vector Machine, and KNN for medical data classification with various numbers of attributes and instances. Its include two type classification namely present or absence data distribution from the Cleveland heart disease data set. The experiment outcomes positively demonstrate that the decision tree classifier is effective in undertaking healthcare data classification tasks.

Keywords- Classification, Machine learning, decision tree, naïve Bayes, support vector machine algorithms, heart disease dataset.

I. INTRODUCTION

Machine Learning is the ability of machines to adopt human behavior, in which a machine composed of different algorithms using these algorithms chooses its own choice and provides the user with the outcome or output. Machine learning is the skill of learning machines, where a machine is designed with certain algorithms from which it can make its own choices and give the user the answer. Machine Learning Algorithms are a step-by-step method for extracting information from the data set without relying on a patch programmer. Such data is useful in predicting the output of a given input. Inside the data set collection, i.e. given to it.

Supervised learning algorithms aim to model relationships and dependencies between the output of the goals and the input features so that the output values for new data can be predicted based on certain relationships that have been learned from previous data sets. Healthcare data classification is a challenging task in the field of medical research. Both for a patient and the doctor, the medical record is very useful. The medical record would usually assist the doctor in classifying the illnesses, diagnosing, and treating the patient properly. In recent days, the volume of Healthcare data is huge. Therefore, the seriousness of manual diseases is difficult to identify and understand. This paper describes the classification of heart diseases through supervised machine learning.

1. Healthcare dataset: Cleveland's heart disease data set is a multivariate data set. It includes 76 attributes and 303 instances that range from Categorical, Integer, and True. However, the studies suggested involving the use of a subset of 13. The prediction area applies to the patient's existence of heart disease. The prediction field concentrated on simply attempting to distinguish the presence of diseased (value 2) data from non-diseased (value 1).

2 Decision tree: train classification decision tree to predict responses to data. Follow the decision of the root tree (beginning) node up to a leaf node to predict the answer. The leaf node contains the response. The value of one predictor (variable) is verified at each stage of a prediction. This tree predicts identifiers based on two predictors, x1 and x2. To predict, start at the top node. Check the values of the predictors in each decision to determine which branch to obey. When a leaf node is reached by the branches, the data is labeled as either form 0 or 1.

A Naive Bayes: Bayes 'theorem (often called Bayes' law after Thomas Bayes), in probability theory, compares the conditional and marginal probabilities of two random events. Often used for calculating subsequent probabilities given observations. A naive classifier of Bayes is a concept that deals with a simple probabilistic classification based on applying the theorem of Bayes. Simply put, A Naïve Bayes classifier assumes that the presence (or absence) of a certain attribute of a class is irrelevant to the presence (or absence) of any other feature.

4 Support Vector Machine: Support Vector Machine: By finding the best hyper-plane that separates all data points of one class from those of another class, an SVM classifies information. The support vector machine algorithm performs classification by finding the hyper-plane or classifier which maximizes the margin between two classes. Two groups are divided by Hyper-plane. Classification can be seen as a task of separating classes in the space of features.

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A Review on IoT: Protocols, Architecture, Technologies, Application and Research Challenges

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Abstract - The Internet of Things (IoT) is a paradigm that is speedily gaining ground in the scenario of modern wireless telecommunications. Using IoT, billions of things get connected and communicate using different protocols and technologies. The expanse of IoT is ever increasing. From home consumers to the industrial one, IoT is becoming part of our everyday life. Individuals, companies and governments are trying to seek realworld IoT solutions which can be economically and technologically viable. In this paper, we have focused on technologics, protocols, applications and future challenges related to IoT. Initially, IoT looks twin to M2M, but in the years to come, it would facilitate realworld objects to communicate, connect and interact with one another in the same way humans do via the web today. Through the paper, we have tried to encapsulate the information regarding the best appropriate protocols, architecture, technologies and usage problems to assist scholars and developers in understanding the various nuances of the Internet of things.

Keywords: Internet of Things, RFID, Wireless Sensor Networks, Object, Security, Identification

I. INTRODUCTION

Within the two decades of its inception, the Internet of Things has impacted almost every field, and today only the sky is the limit for the opportunities it offers. Before delving into the architecture, technologies and usage problems, let's discuss what do we mean by lo1? Internet is an open resource on which anybody can manipulate data. Data is mostly operated on the Internet by human beings who are systematically slow, inefficient handler of data [6]. Systems could become more efficient and scalable if we connect sensors to real-world objects, and these real-world objects can then connect and inetract with one another in like manner as humans do via the web today. However, then how loT is different from sensor network" or how is it different from Big Data which handles enormous volumes of data efficiently or how loT differs from M2M (Machine to Machine) or D2D (device to device) communication? Even Cyber-Physical System which appears the same as toT as they also interact with the real-world objects through sensors [5]. It is difficult to have an all-encompassing definition of the Internet of things but to define: we can say

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loT (Internet of Things) incorporates everything which is connected to the Internet from small sensors to devices to wearable [7]. These connected devices collect inta, analyse it and create action, loT performs of all the actions which other technologies like a sensor network. Big data, M2M or D2D communication do in isolation. Invertors of the traditional Internet would have never imagined that this "networks of networks" will one day make billions of devices to connect and interact with each other like realworld entities. With the burgeoning of IoT, certain aspects have become more relevant than they were with the traditional Internet [6].

Devices Heterogeneity: Today, IoT is useful in essentially every field which employs different devices. These devices use different operating systems, protocols and architecture and have different communication and computational abilities. Thus, it is essential to develop protocols and architecture for IoT, which can make these heterogeneous devices work in collaboration.

Scalability: Unlike the one size fits approach, scalability is the ability of the system to handle data as it grows. With billions of devices to use IoT scalability concerns are there at every stage from naming and addressing to service provisioning and supervision [14].

Energy-optimized solutions: wireless technologies consume more energy than the wired technologies. As per CISCO, there would be 50 billion to T devices by the end of this decade; thus, energy optimization is a critical aspect of IoT development.

Localization and tracing abilities: Localizations penains to an object's position, and Tracking is its position over a while. As devices connected through fo'l can connect and communicate with one another other, it facilitates localization and Tracking.

Set in security and privacy-preserving devices: Due to the tight entanglement with the physical domain. (o) technology should be protected and privacy-preserving by choice. This suggests that security should be taken as a key system-level property, and be taken under consideration within the proposal of designs and techniques for to 1 solutions [23].

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Chapter 20 Security Threats for Time Synchronization Protocols in the Internet of Things



Suresh Kumar Jha, Niranjan Panigrahi and Anil Gupta

Abstract The Internet of Things (IoT) is an emerging field of application includes several technologies such as the Internet, Wireless Sensor Networks (WSN). Radio Frequency Identification (RFID), and communication technology which build a system that connects real and digital worlds. For the consistent working of the IoT ecosystem, the backbone WSN needs time synchronization. In the IoT ecosystem, the sensors are generally located in an unattended environment where may be a high chance of the existence of malicious nodes. In such a scenario, the time synchronization protocols will behave incorrectly which in turn will hamper the normal working of other dependent protocols. This chapter contributes a thorough insight into the possible threats to time synchronization in backbone WSN of IoT, existing security measures with qualitative and quantitative analysis, and their scope and limitations. This will further help the research community to develop light-weight and efficient secured time synchronization protocols for IoT.

Keywords IoT · WSN · Time synchronization · Security threats

20.1 Introduction

In a short time ago, the Internet of Things (foT) emerged as a new era of application in almost all fields of society and engineering problems. In all applications of loT, sensors are deployed to form a network to observe the physical or natural condition

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Glioma Tumor Detection Through Faster Region-Based Convolutional Neural Networks Using Transfer Learning.

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Abstract: - Glioma Tumor is generally found in the brain and spinal cord. This tumor begins in glial cells that cover the nerve cells and control the function of that. The Glioma tumor is classified based on glial cells involved in the Glioma tumor formation. The tumor affects the normal activity of the patients such as loss of memory, difficulties in speech, confuse the identification of objects, and also causes difficulties to maintain the balance of the body. The early detection of Glioma tumor helps healthcare practitioners to suggest a suitable treatment for the disease. The detection of a Glioma tumor is a challenging task. Many types of approaches had been proposed by the researchers and academicians for accurately detecting the Glioma tumor. Accurately detecting the brain tumor is still a big challenge. Because of recent advances in image processing and computer vision, healthcare professionals are using sophisticated disease diagnostic tools for disorders/disease prediction. The Neurosurgcons and Neuro-Physicians use the magnetic resonance imaging technique to identify multiple brain tumors. The approaches to computer vision play a significant role in the automated identification of different Brain tumors. This research paper explores the Convolutional neural network-based Faster R-CNN approach for the Glioma tumor detection using four pre-trained deep networks such as Alexnet, Resnet18, Resnet50, and Googlenet. The proposed approach of object detection as compared to other R-CNN approaches is more efficient and accurate having higher precision. The proposed model detects the Glioma tumor with 99.9% accuracy. The pre-trained networks used to train the tumor detection model are Alexnet, Resnet18, and Resnet50, and Googlenet. As compare to Alexnet, resnet18, and Googlenet deep networks, the Resnet50 Pre-trained network performed well with higher accuracy of detection.

Keywords: Glioma Tumor, Magnetic Resonance Imaging, Computer vision, Convolutional Neural networks, Pre-trained networks, Deep learning.

Performance Evaluation of Word Representation Techniques using Deep Learning Methods

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Abstract-Word vectors are the real-valued numbers which allow machine learning algorithms to extract the semantic information concern with the words when trained on natural language corpora. The paper explores word representation techniques with evaluation criteria to measure the quality of representation through deep learning models like BERT. The performance of these words vectors can be evaluated using certain measures. Broadly, the two classes of evaluation are intrinsic and extrinsic evaluation. Intrinsic evaluators directly extract syntactic or semantic relationships between the words independent of any language processing task. These evaluators focus on subtasks while extrinsic evaluators consider complete natural language processing task as a measure of performance like chunking, sentiment analysis etc. The experiments have been performed using BOW model, Word2Vec and BERT language model. In this research work word-similarity task is considered for intrinsic evaluation and part-of-speech (POS) tagging task is used as a measure for extrinsic evaluation. The experiments have been performed asing python, sklearn machine learning toolkit and keras deep learning framework. BERT language model is used which has recently emerged as the prominent tool for natural language processing. The result obtained from the experiment in this research for word embedding representation techniques are efficient and better compared to other existing traditional models. However, considering large datasets this can be enhanced for better accuracy

Keywords— Word Vector, Word Embedding, Distributed Representation. Intrinsic Evaluators, Extrinsic Evaluators, BOW, Word2Vec, BERT, Pre-trained Embedding.

L INTRODUCTION

The role of natural language processing is to extract information from unstructured text. A natural language processing system allows computers -to understand the natural language and perform specific tasks like elassification, part-of-speech tagging or sentiment analysis etc. The most significant task is to represent the meaning of words in a computer. The systems should be able to extract the similarity and difference between the words. Generally, the taxonomy like WordNet is used to express the hypernyms and synonyms sets. But this leads to a problem of missing words i.e. the words which are not defined in the corpus cannot be expressed. Word vectors are the real number vectors that encode the notion of similarity and difference between. the words. These are the learned representation of the input. For example if there are k-million words in a language, then there exists some kdimensional space to encode the semantics of the language. Each dimension encodes specific meaning which is transferred during communication. The numbers in the word vector represent the word's distributed weight across dimensions. The numerical weight of the word represents the closeness of the concept [10]. The vector embeds both semantic and syntactic information of the word obtained from the corpus.

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The semantic dimension indicate tense (past present fature tense). number (singular/plural number). gender (masculine/feminine gender) etc. As shown in f gure 1, each column represents the dimension which captures defined meaning or some specific concept. The four dimensions are animal, domestic, pet and fluffy respectively. The each weight of the word within the column (dimension) represents its closeness with the concept.

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Figure 1: word vector representation with specific dimensions [10].

The dimensions of the vector contain the meaning of the word. Using these continuous vectors space machines can extract similarities between the different words [10]. The words with similar word vectors means they are similar in some context. Word-embedding is a significant tool of natural language processing to learn quality representation for various tasks like semantic analysis, information question- answering systems and machine retrieval. translation etc [1]. The most significant point in the study of distributional semantics is to evaluate the quality of word representation models [15]. There are no clear criteria about the evaluation of these models. Ip engineers evaluate the performance of these models by experimenting on specific tasks like pos tagging, classification etc while computational linguistics perform experimentation using methods of cognitive science.

The presents paper the significance word representation in natural language processing with various word representation approaches. It explains the comparative analysis of conventional and current word representational techniques for intrinsic and extrinsic evaluation. The paper is organized as follows: The section 1 cover the basic introduction and section 2 shows the related work done in the domain. Section 3 describes various approaches to word representation. The section 4 exposes the two classes of evaluation i.e. Intrinsic and extrinsic evaluation of word representations. The section 5 covers the experimental sctup and results regarding performance evaluation of the word representation models. The next section concludes the work with specific points to be considered for further work.



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ORIGINAL RESEARCH



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Security Threat Analysis and Countermeasures on Consensus-Based Time Synchronization Algorithms for Wireless Sensor Network

Suresh Kumar Jha¹ - Anil Gupta¹ - Niranjan Panigrahi²

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Abstract

Time synchronization is an indispensable and fundamental requirement for all types of wireless sensor networks (WSNs) protocols and applications. The consistency and correctness of other protocols like localization, routing, etc., are highly dependent on time synchronization. However, due to the hostile deployment of wireless sensor networks, they are prone to cyber-physical attacks that create different threats to time synchronization protocols as well. Recently, consensus-based time synchronization (CTS) algorithms are gaining popularity due to their distributed nature and robustness toward different types of threats such as denial-of-service and node destruction. But, the inherent properties of the consensus-based approach of making in-network averaging make these algorithms vulnerable to message manipulation attacks. In this paper, an in-depth simulation-based analysis is conducted using pymote, a python-based discrete event simulator for WSN, on state-of-the-art CTS algorithms in the presence of message manipulation attacks. A novel and generic algorithm, Message Manipulation Attack Resilient CTS (MMAR-CTS) is proposed embedding which the state-of-the-art algorithms are extensively evaluated based on standard performance metrics, e.g., convergence speed, global synchronization error, and local synchronization error in the presence of the attack, and sufficient observations are derived to show the behavior of these algorithms. The comparison of protocols is validated with simulation results. Simulation results show that MMAR-CTS embedded SATS algorithm is 75% more efficient as compared to other candidate algorithms, measured in terms of convergence speed (number of iterations) and nearly 40% improvement in global and local synchronization error.

Keywords Wireless sensor network · Consensus time synchronization · Message manipulation attack

Introduction

From the last decade, wireless sensor networks (WSNs) have been receiving more attention due to their increasing demand in many applications such as healthcare

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monitoring, area monitoring, industrial domain, and threat detection. WSNs consist of a huge number of low-cost, battery-operated, and small motes. Time synchronization is a critical requirement among these motes due to its distributed nature and unavailability of a centralized clock. It is required between motes for different applications, such as multi-agent networks, data fusion, moving objects trajectory estimations, and different monitoring systems. It is also a prerequisite for the correctness and consistency functionality of other protocols [1]. Broadly, there are two types of approaches for time synchronization algorithm in WSN, centralized and distributed approach. The centralized algorithms are multi-hop, organized the network in a rooted tree structure, and synchronization is achieved with reference to the root's time. This type of approach has many shortcomings such as root node failure problems and hierarchy or cluster-creation overhead. The recent approach of time synchronization in WSNs is based on distributed consensus theory and based on this, many

SN Computer Science

Performance Evaluation of Merging Techniques for Handling Small Size Files in HDFS

Vijay Shankar Sharma and N. C. Barwar

Abstract When dealing with the storage of large files. HDFS is one of the good choices as a distributed storage. Processing a large number of small files results in the performance bottleneck of HDFS. A massive number of small files will produce excessive metadata that leads to inefficient utilization of the Name Node memory, and frequent function calls will consume all over more time to process: therefore, it can be concluded that HDFS degrades when handling with small files. A detailed performance evaluation is being conducted to understand the impact of increasing small files in Hadoop for processing. This paper mainly evaluates sequential files, CombineFileInputFormat, HAR and Hadoop streaming techniques to deal with small file problem in HDFS. Empirical evaluation conducted in this paper shows that HAR and CombineFileInputFormat perform better and have consistent and stable results when increasing number of files for processing.

Keywords Hadoop · MapReduce · HAR · Hadoop streaming · Sequential file · CombineFileInputFormat · Small files · HDFS

1 Introduction

The function of Hadoop is identified by its two major core components, i.e., Hadoop Distributed File System (HDFS) and MapReduce. The HDFS stores huge data into the computing nodes. This huge data cannot be stored directly to the computing nodes; HDFS divides the large file into 128 MB data chunks, and these data chunks

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This Research work is done under the Project "The Optimization of Storage and Access Efficiency in Hadoop Framework for small file applications." The project is sponsored by the TEQIP-III at M.B.M Engg. College. Jodhpur (Rajasthan), India.

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IMAGE CLASSIFICATION WITH DEEP LEARNING BASED ON DIFFERENT CONVOLUTIONAL LAYERS USING TENSORFLOW

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ABSTRACT

Deen learning is the subfield of machine learning which uses neural networks that institute by the structure and functioning of the human brain. Deen learning is a new antroach for data analysis and nrediction; it has become very nonular recently. Deen learning has achieved much higher success than machine learning in many antifications, one of the reason for this is, that machine learning not able to process large amount of data effectively as well as it also not able to extract the features from the data automatically. Deen learning is being recognized as an essential tool for artificial intelligence research, with various annihications in several areas such as sneech recognition, object recognition and image classification. In matricular, Deen Learning is nreferred in the classification of images, because it can provide efficient results. In this namer, a deen learning to classify images and sigmoid classifier and Rectified Linear Unit (ReLu) function for deen learning convolutional neural network. At last, the each image features are trained with convolutional neural network for image classification. The mronosed antroach is compared for one and two convolutional layers on CPU system and finally we conclude that image classification with two convolutional layers gives better validation accuracy.

KEYWORDS-

Deeπ Learning; Tensorflow; Keras; Conolutional Neural Network; ReLu; Sigmoid Classifier; Image Classifićation

1.INTRODUCTION

Deeπ learning is a new aππroach for data analysis and πrediction; it has become very πoπular recently. Deeπ learning is being recognized as an essential tool for artificial intelligence research, with various aππlications in several areas such as sneech recognition, object recognition and image classification [3]. For Classification πroblems, more accurate values can be obtained using Deeπ Learning instead of Machine Learning.

Deeπ Learning ćan be ćlassified into four τγπes: Deeπ Neural Network (DNN), Convolution Neural Network (CNN), Rećurrent Neural Network (RNN) and Q-learning. These Deeπ Learning τγπes are raπidly evolving, with several software πaćkages including Theano, CuDNN, Caffee, and Keras [3].

By using a Convolutional neural network in dee π learning, a model ćan be ćreated to enable nowerful and often ćorrećt assumptions by changing various marameters such as activation function and number of convolutional layers. There are several libraries used in dee π learning studies [2].

TensorFlow is one of the libraries used for image classification in deeπ learning. TensorFlow is an onen-source software library develoned by the Google in 2015 for numerical comπutation. TensorFlow can deπloy RNN, DNN and CNN not only to multi core CPUs, but also to GPUs. It also summorts the AdaGrad, Dronout, and ReLu functions, which are very

Chapter 6 A Theoretical Approach to Reinforcement Learning Algorithm and Nash Equilibrium to Maximize the Score in Imperfect Information Game

Ruchi Vyas and Alok Singh Gahlot

Abstract Computers have just overshadowed the degree of human play in imperfect information games like Scrabble, yet there remains an opportunity to get better. Specifically, there is a lot to be acquired about the rival's tiles and moves. Reinforcement learning is one of the parts of Machine Learning. It is tied in with making an appropriate move to increase reward in a specific circumstance. The Nash Equilibrium is a hypothesis in game theory that communicates that a player can achieve the ideal outcome by not wandering from their initial strategy. Reinforcement learning algorithm and game theory would be best technique for training the agent. It will learn from as much as it plays, such that our agent can play and win the game with different persons with their different playing strategy they use for Scrabble game. To do this, our agents need to find out about other players' strategies and win every time they play against the human.

Keywords Reinforcement learning · Nash equilibrium · Decision-making · Machine learning

1 Introduction

Scrabble is an imperfect information game, that is, the current player is unknown of the rack of other player, making it elusive out of the rival's best course of action until the finish of the game. Additionally, there is innate arbitrariness present in Scrabble as arbitrary letters are being chosen from the pack to the current player's rack at each round [1]. Our main motive is to provide training to the agent every time it plays against the human and gets itself skilled and ready for the next game.

In supervised learning, an agent is trained to play by gaining knowledge from the data sets provided by the trainer but in reinforcement learning an agent gets rewards whenever it wins so the main objective of the agent is to maximize its rewards and according to our implementation, the agent will be learning how to win the game

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Performance Evaluation of Word Representation Techniques using Deep Learning Methods

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thytract--Word vectors are the real-valued numbers which allow machine learning algorithms to extract the semantic information concern with the words when trained on natural language corpora. The paper explores word representation techniques with evaluation criteria to measure the quality of representation through deep learning models like BERT. The performance of these words vectors can be evaluated using certain measures. Broadly, the two classes of evaluation are intrinsic and extrinsic evaluation. Intrinsic evaluators directly extract syntactic or semantic relationships between the words independent of any language processing task. These evaluators focus on vuhtasks while extrinsic evaluators consider complete natural language processing task as a measure of performance like chunking, sentiment analysis etc. The experiments have been performed using BOW model. Word2Vec and BERT language model, in this research work word-similarity task is considered for intrinsic evaluation and part-of-speech (POS) tagging task is used as a measure for extrinsic evaluation. The experiments have been performed using python, sklearn machine learning toolkit and keeas deep learning framework. BERT language model is used which has recently emerged as the prominent tool for natural language processing. The result obtained from the experiment in this research for word embedding representation techniques are efficient and better compared to other existing traditional models. However, considering large datasets this can be enhanced for better accuracy

Keywords— Word Vector, Word Embedding, Distributed Representation, Intrinsic Evaluators, Extrinsic Evaluators, BOM, Word2Vec, BERT, Pre-trained Embedding.

L. INTRODUCTION

The role of natural language processing is to extract information from unstructured text. A natural language processing system allows computers to understand the natural language and netiom specific tasks like classification, part-of-speech tagging or sentimem analysis etc. The most significant task is to represent the meaning of words in a computer. The systems should be able to extract the similarity and difference between the words. Generally, the taxonomy like WordNet is used to express the hypernyms and synonyms sets. But this leads to a problem of missing words i.e. the words which are not defined in the corpus cannot be expressed. Word vectors are the real number vectors that encode the notion of similarity and difference between the words. These are the learned representation of the input. For example if there are k-mittion words in a language, then there exists some kdimensional space to encode the semantics of the language. Each dimension encodes specific meaning which is transferred during communication. The numbers in the word vector represent the word's distributed weight across dimensions. The numerical weight of the word represents the closeness of the concept [10]. The vector embeds both semantic and syntactic information or the word obtained from the corpus.

Dr. N.C. Barwa MBM Engineering Calleya oJal Naroin Yyas University - Indhyaro Jodhpur, India Bebarwar djinvuledalin

The semantic dimension indicate tense (past present fiture (ense), aumber (singular plural number) gender (masculine feminine gender) etc. As shown in figure I, each column represents the dimension which capitres defined meaning or some specific concept. The four dimensions are animal, domestic, pet and fluffy respectively. The each weight of the word within the column (dimension) represents its closeness with the concept.



Figure 1: word vector representation with specific dimensions [10].

The dimensions of the vector contain the meaning of the word. Using these continuous vectors space machines can extract similarities between the different words [10]. The words with similar word vectors means they are similar in some context. Word-embedding is a significant tool of natural language processing to learn quality representation for various tasks like semantic analysis, information question- answering systems and machine retrieval. translation etc [1]. The most significant point in the study of distributional semantics is to evaluate the quality of word representation models [15]. There are no clear criteria about the evaluation of these models, ip engineers evaluate the performance of these models by experimenting on specific tasks like pos tagging, classification ete while computational Inguistics perform experimentation using methods of cognitive science.

The paper presents the significance ъĽ word representation in natural language processing with various word representation approaches. It explains the comparative analysis of conventional and current word representational techniques for intrinsic and extrinsic evaluation. The paper is organized as follows: The section I cover the basic introduction and section 2 shows the related work done in the domain. Section 5 describes various approaches to word representation. The section 4 exposes the two classes of evaluation i.e., (preinste and extrinsic evaluation of word representations. The section 5 covers the experimental setup and results regarding performance evaluation of the word representation models. The next section concludes the work with specific points to he considered for further NOR



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An Efficient Approach to Enhance the Scalability of the HDFS: Extended Hadoop Archive (EHAR)

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Abstract:- The Hadoop framework is most popular among data analytics applications. The file system of the Hadoop (HDFS) provides the layered storage facility for the frequent and infrequent data. In HDFS data can be archived using the HAR (Hadoop Archive) technique, but HAR archive are immutable means once the archive created it cannot be modified. One has to rewrite the whole archive if want to append the some new file to the existing archive. This paper introduces extended Hadoop archive (EHAR) that will resolve the scalability issue of the HDFS and also provide the mechanism to append the new files to the existing Hadoop archive. The experimental result shows that the execution time of the proposed approach is 53% to 39% lesser than the native HAR for the different fixed size files and 52% to 38% lesser than the native HAR for the different variable size files.

Keywords— HDFS, Index Files, HAR, Scalability, B-Tree, NameNode, EHAR, Computation Layer, Archive Layer.

L INTRODUCTION

In the 21st century the data becomes very important asset for each and every organization and individual. The rate of data production by various direct and indirect platforms is also very fast. The analytics and analysis of this fast growing unstructured data is becoming the popular application domain for the researchers and scientists. There are number of technological issues to handle such fast growing unstructured data i.e. scalability, fault tolerance, etc. Hadoop Distributed File System (HDFS) is the most popular file system to efficiently analyze the large amount of data. HDFS is capable to store and process fast growing unstructured data along with features of data availability and scalability. The fast growing unstructured data is processed on the different storage layers, these layers are defined on the basis of the use of data. The data that is used frequently is stored at the computation layer of storage and the data that is used less frequently is stored at the archive layer. This classification of data will benefit in number of different ways i.e. data stored at the archive layer will require relatively less computation power in comparison to the computation layer and requires high and stable storage capacity, whereas computation layer does not need log term storage facility, it requires high computation capability. The data that needs to be executing faster and frequently are processed at the computation layer and the data for archival purpose and processed less frequently

are stored at the archive layer. The benefit of storing the data in different layers is that both layers can grow independently hence provides the scalability and reliability at a great extent.

The HDFS provides the storage layer separation for the frequent and un-frequent data, thus it is suitable for the archival storage. HDFS will be able to store fast growing unstructured data efficiently with the features of the scalability and data availability and data analytics frameworks can directly access the data stored in the archive, there is no need of the data ingestion. HDFS works on the principle of the master-slave architecture, the central node (NameNode) in the HDFS will works as the master node and responsible for the meta-data management. The central level meta-data management at the master node will limit the scalability of the HDFS, because as the number of files increases it will also increase the NameNode memory requirement, thus while dealing with the million number small files the performance of the HDFS degrades. Each file, directory and block in the NameNode is represented as the object and that will occupy approximately 150 bytes of the memory in the NameNode, therefore it comes to the million number of small files. NameNode memory get overloaded and performance of the HDFS degrades, number or researches provide several solutions to overcome from the small file problem of the HDFS. Some researchers suggest increasing the NameNode memory by allowing multiple NameNode (Federated Name Nodes) to store the meta-data; each NameNode is responsible to save the subset of the meta-data. Some researchers proposed that merging the small files can solve the small file problem; the major solutions based on the merging of the small files are sequence file, combinefileinputformat and map file. HDFS also provide a solution to deal with the small file problem that is HAR (Hadoop Archive). In HAR small files are merged and then stored to the HDFS. The process of archiving file using the HAR will be done in two steps; the first step is to merge the small files by writing binary data of the small files to the part files, the second step is updation of the index files, in this step both index and masterindex file are updated. With help of theses index files one can access the small file from the archive without any data connector, the small files in the archive are treated as the normal files in the HDFS. The problem with HAR archive is that once the archive

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A Novel Technique for Handling Small File Problem of HDFS: Hash Based Archive File (HBAF)

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Abstract. Now a day's, Data is exponentially increasing with the advancement in the data science. Each and every digital footprint is generating enormous amount of data, which is further used for processing various tasks to generate important information for different end user applications. To handle such enormous amount of data, there are number of technologies available, Hadoop/HDFS is one of the big data handling technology. HDFS can easily handle the large files but when there is the case to deal with massive number of small files, the performance of the HDFS degrades. In this paper we have proposed a novel technique Hash Based Archive File (HBAF) that can solve the small file problem of the HDFS. The proposed technique is capable to read the final index files partly, that will reduce the memory load on the Name Node and offer the file appending capability after ereation of the archive.

Keywords, HDFS, Small File Problem, Meta Data Management, Hash Function, HAR, Map File, SSHF, HT-MMPHF, Merging Technique.

1. Introduction

Hadoop is open-source technology to handle the vast amount of unstructured and big data, which offers the wide range functionality in comparison to the traditional relational data bases. The file system of Hadoop is known as the Hadoop Distributed File System (HDFS) that is based on the master slave architecture. In this architecture there is a Name Node that acts as a master with processing capabilities and stores the meta-data information of the files stored in the file system. There are number of Data Node's that act as the slave means these Data Node's arc only used to store the data, no processing is required at the Data Node's. Once a file is stored on the HDFS it is divided in the 128 MB size blocks and then these blocks are stored on the HDFS. The size of the HDFS block is variable means client can configure the size of the HDFS block as per the requirement, by default it is 128 MB. To ensure the availability of the data, HDFS replicate the data blocks on the Data Node's and it will be decided by the replication factor that is by default 3, means each data block is written on the three Data Node's, in case if any one of the Data_Node's gets down then data block can be



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Abstract When dealing with the storage of large files. HDFS is one of the good choices as a distributed storage. Processing a large number of small files results in the performance bottleneck of HDFS. A massive number of small files will produce excessive metadata that leads to inefficient utilization of the Name Node memory, and frequent function calls will consume all over more time to process; therefore, it can be concluded that HDFS degrades when handling with small files. A detailed performance evaluation is being conducted to understand the impact of increasing small files in Hadoop for processing. This paper mainly evaluates sequential files. CombineFileInputFormat, HAR and Hadoop streaming techniques to deal with small file problem in HDFS. Empirical evaluation conducted in this paper shows that HAR and CombineFileInputFormat perform better and have consistent and stable results when increasing number of files for processing.

Keywords Hadoop · MapReduce · HAR · Hadoop streaming · Sequential file · CombineFileInputFormat · Small files · HDFS

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The function of Hadoop is identified by its two major core components, i.e., Hadoop Distributed File System (HDFS) and MapReduce. The HDFS stores huge data into the computing nodes. This huge data cannot be stored directly to the computing nodes; HDFS divides the large file into 128 MB data chunks, and these data chunks

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PATCH BASED STEREO MATCHING USING CONVOLUTIONAL NEURAL NETWORK

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Abstract

The paper presents a new Convolutional Neural Network (CNN) architecture, called stacked stereo CNN, for computing disparity map from stereo images. In stacked stereo CNN, left and right image patches are stacked back-to-back and fed to a single tower CNN. This is in contrast to Siamese network where two towers are used, one for the left patch and other for the right patch. The proposed network is trained on a large set of similar and dissimilar image patches, which are generated from stereo images and their ground truth images from Middlebury stereo datasets. The network returns a dissimilarity score for a pair of image patch which is used to compute the cost volume. The cost volume is further refined using post processing steps before generating the final disparity map. The proposed network is evaluated on Middlebury datasets and achieves comparable results to the state-of-art algorithms.

Keywords:

Stereo Vision, Patch Matching, Disparity Map, CNN

1. INTRODUCTION

Stereo vision is a widely used technique to estimate depth of various scene points from two images of the scene obtained from two slightly different viewpoints. The basic principle of stereo vision is that the depth of a scene point is inversely proportional to its disparity in the left and right images. However, efficient and accurate implementation of this simple principle; specifically calculation of disparity, is eluding researchers for the last three decades due to the presence of occlusion, repetitive patterns, reflections, texturcless areas. Thus, the stereo vision is still a very active research area of computer vision. It has many applications, such as 3D scene reconstruction, autonomous driving, obstacle avoidance and robotics.

Over three decades of research in stereo vision, many methods have been reported in literature. These methods can be grouped into two categories: traditional approaches and machine learning based approaches. Traditional disparity estimation methods start by first computing dissimilarity cost at each disparity level for each pixel and generates a cost volume followed by cost volume filtering for smoothing and noise removal and finally, disparity selection by selecting index of the lowest cost. Commonly, some measures of a small window around the pixel of interest in one view, called the reference image, is used to locate the most similar window in the other view called the target image. The commonly used handcrafted similarity measures are: absolute difference or squared difference of pixel intensities, normalized crosscorrelation. However, due to occlusion, repetitive patterns, reflections, texturcless areas, a large number of wrong matches are generated by direct matching.

To improve the accuracy of the disparity map by traditional methods, a typical pipeline of stereo disparity computation, using other clues from the stereo pair images and neighbourhood continuity, consists of the following steps: (1) matching cost computation, (2) cost aggregation, (3) optimization, and (4) disparity refinement [1]. For more details about these steps, refer [1]. The major drawback of traditional methods is inability of handcrafted similarity measures to generate accurate initial disparity map leading to inaccurate final disparity map, even after applying all the steps of the stereo pipeline.

In machine learning based approaches, neural networks are used in one or more steps of the traditional stereo pipeline. Due to the availability of advanced GPU hardware and deep learning libraries, researchers in stereo vision have reported many deep learning based approaches to calculate disparity maps. These methods outperform traditional methods in terms of accuracy and sometimes speed. Based on how convolutional neural networks (CNN) is used in stereo pipeline, deep learning stereo matching methods are classified into patch based [2][3] or end-to-end [4] [5].

In patch based methods, stereo matching problem can be modelled as a binary or multi class classification problem or a regression problem where a network is trained to categorise similar dissimilar and patches or to generate a similarity/dissimilarity score for the input patches. In a rectified stereo image pair, given a patch from the left (reference) image, the task of the network is to locate the best matching patch in the right (target) image. In patch based methods, the hand crafted feature to generate matching score is replaced by a trained network. Similar to traditional methods, to further refine the disparity map, extensive post processing steps are used. On the other hand, in end-to-end deep learning methods, hourglass shaped deep convolutional neural networks are used to generate the final disparity map in one go and no further post processing steps are used. Currently, the end-to-end networks are capable to handle domain specific problems. Researchers are unable to train a generic stereo matching network due to non-availability of suitable labelled datasets. Further, the end-to-end methods are very expensive in terms of memory requirements.

In this paper, a new CNN architecture, called stacked stereo CNN (SS-CNN), for the patch based stereo matching is proposed. In contrast to commonly used two tower Siamese network [2] [3] for the patch based stereo matching, the proposed network is a single tower CNN where the two input patches are stacked together along the colour plane axis before feeding to the network. The network directly generates the dissimilarity score for the input patches which can be used as dissimilarity cost in downline processing steps. The dataset to train the proposed network is generated automatically from publically available stereo images datasets with ground truth from Middlebury [6]. The raw disparity map obtained from the proposed network is further refined using semi global matching and left-right (LR) consistency check. Further, a new method is proposed to fill inconsistent disparities generated after LR check. Typically, inconsistent disparities are



Article

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Kinetic study and modeling of homogeneous thermocatalytic decomposition of methane over Ni-Cu-Zn/Al2O3 catalyst for production of hydrogen and bamboo-shaped carbon nanotubes

Sushil Kumar Saraswat, Bipul Sinha, Kamal K. Pant, and Ram B. Gupta Ind. Eng. Chem. Res., Just Accepted Manuscript • DOI: 10.1021/acs.iecr.6b03145 • Publication Date (Web): 25 Oct 2016 Downloaded from http://pubs.acs.org on October 31, 2016

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Hierarchical nitrogen-doped porous carbon derived from lecithin for high-performance supercapacitors

Muslum Demir, 1 * Sush I Kumar Saraswat and Ram B. Gupta*

The development of renewable carbon sources for sustainable energy storage applications is of significance importance. Herein, we report the synthesis of three-dimensional N-doped carbons derived from lecithin via a simple route. Hierarchical porous carbons with high surface area (up to 1803 m² g⁻¹) and nitrogendoping level (up to 9.2 wt%) were successfully prepared by hydrothermal carbonization and a subsequent thermal annealing. The electrochemical performance of the carbon electrodes was examined with both two and three-electrode cell configurations in 1 M KOH and 1 M H₂SO₄ electrolytes. The as-prepared NC-800 electrode features a large specific capacitance (285 F g⁻¹ at 0.5 A g⁻¹), high-rate capacitive behavior, and long-term cycling stability (8% loss after 20 000 cycles). Furthermore, NC-800 exhibits an energy density of 24.7 W h kg⁻¹ at a power density of 500 W kg⁻¹ in 1 M H₂SO₄. The excellent electrochemical performance of N-doped carbons is attributed to the unique hierarchical porous frameworks along with pseudocapacitive effect. This work opens up a new approach for preparation of hierarchical N-doped porous carbon materials with tailored properties for supercapacitor applications.

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1. Introduction

Electrochemical supercapacitors (ESs), also known as electrodouble layer capacitors have received much attention due to their high power density, fast charge-discharge rate, and long cyclability.¹⁻³ ESs have been extensively implemented in a variety of applications such as electronic devices, hybrid 'lectric vehicles, memory backup, *etc.*⁴ ESs can be classified into two types based on their charge storage mechanism: (a) electric double layer capacitor (EDLC) in which energy is stored by adsorption of ions on the electrode surface and (b) pseudocapacitor (also known as faradaic supercapacitor) in which charge is stored through redox reactions on the electrode material.³

The electrode material plays a key role in determining the capacitance of a supercapacitor. To date, porous activated carbons (PACs),^{5,6} metal oxides,⁷ conductive polymers,⁸ graphene⁹ and carbon nanotubes¹⁰ have been utilized as potential electrode materials in energy storage technologies.^{11,12} Among these, abundant PACs present high surface area, excellent stability, and moderate cost. However, pristine (or bare) PACs suffer from low electron/ion conductivity, lacking of pseudocapacitance contribution but also their mediocre electrochemical performance lead to a poor energy/power density. In order to

overcome these issues, pristine PACs have been modified by introducing heteroatoms (such as N, S, P) into their framework to further enhance the electrochemical activity, surface wettability, and electron/electrolyte conductivity through the pseudocapacitive contribution.13-13 The induced electrochemical activity may arise from shifting of the conjugation electrons between heteroatom (lone-pair) and carbon framework, which causes facilitation of electron transfer.16 Moreover, the high surface area of PACs is mostly due to their overwhelmingly microporous structure (i.e., micropore distributions ranging from 0.5 to 1.1 nm). These narrow pores do not allow adequate transport of ions which greatly hinder practical applications of PACs as high energy/power density supercapacitors. 17-19 Therefore, it is essential to develop hierarchical porous architectures with abundant micropores (to accumulate charge effectively), interconnected mesopores (to reduce the ion diffusion distance) and appropriate macropores (to serve as the ionbuffering reservoirs for storing electrolyte ions).20-22 In the last decade, many template-based methods such as using silica oxides or metallic compound have been reported for synthesizing of hierarchical porous carbons.23,24 .- However, these methods could not be commercialized due to the consumption of high-cost templates and multistep synthesis process. Thus, it is vital to develop a simple and inexpensive method for fabricating of hierarchical porous carbon. In this work, we utilized a straightforward chemical activation (with KOH) approach which yields a 3D hierarchical porous structures. The successful formation of hierarchical porous carbon using KOH activation

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Hierarchical nitrogen-doped porous carbon derived from lecithin for high-performance supercapacitors

Muslum Demir, 1 * Sush I Kumar Saraswat and Ram B. Gupta*

The development of renewable carbon sources for sustainable energy storage applications is of significance importance. Herein, we report the synthesis of three-dimensional N-doped carbons derived from lecithin via a simple route. Hierarchical porous carbons with high surface area (up to 1803 m² g⁻¹) and nitrogendoping level (up to 9.2 wt%) were successfully prepared by hydrothermal carbonization and a subsequent thermal annealing. The electrochemical performance of the carbon electrodes was examined with both two and three-electrode cell configurations in 1 M KOH and 1 M H₂SO₄ electrolytes. The as-prepared NC-800 electrode features a large specific capacitance (285 F g⁻¹ at 0.5 A g⁻¹), high-rate capacitive behavior, and long-term cycling stability (8% loss after 20 000 cycles). Furthermore, NC-800 exhibits an energy density of 24.7 W h kg⁻¹ at a power density of 500 W kg⁻¹ in 1 M H₂SO₄. The excellent electrochemical performance of N-doped carbons is attributed to the unique hierarchical porous frameworks along with pseudocapacitive effect. This work opens up a new approach for preparation of hierarchical N-doped porous carbon materials with tailored properties for supercapacitor applications.

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1. Introduction

Electrochemical supercapacitors (ESs), also known as electrodouble layer capacitors have received much attention due to their high power density, fast charge-discharge rate, and long cyclability.¹⁻³ ESs have been extensively implemented in a variety of applications such as electronic devices, hybrid 'ectric vehicles, memory backup, *etc.*⁴ ESs can be classified into two types based on their charge storage mechanism: (a) electric double layer capacitor (EDLC) in which energy is stored by adsorption of ions on the electrode surface and (b) pseudocapacitor (also known as faradaic supercapacitor) in which charge is stored through redox reactions on the electrode material.³

The electrode material plays a key role in determining the capacitance of a supercapacitor. To date, porous activated carbons (PACs),^{5,6} metal oxides,⁷ conductive polymers,⁸ graphene⁹ and carbon nanotubes¹⁰ have been utilized as potential electrode materials in energy storage technologies.^{11,12} Among these, abundant PACs present high surface area, excellent stability, and moderate cost. However, pristine (or bare) PACs suffer from low electron/ion conductivity, lacking of pseudocapacitance contribution but also their mediocre electrochemical performance lead to a poor energy/power density. In order to

overcome these issues, pristine PACs have been modified by introducing heteroatoms (such as N, S, P) into their framework to further enhance the electrochemical activity, surface wettability, and electron/electrolyte conductivity through the pseudocapacitive contribution.13-15 The induced electrochemical activity may arise from shifting of the conjugation electrons between heteroatom (lone-pair) and carbon framework, which causes facilitation of electron transfer.36 Moreover, the high surface area of PACs is mostly due to their overwhelmingly microporous structure (i.e., micropore distributions ranging from 0.5 to 1.1 nm). These narrow pores do not allow adequate transport of ions which greatly hinder practical applications of PACs as high energy/power density supercapacitors. 17-19 Therefore, it is essential to develop hierarchical porous architectures with abundant micropores (to accumulate charge effectively), interconnected mesopores (to reduce the ion diffusion distance) and appropriate macropores (to serve as the ionbuffering reservoirs for storing electrolyte ions).20-22 In the last decade, many template-based methods such as using silica oxides or metallic compound have been reported for synthesizing of hierarchical porous carbons.23,24-However, these methods could not be commercialized due to the consumption of high-cost templates and multistep synthesis process. Thus, it is vital to develop a simple and inexpensive method for fabricating of hierarchical porous carbon. In this work, we utilized a straightforward chemical activation (with KOH) approach which yields a 3D hierarchical porous structures. The successful formation of hierarchical porous carbon using KOH activation

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Recent advancements in semiconductor materials for photoelectrochemical water splitting for hydrogen production using visible light



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ABSTRACT

Water splitting technology directly stores solar energy into the chemical bonds of diatomic hydrogen to be used as a clean fuel without producing any unwanted side reactions, byproducts or environmentally polluting compounds. Semiconductor materials are needed for a photoelectrochemical (PEC) device to catalytically convert photons from sunlight into chemical energy. Materials implemented in a device for sustainable hydrogen production are required to be inexpensive, highly photo-active, chemically stable, environmentally sustainable, and have a high solar-to-hydrogen conversion efficiency. Although many semiconductor composites and nanostructures have been examined, thus far, no material satisfies all criteria of an implementable photocatalyst and many materials do not show necessary energy conversion efficiency. Materials that depicted a high efficiency often rely on the ultraviolet portion of the solar spectrum, which does not contain enough energy for the industrial utilization of PEC water splitting technologies. Focusing on the use of the visible spectrum is promising for hydrogen production. Herein, recent advancements in the activity of visible light semiconductors are presented, including both platinum and non-platinum group materials. This review touches on the latest developments in various synthesis schemes capable of achieving suitable water splitting compositions and architectures while highlighting the challenges being faced when designing visible light-active water splitting photocatalysts. Interesting advancements in the use of nanostructures for designing the next generation of catalysts will be discussed. Also, for the proper comparison of catalytic efficiencies, it is important to establish terminology that can compare data across a magnitude of experimental conditions. A notable challenge associated with the catalysis is its stability or photocorrosion, which lacks established protocols. Promising future directions for designing next generation materials are discussed.

. Introduction

The energy crisis in the mid-1970s triggered a worldwide research enthusiasm for the expansion of renewable energy resources to replace conventional fossil fuels. Recently, increasing CO₂ levels and atmospheric pollution have led to the development of several clean energy resources, including solar, wind, geothermal, tidal, etc. With an increase in the population and industrialization, the global energy demand increases with each passing day, further leading to the depletion of fossil fuels. Simultaneously, the concentration of greenhouse gases in the atmosphere is increasing daily resulting from the burning of fossil fuels to meet ever-growing energy demands. Greenhouse-gas emissions from the energy sector represent roughly two-thirds of all anthropogenic greenhouse-gas emissions, which have steadily risen over the past century. Solar energy via sunlight is one of the most promising atternative energy resources that can replace fossil fuels and fulfill the rising global energy demand. For example, the total energy consumption of the world projected for the entire year of 2020 is approximated to be 663.6 exajoules, equivalent to all of the energy from sunlight striking the Earth for just 90 min (given that the average energy rate of sunlight striking the surface of the Earth is ca. 1,200,000 TW) [1]. However, unlike the reasonably reliable petroleum fuel supply chain, sunlight intensity is intermittent and dependent upon the geographic location, weather forecast, and time of day [2].

Hydrogen production from sunlight and water is being considered as a promising solution to supply sustainable energy; it is environmentally clean and can act as a suitable buffer between energy supply and demand. Based on the solar harvesting technology utilized, solar hydrogen production methods can be generally categorized (Fig. 1) as: (a) solar photocatalytic water splitting: utilizes photo-active electrodes, particles, or photovoltaic cells made of semiconductors or semiconductor composites to split water with and without an external

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Nitrogen and oxygen dual-doped porous carbons prepared from pea protein as electrode materials for high performance supercapacitors

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ABSTRACT

Porous carbons as electrode materials are highly desired for use in energy storage/conversion devices. Herein, the development of a series of highly porous nitrogen and oxygen co-doped carbons by using pea protein (PP) as a cost-effective, sustainable and nitrogenrich precursor is reported. Pea protein derived carbons (PPDCs) have been prepared by applying a straightforward two-step synthetic route including pyrolysis and KOH-chemical activation. Potassium hydroxide has been employed to generate porosity and introduce oxygen functionalities into the framework of carbon. The heteroatoms doping content and porosity parameters have been tuned by varying the synthesis temperature and activator to precursor ratio. The carbon obtained with optimal synthetic parameters (T = 800 °C and KOH/Precursor = 4) featured the highest surface area, the maximal pore volume and N-/O doping level of 3500 m² g⁻¹, 1.76 cm³ g⁻¹, and 2.5-/17.9 at%, respectively. PPDC-4-800 as supercapacitor presented a very high specific capacitance (413 F g⁻¹ at 1.0 A g⁻¹ in 1 M KOH), remarkable cycling stability (92% retention after 20000 cycles) and outstanding rate capability (210 F g⁻¹ at 30 A g⁻¹). The cooperative effects of the well-developed porous architecture and surface modification of PPDCs resulted in enhanced electrochemical performances, suggesting their potential application for energy storage devices.

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Introduction

Due to the fast-growing consumption of energy in our industrial society, development of inexpensive and efficient energy storage devices emerges as an absolute necessity [1]. In this regard, batteries and capacitors have gained much attention as two major storages technologies. The electrochemical reaction as the primary storage mechanism in the batteries may hinder their performance. On the contrary, the charge separation mechanism in the supercapacitors (also known as ultracapacitors) does not limit their storage properties. Thus,

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Summary

KEYWORDS

carbonization, lignin, supercapacitor

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RESEARCH ARTICLE



WILEY ENERGY RESEARCH

Lignin-derived heteroatom-doped porous carbons for supercapacitor and CO₂ capture applications

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The present study reports the economic and sustainable syntheses of functional

porous carbons for supercapacitor and CO2 capture applications. Lignin, a

byproduct of pulp and paper industry, was successfully converted into a series

of heteroatom-doped porous carbons (LHPCs) through a hydrothermal

carbonization followed by a chemical activating treatment. The prepared

carbons include in the range of 2.5 to 5.6 wt% nitrogen and 54 wt% oxygen in

its structure. All the prepared carbons exhibit micro- and mesoporous structures

with a high surface area in the range of 1788 to 2957 $m^2 g^{-1}$. As-prepared LHPCs

as an active electrode material and CO2 adsorbents were investigated for

supercapacitor and CO2 capture applications. Lignin-derived heteroatom-doped

porous carbon 850 shows an outstanding gravimetric specific capacitance of

372 F g⁻¹ and excellent cyclic stability over 30,000 cycles in 1 M KOH.

Lignin-derived heteroatom-doped porous carbon 700 displays a remarkable

 CO_2 capture capacity of up to 4.8 mmol g⁻¹ (1 bar and 298 K). This study illustrates

the effective transformation of a sustainable waste product into a highly functional

carbon material for energy storage and CO2 separation applications.

biomass, chemical activation, CO2 separation, heteroatom-doped carbon, hydrothermal

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1 | INTRODUCTION

Supercapacitors, also named as electrochemical capacitors, are high-performance energy storage devices. During the last decades, supercapacitors have become very prominent devices because of their excellent cyclability, a high power density, and an excellent charge/ discharge rates.¹ Supercapacitors have been classified as two types based on the charge storage mechanism: first, electric double layer capacitors (EDLCs) and second, pseudocapacitors (PCs). Electric double layer capacitors store the charge electrostatically within the active material/ electrolyte interface. In contrast to EDLCs, PCs store the charge via reversible redox reaction and fast process.²⁻⁵ To date, carbon-derived electrode materials have been widely used for EDLCs owing to their low cost, excellent

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RESEARCH ARTICLE



Adsorptive removal of heavy metals from industrial effluents using cow dung as the biosorbent: Kinetic and isotherm modeling

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Abstract

This article investigated an eco-friendly technique for the removal of heavy metals using biosorbent derived from cow dung. Heavy metals bearing wastewater were collected from a common effluent treatment plant located at Sangariya, Jodhpur (Rajasthan, India) to evaluate the removal efficiency of synthesized cow dung-activated carbon. The prepared activated carbon materials have a high surface area in the range of 948-1072 m²/g and also have significant quantities of micropore and mesopore volumes. Furthermore, pore diameters were in the range of 2.24-2.33 nm. Surface morphology was improved after being treated with NaOH. The adsorbent material was found to be an efficient medium for the removal of Cr(VI) and Cd(II). The results revealed that more than 95.6% of Cr(VI) and 66.88% of Cd(II) were achieved at the optimized condition of pH12.0, initial concentration of heavy metals 10 mg/L, 300 min of contact time, and the dose of 0.2 g/L, whereas only 16.3% removal efficiency was observed for Ni(II). Equilibrium data have been analyzed by Langmuir. Freundlich, Temkin, and Redlich and Peterson (R-P) isotherm models with the help of nonlinear regression analysis. Experimental data were best fitted for Freundlich and **R-P** isotherms.

KEYWORDS

adsorption, biosorbent, cow dung-activated carbon (CDAC), heavy metal

1 | INTRODUCTION

Pure water, vital for a healthy environment, is a resource that is adversely affected both quantitatively and qualitatively by man-made activities. Rapid industrialization and urbanization have brought a real water crisis. Industries continue to be a major cause of water pollution due to diverse kinds of waste, especially toxic heavy metal ions released in water bodies, without adequate treatment (Nguyen et al., 2013). Water quality changes significantly with the presence of toxic heavy metals (Ni, Cd, Zn, Hg, Cr, Pb, Cu, and As) when the level exceeds prescribed limits. Thus, it becomes potentially harmful to all kinds of life on this planet. Heavy metals in water streams originate from the effluent of smelters, mines, and various industries such as batteries, tanneries, electroplating, steel, refining ores, paint manufacture, pesticides, fertilizers, pigment manufacture, printing, and photographic sectors (Babalola, 2018). The nature and composition of industrial effluents depend mainly on raw materials, process, and treatment methods.

The ingestion of heavy metals via the food chain, in concentrations above the permissible limit, has a detrimental effect on human physiology and other biological systems. Due to their hazardous tendency of accumulation and toxicity, they pose a severe threat to the function of different organs in the human body and aquatic animals (Fu, & Wang, 2011; Rangabhashiyam, Jayabalan, Rajkumar, & Balasubramanian, 2019). Various agencies, viz., the U.S. Environmental Protection Agency (EPA), the Bureau of Indian Standards (BIS), and the Indian Council of Medical Research (ICMR), set regulatory limits for atalytic Cracking of Waste Polypropylene in a Nitrogen Fluidized ...

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Journal of Geoscience and Environment Protection (journalarticles.aspx?journalid=2432) > Vol.4 No.4, April 2016 (home.aspx?issueid=7853#65421)

Catalytic Cracking of Waste Polypropylene in a Nitrogen Fluidized Bed Reactor

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Abstract

Polypropylene (PP) is rated first as volume leader in the plastic sector. Its non-biodegradable property poses serious environmental problem in case of disposal. The catalytic cracking of PP was performed with various catalysts i.e. ZSM-5, Zeolite, RB and SPS. The cracking was observed under different feed to catalyst ratio i.e. 1:1 to 5:1. The fluidized bed reactor was fabricated with arrangement to measure the temperature ranging from 100- C to 800- C. The effective of feed to catalyst ratio was found 3:1 at a temperature range of 420- C - 510- C and catalyst ZSM-5 gives maximum liquid conversion of waste PP. Conversion of PP to liquid fuel will not only resolve the problem of disposal of waste polypropylene plastic but also give a value aided product.

Keywords

Waste PP (articles.aspx?searchcode=Waste+PP&searchfield=**Aby** wob**i**&page=1&skid=0), Stalytic Cracking (articles.aspx?searchcode=+Pyrolysis&searchfield=keyword&page=1&skid=0), Catalytic Cracking (articles.aspx?searchcode=+Catalytic+Cracking&searchfield=keyword&page=1&skid=0), ZsM-5

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ect of Reduction in Peak Expiratory Flow Rate on Blood Pressure of Sand one Mine Workers

a Ram Panwar (articles.aspx?searchcode=Banna+Ram++Panwar&searchfield=authors&page=1)¹, Anil Vyas

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Expiratory Flow Rate (PEFR) measures the airflow through the bronchi and thus the degree of obstruction in the airways. sure to high concentration of respirable suspended particulate matter (RSPM) decreases the PEFR and the decrease inds upon the exposure concentration of particles and exposure duration. The decrease in PEFR is found to be responsible crease in blood pressure (BP). Relationship between increase in BP and reduction in PEFR is not exactly linear but it can insidered as liner. It is noticed that if PEFR is reduced to about 50% to 60% in that case sudden increase in BP is ded and behaviour of BP rise has complex pattern. It is also an established fact that if PEFR is reduced more than 50 %, treated as severe respiratory problem. There are many factors (i.e. smoking habits, medical treatment, physiology, which may govern the increase of BP in this condition. Estimated relationship is found as: ISBP = 0.213 + 0.263 IPE_F, = 0.102 + 0.176 IPEF.

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COMPARATIVE STUDY OF MEMBRANE CAPACITIVE DEIONIZATION TECHNOLOGY AND REVERSE OSMOSIS FOR TOTAL DISSOLVED SOLIDS FROM WATER

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Abstract—Growing human population, severe neglect and over-exploitation of water resources has made water, a scarce commodity. The when world is concerned for the availability of clean and potable water. Most of the available water is saline and is not potable. Water supplies are running out of the actual water needs of the society. We are now in need of finding cost competitive newer technologies for reclaiming this valuable life-sustaining liquid. Membrane capacitive deionization is one of those prominent technologies which assure to be more efficient with higher water recovery and less power consumption. This comparative study was done to evaluate the salt removal efficiency of Membrane Capacitive Deionization over reverse osmosis. The pilot plant (CapDI) manufactured by Voltea (Netherland) was provided by InNow India Pvt. Ltd for carrying out this study. It was found that Capacitive deionization technique is very efficient in removal of low salinity feed water sources. Energy consumption is quite low approximately only 20 to 30% of energy utilized by reverse osmosis. And flow recovery rate of CapDI plant is also high than reverse osmosis plant.

Index Terms-Electric Conductivity, Membrane Capacitive Deionization, Trace Metals

I. INTRODUCTION

The desalination of seawater and brackish groundwater to provide fresh drinking water is an established and thriving industry. Desalinisation refers to any of several processes that removes amount of salt and any other minerals present in the saline water. Salt water is desalinated in order to produce fresh water that is suitable for human consumption or irrigation. The most commonly used technologies at present for the desalination process are Thermal Distillation and Reverse Osmosis (RO) filtration.

Rajasthan is the largest state of India, it shares only 1/10 of the average share of water than rest of the country [1]. Water supplies in most of the Indian cities including cities of Rajasthan are not matching the actual water need of the society. Groundwater is the major source of drinking water in some part of the Rajasthan. Presence of higher amount of salts in underground water sources in the western Rajasthan is incing the less availability of potable water to the population. This study was done to evaluate removal of salts from membrane capacitive deionization.

By definition, Membrane Capacitive Deionization is a combination of conventional Capacitive Deionization with ion-exchang membranes (IEMs) placed in front of the electrodes. Ion exchange membranes can be positioned in front of one or both electrodes. Ion exchange membranes have a high internal charge due to covalently bound groups such as sulfonate or quaternary amines, which allows eas access for one type of ion (the counter ion) and block access for the ion of equal charge sign (the co-ion). Addition of Ion-exchang membranes significantly improves desalination performance of the Capacitive Deionization process, in terms of salt adsorption, charg efficiency and energy consumption. The membranes can be included as stand-alone films of thicknesses between 50 and 200 µm, or can b coated directly on the electrode with a typical coating thickness of 20 µm[2].

MCDI Working

Desalination by MCDI is done by applying constant current with varying voltage, so method is known as constant current(CC).

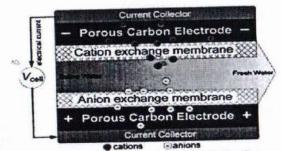


Figure 1 membrane capacitive deionization.

In CC-operation the effluent salt concentration level remains at a fairly constant value, namely at a constant low value during adsorpti and at a constant high value during desorption. Another advantage of CC operation is that one can precisely tune the effluent salt concentrat level by adjusting the electrical current, or water flow rate, as control parameters. CC operation works only in MCDI and not in CDI. Inste

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Assessment of Fluoride Contamination on Groundwater Along Jojari River Due to Discharge of Steel Industries Wastewater

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1bstract- Environmental pollution is placing an everincreasing load on the various resources of our environment, including soil. Soils polluted with various pollutants can be found near industrial areas, metropolises, along major transportation routes, underground soil, and areas treated with waste-water sludge, but soils can also be polluted geologically. Soils are able to accumulate these ions for many years without the obvious signs of their acute toxic effect. However, the filtering/purifying capacity of soils is finite and, above a certain level, soils are no longer able to absorb these elements and become sources of pollution themselves. Toxic elements are released into water, absorbed by cultivated crops and plants; they are assimilated into vegetative and generative organs, and enter the food-chain where they cause long-term harm. Presence of low or high concentration of certain ions is a major issue as they make the groundwater unsuitable for various purposes. Fluoride is one such ion that causes health problems in people living in more than 25 nations around the world. Waste water from steel industries of Jodhpur is discharged into the Jojari river. Fluoride ions from this wastewater leach into the groundwater and contribute high fluoride concentration in the nearby underground water. Samples of underground water were collected along the Jojririver. Concentration of fluoride in some of the samples was found above the permissible limits. Health impacts like dental fluorosis and skeletal fluorosis are found in many villages of Jodhpur district. Treatment of wastewater, generated in industries is urgent necessary to bring the concentrations under prescribed limits before discharging it into the river Jojri.

Keywords- Pollution , Fluoride , TDS, Steel Industry , Ground water

I. INTRODUCTION

Jodhpur is situated in the western part of the Rajasthan. It is the second largest city of Rajasthan after Jaipur. City is well known for its textile and steel industries.

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Industries in Jodhpur are mainly located in Industrial Areas developed by RIICO and city is situated on the bank of river Jojari. This river is no more perennial in nature. Fresh water flows into it only in rainy season and in remaining seasons, water in the river contains treated or untreated domestic waste water and treated or untreated industrial waste water.Due to the critical condition of this river it was chosen as the study area. Samples of sludge and ground water were collected from various locations and at various depths. Locations of the sampling point were decided randomly to represent an overall view of the river length.

As wastes from Steel industries is discharged into the river Jojari pollutants are continuously depositing on the river bed. The waste contains large amount of fluoride in the form of HF, it can be harmful to human and crops if the water from tube-wells is used for drinking and irrigation purpose. In the present study, deposited sludge samples from the river bed and water samples from nearby tube well were taken along the river to find out the leaching effect of fluoride from the polluted river water to underground water.

II. OBSERVATIONS & ANALYSIS

Water samples were collected at various depths from investigated sites. 12 samples of underground water and 16 samples of sludge were taken. Before the samples were taken, the water was pumped out for 5-10 minutes until fresh water comes out from deep in the well. New polyethylene sample bottles were taken for sample collection. Two litres of water samples were collected. Grab samples were collected from the tube well and well near Jojari River at all the sampling locations. The sample bottles were soaked in 10% HNO₃ for 24hr and rinsed several times with double distilled water (DW) prior to use. Water samples were collected as per the sampling protocol and tested as per standard method. Water samples were tested for pH, total dissolved solids (TDS) and fluoride.

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Effect of Textile Industry Sludge on River Bed on Under Ground Water near Jojari River

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Effect of Textile Industry Sludge on River Bed on Under Ground Water near Jojari River

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Abstract- Jodhpur is one of the most industrialized city of Rajasthan and mainly known for textile industry. This city is situated along the river Jojari in which fresh water flows only in monsoon season and rest of the years only treated and untreated domestic and industrial waste water flows. Effluents from these industries contain lots of heavy metals and salts present in dissolved forms and they are deposited on river bed since many years. And during a course of time, these contaminants infiltrate through the bed to meet with the ground water table. In this study various parameter in water samples sample from various tube-wells located on the bank of the river i.e., pH , Total Dissolved Solids (TDS), concentration of Na^+ , Ca^{2+} , Mg^{2+} , K^+ , P^+ and concentrations of heavy metals like Ni, Pb, Zn, Cr, Cd etc. was determined using Inductive coupled plasma- Optical emission Spectrometer (ICP-OES). Sludge samples from the bed of river Jojari from various places were collected and Ni, Pb, Zn, Cr, Cd were measured. Results indicate that leaching of deposited metals are taking place and is polluting upper level of ground water. Presently leaching effect is not found in deep underground water, it may be because of presence of impermeable layer of soil at certain depth. But if this continues to be same in nearby future then, it may contaminate deep layer of ground water Inhla an wall

treated and untreated waste from different textile industries flows. This industrial waste water contains various types of heavy metals and these metals are deposited in the river bed. Heavy metals are important environmental pollutants, particularly in areas with high anthropogenic sources [2]. These pollutants are extremely persistent in the environment, nonbiodegradable nonthermodegradable, therefore could readily accumulate to toxic levels [1,3].Heavy metals contribute to environmental pollution because of their unique properties; heavy metals do not leach from the topsoil and have the potential to accumulate in the different organs (such as the kidneys, bones and liver) leading to unwanted side effects [4,5]. Each heavy metal shows specific signs of its toxicity. Some effects of heavy metals could be toxic (acute, chronic or sub-chronic), neurotoxic, or even carcinogenic, mutagenic or teratogenic [5]. Heavy metals can accumulate in the soil at toxic levels due to long-term application of wastewater. Metals can be transferred from soil to the other ecosystem components, such as underground water or crops, and can affect human health through the water supply and food [1,6]. Soils, as filters of toxic chemicals, may adsorb and retain heavy metals from wastewater. The amount of heavy metals mobilized in the soil is a function of pH, clay content, organic matter content estion evolution conscitu and other

AIR QUALITY INDEX DETERMINATION OF COMMERCIAL AREAS OF JODHPUR CITY: A CASE STUDY

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Abstract: This paper presents a case study of Jodhpur City in which an attempt has been made to prepare an inventory of pollutants (PM10, PM2.5, SO2, NOx, CO) at regional level to know the current cumulative air pollution load in the study area and thereafter computing Air Quality Index by computing sub index for every pollutant. Monitoring stations were set up at seven different locations and sar s have been analysed and subsequently air quality index has been computed. The results reveal that gaseous pollutants such as SO2 NO2& CO are within the permissible limits. PM25 levels exceed the prescribed National Ambient Air Quality standards (NAAQS) and PM10 levels also exceeded the prescribed NAAQS during all the monitoring location thus particulate matter is the predominant cause of air pollution in the study area. The AQIs were calculated using IND-AQI procedure. It has been observed that the calculated AQIs value for SO₂ falls under 'good' category. The calculated AQIs values for NO₂ & CO fall under 'good' and 'satisfactory' categories. The calculated AQIs values of PM10 fall under 'moderate' and 'poor' categories. The calculated AQIs values of PM25 fall under 'moderate', 'poor' and also in 'very poor' categories. The overall AQI was found to fall under the category 'Poor' owing to PM25. Thus it is observed that PM2.5 is responsible pollutant at these seven locations in Jodhpur.

Keywords: Air quality index, ambient air quality, Jodhpur city, Residential area, PM10, PM2.5, SO2, NO2, CO.

I. INTRODUCTION

Today pollution in urban areas especially in commercial areas has become an important issue to all the government. Because of increasing commercial activities, industrial activities and transportation load air quality is continuously deteriorating. The acute health effect of suspended particulate matter (SPM), even at short term low levels exposure; include increased daily mortality and hospital admission rates for exacerbation of respiratory disease. Long term exposure to PM2.5 increases the risk of the non accidental mortality. Living close to busy traffic appears to be associated with elevated risk. The available human clinical results do not establish a mechanistic pathway leading to adverse health impacts for short term NO2 exposure at present day ambient environment. In all the analytical studies total mortality was directly associated with long term exposure to particulate matter. Each day our lungs are directly exposed to more than 7000 liters of air, w' h contain varying amount of inorganic, organic particles and various types of gases. Air Quality Index is a medium to communicate the que ity of ambient air to common people so it is easy to understand. It transforms the complex data of various air pollutants into a single number which is called index value along with nomenclature and colour. Jodhpur is the second largest city of Rajasthan and is a well-known tourist place. Varieties of pollutants are emitted in ambient air of Jodhpur city but particulate matters primarily dominate. Jodhpur is Rajasthan's most polluted city as per May 2016 report of World Health Organisation. Therefore an attempt was made to present overall air quality in residential areas of Jodhpur city in terms of Air Quality Index & AQI has been calculated as per the guidelines of Central Pollution Control Board of India.

II. MATERIAL AND METHOD

Seven sampling stations were selected for monitoring of air quality in the commercial areas of Jodhpur City for the analysis of air pollution and determination of Air Quality Index i.e. Paota Circle, Jaljog Circle, BasniCircle, Akhaliya Circle, NaiSarak, Ratanada Circle and Near Pungalpada. Five ambient air pollutants (i.e.PM10, PM25, SO2, NO2 and CO) were determined using Respirable Dust Sampler, Fine Particulate Sampler, gaseous sampling attachment (EPA modified-West and Gaeke method for SO2 and Modified Jacobs Hochheiser method for NO2) and CO meter respectively. Readings were taken during the months of March to May as per the norms established by Central Pollution Control Board. Particulate matters measured by Cyclonic Flow Technique and Gravimetric method using GF/A filter papers on 8 hourly basis for 24 hours. Size of filter paper for PM10 was 20.3 cm × 25.4 cm with a flow rate of 1000 L/min and 47 mm at the rate of 16.7 L/min for PM25. Gaseous pollutants which were SO2 and NO2 were measured using gaseous sampling attachment attached with Rapid Dust Sampler. Carbon Mono-oxide was measured using CO meter at the desired locations instantly.

2.1 Sub-Index calculation

Air Quality index (AQI) is so deigned that any three of the parameters from PM10, PM25, SO2, NO2, CO, O3, Pb, &NH3, are sufficient to calculate the AQI. Sub-indices of eachselected pollutants were calculated and then highest value from among all the values of sub index was considered as AQI for that area.

The sub-index (I_p) for a given pollutant concentration (C_p) was calculated as,

$$I_{P} = \left[\left\{ \frac{I_{HI} - I_{LO}}{B_{HI} - B_{LO}} \right\} \times (C_{P} - B_{LO}) \right] + I_{LO}$$

Where

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SETTING THE STREET

Determination of Air Quality Index Around a Thermal Power Plant-A Case Study of RWPL at Bhadresh, Barmer

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Determination of Air Quality Index Around a Thermal Power Plant-A Case Study of RWPL at Bhadresh, Barmer

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Abstract: This paper presents a case study on determination of Air Quality Index for a Thermal Power Plant known as Raj West Power Limited (RWPL), situated at Bhadresh in Barmer district of Rajasthan state. Air pollutant concentration were measured in the prevalent windward direction, leeward direction, and in the crosswind directions at both left and right to the prevalent windward direction around the plant. Method for calculation and experimentation was based on the basis of guidelines given by Central Pollution Control Board of India. Five criteria pollutants i.e., PM₁₀ PM_{2.5} SO₂, NO₂ and CO were chosen for AQI determination at the given locations. Pollutants concentrations were found different directions. Maximum AQI was observed in the windward direction and minimum in leeward direction.

Key words: Air Quality Index, PM10, PM25 SO2, NO2 and CO, Thermal Power Plant, Air pollution.

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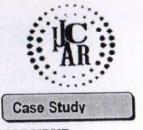
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I. INTRODUCTION

Raj West Power Limited (RWPL) is a part of JSW Group and the project consist of 8x135 MW Thermal Power Plant at village Bhadresh in Barmer District of Rajasthan state. Geographically the Plant is located at 26° 02' 34.7" N Latitude & 71° 15' 24.76" E Longitude having an elevation of -184 meter above MSL, which is suitable for installation of 8x135MW considering the availability of all the basic requirement. The plant is operational under environmental clearance (EC) granted by Ministry of Environment and Forests and consent to operate (CTO) granted by Rajasthan state pollution control board³. Purpose of this study is to measure the Air Quality Index in surrounding area of Thermal Power Plant as many villages are situated in its nearby areas. Thermal power plants are well known for its pollutant emissions like oxides of sulfur, nitrogen and carbon along with particulate matters⁷. Sulphur dioxide pollution, which takes a major toll on public health, including by contributing to the formation of small acidic particulates that can penetrate into human lungs and be absorbed by the bloodstream. SO₂ also

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AIR QUALITY INDEX DETERMINATION OF RESIDENTIAL AREAS OF JODHPUR CITY: A CASE STUDY

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ABSTRACT

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Air quality index, ambient air quality, Jodhpurcity, Residential area, PM₁₀, PM_{2.5}, SO₂, NO₂, CO. This paper presents a case study of Jodhpur City in which residential areas have been analysed for their ambient air quality analysis. Whole experimental and calculative procedure was based on the guidelines of Central Pollution Control Board of India. 24 hourly average concentrations of five criteria pollutants i.e., PM₁₀, PM_{2.5}, SO₂, NO₂ and CO were selected for the study for the year 2016 at five different locations of residential areas in Jodhpur city. Observations were taken twice in a week for three months. Results revealed that SO₂ and NO₂ concentrations were within prescribed limit of standard norms. CO concentration was also within permissible limit except few areas. Only particulate matters were crossing the standard limit and specially PM₁₀. Overall AQI was falling under the category of Good to moderatecategory. Thus, it can be concluded from the study that major pollutionin the residential areas of Jodhpur was due to particulate matters.

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INTRODUCTION

Today pollution in urban areas especially in residential areas as become an important issue to all the government. Because of increasing commercialactivities, industrial activities and transportation load air quality is continuously deteriorating. The acute health effect of suspended particulate matter (SPM), even at short term low levels exposure; include increased daily mortality and hospital admission rates for exacerbation of respiratory disease⁶. Long term exposure to PM2.5 increases the risk of the non accidental mortality. Living close to busy traffic appears to be associated with elevated risk1. The available human clinical results do not establish a mechanistic pathway leading to adverse health impacts for short term NO2 exposure at present day ambient environment². In all the analytical studies total mortality was directly associated with long term exposure to particulate matter 5. Each day our lungs are directly exposed to more than 7000 liters of air, which contain varying amount of inorganic, organic particles and various types of gases3. Air Quality Index is a medium to communicate the quality of ambient air to common people so it is easy to understand. It transforms the complex data of various air pollutants into a single number which is called index value along with nomenclature and colour. Jodhpur is the second largest city of Rajasthan and is a well-known tourist

place. There are more than 3 lakh registered vehicles ir Jodhpur city and also this city has desert like climatic and soi structure which in overall contribute more to air pollution Varieties of pollutants are emitted in ambient air of Jodhpur city but particulate matters primarily dominate. Jodhpur i Rajasthan's most polluted city as per May 2016 report c World Health Organisation⁷. Therefore an attempt was mad to present overall air quality in residential areas of Jodhpur cit in terms of Air Quality Index & AQI has been calculated a per the guidelines of Central Pollution Control Board of India

MATERIAL AND METHOD

Monitoring has been carried out at five different locations residential areas of Jodhpur city i.e., Chaupasani Housii Board Sector-10, Shastri Nagar, Sector-G, Saraswati Naga Golf Course and Nehru Park. Five ambient air pollutar (i.e.PM₁₀, PM_{2.5}, SO₂, NO₂ and CO) were determined usin Respirable Dust Sampler, Fine Particulate Sampler, gaseo sampling attachment (EPA modified-West and Gaeke meth for SO₂and Modified Jacobs Hochheiser method for NO₂) a CO meter respectively. Readings were taken for twice in week during the months of March to May as per the nor established by Central Pollution Control Board. Particul matters measured by Cyclonic Flow Technique i Gravimetric method using GF/A filter papers on 8 hourly bit for 24 hours. Size of filter paper for PM₁₀ was 20.3 cm×2

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Research Paper

Assessment Of Fluoride Removal By Membrane Capacitive Deionization

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ABSTRACT: Water is the symbol of existence of life. In the modern industrial era, we have used water so careJlessly. To complicate matters, increasing groundwater extraction around the globe results in progressive salt water ingress in wells and aquifers. Potable water as well as water for agriculture and industry has become critical. Rajasthan is the largest state, which covers 10% of the country area but receives only 1/100 of the total rains. It shares only 1/10 of the average share of water than rest of the country. The geographical and geological setup leads to deterioration of water quality. Therefore, state faces acute water crisis making Groundwater a centralized source of drinking water for millions of rural and urban families in Rajasthan. Unfortunately, Groundwater is deeper and contains high minerals and concentrated chemicals, making the water unfit to drink. Water quality standards are not meeting the prescribed Indian standards. Underground water of twenty three districts of Rajasthan contain high fluoride, which causes adverse health effects i.e. Dental fluorosis, skeletal fluorosis, nonskeletal manifestation etc. Many reverse osmosis plants have been installed in Rajasthan for removal of fluoride from ground watJer. But, due to high power consumption, scaling and fouling of membranes, reduced water recovery and poor maintenance, most of the RO plants are not working properly. Thus, alternative technology is required with low power consumption and maintenance cost for the treatment of underground water. The study was carried out to evaluate efficiency of membrane capacitive deionization for removal of fluoride from underground water with elevated electric conductivity in the western Rajasthan. Accordingly, certain areas of Jodhpur and Jaisalmer districts were selected as the study area. The pilot plant (CapDI) manufactured by Voltea (Netherland) was provided by InNow India Pvt. Ltd for carrying out this study. It is found that MCDI technology is very effective in fluoride removal if total dissolved solids concentration is less than 5000 mg/lt and percentage reduction of fluoride by MCDI technology is almost same as of by reverse osmosis technology. It was found that MCDI technology requires less power & gives more water recovery with low maintenance cost. Therefore it can be said MCDI technology is better than reverse osmosis technology. Keywords: Fluoride, Membrane capacitive deionization (MCDI), Water Recovery, Reverse osmosis

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I. INTRODUCTION

Inadequate rainfall and Inattentive use of Water has resulted in critical water scarcity. Rajasthan is the largest state, which covers 10% of the country area but receives only 1/100 of the total rains. It shares only 1/10 of the average share of water than rest of the country [1]. Groundwater is the principal source of drinking water in rural and urban Rajasthan. Due to careless use, continuous groundwater extraction, reduced rainfall and geographical setup, groundwater contains much elevated amount of salts making water unfit for not only drinking but also for other purposes. As far as Fluoride is concerned, Ground water fluoride contents in high levels are present in all 33 districts and have become a serious health related issue in 23 districts of Rajasthan [2]. Higher concentration of fluoride in water causes adverse health effects i.e. Dental fluorosis, skeletal fluorosis, nonskeletal manifestation etc. Many reverse osmosis (RO) plants have been installed in Rajasthan for removal of fluoride from ground water. But, due to high power consumption, scaling and fouling of membranes, reduced water recovery and low maintenance, most of the RO Plants are not working properly. Thus, alternative technology is required with low power consumption and maintenance cost for the treatment of underground water. Membrane capacitive deionization is the emerging technology which provides higher percentage of salt removal with lower power consumption. The energy efficiency of Membrane Capacitive Deionization M(CDI)

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Interference Study of Pollutants Released from Various Industrial Areas in a Region: A Case Study

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Abstract Jodhpur is well known city of Rajasthan state in India and is a tourist place. Jodhpur is surrounded by industrial areas and defence installations. Air pollution is now becoming a challenge to the administration of a city because of its adverse effects on human beings. In this study four monitoring stations were selected to find pollution level in the ambient air. Air Quality Index was calculated by considering five pollutant parameters i.e. SO₂, NO₂, PM₁₀, PM_{2.5}, CO at all monitoring stations. Minimum, average and maximum air quality index were calculated at each industrial area monitoring stations. It was observed that PM₁₀ and PM_{2.5} are responsible air pollutants which governs the air quality index. In this study duration weather was clear and wind direction was either from North direction or from North-East direction. SCREEN3 Air Dispersion Model was used to find the pollutant concentration with increasing distances from area sources. Modelled AQI was also calculated before and after overlapping zone using SCREEN3 Air Dispersion Model. It was observed that air pollution from one industrial area is interfering the AQI of other industrial area.

Keywords: Air pollution, Industrial area, PM10. PM2.5. AQI, Air dispersion model

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1. Introduction

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Jodhpur is well known city of Rajasthan state in India and is a tourist place. Jodhpur is surrounded by industrial areas and defence installations. Jodhpur city has major four industrial areas. Basni industrial area has mainly textile / timber / Guar gum industrial units. Boranada industrial area has mainly Metal and Wooden Handicrafts industrial units, Mandore industrial area has oil mills/Guar gum/ textile / Stone Processing industrial units. Kankani industrial area has mainly handicraft / plastic industrial units. Air pollution is now becoming a challenge to the administration of a city because of its adverse effects on human beings. The acute health effect of suspended particulate matter (SPM), even at short term low levels exposure; include increased daily mortality and hospital admission rates for exacerbation of respiratory disease [1]. Long term exposure to PM2.5 increases the risk of the non accidental mortality. Living close to busy traffic appears to be associated with elevated risk [2]. The available human clinical results do not establish a mechanistic pathway leading to adverse health impacts for short term NO2 exposure at present day ambient environment [3]. In all the analytical studies total mortality was directly associated with long term exposure to particulate matter [4]. Therefore it is now essential to have knowledge about the AQI in various reasons because of industrial areas and effects of one industrial area on other. The AQI was divided in six categories considering five pollutants (PM10, PM2.5, NO2, SO2, and CO) as per the norms given by Central Pollution Control Board (CPCB) of India. Air quality index values are typically grouped into various ranges [5] and is given in Figure 1 and breakpoint concentration for various pollutants are given in Table 1 [6].

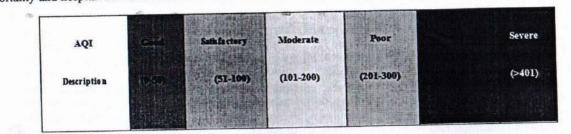


Figure 1. Overall AQI Systems [5]

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RESEARCH ARTICLE

OPEN ACCESS

Street Level Modeling of Pollutants for Residential Areas

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ABSTRACT:

An effort has been done here to model the pollutants concentration using a software i.e., COPERT STREET LEVEL. This software is a Microsoft windows based software and calculates emission on street basis. Working of this model is limited to calculation of pollutants up to street level only. Area under consideration is taken from streets of Jodhpur city which are basically residential areas. Six residential areas have been considered. Pollutants are modelled considering Indian environmental conditions and compared with the actual possible data of streets. Overall analysis shows the slight variations in pollutant concentration from actual conditions. It may be due to dust storms and heating effects which are highly prevalent due to geographical conditions of Jodhpur. Pollution estimations are represented in their standard units which are further converted into Air Quality Index. This Air Quality Index is calculated from the year 2016 to 2025 in alternate year. Pollutants which are calculated using this model are carbon monoxide, oxides of nitrogen and particulate matters. This model doesn't differentiate between PM_{10} and $PM_{2.5}$. Model results shows that pollutant concentrations are increasing if number of vehicles keeps on increasing and other street characteristics remains unchanged. Most dominating pollutant was observed to be carbon monoxide.

Key words: modeling of pollutants, COPERT STREET LEVEL, air quality index, residential area pollutant estimation, carbon monoxide, oxides of nitrogen, particulate matters.

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I. INTRODUCTION

Jodhpur, popularly known as Blue City of Rajasthan is the second largest city of state. Climate of Jodhpur is generally very hot due to its nearby desert areas. Temperature variations may occur from 45°C in summer to 0°C in winter. Hence it faces extreme weather conditions. This geographical condition changes the environmental nature of this city. As it is fastest upcoming state of Rajasthan, it is now witnessing the large number of human population and also enormous increase in vehicular numbers. It has led to increase in vehicular pollution to a very large extent. As per the latest WHO report, Jodhpur is the most polluted city of Rajasthan and grabbed 30th position in global ranking. It is followed by Jaipur at 33rd, Kota at 58th and Udaipur at 59th position. Such a high level of pollution is not only limited to industrial or commercial areas but also it can be found in residential areas also. Air pollution modeling is a method of determining the concentration of different air pollutants at different locations and different time period mathematically either manually or with the help of some software based on certain mathematical formulae. To calculate the level of pollution in the streets of such areas, COPERT STREET LEVEL model has been used. It is a standalone MS Windows software designed to calculate emissions on a street basis. It is structured in such a way as to work alongside traffic analysis tools. It is assumed during uses of this model that environmental conditions of India have been taken nearest to matching country. But do not correspond to exact environmental conditions of Jodhpur city as this city comprises lots of dust storms and heat waves. All these values were calculated at all monitoring stations of Jodhpur.

II. MATERIAL AND METHODOLOGY

This model uses the all characteristics of streets i.e., street length, time, number and type of vehicles, average speed of vehicles, emission and geographical characteristics and passenger car equivalents etc. pollutants estimated for measurement of quality of ambient air are carbon monoxide, oxides of nitrogen and particulate matters. These pollutants can help to predict future Air Quality Index of monitored streets. These values are inserted in an excel sheet first as shown in fig. 3.1and then uploaded in this software. After uploading, an input is given for passenger car unit (PCU). PCU's of different vehicles are given in table 3.1. As this model is country specific hence, in this case, country chosen was Turkey among the entire possible available list of COPERT STREET LEVEL as India

DETERMINATION OF AIR QUALITY INDEX OVER TSDF-A CASE STUDY OF UDAIPUR

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Abstract-Udaipur is well known tourist place in India and is known as "Lake City". A hazardous waste disposal site was constructed in Udaipur for disposal of hazardous waste generated by the various industrial and commercial activities in the state of Rajasthan. The purpose of this paper is to discuss the analysis of the ambient air quality over TSDF site of Udaipur city in terms of air quality index (AQI). The 24-hourly average concentrations of five major criteria pollutants, viz. Particulate matter PM10, PM2.5, Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂) and Ammonia(NH₃) at three different locations in TSDF site were measured as per guidelines of CPCB of dia. Selected stations were near store Room, security Room roof top and secured landfill. The AQIs were calculated using IND-AQI prededure. Concentration of PM10 and PM205 was found above the prescribed limit whereas concentration of SO2 NO2 and NH3 was found below the prescribed limits laid down by CPCB of India at all considered sampling points. From the analysis of AQI it is concluded that PM₁₀ is governing factor for determination of AQI at all the sampling station. According to AQI over TSDF, this site falls in the category of moderate type. Therefore now it is time to reduce the PM10 and PM25 concentration at site by plantation and or by other means so that air quality is maintained in the nearby area of TSDF.

Index Terms—Air quality index (AQI), PM10, PM25, CPCB, TSDF

I. INTRODUCTION

Computation of the AQI requires an air pollutant concentration over a specified averaging period, obtained from an air monitor or model. Taken together, concentration and time represent the dose of the air pollutant. Health effects corresponding to a given dose are established by epidemiological research I. Air pollutants vary in potency, and the function used to convert from air pollutant concentration to AQI varies by pollutant. Air quality index values are typically grouped into ranges. Each range is assigned a descriptor, a color code, and a standardized public health advisory. The AQI can increase due to an increase of air emissions (for example, during rush hour traffic or when there is an upwind forest fire) or from a lack of dilution of air pollutants. Stagnant air, often caused by an anticyclone, temperature inversion, or low wind speeds lets air pollution remain in a local area, leading to high concentrations of pollutants, chemical reactions between air contaminants and hazy conditions. On a day when the AQI is predicted to be elevated due to fine particle pollution, an agency or public health organization might advise sensitive groups, such as the elderly, children, and those with respiratory or cardiovascular problems to avoid outdoor exertion. Declare an "action day" to encourage voluntary measures to reduce air emissions, such as using public transportation [2]. Recommend the use nasks to keep fine particles from entering the lungs [4]. During a period of very poor air quality, such as an air pollution episode, when the AQI indicates that acute exposure may cause significant harm to the public health, agencies may invoke emergency plans that allow them to order major emitters (such as coal burning industries) to curtail emissions until the hazardous conditions abate [5]. Most air contaminants do not have an associated AQI [6]. Many countries monitor ground-level ozone, particulates, sulfur dioxide, carbon monoxide and nitrogen dioxide, and calculate air quality indices for these pollutants [7]. The definition of the AQI in a particular nation reflects the discourse surrounding the development of national air quality standards in that nation [8]. Website allowing government agencies anywhere in the world to submit their real-time air monitoring data for display using a common definition of the air quality index has recently become available [9]. Central Pollution Control Board (CPCB) of India has formulated guidelines to calculate AQI and can be calculated as discussed below:

An air quality index is defined as an overall scheme that transforms the weighed values of individual air pollution related parameters (pollutant concentrations) into a single number or set of numbers. The result is a set of rules (i.e. set of equations) that translate parameter values into a more simple form by means of numerical manipulation .If actual concentrations are reported in µg/m³ or ppm (parts per million) along with standards, then it cannot be considered as an index. At the very last step, an index in any system is to group specific concentration ranges into air quality descriptor categories. Primarily two steps are involved in formulating an AQI:

(i) Formation of sub-indices (for each pollutant) and

(ii) Aggregation of sub-indices to get an overall AQI.

Formation of sub-indices (I1, I2 ... In) for n pollutant variables (X1, X2,...Xn) is carried out using sub index functions that are based on air quality standards and health effects, Mathematically;

[1]

i = 1, 2,.... n $Ii = f(X_i),$

Each sub-index represents a relationship between pollutant concentrations and health effects.

Aggregation of sub-indices, Ii is carried out with some mathematical function (described below) to obtain the overall index (I), referred to as AQI.

 $I = F(I_1, I_2, ..., I_n)$

[2]

[3]

The aggregation function usually is a summation or multiplication operation or simply a maximum operator. Sub-indices (Step 1)-Sub-index function represents the relationship between pollutant concentration Xi and corresponding sub-index Ii. It is an attempt to reflect environmental consequences as the concentration of specific pollutant changes. It may take a variety of forms such as

linear, non-linear and segmented linear [10]

Typically, the I-X relationship is represented as follows:

 $I = \alpha X + \beta$

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REVIEW ON EFFECTS OF SOME HEAVY METALS ON PLANTS AND HUMAN HEALTH

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Abstract—Wastes are the major source of soil pollution, originating from mining, chemical, metal processing industries and other allied industries. These wastes include many chemicals like heavy metals, phenolic, organic, non-metals etc. Heavy metals are the intrinsic components of the environment, with essential and non-essential both types. Heavy metal accumulation in soil is major concern in agricultural production due to its adverse effect on food safety, marketability and crop growth and also due to phyto-toxic effects and environment health of soil organism. The toxic effect of heavy metals, even though they do not have any biological role, remain present in some or the other form harmful for human body and its person functioning. Metal toxicity depends upon the absorbed los(a) he route of exposure and duration of exposure, acute or chronic. This can lead to various disorder and can also result in excessive damage due to oxidative stress induced by free radical formation. This review paper details about some heavy metals and their 'oxicity mechanism along with their health effect. Heavy metals exhibit toxic effects towards soil by affecting key microbial process and lecrease the number and activity of soil micro-organism. Even low concentration of heavy metal in plants and subsequent accumulation ulong the food chain is potential threat to human health

Index Terms-Heavy metals, Effects on Human health, Toxicity, Effects on plants

I. INTRODUCTION

Metallic elements are intrinsic components of the environments. Heavy metals or toxic metals when present in excess of required concentration or is unwanted which were found naturally on the earth, and become concentrated as a result of human caused activities, enter in plants, animal and human tissues via inhalation, diet and manual handling can bind to, and interfere with the functioning of vital cellular components1. Heavy metals are significant environment pollutants and their toxicity is a problem of increasing significance for ecological, evolutionary, nutritional and environmental reason. They are group of metals and metalloids with atomic density greater than tagker or those which are 5 times or more, greater than water, including copper, manganese, lead, cadmium, nickel, cobalt, iron, zinc, thromium, silver. Uptake of heavy metals by plants and subsequent accumulation along the food chain is a potential threat to human health. Adverse health effects of heavy metals have been known for a long time. Exposure to heavy metals continues and is even increasing in some areas. For example mercury is still used in gold mining in many part of Latin America. Arsenic is still common in wood preservatives, and etremation and the aremain a common additive to petrol, although this use has decreased dramatically in the developed countries. This paper briefly lest? os the nature and properties of heavy metal and its effect on the plants and human health.

II. SOURCE AND EMISSION

Toxic metals, to a large extent, are dispersed in the environment through industrial effluents, organic wastes, refuse burning and transport ind power generation. They can be carried to places many miles away from the sources by wind, depending upon weather. They are found in gaseous form or as particulates.

Metals	Manufacturing Industry	
Arsenic	Paints and Textile	
cadmium-	Electronics and pigments	
chromium	Metal plating	
copper	Plating	
lead	Plating	
zinc	Galvanizing, plating iron	

Fable 1 List of Metals

III. EFFECTS ON PLANTS

The heavy metals available for plant uptake are those present as soluble components in the soil solution or those soluble by root exudates 3. Plants require certain heavy metals for their growth and upkeep, but excessive amounts of these metals can become toxic to plants. The ibility of plants to accumulate essential metals equally enables them to acquire other non-essential metals 9. They adversely affect the plant oth directly and indirectly. Some of the direct toxic effects caused by high metal concentration include inhibition of cytoplasmic enzymes ind damage to cell structure due to oxidative stress10. Indirect toxic effect includes replacement of essential nutrients at cation exchange ites of plants11. The negative influence of heavy metals on the growth and activities of soil microorganisms also indirectly affect the growth of plants. Reduction in the number of beneficial soil microorganisms due to high metal concentration may lead to decrease in organic matter Scientific Journal of Impact Factor (SJIF): 4.72

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EFFECTIVENESS STUDY OF MEMBRANE CAPACITIVE DEIONIZATION TECHNOLOGY IN TRACE METAL REMOVAL FROM WATER

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Abstract:

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Increasing environment protection awareness made the availability of clean water, technological, social and economical challenge of the 21st century. Water, is a scarce amenity not only in India but in the whole world. Most of the available water is saline and is not potable. Water supplies are not matching the actual water needs of the society. We have been squandering and polluting water resources since ages and are now in need of finding cost competitive newer technologies for reclaiming this valuable life-sustaining liquid. Membrane capacitive deionization is one of those prominent technologies which assure to be more efficient with higher water recovery and less power consumption.

In this study concentration of trace metals viz. Barium, Arsenic, Lead, Chromium, Cadmium, Nickel and Boron in ground water samples from western Rajasthan were determined using Inductive coupled plasma- Optical emission Spectrometer (ICP-OES). These metals have toxic effects on the human health; most of them are carcinogenic and can cause fatal effects if consumed in fewer amounts continuously for long duration. This study has also been done to assess the removal of trace metals by membrane capacitive deionization process. Electrical conductivity of water was assessed to compare the results with trace metals. Certain areas of Jodhpur and Jaisalmer districts of Rajasthan state in India were selected as the study area. The pilot plant (CapDI) manufactured by Voltea (Netherland) was provided by InNow India Pvt. Ltd for carrying out this study. The maximum EC was reduced by 98 %, whereas the trace metals Barium, Cadmium, Chromium and Boron were removed by 57%, 70%, 50%, and 74% respectively. Thus it can be interpreted from the study that Membrane Capacitive Deionization Technology can remove the Heavy and Toxic metals up to a certain limit effectively with low power consumption.

Keywords: Chromium, Electric conductivity, Lead, Membrane capacitive deionization, Trace Metals, Water Recovery.

I. INTRODUCTION

Potable Water is a scarce source. Rajasthan is the largest state of India, Rajasthan shares only 1/10 of the average share of water than rest of the country [1]. Water supplies in most of the Indian cities including cities of Rajasthan are not matching the actual water need of the society. Groundwater is the major source of drinking water in some part of the Rajasthan. Presence of higher amount of salts and trace metals in underground water sources in the western Rajasthan is enhancing the less availability of potable water to the population. Trace metals removal from water in field is difficult. These are carcinogenic and can cause fatal effects if consumed in less amount for long duration. This study was done to evaluate removal of trace metals from membrane capacitive deionization.

By definition, Membrane Capacitive Deionization is a combination of conventional Capacitive Deionization with ionexchange membranes (IEMs) placed in front of the electrodes. Ion exchange membranes can be positioned in front of one or both electrodes. Ion-exchange membranes have a high internal charge due to covalently bound groups such as sulfonate or quaternary amines, which allows easy access for one type of ion (the counter ion) and block access for the ion of equal charge sign (the co-ion). Addition of Ion-exchange membranes significantly improves desalination performance of the Capacitive Deionization process, in terms of salt adsorption, charge efficiency and energy consumption. The membranes can be included as stand-alone films of thicknesses between 50 and 200 µm, or can be coated directly on the electrode with a typical coating thickness of 20 µm[2]. International Journal of Engineering Science Invention ISSN (Online): 2319 – 6734, ISSN (Print): 2319 – 6726 www.ijesi.org ||Volume 6 Issue 12|| December 2017 || PP. 09-12

Air Quality Index Assessment of Industrial Areas of Jodhpur City

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Abstract: Jodhpur district is centrally situated in Western region of Rajasthan state. In this study four monitoring stations were established to find pollution level in the ambient air of various industrial areas situated around the city. Four industrial areas where samplings were done are Basni industrial area, Boranada industrial area, kankani industrial area and Mandore industrial area. Air Quality Index has been calculated by considering five pollutant parameters i.e. SO_2 , NO_2 , PM_{10} , $PM_{2.5}$ and CO. Minimum, average and maximum air quality index were calculated for every industrial area. It was found after analysis that air quality index of Basni and Mandore industrial falls under Poor category, while other industrial area falls in Moderate category. In the analysis, it was also observed that PM_{10} and $PM_{2.5}$ were responsible air pollutants for maximum subindex as well as air quality index. Hence it is the time to plan activities in industrial areas to control air pollution emissions otherwise in future problem may aggravate and create a serious condition. **Keywords:** Air pollution, AOI, industrial area, PM_{10} , $PM_{2.5}$.

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Introduction

I.

The 'Surya Nagari' Jodhpur is the second largest city of Rajasthan and the gateway of famous 'Thar Desert'. Air pollution of a city mainly depends upon the pollution from industrial areas, pollution from transportation; fuel burning and house hold activities. Pollution due to industrial areas around city significantly affects air quality of city if city lies on the downwind direction.

Air pollution is physical or chemical changes brought about by natural processes or human activities that result in air quality degradation^[1]. Air is invariably impure and is always contaminated with gases like CO, NO2, SO2, and others (which are poisonous in nature) and finely divided solid and liquid particles and smog. Air becomes polluted due to the presence of the above contaminants. The presence of these contaminants in the air is called air pollution and the materials which pollute the air are called air pollutants^[2]. As the population increased, people began to congregate and establish cities. The release of large amounts of smoke and other forms of waste into the air caused an unhealthy condition because the pollutants were released faster than they could be absorbed and dispersed by the atmosphere^[3]. "More than 2 million premature deaths each year can be attributed to the effects of urban outdoor air pollution and indoor air pollution .More than half of this disease burden is borne by the populations of developing countries. Heart attacks, respiratory diseases, and lung cancer are all significantly higher in people who breathe dirty air compared to matching groups in cleaner environments^[1]. The acute health effect of suspended particulate matter (SPM), even at short term low levels exposure; include increased daily mortality and hospital admission rates for exacerbation of respiratory disease^[4]. Living close to busy traffic appears to be associated with elevated risk^[5]. The available human clinical results do not establish a mechanistic pathway leading to adverse health impacts for short term NO2 exposure at present day ambient environment^[6].Each day our lungs are directly exposed to more than 7000 liters of air, which contain varying amount of inorganic, organic particles and various types of gases^[7]. Hence it is now, time to assess the air quality of the area in terms of pollutant concentration. Basni industrial area has mainly textile / timber / Guar gum industrial units. Boranada industrial area has mainly Metal and Wooden Handicrafts industrial units, Mandore industrial area has handicrafts/ oil mills/ Guar gum/ textile / Stone Processing industrial units. Kankani industrial area has mainly handicraft / plastic industrial units^[8].

II. Methodology, Observations, Calculations and Analysis

Monitoring was carried out in all the four industrial areas as per central pollution control board (CPCB) of India guidelines. Five pollutants (SO₂, NO₂, PM₁₀, PM_{2.5} and CO) were measured to calculate AQI of a particular area. AQI has been developed and used effectively in many industrialized countries to represent

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A REVIEW

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BSTRACT: An environment plays a vital role for the sustainability of life on our planet. Environmental comprises some very basic $ar_{i,2}$ (ters on which earth's life is very much dependent i.e. air, water and soil etc. Every parameter has got its own importance but air and vate, are two such thing without which human life can never be imagined. Further, water can be made usable by providing some degree of eatment but if air gets polluted to alarming level then ,it will not be so easy to adverse this effect. Air pollution receives one of the prime oncern in India, primarily due to rapid economic growth, industrialization and urbanization with associated increase in energy demands. acks of implementation of environmental regulations are contributing to the bad air quality of most of the Indian cities. Air pollutants roduced in any air shed are not completely confined, but at time trespassing all the geographical boundaries, hence do not remain only a roblem of urban centres, but spread and affect remote rural areas supporting large productive agricultural land. Air pollutants pose risks on ield of crops depending on the emission pattern, atmospheric transport, leaf uptake and have a deleterious effect on a varie ty of bioche mical nd physiological processes and on structural organization within the cells.

ir pollutants have been shown to reduce the growth and yield before any visible symptoms appeared. It is now commonly believed that jury initially takes place at the biochemical level (interference with photosynthesis, respiration, lipid and protein biosynthesis, etc.), ibsequently progressing to the ultrastructural level (disorganization of cellular membranes), and then to the cellular level (cell-wall, esophyll, and nuclear breakdown). Finally, visible symptoms develop (chlorosis and necrosis of foliar tissues). An adverse effect caused by r pollutants depends not only upon its concentration, but also on the duration and combination of air pollutants. Biochemical injury results hen the concentration of the pollutant exceeds the capacity of the tissues to detoxify it through their normal metabolism. The subtle and aried nature of the biochemical and physiological effects produced by air pollutants suggest that reduction in plant growth and yield.

eywords : Air pollution, injury, SO2, NO2, CO, plant physiology.

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INTRODUCTION

ir pollution is a major problem today not only in india but in the whole world. Air pollution adversaly affecting the various constituent of e environment. The main air pollutants are represented by gases forms, particles in suspension, different ionizing radiation. The gases forms e: oxidized and reduced forms of carbon (CO₂, CO, CH₄), of nitrogen (NO₂, NO, N₂O₄, NH₃, NH₄⁺), SO₂, O₃, C₆H₆ vapours, Hg, volatile nenos, Cl₂, etc. The particulate forms are: PM10 and PM2.5 particulate matter, heavy metals with toxic effect (Pb, Ni, Cd, As), PAHs(phycyclic aromatic hydrocarbons) etc.

ir pollution was earlier considered as a local problem around large point sources. But due to use of tall stacks and long range transport of pllutants, it has become a regional problem. The transboundary nature of pollutants was clearly evident when areas remote from sources of t pollution also showed higher concentrations of air pollutants. Uncontrolled use of fossil fuels in industries and transport sectors has led to e increase in concentrations of gaseous pollutants such as SO₂, NOx, etc.

fects of different kinds of pollution can be determined by the nature of pollutants, their concentration and the period of exposure. Under posure to high concentration, plants suffer acute injury with externally visible symptoms, such as chlorosis, discolouration, necrosis and ath of entire plant. Besides morphological changes, chemical, biochemical, physiological and fine structural changes also occur in plants.

ir pollution decreases the yield of all crops by affecting their photosynthetic activity and growth. Pollution damage can also be recognized ' the accumulation of toxic material in the plant, changes in pH followed by solubilization of toxic salts of metals like aluminum, reduced increased activity of certain enzymes, increase in compounds with SH groups and phenols, lowered ascorbic acid level in the leaves, pression of photosynthesis, stimulation of respiration, low dry matter production, changes in permeability, disturbances in water balance d reduced fertility under prolonged exposure. Plants show reduced productivity and yield and quality is lowered and ultimately they die. the symptoms of pollution affected plants are varied and unspecific. A particular pollutant affects different plants in very different ways and particular symptom can be produced by a variety of substances. The development and severity of the injury depends not only on the ncentration of the particular pollutant, but also on a number of other factors. These include the length of exposure to the pollutant, the fluence of external factors (pollutants) on plants depends upon the species, stage of development and the organ and tissue involved as well the environmental factors conducive to a build-up of the pollutant and to the preconditioning of the plant, which make it either susceptible resistant to injury. Morphological alteration of a plant and floristic composition of a plant community are commonly used to indicate fiity of Pesticide Leachate in Underground Water -...

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Inter-state Mobility of Pesticide Leachate in Underground Water

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Singh, S.; Singh, S. K.; Chaubey, J.; Arora, H.; Bhandari, K.; Vyas, A.

Pesticide usage has become an integral part of modern agriculture; excessive and injudicious usage of which generally leads to groundwater pollution. Assessment of pesticide impact on groundwater, employing certain tools and available dataset, is a foremost step towards the preparation of regulatory policies that governs the application of pesticides to agricultural fields. In this study, the impact of pesticide usage is assessed for an agricultural area lying in North-western India employing a model named Pesticide Impact Rating Index (PIRI). Four pesticides wiz, Atrazine, Chlorophyrifos, Phorate and Monocrotophos, were selected and a relationship is established between their usage and their impact on the quality of groundwater (by employing PIRI) for the study area consisting of seven farms lying in Nakodar tensi of Punjab state in India. Groundwater sampling was conducted for these locations and samples were analyzed for observed values of pesticide residues. Furthermore, these observed values were compared with the PIRI model estimates and results showed that though the observed values were higher corresponding to the estimated values, but the ratio seemed to be fluctuating within consistent range. Therefore, the evaluation of PIRI model for the study area resulted in promising results subject to the introduction of analysis. The study is further extended to observe the occurrence of the pesticides in the downstream side of the study area. The same pesticides have been detected in underground water available in desert of Jaisalmer district of Rajasthan which is about 700 km away from the area where these pesticides are used. It indicates inter-state pollution and contamination of underground water, the remediation of which is of utmost importance for the study area and is recommended for a sustainable future.

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R. Arun Karthick¹, Ketan Jangir² and Pradipta Chattopadhyay¹

Foaming and Cleaning Performance Comparison of Liquid Detergent Formulations using Mixtures of Anionic and Nonionic Surfactants

Modern detergents are typically appreciated for their cleaning performance rather than foaming characteristics. The aim of the current study was to compare the foaming and cleaning abilities of liquid detergents, built from a combination of surfactants, to be applied for household laundry purpose. A total of eighteen different liquid detergent formulations containing mixtures of important anionic, nonionic surfactants, and other additives were prepared. The first set of nine new detergent formulations (S1) was prepared using the surfactants sodium lauryl sulfate (SLS), Tween-20 and Tween-80. Another set of nine new detergent formulations (S2) was prepared using surfactants SLS, Triton X-100 and alkyl polyglucoside (APG). The impact of water quality (RO, hypersaline or hard water) on the foam properties of the detergent formulation sets (S1 and S2) was systematically examined. The second set of detergent formulations (S2) showed a better performance in terms of foamability and foam stability, regardless of the water quality. Also, the surface tension of the detergent formulation set S2 was found to be lower and it showed a higher detergency for both cotton and woolen fabrics. The detergency of the formulation no S2.9 (in set S2) was the maximum amongst all the detergent formulations. The surface morphology of the cotton and woolen fabrics, washed with liquid detergent formulation no S2.9, displayed the removal of oily soil and grease from the surface of the fabrics, without affecting the quality of the fabrics.

Key words: Detergent formulation, non-ionic surfactants, application of surfactants, anionic surfactants

Vergleich der Schaum- und Reinigungsleistung von flüssigen Waschmittelformulierungen unter Verwendung von Mischungen aus anionischen und nichtionischen Tensiden. Moderne Waschmittel werden typischerweise eher für ihre Reinigungsleistung als für ihre Schaumbildungseigenschaften geschätzt. Das Ziel der vorliegenden Studie war es, die Schaumund Reinigungsleistung von Flüssigwaschmitteln zu vergleichen, die aus einer Kombination von Tensiden bestehen und für die Haushaltswäsche verwendet werden. Insgesamt wurden achtzehn verschiedene flüssige Waschmittelformulierungen hergestellt, die Mischungen von wichtigen anionischen, nichtionischen Tensiden und anderen Additiven enthielten. Der erste Satz von neun neuen Waschmittelformulierungen (S1) enthielt die Tenside Natriumlaurylsulfat (SLS), Tween-20 und Tween-80. Ein weiterer Satz von neun neuen Waschmittelformulierungen (S2) wurde unter Verwendung der Tenside SLS, Triton X-100 und Alkylpolyglucosid (APG) hergestellt. Die Auswirkung der Wasserqualität (RO, stark salzhaltiges oder hartes Wasser) auf die Schaumeigenschaften der Waschmittelformulierungssets S1 und S2 wurde systematisch untersucht. Das zweite Waschmittelformulierungset S2 zeigte unabhängig von der Wasserqualität eine bessere Leistung hinsichtlich der Schaumentstehung und Schaumstabilität. Auch wurde gefunden, dass die Oberflächenspannung des Waschmittelformulierungssets S2 niedriger war und eine höhere Waschleistung sowohl für Baumwolle als auch für Wollgewebe hatte. Die Formulierung Nr. S2.9 (in Satz S2) hatte die höchste Waschleistung unter allen Waschmittelformulierungen. Die Oberflächenmorphologie der mit der flüssigen Waschmittelformulierung Nr. S2.9 gewaschen Baumwoll- und Wollgewebe zeigte, dass öliger Schmutz und Fett von der Gewebeoberfläche entfernt werden konnten, ohne die Qualität der Gewebe zu beeinflussen.

Stichwörter: Waschmittelformulierung, nichtionische Tenside, Tensideinsatz, anionische Tenside

1 Introduction

A detergent product is a composition of various chemicals namely surfactants, filler, builders and solubilizers. Surfactants, being the primary component, resemble the major influencing factor in formulating an effective detergent product [1]. The detergency is the measure of surface cleaning by any detergent formulation [2]. The surfactant is a major component affecting the detergency of any laundry product. Since detergency is the prime factor in measuring the cleaning efficiency, the choice of selecting a surfactant in preparing a detergent formulation is important [3]. The selection of additives is also a prime factor in the formulation of a wellbalanced detergent. The major additives used in the detergent formulation include builders, solubilizers, and polymers. Each of these components contributes to the improvement of detergent performance [4]. For instance, the presence of a water soluble polymer in the detergent formulation helps in preventing the redeposition of oily soil on the fabric after being removed by the detergent action [5, 6]. Builders used in the detergent mixture to eliminate the water hardness thereby increasing the performance of the detergent [7]. Enzymes have been incorporated in modern detergents so as to remove any organic compound such as fat, oil secretions, and protein which are insoluble in water [8]. The use of environmental friendly surfactants and other additives prepared from biodegradable products have been pursued producing detergent formulations in the last decade. Detergents prepared with a mixture of surfactants have a greater impact in the removal of soil from fabrics. Nonionic surfactants such as alkyl polyglucoside show a sy-

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Identification of psychological factors associated with car ownership decisions of young adults: Case study of Jodhpur city, India



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ARTICLE INFO	A B S T R A C T
<i>Keywords:</i> Car ownership decisions Developing countries Principal component analysis Binary logit model	In the context of a developing country, not many studies have attempted to examine the attitudinal factors that influence the car ownership decisions of young adults. The present study aims to identify the pertinent psycho- logical factors and their effects, along with demographic variables, upon car ownership decisions. The study used 813 individuals' responses to employ a principal component analysis and subsequent binary logit model to determine the future car ownership decisions. The major findings show that the individuals who are status seekers, image-conscious, passionate for cars, obsessed with cars, and influenced by peers/external factors are more likely to buy a car in the near future. However, those who are conscious about paying high taxes, envi- ronmental sustainability and traffic problems are less likely to buy a car in the near future. The results of this study can help transport planners and policymakers to develop and implement transport policies that could potentially discourage the use and ownership of cars in order to develop sustainable mobility patterns in the future.

1. Introduction

1.1. Background and need of the study

Cars are the most important matter of concern for transportation planners because their growth and use in cities cause serious environmental and urban problems like congestion, air pollution, accidents, etc. (Newman and Kenworthy 1999; Gärling and Schuitema 2007; Tao et al., 2019) and leads towards unsustainable development. Car ownership and their uses are increasing in developing countries (like India) due to rising income levels (Belgiawan et al., 2014). As the income increases, those who already have a car, tend to buy a second or a third. As per report of Niti Aayog, in 2018, India had 22 cars per 1000 population and by 2025 the number of cars is likely to be 35 cars per 1000 population (Ghate and Sundar 2014) and it is expected to increase about 175 cars per 1000 population by 2040 (IEA 2015). It is to be noted that, these numbers are the ratio of expected total cars to the expected total population of India. In 2017, the developed countries like New Zealand, USA, Australia, Canada, Japan, etc. have car-ownership levels above 450 cars per 1000 persons. As per MoRTH report (MoRTH 2012), developed cities of India like Delhi have 157 cars, Chennai 127 cars, Pune 92 cars, Bangalore 85 cars, Hyderabad 72 cars per 1000 population. These cities of India may also follow the same trend (as of developed countries) if corrective steps are not taken today to reduce the growth of car ownership and their uses.

The growth in car ownership and uses are influenced by various factors like socio-demographic variables like income, age, gender, etc. (Bergstad et al., 2011; Dargay and Hanly 2007; Delbosc and Currie 2014; Verma et al. 2016, 2017), quality attributes of public transport (Beirão and Sarsfield 2007; Cullinane 2002; Ibrahim 2005; Redman et al., 2013), cost of buying and running cars, journey requirements (work or non-work) (Banister and Button 1993) and psychological factors like status, comfort, independence, intension, aspiration, happiness, pro-sustainability, etc. (Belgiawan et al. 2011, 2014, 2016; Ghate and Sundar 2014; Setiawan et al., 2015; Steg et al., 2001; Steg 2005; Verma et al. 2016, 2017; WU et al., 1999; Zhu et al., 2012). As most of the studies pointed out, that psychological factors are affecting car ownership and their uses majorly but these studies are mostly done in developed countries. A comprehensive study related to psychological behavior, regarding car ownership decisions, for developing countries has been found to be very limited in the existing literature. This study tries to identify the psychological factors and their effects, along with demographic variables on car ownership decisions of young Indian adults, in near future. This study mainly focusses on young adults because they will be the future decision-makers of their family. The results of the study will help transport planners and policymakers to develop

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sustainable transportation policies to reduce the ownership and usage of cars.

The next section of the paper deals with the literature review of research work done previously on car-ownership decisions followed by sections on the study area, research methodology, demographic characteristics of the respondents, model structure and results, estimation of coefficient of binary logit model and validation of binary logit model. The last section includes key findings and policy recommendations from the study.

1.2. Previous research on factors associated with car ownership decisions

One of the recent studies on car ownership decisions was done by Verma et al. (2016) in Bangalore city, India. They analyzed that the factors responsible for increase in car ownership in India are low-interest rates on the car loan. People who come from car-owning household and qualified at or above post-graduation level are feeling safe and comfortable in cars as compared to other modes of transport, while the availability of good public transport came out to be a major factor in deterring car use but the overall scores on the service quality dimensions show that the user expectations is not met by urban bus transport service. Cullinane (2002) suggested that if the quality of public transport service is good and cheap, it can suppress the demand for the car. Car usage is not only popular because of its instrumental factors such as its speed, convenience and flexibility but other factors also seem to play an important role, such as arousal, feelings of sensation, power and superiority (Belgiawan et al. 2011, 2016; Steg 2005). Easy finance schemes or low-interest rates on car loans have played an significant role in growing car ownership among youngsters in India. Also the use of a car is more for personal use rather than official use, especially for social and recreational trips (Verma et al., 2016). According to Ghate and Sundar (2014) owning a car is not always about essential requirement but many times, it is for aspiration and status symbol also.

Two different scenarios can be seen in developed countries like Germany, France, Great Britain, etc. and developing countries like China, Malaysia, and India. Young people are becoming increasingly less likely to obtain a car driving license in Australia, North America, and most of the Europe. Delbosc and Currie (2014) investigated the demographic and structural justification for these trends. They documented that in both the regional and metropolitan groups, cars were described with reference to providing freedom and control over their time and activities. Cars are referred to as an achievement, a symbol of maturity, adulthood, and expression for freedom. The ownership of car did not appear to infer the status of symbol and luxury, but owning an expensive car gives higher social status than an inexpensive or old car. Belgiawan et al. (2014) analyze undergraduate student's (age cohort until 30) motivation regarding car ownership in developing countries like China, Indonesia, Lebanon and developed countries like Japan, Taiwan, Netherlands, and the USA. They found that in developed countries, students have less desire to buy a car in the near future, in comparison to developing countries. Expectations of others seem to be an important factor affecting buying intentions whereas symbol, affection of cars and income are less correlated with Intentions. Zhu et al. (2012) identifies that Chinese college students have a strong, planned intention for car ownership. Like Hong Kong students, they also perceived that cars provide comfort, save time, help to travel to more desired places, and as a success symbol. Belgiawan et al. (2011); Belgiawan et al. (2016) analyze the physiological factors for car ownership decisions in Bandung, Indonesia using binary logistic regression analysis and they found that convenience, social orderliness, and arrogant prestige are significant determinants for future car-ownership decisions. Pojani et al. (2018) analyzed the mobility intentions of young university students in Tirana, Albania using Structural equation Modelling. They found that individuals who do not like cars and

driving, want to buy cars and drive in the future. This Pro-car attitude indicates that cars will remain a strong status symbol. Steg (2005) examined various motives of car use in Netherlands and results revealed affective and symbolic factors positively affecting the utility of driving. The existence of three groups was suggested by Sigurdardottir et al. (2014) while narratively analyzing the intention behind the car and driving license ownership among Danish young adults groups. The first group have car-oriented social networks, perceive cars with high symbolic, affective, instrumental, and relational values and visualize a car-oriented lifestyle in the future; the second group associated with high relational and instrumental values of cars, perceive the cost of running and maintenance as a strong barrier and visualize a car-oriented lifestyle in the future; the third group, have a low interest in cars and visualize a cycling-oriented future. Steg et al. (2001) tried to identify the relative importance of symbolic and affective factors to the instrumental and reasoned motives for car use and they found that instrumental, reasoned, symbolic and affective factors of the cars are significantly contributing towards ever increasing use of car. At the earlier stage of motorization, household vehicle ownership was influenced by economic, sociological, and psychological factors (WU et al., 1999). People were of the opinion that expensive vehicles give more symbolic meaning and the effect of the economic factor in the symbolic utility of a vehicle tends to diminish. Setiawan et al. (2015) explored university student car commuting behavior in Surabaya, Indonesia. The result revealed that the actual behavior of using cars is influenced by their habit and intention to use car for traveling in campus. Young people's travel behavior and intentions are influenced by identity, social recognition, self-image and desire to drive a car (Line et al., 2010). Although they are aware of climate changes but their understanding of the link between transport and climate change is weak. There is always a scope to reduce the intention to drive cars by motivating towards environment sustainable modes before they develop driving habits. Awareness program concentrating on the consequence of cars and ascription of responsibility, had a positive impact on the personal norm and intension to reduce car-transport (Liu et al., 2017). A significant influence of the parents on the attitude of the children toward the cars was observed by Nishihara et al. (2017) in a study performed on young adults across Japan. Young adults are more aware of the environmental and urban problems and the fact that the car is not environmental friendly. However, majority of them say that it is very difficult to take away cars because of their usefulness.

To summarize it all, there is growing study on young people's travel mode choices and many studies explaining their travel behavior. The trend of driving license and car ownership is reduced in the developed countries but enthusiasm can be seen in developing countries. Table 1 shows the summary of key factors behind this fascination to car ownership, which are independence, status symbol, comfort, and freedom. Few studies have also addressed the environmental attitudes of young people, but the concern for the environment does not affect much until youth is made aware of the repercussions of excessive use of vehicle on environment. It is noticeable that most of the existing studies are concentrated on developed countries only. Very few researches had their focus on developing countries. For fast-growing countries like India, it is necessary to have knowledge about the travel trends among youth population for transport planning and future development.

2. Study area and methodology

2.1. Study area

The study is conducted in Jodhpur city of India. Jodhpur is the second-largest city of Rajasthan and it is one of the famous tourist destinations of India. It is also known as the "Sun City" because of its sunny and bright weather. Jodhpur metropolitan region has a population of

Table 1

Summary of literature review of psychological factors associated with car ownership decisions.

Authors	Study Area	Sample Size	Psychological factors considered in the study
WU et al. (1999)	Xi'an City, China	2703	Symbolic utility, Use-value Attitude, Sign- value Attitude and Ostentation desire
Steg et al. (2001)	Groningen and Rotterdam, Netherlands	185	Instrumental-reasoned and symbolic- affective functions
Cullinane (2002)	Hong Kong	389	Image and symbol
Steg (2005)	Rotterdam, Netherlands	113	Independence, instrumental, symbolic and affective
Zhu et al. (2012)	Shanghai and Zhenjiang, China	963	Symbol of success, In control of life, Future necessity and Symbol of modern life
Belgiawan et al. (2014)	China, Indonesia, Japan, Lebanon, Netherlands, Taiwan, and USA	China (167), Indonesia (200), Japan (142), Lebanon (271), Netherlands (84), Taiwan (139), and USA (226) Total = 1229	Symbolic affective, independent, negative aspects, social orderliness, safety and reliability, and convenience
Delbosc and Currie (2014)	Regional Victoria and Metropolitan Melbourne, Australia	100	Social status and environmental attitude
Sigurdardottir et al. (2014)	Denmark	-	Symbolic, affective, instrumental, and relational values
Belgiawan et al. (2011); Belgiawan et al. (2016)	Bandung, Indonesia	500	Symbolic/Affective, arrogant prestige, Convenience, comfort, and social orderliness.
Liu et al. (2017)	China	600	Ascription, Intention
Nishihara et al. (2017)	Japan	300	Usefulness, Image, Environmental/Safety
Verma et al. (2016)	Bangalore, India	646	Pro-sustainability, status-seeker, tax- conscious, happiness-oriented, comfort- oriented and city conscious
Verma et al. (2017)	Bangalore, India	750	Enjoyment and image, happiness, like driving vehicles, city conscious, congestion influence, comfort oriented, opportunity/ image conscious, tax and environment conscious, societal image seeker, pro- sustainability, peer/external influences and status.

nearly 1.138 million as per the census population data (Census, 2018). It is one of the fastest-growing cities of India with an average annual growth of 3% which is slightly more than the country urban growth. In addition to the local population of Jodhpur city, an average of 4000 tourists visit the city every day (Jodhpur Development Authority 2010). According to the Government of India, people aged between 15 and 29 years are considered as a youth (Central Statistics Office Ministry of Statistics and Programme Implementation 2017). As per this report, the youth population of India is nearly 19.10% of the total population. The growth of the population has not been matched by investment in transportation infrastructure, especially in public transportation. As a result, the proportion of people traveling by private mode of transport has been increasing due to which overcrowding and congestion on limited infrastructures such as on roads and parking facilities increased. The public transport buses in the city are inadequate and often overcrowded and because of this, private mode share has increased. According to Regional Transport Authority (RTO) in the period from 2003 to 2011 the registration of new motorcycles have grown at an annual average growth of about 18% while cars have grown at about 14% which indicates greater private vehicle population in future (Asian Development Bank 2012). As of now, the bus (minibus and semi low-floor bus) is the only main public transport of the city. There are two types of buses, minibus, and semi low-floor bus. Mini Buses are operated by a majorly private operator under contract to Jodhpur City Transport Services Ltd (JCTS) which was set up as a joint venture of Jodhpur Municipal Corporation and the Urban Improvement Trust, Jodhpur and semi-low floor buses are operated by Jodhpur Municipal Corporation itself. The bus system, both government or privately operated is inadequate in terms of comfort and frequency and most of the time they are operated in crush capacity (Jodhpur Development Authority 2010). These factors contributes in psychological

perception and affects car ownership decisions. Motorized three-wheelers (Auto-rickshaw) and taxi are the most common Intermediate public transport modes. Nearly 45% of peak hour trips are non-motorized trips out of which 38% are walk trips. There is significant usage of cycle rickshaws and bicycles in the city especially near the city center area and rest 55% of motorized peak hour trips are made by two-wheelers (46%), car (19%), auto-rickshaw (25%), taxi (1%), and public transport (8%) respectively (Jodhpur Development Authority 2010).

2.2. Study methodology

The overall framework of study methodology adopted for this study is shown in Fig. 1. A set of questionnaire was prepared to analyze the perception of young adults related to car-ownership decisions. As mentioned earlier, this study mainly concentrates on young adult's (which is the future) travel behavior because they are going to become decision-makers in the near future and it is very important to analyze their psychological perception related to car-ownership decisions to develop future policies related to transportation. The questionnaire recorded socio-demographic information (like age, gender, income, education qualification, occupation, number of two-wheelers and fourwheelers owned by the family, number of members in the family, possession of a driving license), frequency of using public transport and perception related questions on Likert scale (strongly agree = 5; agree = 4; neutral = 3; disagree = 2 and strongly disagree = 1) about future car ownership, growth of cars in India, car-related individual image, peerinfluence, social status, and transport policy.

A manual pen and paper method of data collection was adopted for the present study. The questionnaire is only meant for young adults (age

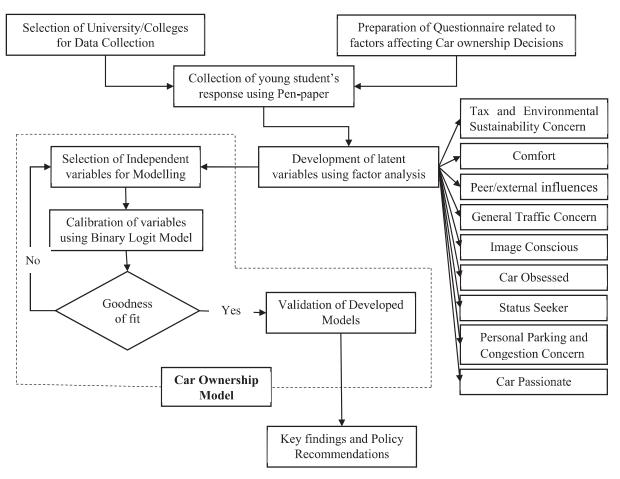


Fig. 1. Framework of study methodology.

group 15–29 years), therefore, to make the data collection process convenient, responses were collected from the randomly selected colleges and universities of Jodhpur. Permissions were obtained from various administration authorities to conduct the survey inside colleges and universities. For some college/university which did not permit to conduct a survey inside their campus, the survey was conducted outside their jurisdiction area. One drawback of this adopted survey methodology is that since the dataset consists of students from colleges and universities only, a generalization to the larger younger-adult population is limited.

A total of 1130 data samples were collected from November to December 2019, out of which 956 data samples are considered valid after removing incomplete or erroneous observations. The socio-demographic information of the respondent is shown in Table 2. This study developed the nine latent variables (shown in Table 3) using principal component analysis (PCA) in SPSS software for the development of a binary logit model. 85% of the randomly selected data samples i.e. 813 samples is used for the model calibration and remaining 143 samples are used for the validation of calibrated model. The binary logit is calibrated considering socio-demographic and psychological factors and validated in N-Logit software. The developed model is then verified in terms of the logical signs and the significance level of each variable (checked using pvalues). For the overall goodness-of-fit of the models, parameters like McFadden's rho-squared value and prediction success rate (validation) of the models are taken into consideration. Once the developed model is validated, the key findings are observed from the results and that will help in policy recommendations for future transport planning.

2.3. Demographic characteristics of the respondents

This section broadly summarizes the demographic characteristics of the collected data samples. The collected data shows that a higher percentage of males (71.34%) participated in the questionnaire survey than females (28.66%), reflecting the gender ratios (in general more male candidates than females) in colleges. The average age of the participants is 21.06, also everyone has at least 4–5 members in the family.

Most of the respondents are under-graduate and from the engineering background, may be because of large samples from engineering students only. Only 40% of the participants have household car ownership. Almost 40% of participants have possession of their own driving license and only 30% of the respondents live with their family. About 45% of the participants never travel through public transport.

2.4. Estimation of psychological factors

The various psychological variables considered for the model estimation are given in Table 3. Since the questions on the survey form are the attitudinal type and their responses are based on the Likert scales. The factor analysis approach is used to reduce the number of explanatory variables. A total of 813 data samples are selected for final analysis after data cleaning and the value of Cronbach's alpha reliability coefficient for Likert scale is 0.89, which is satisfying the minimum acceptance limit of 0.7 (Churchill 1979).

The sample adequacy measures such as Kaiser-Meyer-Olkin value (0.864) and Bartlett's test of sphericity (approximate chi-square is

Table 2

Respondent demographics.

Characteristics	Number	Share
Categorical Variables		
Gender		
Male	682	71.34%
Female	274	28.66%
Degree		
Under-Graduation	828	86.61%
Post-Graduation	128	13.39%
Course Pursuing		
Engineering	832	87.03%
Others (Medical, science, management, etc.)	124	12.97%
Household Car Ownership		
Yes	398	41.63%
No	558	58.37%
Possession of own driving license		
Yes	376	39.33%
No	580	60.67%
Living with family		
Yes	290	30.33%
No	666	69.67%
Uses of Public Transport		
At least once in a week	168	17.57%
At least once in a month	116	12.13%
Very Occasionally	248	25.94%
Never	424	44.35%
Quantitative Variables		
Age of the Respondent		
15–18 years	78	8.16%
19–21 years	554	57.95%
22–25 years	286	29.92%
26–29 years	38	3.97%
Average	21.07 (2.05) ^a	_
Numbers of members in the family		
≤ 2	10	1.05%
3	74	7.74%
4	392	41.0%
5	254	26.57%
6+	226	23.64%
Average	4.96 (1.68) ^a	-
^a Value in parantheses shows the standard de		

^a Value in parentheses shows the standard deviation.

15,457.333, a degree of freedom is 820, and significance is 0.000) indicates that collected data is fit for factor analysis. Principal component analysis (PCA) along with the varimax rotation method with Kaiser Normalization is used for extracting factors, and total 9 factors are retained on the basis of eigenvalues and variance explained by the variables. Eigenvalue shows the total variance explained by each factor. Generally, all the factors with eigenvalues of more than 1 should be extracted. Thus, total 9 factors are extracted which explained 61.48 percent of the total variance. A factor loading of '0.3' has been set as the benchmark for identifying each factor. The name of the factors, variable labels, and factor loadings are summarized in Table 3.

The factors are named on the basis of factor loadings which describe the correlation between the underlying factors and the statements. Factor scores are then derived from the extracted factors for evaluating the relative significance of perceptions and attitude in the car ownership behavior of young adults. The factor scores for each of the observations are deduced from the factor loadings and the Likert-type Scale responses for each observation in the sample. These factor scores are used for the analysis of car ownership decisions of young adults in the near future.

3. Model structure and results

The aim of this study is to analyze the car-ownership propensity of young Indian students. A Binary Logit Model (BNL) was used to calibrate the parameters of the utility equations associated with each individual i and alternative j. In the binary case, only two alternatives are available to each decision-maker. Therefore the decision to buy a car in the near future is considered as a dependent variable (binary variable, 1 = if going to buy a car in near future or 0 = not buying a car) and demographic, psychological factors considered as an independent variable for model development. The probability function of the Binary logit model is derived as the following:

Utility equation for individual i and alternative j (here j = buying a car, not buying a car in the near future) is:

$$U_{ij} = \beta'_{j} x_{ij} + \varepsilon_{ij} \tag{1}$$

The vector x_{ij} includes socio-economic, socio-demographic characteristics and attitudinal perception factors regarding car-ownership decisions. The coefficient of utilities, which is calibrated from observed data is represented by β'_{J} . The random term represents the latent (i.e. unobserved) variables that drive the choice process of an individual. It was assumed that e_{ij} is not correlated with x_{ij} (i.e. x_{ij} is exogenous in the random utility function) and normally distributed.

$$U_{i1} = \beta'_1 x_{i1} + \varepsilon_{i1} \tag{2}$$

$$U_{i0} = \beta_0 x_{i0} + \varepsilon_{i0} \tag{3}$$

Where, U_{i1} represents the utility of buying the car in the near future and U_{i0} represents the utility of not buying a car in the near future. We assume that the utility of the second alternative (not buying a car) is zero.

$$U_{i0} = 0$$
 (4)

The probability of choosing alternative 1 (buying a car in the near future) is:

$$Prob(U_{i1} > 0) = Prob(\beta'_{1}x_{i1} + \varepsilon_{i1}) > 0$$
(5)

$$Prob(U_{i1} > 0) = \frac{exp(\beta'_1 x_{i1} + \varepsilon_{i1})}{exp(\beta'_1 x_{i1} + \varepsilon_{i1}) + exp(\beta'_0 x_{i0} + \varepsilon_{i0})} > 0$$
(6)

Table 4 presents the results of the binary logit model after trying different combinations of demographic and psychological variables. To examine the presence of multi-collinearity before model calibration, Pearson's correlation coefficients are reported in Appendix A. Since, multi-collinearity is indicated when the correlation coefficient of independent variables is 0.90 and higher (Pallant 2010). None of the socio-demographic and psychological variables in this sample show collinearity problem. NLOGIT 5 econometric software is used for the calibration of the model. The dependent variable is the decision to buy a car in the near future (Yes > 0; No ≤ 0). The results of the developed model show that respondents whose education gualification is higher than the post-graduation level are more likely to buy a car with 99% confidence level than the respondent who is qualified below this level. It may be because these people are going to get a high paid job and have the confidence to afford a car in the near future. The individuals whose educational background is related to engineering are more likely to buy a car compared to medical, science, management students etc. at 99% of confidence level. It may be because of data samples having a large percentage of engineering students' responses. Further studies are required to understand the impact of educational background on car-ownership decisions. As expected, Individuals having a four-wheeler driving license and car in their household have a positive effect on car-buying decisions than those who do not have a car in their household with 95% of confidence level. This implies that an individual wants to buy his/her own vehicle instead of depending upon the common household vehicle. It is interesting to observe that the number of members in the family have a positive impact on car buying decisions with 95%

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Table 3

Factor loadings from principal component analysis with varimax rotation with kaiser normalization (N = 813).

Factor Name	Statements	Factor Loading
Factor 1: Tax and Environmental Sustainability Concern	I will not use a car if parking charges are high	0.843
Eigen Value: 4.122	I will not use a car if fuel taxes are high	0.806
% of Variance: 10.05	I will not buy a car if car ownership and additional taxes are high	0.760
Reliability: 0.868	I will sacrifice traveling by car for sustainable environment and better future	0.673
	Does advertisement related to Impact of car usage on the environment, will reduce the car ownership	0.647
	I will not use a car if bicycle infrastructure is appropriate	0.590
	I will not use a car if public transport is appropriate	0.561
	I will not use a car if I get a Job near my house (within 1 km)	0.476
Factor 2: Comfort	I enjoy traveling by or driving a car	0.791
Eigen Value: 4.045	Car is the best mode for leisure activity travel	0.773
% of Variance: 9.867	Car is the safest mode of transportation	0.711
Reliability: 0.839	Traveling by car is less stressful	0.701
	Car is more comfortable than public transportation	0.688
	I would be happier if I had a car	0.431
Factor 3: Peer/external influences	I should own a car when my relative have it	0.848
igen Value: 3.854	I should own a car when my friend have it	0.844
% of Variance: 9.401 Reliability: 0.831	I should take a car when my family purchase for me (If I'm not able to afford it in the future)	0.655
•	If car loans are easily available then I will buy a car next day or within a month	0.626
	I will buy things because of their attractive advertisement (In the future when you have enough money do you buy a car based upon an attractive advertisement)	0.618
	Car will improve my career opportunities	0.541
	Car will improve my social image	0.360
Factor 4: General Traffic Concern	Major traffic problems like congestion can be reduced by discoursing the use of cars.	0.785
Eigen Value: 3.078	Major cause of environmental air pollution can be attributed to car fumes	0.752
% of Variance: 7.507	Cars are more involved in fatal accident	0.734
Reliability: 0.816	Traffic by cars is increasing so fast that the existing roads network not able to manage increased traffic by the year 2025	0.685
Factor 5: Image Conscious	People will not give me importance, if I use Public Transport for daily travel	0.766
Eigen Value: 2.959	People will give me more importance, if I have a car	0.742
% of Variance: 7.217	People without car suffers more, because modern life favors car	0.729
Reliability: 0.766	Coming a college by a car is considered as a cool person	0.635
······································	In India, owning car is essential after Job	0.383
Factor 6: Car Obsessed	In future, I don't want to see myself to commute my daily travel by walking or cycling	0.736
Eigen Value: 2.179	In future, I don't want to see myself riding on a public transport bus or an auto-rickshaw	0.674
% of Variance: 5.314	to commute my daily travel	0 521
Reliability: 0.647	Car will improve more my personal life with respect to Public Transport	0.531 0.373
Factor 7: Status seeker	Coming to a college by a bicycle or walk is unfashionable I will buy a car because it is a symbol of status	0.658
Eigen Value: 1.788	Car is a success symbol for me	0.658
% of Variance: 4.360	Cal is a success symbol for me	0.036
Reliability: 0.795		
Factor 8: Personal Parking and Congestion Concern	I want to buy a car, but driving on the road is too difficult because of heavy traffic	0.839
Eigen Value: 1.734	I want to buy a car, but parking is very difficult	0.838
% of Variance: 4.230 Reliability: 0.748		
Factor 9: Car Passionate	Buying a new car is a dream for me	0.487
Eigen Value: 1.449	I will buy a car as soon as I am able to afford it	0.451
% of Variance: 3.534 Reliability: 0.160	Growth of cars in country is a sign of developing nation and it should be encouraged	0.361

Total Variance explained: 61.48%.

Method of Extraction: Principal Component Analysis.

Method of Rotation: Varimax with Kaiser Normalization (Rotation converged in 9 iterations).

Note: Loadings less than 0.30 are omitted.

confidence level, which is logically obvious, i.e. if the number of people in the family increases, then the demand for vehicles will be increased for daily travel. Those who are staying with family are less likely to buy a car in the near future at 90% confidence level. Expectedly, an individual's propensity of using public transport have a negative coefficient with 95% confidence level. Those who are using public transport at least once in a week are less likely to buy a car in comparison to those who are using it once in a month, occasionally and never. This suggests that, if the use and serviceability of public transport will improve, that could make a significant impact on the car buying behavior of young adults. Various psychological variables are also found significant in the above utility equation of buying a car in the near future. Those who have a "Tax and Environmental Sustainability concern" are less likely to buy a car in the near future with 90% of confidence level (Verma et al. 2016, 2017) and those individuals whose decisions are influenced by peer/external factors (like advertisements or inspired by relatives) are more likely to buy a car with 99% of confidence level. As per the model, individuals concerned with general traffic-related issues like accidents, pollution, congestion, and parking etc. are less likely to buy a car at 99% of confidence level. Those who are image-conscious and passionate about

Table 4

Results of binary logit model for car ownership decisions in the near future.

Variable	Coefficient	t-value
Constant	-0.82223**	-2.09
Education Qualification	0.67483***	2.92
(If qualification \geq P.G.		
level $= 1$, otherwise 0)		
Course Pursuing (If	0.70173***	3.00
course related to		
Engineering $= 1$,		
otherwise 0)		
Household car ownership	0.38287**	2.33
(yes = 1, otherwise 0)		
Possession of Car Driving	1.65785**	2.08
License (yes $= 1$,		
otherwise 0)	0.0007044	1.00
Number of members in	0.09073**	1.96
the family	0.00 510*	1 71
Living with family (yes $=$	-0.28,512*	1.71
1, otherwise 0)	-0.15182**	-2.16
Uses of public transport (If, use at least once in a	-0.13182	-2.10
week $= 1$, at least once		
in a month $= 2$, very		
occasionally = 3, never		
= 4)		
Factor 1: Tax and	-0.13053^{*}	-1.68
Environmental		
sustainability concern		
Factor 3: Peer/external	0.27368***	3.85
influences		
Factor 4: General traffic	-0.25293***	-3.26
concern		
Factor 5: Image conscious	0.15698**	2.21
Factor 6: Car obsessed	0.21453***	2.90
Factor 7: Status seeker	0.21877***	3.07
Factor 8: Personal	-0.21587***	-2.83
parking and congestion concern		
Factor 9: Car passionate	0.14078**	2.07
Goodness-of-fit measures:		
Log-likelihood function:	-418.084	
LL(β)		
Log-likelihood at constant	-559.684	
only: LL(0)		
McFadden's Rho-squared	0.253	
(ρ2)		

Note: ***, **, * = => Significance at 1%, 5%, and 10% level.

Likert Scale: (strongly agree = 5; agree = 4; neutral = 3; disagree = 2 and strongly disagree = 1).

cars are more likely to buy a car in the near future with 95% of confidence level. Another interesting finding is that those who are status seekers (Ghate and Sundar 2014; Pojani 2018) and obsessed with the car are likely to buy a car in the near future with 99% of confidence level.

Prediction success table.

Effect of the gender (1 if male, 0 if female), age of respondent (absolute value between 15 and 29) and comfort (as a psychological variable) was also examined on the decision to buy a car in the near future of young adults; however, these variables were found to be insignificant in the developed model. The binary logit model is developed using 15 variables and the value of log-likelihood at function is -418.084 and the value of log-likelihood at a constant is -559.684. The goodness-of-fit for the calibrated model is analyzed by finding out the McFadden's Rhosquared (ρ 2) value given by equation (7),

$$Rho - squared = 1 - \frac{Log \ likelihood \ at \ function}{Log \ likelihood \ at \ constant}$$
(7)

 $= 1 - \frac{(-418.084)}{(-559.684)} = 0.253$ The rho-square value (0.253) of developed model is lies between 0.2 and 0.4. It shows that the developed model is good fit (Hensher et al., 2016).

3.1. Validation of the binary logit model

The prediction success table is the cross-classification between observed and predicted choices of decision makers. As mentioned earlier, 143 randomly selected data sample were used for the validation of calibrated model. The prediction success table of the developed binary logit model for validation is shown in Table 5. The overall prediction success rate is found to be more than 81%, which shows that the developed model is reasonably good.

4. Key findings and policy recommendations

This study aims to identify the psychological/attitudinal factors along with demographic variables and their effects on car ownership decisions of young adults (future decision maker of their family). The questionnaire comprising of demographic characteristics, frequency of using public transport and attitudinal behavior-related questions on future car ownership decisions is conducted in the Jodhpur city of India and responses from 813 individuals (age group 15–29 years) are used in this study. The study employed a principal component analysis, and a subsequent binary logit model to determine the young Indian adults' perception towards car ownership decisions in the near future. This study gives many insights about car-ownership decisions. The major findings of the study are:

- 1. Gender of the respondent had no significant role in car ownership decisions.
- 2. Individuals whose educational qualification is higher than the postgraduation level and have educational background related to engineering are more likely to buy a car in the near future.
- 3. Individuals having a four-wheeler driving license and the car in their household have a higher tendency to buy a car than those who do not have a car in their household.

Observed Choices of Individual	Predicted Choices of Individual		Row Totals	Observed Share (%)
	Buying a car	Not buying a car		
Buying a car	57	11	68	47.55
Not buying a car	16	59	75	52.45
Column Totals	73	70	143	100
Predicted Share (%)	51.05	48.95	100	
% Correctly Predicted	78.08	84.29	81.12	

- 4. Frequency of using public transport, have a considerable impact on attitudinal behavior regarding car-ownership decisions.
- 5. Those who are conscious about environmental sustainability, paying high taxes, and general traffic problems (like congestion, parking, accidents, etc.) are less likely to buy a car in the near future.
- Individuals whose decisions are influenced by peer/external factors (like advertisements or inspired by relatives) have a higher tendency to buy a car.
- Respondents who are passionate about cars, obsessed with cars, image-conscious and status seekers are more likely to buy a car in the near future.

From a broad viewpoint, this study recommends some policies to reduce the growth of new cars in developing countries like India:

- The awareness programs/campaigns concentrating on the effect of cars on environmental sustainability and imposing high taxes on the purchase of new cars and fuels may decline the growth of new cars in developing countries.
- 2. Implementing road pricing in the form of per kilometer charge will be a much effective incentive in congested areas. It will force people to get out from their cars. Then provide education and information about other forms of sustainable transport (Kroesen 2020).
- 3. The external factors like advertisements related to consequence of cars in daily life, environments, etc. can alter or affect the growth of cars.
- 4. The quality of public transportation (comfort, fare, speed, safety, frequency, and reliability, etc.) influences use and car-owning behavior (He and Thøgersen, 2017). Hence, by improving the quality of public transport (as per user expectations) would increase the attractiveness of public transport with respect to car driving.
- 5. Like other developing countries (ex. China), Indian government should develop and implement transport policies that could potentially discourage use and owning a car without necessity purpose (like for status/image purpose) in order to ensure better sustainable mobility patterns in the future (Gärling and Loukopoulos 2008).
- 6. Policies that make the acquisition and driving a car more expensive on roads (by increasing toll taxes and fuel prices) would help to decline the growth of cars.

This study is highly relevant for transport planners, policy and decision-makers. The results of this study could be improved by considering larger sample sizes of young adults' across India (as this study only concentrates on the college/university young adults) and by incorporating various variables like age, gender, working employee, job seeker, perception about electric cars, frequency and use of other modes of transportation in the model.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Pearson's correlations among demographic and psychological (n = 813)

		/ cn /n
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15	1 0.471 -0.039	-0.005 0.265 male & 0 f Car Drivin nocern; FA FAC9 = Ca
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11	1 0.249 0.287 0.287 0.287 0.418 0.418	$\begin{array}{c} 0.223 \\ 0.223 \\ \text{Engineerir} \\ \text{ership (yes \\ FAC1 = T; \\ 3 = \text{Person} \end{array}$
10	1 1 0.285 0.013 0.013 0.013 0.013 0.013 0.056 0.076	-0.150 -0.150 d car owne ever = 4); eker; FAC8
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Protection of Distribution Feeder Using Stockwell Transform Supported Voltage Features

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Abstract— This paper presents a research work focussed on the identification of faults on the distribution feeder supported by Stockwell transform based summing of absolute values and median features using the voltage signals. A fault index is proposed which is obtained by the multiplication of H-index (obtained summation of absolute values S-matrix evaluated by ST supported decomposition of voltage) and VS-index (obtained median of absolute values S-matrix evaluated by ST supported decomposition of voltage). Classification of faults is achieved using decision rules. Investigated faults include phase to ground, fault between two phases, two phases to ground fault and fault involving all three phases and ground. Performance of algorithm is tested on high fault impedance and fault incidence angle. Proposed study is performed using MATLAB software in Simulink environment.

Keywords— Distribution Feeder Fault, Hilbert transform, protection, Stockwell Transform, voltage.

I. INTRODUCTION

Feeders used to transform power from grid substations (GSS) to the consumer ends are normally known as power distribution lines. These are exposed to different various natures of failures which are commonly not expected due to involvement of the random causes. These failures adversely affect the availability as well as reliability of the network. Accurate detection and identification of type of fault on these distribution feeders help to restore the power supply timely and also avoid the severe damage to the power system equipments [1]. Many schemes have been reported in last decades for the recognition of faults to design protection scheme for the radial distribution feeders. Signal processing methods have played a significant role for the identification of the faults. Signal analysis approaches like Wavelet transform (WT), Fourier transform (FT), Short time Fourier transform (STFT), fast Fourier transform (FFT), Stockwell transform (ST), Gabor transform (GT) etc. are reported for identification of faults [2]. Mahela et al. [3], introduced an approach using Stockwell transform for identification of faults on the transmission line in the presence of Thyristor switched capacitor (TSC). An intelligent scheme for identification of HIF on distribution network based on a combination of probabilistic neural network (PNN) and adaptive extended Kalman filter (AEKF) is found in [8]. AEKF is implemented

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for estimation of separate components of harmonic in HIF as well as no-fault (NF) associated with the current signals in the presence of non-linear loads. These harmonic components have been used utilized for training and testing of PNN which helps for classification of HIF from NF accurately. In [9], authors introduced an approach for location of fault in network of power system based on the processing of voltage signals. Voltage signals are converted into absolute values of phasor of complex valued which indicate travelling waves associated with the faults. This has been processed further for localization of faults using Hilbert-Huang transform (HHT). Results are validated on in mixed feeder for all types of faults including HIF of arcing. In [10], authors presented modelling of HIF on distribution feeder. Proposed model uses resistance of non-linear nature which represents high impedance path in the faulty event. Performance analysis of various parameters which are electric in nature and pertains to the fault of high impedance has been evaluated. In [11], a methodology for detection of HIF in distribution feeder of power network using Mathematical Morphology (MM) is proposed. Current signals are utilized for detection of HIF faults. MM is implemented for extraction of the features (in time domain) and a classification of HIF faults has been achieved using the rule supported algorithm. Data has been collected on network of power distribution utility. Low impedance faults (LIF) and switching transients have been simulated in MATLAB. It is established that proposed method is effective in detection and differentiation of HIF from switching transients. This is achieved is time lesser compared to that utilized by different approaches maintaining high security as well as dependability. Performance of introduced algorithm is independent on location of fault, time of fault inception, and fault type. Following is the main contribution of the paper:-

- An algorithm supported by Stockwell transform using voltage signals for identification of faults on the distribution feeder is proposed.
- Classification of faults is achieved using decision rules.
- Performance of algorithm is tested on high fault impedance and fault incidence angle.

II. PROPOSED DISTRIBUTION TEST SYSTEM

Proposed study related to fault identification and classification associated with distribution feeder is performed with the help of IEEE-13 bus distribution network. IEEE-13 3rd International Conference on Emerging Technologies in Computer Engineering: Machine Learning and Internet of Things (ICETCE-2020), 07-08 February 2020, (IEEE Conference Record #48199)

Information Processing in Extended Hodgkin-Huxley Neuron Model

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Abstract—Models of a variety of neurons share the same form as the Hodgkin-Huxley (HH) neuron and evidence suggests that single-compartment models can capture the key properties of in vivo and in vitro neurons. In this paper we are going to discuss about how the conductance of the excitatory and inhibitory synapse vary when the pre synaptic action potential arrived at the synapse and how this synaptic conductance affects the information transfer in the single neuron. In our model the injected current is replaced with the synaptic current in the HH model. In order to validate the impact of excitatory and inhibitory synapse in the generation of action potential, the extended HH model is examined with various synaptic inputs.

Index Terms- HH Model, Mean Firing Rate, Entropy, Synaptic Conductance, Spike Train.

I. INTRODUCTION

Many models of brain function have been built; they differ in their objectives, requirements and limitations. Based on the questions what, how and why that a model can answer, the models can be classified as conceptual/phenomenological/black box type, mechanistic type/realistic or interpretive type models respectively. Hodgkin & Huxley model is a biological model which is accurately designed to describe and predict the behaviour of the neuron .Izhikevich[6] in his paper reviewed neurocomputational features of various spiking models and ranked the models based upon the neuro-computational behaviour, their implementation efficiency, etc. HH model is the only biological model which finds its way to achieve the complete fit of data which Izhievich have discussed.

II. HODGKIN & HUXLEY MODEL

Intracellular recordings of the neuron state that the action potential is characterized as the sudden increase in the membrane potential (depolarization) followed by a slow sharp decrease towards the resting potential. This may be followed by a fall below the resting potential due to the fall in membrane potential below the resting potential called after hyperpolarisation phase. Hodgkin and Huxley (partly in collaboration with Katz) were the first to describe the active mechanisms quantitatively [5]. The final paper of Hodgkin and Huxley [5] shows the complete expression for the three ionic currents. The description of how the membrane potential changes in time is explained in the equation

$$\sum_{m} \frac{dV}{dt} = -\overline{g}_{Na}m^{3}h(V - E_{Na}) - \overline{g}_{K}n^{4}(V - E_{K}) - \overline{g}_{L}(V - E_{L}) + I_{inj}$$
(1)

The HH model is stimulated by the external injected current. Similar to real neuron this model generates repetitive firing and the greater the input current, the faster the firing rate. However the real single neuron firing traces show high variability, for instance, the coefficient of variation in the spike interval (ISI) of neuron firing in response to the stimulus for a period of several seconds is approximately equal to 1 as expected from the Poisson process[4].Furthermore, the neuron receives inputs from several other neurons. The current generated by these neurons may be from the excitatory or from inhibitory, which are approximately balanced to each other [10]. To study this behaviour, the original HH model described in the equation 1.1 is extended by adding additional synaptic currents. Simulations based upon applying Poisson distributed excitatory and inhibitory inputs demonstrate that the neuronal firing output shows considerable variability in the ISI. Depolarizing with balanced synaptic current reduces the membrane time constant and also affects the information processing in several aspects[1-2],[7-9].

In this paper the extended HH model is modelled with the network consisting of 1000 excitatory and 200 inhibitory synapses. The excitatory and inhibitory synapses are activated by the spike train generated by a Poisson process of various rates f_{ex} , f_{in} respectively [3]. The behaviour of the membrane potential is approximated using the conductance-based relationship is now given below by (2).

$$C_{m}\frac{dv}{dt} = -\overline{g}_{Na}m^{3}h(V - E_{Na}) - \overline{g}_{K}n^{4}(V - E_{K}) - \overline{g}_{L}(V - E_{L}) + I_{evn}$$
(2)

where, I_{syn} is the synaptic current and the synaptic current is given by (3).

$$I_{syn} = -\overline{g}_{exe}(V - E_{Na}) - \overline{g}_{in}(V - E_K)$$
(3)

The time course of synaptic input can de described by a simple decaying exponential function. The synaptic conductance [4], [11] is calculated as given below in (4).

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Article

Convolutional Neural Networks with Transfer Learning for Recognition of COVID-19: A Comparative Study of Different Approaches

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Abstract: To judge the ability of convolutional neural networks (CNNs) to effectively and efficiently transfer image representations learned on the ImageNet dataset to the task of recognizing COVID-19 in this work, we propose and analyze four approaches. For this purpose, we use VGG16, ResNetV2, InceptionResNetV2, DenseNet121, and MobileNetV2 CNN models pre-trained on ImageNet dataset to extract features from X-ray images of COVID and Non-COVID patients. Simulations study performed by us reveal that these pre-trained models have a different level of ability to transfer image representation. We find that in the approaches that we have proposed, if we use either ResNetV2 or DenseNet121 to extract features, then the performance of these approaches to detect COVID-19 is better. One of the important findings of our study is that the use of principal component analysis for feature selection improves efficiency. The approach using the fusion of features outperforms all the other approaches, and with this approach, we could achieve an accuracy of 0.94 for a three-class classification problem. This work will not only be useful for COVID-19 detection but also for any domain with small datasets.

Keywords: convolutional neural networks; transfer learning; K-means clustering; principal component analysis

1. Introduction

COVID-19, a global pandemic, is still spreading in many parts of the world since its identification in late December 2019. In these nine to ten months, this disease has become one of the most significant public health emergencies requiring remedial measures and early diagnosis. In many countries till recently, reverse transcription-polymerase chain reaction (RT-PCR) tests are the most popular diagnostic method for detecting COVID-19. Although popular, this method suffers from limitations in its long wait time and low sensitivity. Therefore, for the early diagnosis of COVID-19, many have started using molecular tests to determine the coronavirus. For example, many existing machines like Genmark's ePlex Respiratory Pathogen instrument or Abbott's ID, etc., have a COVID-19 feature for testing, which takes much less time [1,2]. The other advantage is that the sensitivity of these molecular tests is around 90% better than the RT-PCR method having a sensitivity of about 70%. However, both the RT-PCR method or molecular testing approach need expensive equipment and trained professionals. Further, the availability of these methods is limited in remote areas and low and middle-income

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Convolutional Neural Networks with Transfer Learning for Recognition of COVID-19: A Comparative Study of Different Approaches

by

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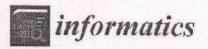
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Voltage-Based Hybrid Algorithm Using Parameter Variations and Stockwell Transform for Islanding Detection in Utility Grids

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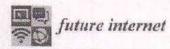
Abstract: This paper has introduced an algorithm for the identification of islanding events in the remotely located distribution grid with renewable energy (RE) sources using the voltage signals. Voltage signal is processed using Stockwell transform (ST) to compute the median-based islanding recognition factor (MIRF). The rate of change in the root mean square (RMS) voltage is computed by differentiating the RMS voltage with respect to time to compute the voltage rate of change in islanding recognition factor (VRCIRF). The proposed voltage-based islanding recognition factor (IRFV) is computed by multiplying the MIRF and VRCIRF element to element. The islanding event is discriminated from the faulty and operational events using the simple decision rules using the peak magnitude of IRFV by comparing peak magnitude of IRFV with pre-set threshold values. The proposed islanding detection method (IDM) effectively identified the islanding events in the presence of solar energy, wind energy and simultaneous presence of both wind and solar energy at a fast rate in a time period of less than 0.05 cycles compared to the voltage change rate (ROCOV) and frequency change rate (ROCOF) IDM that detects the islanding event in a time period of 0.25 to 0.5 cycles. This IDM provides a minimum non-detection zone (NDZ). This IDM efficiently discriminated the islanding events from the faulty and switching events. The proposed study is performed on an IEEE-13 bus test system interfaced with renewable energy (RE) generators in a MATLAB/Simulink environment. The performance of the proposed IDM is better compared to methods based on the use of ROCOV, ROCOF and discrete wavelet transform (DWT).

Keywords: distribution grid; islanding event; renewable energy; Stockwell transform

1. Introduction

Renewable energy (RE) provides clean energy to the consumers and reduces transmission losses when integrated to the grid in large quantum near-load centers. The structure of the conventional power network has been modified, and the power network is smarter and more efficient. In addition, problems arise because of grid convergence that urgently needs to be solved. Unintentional islanding is an important problem that can lead to poor quality of power (PQ), frequency instability and a risk to the personal safety of the consumer. Hence, it becomes essential for detecting this scenario accurately and reliably to isolate islanded network immediately [1]. According to the IEEE Std. 1547, the islanding event should be identified within 2 s after it has an incident on the network. The methods of islanding detection (IDMs) are graded into passive IDM, active IDM and hybrid IDM [2]. For identification of the islanding, passive IDMs use under/over voltage, under/over frequency,





Article



A Fusion-Based Hybrid-Feature Approach for Recognition of Unconstrained Offline Handwritten Hindi Characters

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Abstract: Hindi is the official language of India and used by a large population for several public services like postal, bank, judiclary, and public surveys. Efficient management of these services needs language-based automation. The proposed model addresses the problem of handwritten Hindi character recognition using a machine learning approach. The pre-trained DCNN models namely; InceptionV3-Net, VGG19-Net, and ResNet50 were used for the extraction of salient features from the characters' images. A novel approach of fusion is adopted in the proposed work; the DCNN-based features are fused with the handcrafted features received from Bi-orthogonal discrete wavelet transform. The feature size was reduced by the Principal Component Analysis method. The hybrid features were examined with popular classifiers namely; Multi-Layer Perceptron (MLP) and Support Vector Machine (SVM). The recognition cost was reduced by 84.37%. The model achieved significant scores of precision, recall, and F1-measure—98.78%, 98.67%, and 98.69%—with overall recognition accuracy of 98.73%.

Keywords: Bi-orthogonal; DCNN; DWT; Hindi characters; hybrid-features; fusion; MLP; PCA; SVM; transfer learning

1. Introduction

The increasing demand for the automation of language-based systems is high due to the associated vast application field. It includes digitalization and preservation of the manuscripts of historic significance, computerized editing of handwritten documents, automatic processing of cheques in the bank, recognition of postal address written on mails, parcels, etc. and their address-wise sorting through computer vision, translation of road safety-instructions written in the local language on roadside boards, computerized recognition of medical-aids as mentioned in handwritten prescription, and many more related applications. The machine-based recognition of handwritten scripts is much more difficult than that of printed ones due to inherent unconditional variation in shape, size, skewness, and degree of connectedness between various characters. Countries like India. China, Saudi Arabia, and the United Arab Emirates are developing automation systems in country-specific languages to serve its advantage to the mass of the people as large populations of these countries have not adopted English as their first language.

Many advancements have been reported for English language-based automation systems due to their global acceptance. Extra attention is needed for systems based on languages like Hindi (Devnagari), Chinese, Urdu, Farsi, etc., as they are in a developing



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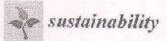
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Article

Design and Performance Analysis of Hybrid Battery and Ultracapacitor Energy Storage System for Electrical Vehicle Active Power Management

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Rashed, G.L; Garg, A.R.; Mahela, O.P.; Khan, B.; Shafik, M.B.; Hussien, M.G. Design and Performance Analysis of Hybrid Battery and Ultracapacitor Energy Storage System for Electrical Vehicle Active Power Management. Sustainability 2022, 14, 776. https://doi.org/10.3390/su14020776

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Copyright: © 2022 by the authors. Licensee MDPI, Basel, 3witzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). Abstract: The electrical energy storage system faces numerous obstacles as green energy usage rises. The demand for electric vehicles (EVs) is growing in tandem with the technological advance of EV range on a single charge. To tackle the low-range EV problem, an effective electrical energy storage device is necessary. Traditionally, electric vehicles have been powered by a single source of power, which is insufficient to handle the EV's dynamic demand. As a result, a unique storage medium is necessary to meet the EV load characteristics of high-energy density and high-power density. This EV storage system is made up of two complementing sources: chemical batteries and ultracapacitors/supercapacitors. The benefits of using ultracapacitors in a hybrid energy storage system (HESS) to meet the low-power electric car dynamic load are explored in this study. In this paper, a HESS technique for regulating the active power of low-powered EV simulations was tested in a MATLAB/Simulink environment with various dynamic loading situations. The feature of this design, as noted from the simulation results, is that it efficiently regulates the DC link voltage of an EV with a hybrid source while putting minimal load stress on the battery, resulting in longer battery life, lower costs, and increased vehicle range.

Keywords: electric vehicles; battery; ultracapacitors; energy storage system

1. Introduction

Electric cars (EVs) are becoming more popular as a result of environmental concerns and rising gasoline prices. When compared to gasoline-based internal combustion engine (ICE) vehicles, EVs have superior fuel economy and adhere to modern world pollution requirements. Standard EVs are available on the market as a power source. It is worth noting that EVs are subjected to a variety of time-varying power needs, such as abrupt acceleration and deceleration (regeneration period). This acceleration and regeneration period is analogous to pulse load changes, and the battery must absorb a huge transient charging current at this time, negatively impacting the battery's performance. A supplementary energy storage technology (ultracapacitor) is occasionally used to mitigate this negative effect on the battery [1].

By incorporating diverse topologies of ultracapacitor connection, the influence of the battery's performance on abrupt charging and draining can be mitigated. An ultracapacitor

Estimation of Faults in Grid Connected Solar Photovoltaic Farm Using Voltage Based Median and Summing Values Features of Stockwell Transform Based Algorithm

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Abstract—Research work under taken in this paper is concentrated to design an algorithm using Stockwell Transform for estimation of faults in grid integrated solar PV farm. An algorithm based on Features such as median and summing absolute values of Stockwell Transform using the voltage signal has been presented in this manuscript. Proposed algorithm can be utilized in protection schemes of the transmission and distribution feeders in the grid integrated solar PV farms. Algorithm has been tested for the estimation of the faults such as phase to ground, phase to phase, two phases to ground and three phases to ground fault on the AC side of the grid. Algorithm is also tested for estimation of faults on the DC bus of the solar PV farms. Study is carried out using MATLAB software.

Keywords—AC grid; DC bus; fault; Solar PV farm; Stockwell Transform.

I. INTRODUCTION

Power utility network is complex in nature which may be considered as spatial and temporal complexity. This network is also nonlinear and non-stationary in nature which includes many uncertainties at different levels of generation. transmission and distribution of electrical power. Transmission lines are constructed with long distances in different geographical regions having variable nature like deserts, plains and hills. These lines are used to transfer power in bulk quantity from generator station to centres of loads over long distances. Hence, possibility fault occurrence on the transmission lines is very in comparison to other components of the utility power network. Frequently observed faults on the transmission line may be included in the categories such as line to ground (LG) fault, double line (LL) fault, double line to ground (LLG) fault, three phase (LLL) fault, three-phase to ground (LLLG) fault and faults of nature inter circuits [1]. Long distance transmission lines are essential requirement of the electric power utility grid to transfer bulk power over long distances from generators to load centres. This includes multiple sending end generators and the multiple receiving load centres. In recent years the power system network

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transmission system deployed the high voltage direct current (HVDC), ultra high voltage DC (UHVDC), multi-terminal DC (MTDC) and multi-terminal AC for transmission of bulk power from one point to the other [2]. Power transfer capability of the existing corridors of the transmission lines have been increased by the use of the compensations devices like series and shunt. In addition of power transfer capability of transmission lines, these compensations also help to increase the voltage profile and improve the transient stability of the system. However, presence of renewable power generation creates additional problems related to protection due to the uncertain in nature of RE sources. The issues observed due to deployment of compensation devices include [3] as detailed.

- Sudden change impedance of line at compensation point
- Inversion of current and voltage
- Frequency components other than the power frequency are introduced in voltage and current signals.

When the solar PV farms are integrated with network of distribution part of the power system, protective devices faces change in behaviour due to fact related to flexibility of changes in number of solar PV plant units. Further, these units are spread over the large area and power output of these units may change due to the variation in solar insolation and wind speed. The solar energy source production capacity is low in terms of volume. It has low operational cost compared to the large sized generators and power plants. Also integration of these units to distribution and transmission networks has been gaining interests due to the economic issues associated with the development of the power plants, reduced environmental pollution, increased power generation efficiency, improved quality of power supplied to customers, reduced losses in power network, improved voltage profile, and liberalized network capacity [4].

Time frequency methods play important role on the detection of transmission line faults to design the efficient

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Recognition of Islanding and Operational Events in Power System With Renewable Energy Penetration Using a Stockwell Transform-Based Method

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Abstract-Integration of RE sources to the utility grid offers technical and operational challenges causing problems of PQ, stability, identification of operational events, etc. This article presents an algorithm to identify events including islanding, grid integration, and outage of the solar PV and WG plants in grid using a ST. Islanding event may occur in the presence of any kind of plant. Processing of negative sequence component of voltage is performed by utilizing ST based multiresolution analysis at the test node and the output matrix is evaluated. The features (F1-F4), VI and STD indexes are obtained from this matrix. These features are utilized for identifying the events and transient phenomenon. The VI and STD indexes are used to recognize the type of RE source present during the islanding and outage events. Moreover, for recognizing the type of RE source at the time of synchronization event, an SI is proposed. This is computed by the ST depended processing of voltage signals. Performance of the algorithm is found satisfactory for all incidence angles and complete voltage cycle under the noisy conditions of 10 dB SNR. As compared to the time-frequency transform based coefficients of the voltage signal, the proposed technique is found to be superior in terms of small NDZ and low computation time and least affected by noise. Further, the developed technique is also efficient to detect various events stated above and the type of RE source. Study is performed using MATLAB/Simulink software and validated in real time using RTDS.

Index Terms-Grid synchronization event, islanding event, outage event, power system network, renewable energy (RE), Stockwell transform (S-transform), transient phenomenon,

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Alternating current.	
Aluminum conductor steel reinforce	d.
Artificial intelligence.	

NOMENCLATURE

- ANFIS Adaptive neuro-fuzzy inference system. DC Direct current. CWT
- Continuous wavelet transform.
- DFIG Double fed induction generator.
- DG Distributed generation.
- FT Fourier transform.
- HID Human interface device.
- IDI Islanding detection index.
- Institute of Electrical and Electronics Engineers. IEEE
- IID Island interconnection device.
- MGP Multigene genetic programming.
- NDZ Nondetection zone.
- NSC Negative sequence component.
- PHEV Plug-in hybrid electric vehicle.
- PQ Power quality.
- PV Photovoltaic.
- Renewable energy. RE
- RTDS Real-time digital simulator.
- SAM Sum absolute magnitude.
- SAV Sum absolute values.
- Synchronization index. SI
- SNR Signal to noise ratio.
- SPS System protection schemes.
- STD Standard deviation.
- ST Stockwell transform.
- STA Absolute values matrix of ST-matrix.
- Short time Fourier transform. STFT
- SVM Support vector machine.
- VI Variance index.
- WG Wind generator.
- WT Wavelet transform.
- kW Kilowatt.
- kVAr Kilovolt ampere reactive.
- kV Kilovolt.
- **MVA** Megavolt ampere.
- MW Megawatt.
- Ω Ohm.

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Combined Stockwell and Hilbert Transforms Based Technique for the Detection of Islanding Events in Hybrid Power System

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Abstract—This paper presents a technique using hybrid features extracted from current signals using Stockwell and Hilbert Transforms for detecting the islanding events and operational events of renewable energy generators and loads. The study is performed on a hybrid power system test network incorporating wind and solar power generators. Results are computed using MATLAB/Simulink software for a variety of case studies. Through the applied technique islanding events are successfully identified and discriminated from operational events.

Keywords-Hybrid power system; wind energy; Hilbert Transform; solar energy; Stockwell Transform,

I. INTRODUCTION

Integration of the Renewable Energy (RE) to grid is being continuously increasing due to the requirement of pollution free energy all around the world [1, 2]. However, the use of renewable energy as green energy has imposed many challenges to the utilities in terms of power quality, power system protection; and reliability [3]. This has caused due to the uncertain nature of the renewable power generation. This has also caused unwanted tripping of the power system equipments and generators. Sometimes, this may also disconnect a section of energy network from the rest of the supply network, and this isolated part of the network would operate in an isolated mode and known as islanding operation of the power system operation. In this mode, the load demand is met by the local generators. Islanding takes place when a distributed generation (DG) and connected load are disconnected, and these DG sources supply power to the loads in isolated mode. Islanding poses many challenges for the power system network. The existing standards do not permit the DGs to operate in islanded mode. Hence, there is a need to detect the islanded operation of the power system network and discriminate the same from the other operational events. The operational events with renewable energy (RE) sources sceanrios like outage of RE plants, grid synchronization of RE plants and islanding of test grid also affects quality of the power. Techniques of signal processing have played important

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roles in the detection of islanding events [4]. However, available techniques use only the single signal processing methods, where the efficiency is quite low [5-10]. The use of combined features of more than two methods may improve the efficiency of islanding detection. In [5], the authors proposed an algorithm for anti-islanding, which is passive in nature and can be used for the inverter, based distributed generation (DG) units as well as synchronous machine supported DG units. At the moment when mismatches between the active power and reactive power approach near to null value, most of the antiislanding techniques, which are passive in nature, cannot be effective for the detection of the islanding phenomenon with good accuracy. In [6], an algorithm was introduced for the identification of islanding of wind turbine based power system network. Applications of trajectory based on state variables and wavelet transform (WT) have been tested in a micro-grid system. Relays are used for the estimation of variations in the energy state of coefficients of time-frequency transform of signals recorded in two-dimensional space [6]. Performance of relay has been improved with the help of selection of signals supported method and using the correlating islanding as well as non-islanding phenomena [6]. In [7], a method is proposed for the detection of islanding, which inserts sufficient and variable impedance on low voltage part of the grid. Identification of islanding will be affected by intelligent agents inserted in a central switch of the micro-grid. It is converted to a hybrid automatic transfer switch (HATS). HATS agent is effective in identification of operational mode of the micro-grid supported by measuring the local parameters and supervising the grid status. In [8], a detailed comprehensive review on Islanding detection methods is presented aiming to aid the design efforts of islanding identification methods and standards of anti-islanding. In [9], a detailed study is presented, which is related to islanding identification scheme that can be implemented in remote areas for the hybrid power plant based on the wind and solar PV systems. Method has also been implemented based on the solution reached using the classification supported by the currents. The proposed techniques are effective in monitoring

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RESEARCH ARTICLE

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Effect of Irradiance on Performance for Poly-Crystalline Photo-voltaic Cell

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Abstract:

In this paper, simulation of 60 Cells Eldora Ultima Silver 1500 V Series by Vikram Solar Panel using Matlab Simulink approach is presented. The method is used to determine the PV & I-V characteristics of proposed module in various conditions especially in different levels of irradiation. In addition, all results from Matlab Simulink are verified with the data sheet of Eldora Ultima Silver 1500 V Series by Vikram Solar Panel.

Keywords — Solar photovoltaic cell, mathematical model, modeling, PV module, standard test condition (STC), PV characteristic; simulink/matlab.

I. INTRODUCTION

Studies of polycrystalline silicon are numerous especially through the technical development of characterization methods in order to raise the performance of solar cells made of this material document is a template. The polycrystalline PV cell (solar cell) converts the sunlight into the electrical energy by the photovoltaic effect. Energy from PV modules offers several advantages, such as, requirement of little maintenance and no environmental pollution. The polycrystalline PV module typically consists of a number of PV cells in series. The conventional technique to model a PV cell is to study the p-n junction physics. The polycrystalline PV cell has a non-linear voltagecurrent (V-I) characteristic which can be modelled using current sources, diode(s) and resistors. Single-diode and double-diode models are widely used to simulate PV characteristics. The singlediode model emulates the PV characteristics fairly and accurately. The manufacturer provides information about the electrical characteristics of PV by specifying certain points in its V-I characteristics which are called remarkable points.

In this paper, a simplified polycrystalline PV equivalent circuit with a diode (The single-diode model) equivalent as model is proposed. The main contribution of this work is the implementation of a generalized polycrystalline PV model with Matlab/simulation.

II. A MATHEMATICAL MODEL OF PHOTOVOLTAIC MODULE

A solar cell is basically a p-n junction fabricated a thin wafer of semiconductor. The in electromagnetic radiation of solar energy can be directly converted to electricity through photovoltaic effect. Being exposed to the sunlight, photons with energy greater than the band-gap energy of the semiconductor creates some electronhole pairs proportional to the incident irradiation. The equivalent circuit of a Poly-Crystalline PV Cell is shown in figure 1. This model is known as a single diode model of solar cell. The current source Iph represents the cell photo-current. Rsh and Rs are the intrinsic shunt and series resistances of the cell respectively. Usually the value of Rsh is very large and Rs is very small, hence shunt resistor may be neglected to simplify the analysis. The polycrystalline panel can be PV modelled mathematically with the equations [(1) to (4)] given below:

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Investigation of Complex Power Quality Disturbances using Discrete

Wavelet Transform

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Abstract – This research work aims to investigate power quality disturbances using discrete wavelet transform technique. MATLAB is used for generation of power quality disturbances using mathematical relations as per IEEE Standard-1159. The investigated power quality disturbances are single stage as well as complex power quality disturbances. These power quality signals are decomposed using discrete wavelet transform with db4 as mother wavelet up to level 4 of decomposition. The plots related to detail coefficients and approximation coefficients are analyzed for detection of PQ disturbances. Power quality disturbance present in the signals are detected and classified using the features of these plots.

Key Words: IEEE, Single Stage Power Quality disturbances, Complex power quality disturbance, discrete wavelet transform, power quality.

1. INTRODUCTION

The considerable changes in a business environment have increased the use of sensitive electronic components, computers, programmable logic controllers, protection and relaying equipments, which have increased the power consumption [1]. The simultaneous occurrence of two or more than two of these disturbances is known as complex power quality disturbance. These disturbances causes the problems such as failure of equipments, short life time of the equipments, malfunction of equipments, instability of the system, reduced efficiency of equipments etc. [2]. Increasing consumer expectation with the requirement of green supply around the globe, where integration of renewable energy sources to the distribution grid is the focus area of smart grid, Electrical Power Systems are expected to deliver power supply continuously at high quality to the consumers. Economy of ant country suffers with huge losses when there are voltage or current abnormalities present in the power delivery. Any deviation / disturbance manifested in the voltage, current and frequency from the standard rating is treated as power quality (PQ) problem that results in failure or malfunctioning of electrical/electronic equipments [3]. Power quality disturbances and resulting problems are due to increasing use of the solid state switching devices, power electronically switched loads, non-linear loads, lighting controls, unbalanced power systems, industrial plant rectifiers and inverters as well as data processing

equipments [4]. Therefore, power quality needs to be monitored and improved. The advanced signal processing and Artificial Intelligence techniques are proposed for recognition of Power Quality Disturbances [5]. The mathematical and signal processing techniques have been utilized for the detection and classification of single stage as well as complex PQ disturbances. An approach for the recognition of PQ disturbances in the power system using wavelet transform and radial basis function neural network (RBFNN) has been reported in [6]. Mahela et al. [7], presented a comprehensive review of various signal processing and artificial intelligent techniques utilized for the automatic recognition of PQ disturbances as well as effect of noise on the detection and classification of these events. Commonly used PQ detection techniques include Fourier transform, Kalman filter, wavelet transform, Stransform, Hilbert Huang transform, Gabor transforms etc. The artificial intelligent tools used for the classification of PQ disturbances are support vector machine, artificial neural network, expert systems, Fuzzy logic, k-nearest neighbor etc. [8]. One variant of Fourier Transform, the Short Time Fourier Transform (STFT) divides the signal into small segments, where these signal segments can be assumed to be stationary and utilized for detection of PQ disturbance [9].

2. SIGNALS GENERATION OF PQ DISTURBANCES

The single stage power quality disturbances are generated using the mathematical relations reported in [10]. The generated single stage power quality disturbances include pure sine wave, voltage sag, voltage swell, momentary interruption, oscillatory transient, impulsive transient and notch. The discrete wavelet transform based plots of pure sine wave are used as the reference curves for the detection of PQ disturbance present in the signal. Single stage Power Quality Disturbances has been investigated in [11] & [12]. The complex power quality disturbances are generated using the various combinations of the above mentioned single stage PQ disturbances. The generated complex power quality disturbances include (voltage sag + harmonics), (voltage swell + harmonics), (momentary interruption + harmonics), (oscillatory transient + voltage sag), (impulsive transient + voltage sag), (oscillatory transient + voltage sag + harmonics), (impulsive transient + voltage sag + harmonics), and (Oscillatory Transient + Impulsive Transient + Voltage sag + Harmonics). The discrete wavelet transform based

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Analysis of Modelling of Double Diode PV Panel and Effects of Various Parameters and Its Efficiency

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Abstract – This paper presents P-V characteristics and efficiency of double diode model equivalent circuit for modeling of photovoltaic cell using MATLAB program. The main work of this simulation is to observe effect of variations in solar cell parameters on output power and efficiency. Since simulation with double diode model require extra equations but due to using efficient iterative method it reduced and less equation for faster calculation. This simulation is based on data provided by solar panel manufacturer.

Key Words: P-V Characteristics, Double Diode, Irradiation, Temperature, No. of Cells, Ideality Factor, Parasitic Resistance

1. INTRODUCTION

Today most of the country use fossil fuel to run vehicles, airplanes, and to power houses and industries but this fossil fuel is limited on earth and will get empty in few decades. [1] To extend this time renewable source of energy is available sun is the great example of renewable source of energy for millions of year as long as the life of sun will give energy. [1][2] Solar gives solar energy in abundant amount of energy in the form of light and various energy, some are harmful like UV some are useful like irradiation and sunlight used by plants and irradiation to heat water, cooking and to generate electricity. [2][3]

Due to blackbody effect almost all material absorbs solar radiation for example a red plate absorbs all visible light 250nm to 2500nm wavelength except 700nm which is red colour's wavelength which is reflected. This absorbed energy heat up the surface, this same pheromone is done with irradiation whose wavelength starts from 700 to make electrical energy with solar cell which captures photons which convert to electrons in junction point and semiconductor will try to make balance between electrons and holes which produce potential across terminals. The energy is very dense in radiation as 1.75W/m²/nm for 500nm wavelength however after 1.5W/m²/nm it starts decreasing near to 0.1 for irradiation. Single layer solar cell is not efficient to collect this amount of densed energy, for higher efficiency multilayer solar panel is used. [4][5][6]

PV technology is getting popular among the world due to it generates energy from free source of energy sun and require less maintenance. Electrical power is generated by a plate of semiconductor its same as other diode with p-n junction where electron-holes pair is generated by collision of sunlight (photons) with atom which release electrons and a hole is left behind this imbalance produces potential across terminals. A single solar cell produce 0.5 to 0.7 V and 0.1 to 0.3A current, which means it requires large array to produce required power this further require large area of land which is an drawback of using solar energy the solution is to increase efficiency of absorption of irradiation, this can be achieve by research in photovoltaic technology which is done by simulation of solar cell. [7]

Researchers use simulation software like matlab and spice for solar cell many pv model is available for an ideal pvcell ideal diode model is used with 3 parameter, single diode model with parasitic resistance with 5 parameters and double diode model with 7-8 parameters and three diode model with 9 parameters.[2][6][7]

In this paper double diode is chosen because this model gives higher accuracy for simulation of solar cell, to reduce simulation time 8 parameter is reduced to seven this result in reduction in no. of equations by the help of efficient iterative method and simulation is done on 7 selected parameter (irradiation, temperature, parasitic resistances, and no. of series and parallel cells and ideality factor) for wide observation on P-V characteristics and their effect on performance & efficiency.

2. Equivalent circuit with double diode model

For mathematical expression of solar cell an equivalent electrical circuit is required as shown in fig 1 which is a double diode model with an current source(lph) which represent current generated by photons, an ideal diode (D1) in parallel to source whose ideality factor is 1, another diode (D2) in parallel with known ideality factor, series and parallel resistance which represent internal resistance of solar cell, Id1 and Id2 is diode leakage current and I is the output current get by removing all losses from Iph. By efficient iterative method ideality factor, series & parallel resistance and saturation current is obtained. [14] The simulation is based on real model data provided by manufacturer of adani eternal series (300wp) whose specifications are shown in Table 1.

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Assessment of impact of relaxation in lockdown and forecast of preparation for combating COVID-19 pandemic in India using Gro...

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Assessment of impact of relaxation in lockdown and forecast of preparation for combating COVID-19 pandemic in India using Group Method of Data Handling



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Keywords; COVID-19 Time series forecasting Group method of data handling

ABSTRACT

Ever since the outbreak of novel coronavirus in December 2019, lockdown has been identified as the only effective measure across the world to stop the community spread of this pandemic, India implemented a complete shutdown across the nation from March 25, 2020 as lockdown I and went on to extend it by giving timely partial relaxations in the form of lockdown II, III & IV. This paper statistically analyses the impact of relaxation during Lockdown III and IV on coronavirus disease (COVID) spread in India using the Group Method of Data Handling (GMDH) to forecast the number of active cases using time series analysis and hence the required medical infrastructure for the period of next six months. The Group Method of Data Handling is a novel self organized data mining technique with data driven adaptive learning capability which grasps the auto correlative relations between the samples and gives a high forecasting accuracy irrespective of the length and stochasticity of a time series. The GMDH model has been first validated and standardized by forecasting the number of active and confirmed cases during lockdown III-IV with an accuracy of 2.58% and 2.00% respectively. Thereafter, the number of active cases has been forecasted for the rest of 2020 to predict the impact of lockdown relaxation on spread of COVID-19 and indicate preparatory measures necessary to counter it.

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1. Introduction

Human civilizations have been periodically challenged by the onset of infectious diseases. In the realm of infectious diseases, a pandemic is the worst case scenario. The latest one in the series of pandemics has been caused by the family of corona viruses. Corona viruses are pleomorphic, single stranded ribonucleic acid (RNA) viruses. The "novel" coronavirus is a new strain that has not been previously identified in humans. The name derives from the crown like appearance produced by the club shaped projections that stud the viral envelope. The 21st century saw its first pandemic in 2002 as Severe Acute Respiratory Syndrome or SARS followed by Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV) [1]. Today the world is fighting another pandemic known as Coronavirus disease 2019 abbreviated as COVID-19. The initial cases of COVID-19 were reported on & December 2019 in Wuhan, Hubei province, China.

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Cases were reported after exposure to the local Hunan South China seafood market that sells a variety of wild animals, suggesting that the zoonotic Coronavirus crossed the barrier from animal to human at this market [2]. The COVID-19 is said to be caused by 2019nCoV (Novel Coronavirus 2019, 2020) termed by World Health Organization (WHO) or SARS-CoV-2(Severe Acute Respiratory Syndrome Coronavirus 2) as termed by the International Committee on Taxonomy of Viruses. COVID-19 virus is categorized by WHO as β -CoV of group 2B [3]. The genome of this virus is identified and it resembles the SARS-CoV (80% similarity) and MERS-CoV (50% similarity) [4,5]. As of 30/06/2020, the world has registered 1,01,85,374 confirmed cases and 5,03,862 deaths due to COVID-19. With nearly 25% of total cases in world, USA has been the most effected country followed by Brazil, Russia, and India. The first confirmed case of novel coronavirus in India was reported on 30 January 2020, in the state of Kerala. As of today, India has reported 5,66,840 confirmed cases and 16,893 deaths due to COVID-19 [6,7].

The spread of coronavirus is by sneezing, cough droplets and contact. This virus tends to enter the body through the mouth, nose, and eyes [8]. It is speculated that the virus may infect a person at a distance of about 6 ft (1.8 m) radius. The virus can sur-

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Automatic Generation Control for Three Area System Using Improved Bacteria Foraging Optimization Algorithm (IBFOA)

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Abstract— Simultaneous optimization of certain parameters like Ki, Ri and Bi has been done which grants not only the best dynamic response for the system but also permits us to use quiet larger values of Ri than put into practice. This will help the industries concerning power for simpler as well as cheaper realization of the governor. The performance of IBFOA is also investigated through the convergence characteristics which reveal that that the Bacteria Foraging Algorithm is relatively faster in optimization such that there is drop in the computational load and also minimum use of computer resource utilization.

Keywords—(IBFOA-Improved Bacteria Foraging Optimization Algorithm)

I. INTRODUCTION

Power systems are very large and complex electrical networks consisting of generation networks, transmission networks and distribution networks along with loads which are being disturbed throughout the network over a large geographical area. The rapid growth of industries has further lead to the increased complexity of the power system. The successful operation of interconnected power system requires the matching of total generation with total demand and associated system losses [1][2]. With time, the operating point of a power system changes, and hence, these systems may experience deviations in nominal system frequency and scheduled power exchanges to other areas, which may yield undesirable effects. In actual power system operations, the load is changing continuously and randomly. The ability of the generation side to track the changing load is limited due to physical/technical consideration, causing imbalance between the actual and scheduled generation quantities. This action leads to a frequency variation. The difference between the actual and the synchronous frequency causes mal operation of sophisticated equipment like power converters by producing harmonics [3].

In the power system, the system load keeps changing from time to time according to the needs of the consumers. Changes in real power affect mainly the system frequency, while reactive power is less sensitive to changes in frequency and is mainly dependant on changes in voltage magnitude. Thus active and reactive powers are controlled separately. The Load Frequency Control (LFC) loop controls the real power & Shri M. G. Soni, Assosiate Professor Electrical Engineering Department MBM Engineering College Jai Narayan Vyas University, Jodhpur, India

frequency and Automatic Voltage Regulator (AVR) loop regulates reactive power & voltage magnitude. Load frequency control has gained in importance with the growth of interconnected systems and has made the operation of interconnected systems possible [4].

Since, frequency is greatly depends on active power and voltage greatly depends on reactive power, so the control difficulty in the power system may be divided into two parts. One is related to the control of active power along with frequency and the other is related to the control of reactive power along with voltage regulation. The active power control and the frequency control are generally known as the Automatic Load Frequency Control (ALFC) [4]. The major objectives of AGC are

 To take care of the required MW power output of a generator matching with the changing load.

 To take care of the appropriate value of exchange of power linking control areas.

• To facilitate control of frequency for larger interconnections.

II. CHARACTERISTICS OF PROPERLY DEGINED POWER SYSTEM

A properly designed power system should respond to the changes in the load smoothly and it should maintain the balance between the powers generated and demanded. Further, the power system should have the following characteristics:

- It should supply power wherever demanded by the costumer.
- It should supply uninterrupted power to the consumer.
- The power system should be capable of meeting the changing load demands.
- The supplied power should be of good quality.
- The power system should supply power at economic rate.
- The necessary safety requirements should be satisfied.

The power delivered must satisfy certain minimal necessities with regard to the quality of supply. The quality of the power system is considered superior if the system frequency is kept around the specified value i. e. 50 Hz and the magnitude of the bus voltage is maintained within the prescribed limits around the normal value. Voltage and

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Effect of Solar Radiation on the Thermal Performance of Power Transformer and its Life Estimation

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Abstract-With the continuous rise in the load demand at consumer end, the performance of the existing operating electrical machines gets affected. The increasing temperature of earth's surface due to solar radiation is another reason of the rise in the temperature of the electrical machines. Power transformers are one of the electrical machines whose performance is directly affected by its inner and outer temperature values as they are generally installed outdoors. The life of the power transformer reduces gradually with the time and sometimes the severe outdoors surface temperatures may lead to sudden explosions that also obstruct the operation of the other associated machines as well. Therefore, thermal modeling of outdoor power transformers should include the consideration of variation in environmental temperature. This is expected to create an opportunity for the research in this field. This includes developing computational thermal models simulation using appropriate software tools. These models can be employed to evaluate the actual operational age of power transformers by estimating equivalent life at the reference temperature on the basis of the time period of the estimated temperature cycle causing acceleration of aging. This paper presents a MATLAB/ Simulink based thermal model determining temperature in increasing the aging acceleration factor, which has been used for estimation of the loss of life of the transformer. Further, the effect of outdoors surface temperature due to the influence of solar radiation for increasing the loss of life of power transformer has also been studied and verified by using the thermal model. The proposed model has been validated using real time data gathered from the power transformer in operation at 220kV GSS, Jhalamand, Jodhpur.

Keywords—life of power transformers, solar radiation, thermal modeling, aging acceleration factor, loss of life.

I. INTRODUCTION

Power transformers are one of the main electrical machines in any electrical substation whose functioning directly governs the operational efficiency and the economic capability of the power system. The reliability of any electrical substation is directly affected by the performance of the constituent power transformers. Any kind of failure in the power transformer normally occurs due to the failure of inner insulation materials caused by high stress, under abnormal or critical operating conditions. The most challenging problem in every power transformers is heat dissipation. Greater the heat accumulated without being dissipated, lesser is the life of the power transformer. Although, the design concept of the power transformers include a robust cooling arrangement system, still the changing environmental conditions outside the power transformers always affect its thermal performance. The inner temperature of the power transformer is directly affected by its inside as well as outside conditions.

The inside conditions include the increase in the power losses of the windings and the core which rises the temperature of the power transformer drastically. This generally happen due to the increase in the load of the power transformers. The insulating oil circulating inside the power transformer absorbs heat from the interior of transformer windings and core through conduction. This heat must be transferred to the transformer oil by convection and further, from the oil to the cooling medium via a heat exchanger.

The outside surrounding conditions that impact on the heat dissipation process may include natural conditions as well as built in conditions. The natural conditions include the effect of solar radiation, wind, rain, dust, natural landscape and humidity. Likewise, the built in condition includes transformer external layout, sheds, buildings, abstractions and design of enclosures, etc. The IEEE loading guides and IEC standard documents of the oil- immersed power transformers provide no such information regarding the above surrounding effects and their impact on the thermal performance of power transformer. By doing the thorough study of the above mentioned environmental conditions, it was found that all those factors have different level of harshness which affects the safe and reliable operation of the power transformers.

This paper presents a technique for estimating the loss of life of power transformer with the help of computational thermal model and employing it to calculate the accelerated aging. Further, the proposed thermal model is modified by incorporating the effect of solar radiation on the surface of power transformer. The most important factor while determining the accelerated aging is the hot spot temperature (HST), which is a major reason for the loss of life of transformer. The HST of a transformer primarily depends on the ambient temperature, the rise in the top oil temperature (TOT) over the ambient temperature and the rise in the winding HST over the top oil temperature. HST values for different load conditions can be estimated with the help of these thermal models on the basis of the thermal characteristics of the power transformer and the cooling system.

The proposed thermal model has been used to predict the loss of life of a 160MVA power transformer in operation at 220kV GSS, Jhalamand, Jodhpur (Rajasthan, India). After Introduction section, the paper includes four more sections that present the state of art, proposed methodology, MATLAB/ Simulink model, results and discussion.

II. STATE OF ART

The research work in the field of thermal modeling of power transformers is having some commonly accepted procedures that primarily come under either IEEE or IEC guidelines. IEEE Guide for Loading Mineral Oil-Immersed Transformers [1] is applicable to oil- immersed distribution and power transformers, with different types of constructions, along with



Free vibration analysis of rotating laminated composite plate type blades with variable thickness

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Keywords Variable thickness Rotating Composite Pre-twisted Panels

ABSTRACT

The dynamic behaviour of rotating flexible bodies, such as turbine blades/exhaust fan blades are significantly different from those of stationary bodies as centrifugal force come into effect in addition to gravity. Such rotating blades may be modelled as cantilever beam plate / panel. A finite element formulation for vibration analysis of rotating laminated composite panels is employed in this article; based on the first order shear deformation theory, an accurate relationship between strains and displacements of pre-twisted panels are derived. The governing equations of motion are derived considering centrifugal force. Here studied the effect of rotation speed (ω), setting angle (ϕ), twist angle (ψ), fibre orientation angle (θ) and variable thickness of panels on the vibration behaviour of cantilever composite panels. Also noticed the loci veering and loci crossing phenomena occurs between symmetric and skew-symmetric modes, respectively at different rotation speeds. $^{\circ}$ 2020 Elsevier Ltd. All rights reserved.

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1. Introduction

Structural components, such as cantilever panels having variable thickness along span wise / chord wise / both span-chord wise, are used in several applications for example: balconies, bridges, multi-story buildings, radio towers, chimneys, air craft wings, marine hulls to design light weight and more efficient structures. The variable thickness of panels can also modify the resonant frequency. Hence, the vibration analysis of the plates with variable thickness is an important matter of concern for the researchers.

Many researchers analysed the free vibration behaviour of square and rectangular isotropic plates [1 6]; orthotropic and laminated composite plates [7 -12] with linearly and parabolically variable thickness using analytical and numerical methods, considering the various combinations of boundary conditions (SSSS, CSCS, CSSS, SSSF, SCSC, SSCF, SSCC, SSFF, SSCS, CCCC, CCCS, CCCF, SSSC, CSSC, SCCS, CCSS, CCSC, SCCC, CSCC, FSCS, FSFS, FSSS, CSCF, CSSF, CCSF, SCSS, here Ssimply supported, C-clamped, F-free along edge x-axis and y-axis).

[13,14] investigated the free transverse vibratory response of symmetric and un-symmetric trapezoidal plates of variable thickness using the variational principle of a minimum energy functional and the Ritz method with the pb-2 global shape functions, respectively. The vibration characteristic of cantilever plates with

linearly variable thickness in one coordinate direction using finite element method based on the classical plate theory [15,16] and first order shear deformation theory [17] has been studied and validated with experimental results. Sakiyama and Huang [18] presented the natural frequencies and mode shapes for thin and moderately thick linearly tapered plates based on an approximate method using the Green function. Shufrin and Eisenberger [19] analysed the free vibrations of rectangular thick plates using both first-order shear deformation theory and higher order shear deformation theory, considering linear and parabolic thickness variations with various (SSSS, SSFF, CCCC, CFFF and CFCF) combinations of boundary conditions. Manna $\left\lfloor 20\right\rfloor$ carried out the free vibration analysis of isotropic rectangular plates with linearly varying thickness in one direction using the first order shear deformation theory considering a higher-order triangular element. The effects of variable thickness and curvature on the vibrations of blades were reported by Lee et al. [21] using shallow shell theory. Budak [22] studied the vibration behaviour of shallow cylindrical shells and rectangular plates of varying thickness using a splineapproximation method, and examined the effects of the curvature of the mid-surface on the natural frequencies. Chen and Li [23] used the Rayleigh-Ritz method to study the vibration behaviour of laminated pre-twisted rotating plates. Authors formulated the

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Buckling analysis of folded structures

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Keywords: Folded structure Stability Compression Shear Box-section

ABSTRACT

Stability characteristics of folded structures has been investigated here using finite element based commercial software ANSYS considering shell element. In this communication authors considered the flat panel, *I*-section, *r*-ctangular or square – section of structure and analysed the buckling behaviour of these under compression, shear and combination of both with various boundary conditions. The critical buckling load of open and close box structures with mode shapes under various loading conditions (pure compression, shear on two edges, shear on one edge, shear on four edges, pure shear on four edges) is presented here. It is noticed that, stability of various sections is increased with the increase in flange width; whereas critical buckling load of closed box is more than the open box under similar conditions due to the cover plate. Moreover, the post-buckling path of cantilever flat panel and the box structure are given to design the thin-walled structures. Present results will enhance understanding of engineers and researchers on the local buckling characteristics of the built-up members; and will be useful for designers those are working on the built-up sections. 7 2020 Elsevier tid. All rights reserved.

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analysis of composite thin walled beams, both open and close cross-sectioned with initial stresses was carried out by |6-7| and

proposed a theoretical model considering the shear flexibility due to warping and bending and obtaining the equations by

Hellinger-Reissner formulation of composite shells. They presented the analytical solutions for simply supported thin-walled

beams using the proposed model for the free vibration and buck-

ling analysis of considered structures. [8-9] studied the buckling

behavior of thin walled laminated composites box-beams subject

to axial loading. They developed a model based on classical lanina-

tion theory which was applicable for flexural, torsional and flexu-

ral-torsional buckling of thin-walled axially loaded composite

box-beam. In order to predict critical loads and buckling modes in case of thin-walled composite bar they developed a displace-

ment based one- dimensional FE model, deriving the governing equations from the principle of the stationary value of total poten-

tial energy. I developed a general theory based on the semi tan-

gential moments and serni tangential rotations for coupled

buckling analysis of thin-walled composite box beams subjected

to eccentric constant axial force, end moments and linearly varying

axial force. [1] carried out coupled flexural, torsional and buckling analyses of thin walled laminated composite box beams by developing a general analytical model considering structural couplings

from material anisotropy and shear deformation effects. They used

1. Main text

Folded structures and box sections are commonly used in civil. mechanical, automobile, marine and aerospace structures. Hence, the buckling behavior of such thin walled structures, made of flat panels is one of the major concerns in several fields of engineering applications. A few analytical investigations [1-4] on the buckling load of rectangular thin-walled boxes are reported based on the hypothesis of assuming that "joints of assembled plates will offer restraints equivalent to simply supported boundary condition for individual plates". However, [5] studied the limitations of the above assumptions considering the cases of symmetric and unsymmetric buckling modes of individual plates of a rectangular hollow tube. The authors concluded that the critical buckling loads of tubes and simply supported plates are nearly equal only for limiting case of thin plate. Hence, a thorough analysis of assembled plate structure is essential for better understanding of the stability characteristics of such tubes.

Even though a significant amount of research has been devoted to investigate the global bending and buckling behaviors of long tubes using one-dimensional beam theory [b-11]. The buckling

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Performance of Different Implicit Time Integration Techniques for Nonlinear Structural Dynamic Analysis

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Abstract: The efficiency of different implicit time integration techniques for the nonlinear transient dynamic analysis of isotropic and laminated composite plates and panels is examined here by employing a shear deformable finite element method based on first order shear deformation theory. The time integration techniques considered here are (a) Newmark's average acceleration scheme, (b) multi-step trapezoidal rule, (c) energy and momentum conserving two-step and (d)three-step time integration techniques. The numerical dissipation (period elongation and amplitude decay) of the above implicit time integration techniques is compared to the dynamic response (displacement, velocity, acceleration and total energy) of plates and spherical panels with initial perturbation and under sinusoidal step loading.

Keywords: *Time integration techniques, nonlinear dynamic analysis, period elongation, plates and panels*

1. Introduction

The large amplitude vibration behavior of thinwalled structural components under different dynamic loads is an important problem to be investigated for their effective and safe design. Generally, the equations of motion for the nonlinear forced vibration of structures is discretized in space domain by the finite element method and the nonlinear differential equation is solved in time domain with the specified initial condition to obtain the transient dynamic

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response of the structure. The direct integration method has the ability to analyze realistic problems and get accurate predictions. For nonlinear transient dynamic analysis, the accuracy of the predictions significantly depends on the adopted time integration scheme.

Different time integration techniques are employed in the literature (Center difference, Houbolt, Wilson- θ method, HHT- α method, WBT- α method and Newmak- β method) for the solution of the nonlinear initial value problem. A general procedure for the solution of nonlinear problems in structural dynamics considering any type of loading is Newmark's time integration method proposed by Newmark [1959]. The Newmark method is the most commonly used methods for solving the nonlinear second order differential equations. Dahlequist [1963] proved that the constant average acceleration method is the most accurate unconditionally stable method. The main disadvantage of the method is that it does not possess numerical damping. Wilson et al. [1973] introduced Wilson- Δ method that is based on the basic assumption that the acceleration varies linearly during the time interval t to $t + \theta \Delta t$ where $\theta \leq 1$. Hilber et al. [1977] proposed the HHT- α method that is unconditionally stable one-step method by introducing an additional parameter for controlling the damping properties of Newmark's algorithm. Further, Wood et al. [1980] introduced WBZ-A method by replacing α parameter of HHT- Δ method with Bossakparameter.



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CFD Analysis in Solar Air Heater for Heat Transfer Enhancement: A Review

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Abstract

The solar strength performs a chief position in contributing closer to the overall boom in sustainable power. For utilising this strength solar Air heaters are used as they may be low value and more generally used collector machines and extensively utilized in lots of programs at low and slight temperatures. Many sun warmers were devised in beyond however the essential issue diagnosed in its miles the lack of thermal strength which did no longer get applied well, that is specially because of a lack of heat transfer the absorber plate's coefficient. With the help of CFD, (Computational Fluid Dynamics), the heat switch fee could be increased by means of incorporating synthetic roughness within the solar heater's absorber plate and their efficacy can be stepped forward through simulations. With growth in temperature of air intake and exhaust by way of addition of absorber plate in duct of air heater advanced temperature levels of sun heaters.

Kennords Solar energy:Solar air heaters.Computational Fluid dyanamics;Absorber plates.Artificial roughness

1. Introduction

The capacity of solar strength is considerable for numerous applications since the centuries, particularly northwest of Rajasthan location easily on hand and substantial. A solar air heater is a specific framework that manages the drying technique and protects the products from dust, rain or insect damage[1]. The consistency of drying products obtained by sun drying is better than that of solar drying [2].sun air heater is an equipment for growing air temperatures using solar powered warmth, it is a form of square conduit encapsulating an absorber, top platform, a returned panel, an enclosed wall below the rear panel, a pitcher cowl over the exposed solar-radiation surface, and a area among the bottom plate and air-pace absorber [3].it's miles indoors surface can be artificially roughened through adding irregularities [4.5]. They can be classified as lively or passive based totally on how sun absorbs and

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CFD Analysis on Solar Air Heater to Enhance the Heat Transfer - A Review

¹Mayank Sharma, ²Dr. Emarti Kumari, ³Dr. P.M. Meena ¹ME Student, ²Assistant Professor, ³Professor Jai Narain Vyas University, Jodhpur, Rajasthan

Abstract

The solar air heaters are extensively brought in use for converting solar energy into thermal energy. There are various applications of these solar air heaters such as process heating, space heating and drying the agriculture products. For enhancing the capability of solar air heater in transferring the heat, powerful computers as well as mathematical model are used to perform computational fluid dynamics (CFD) simulation". The simulation made from CFD is capable of predicting the transfer of momentum, heat and mass in several processes of fluid flow and heat transfer. This work constitutes of reviews of various researchers made in relation of enhancing the performances of the solar air heater. the presented literature reviews contains both numerical as well as experimental analysis conducted by bringing the Roughness geometries fitted on the flow side of absorber plate in use.

Key Points: CFD, Solar Air Heater, SAH.

1. Introduction

For various applications, solar energy is widely used as it is easy to access and present abundantly in various tropical countries like India. Solar energy is a sustainable form of energy. The weakness of direct drying is overcome by solar drving which helps in climinating the contaminants such as animals, birds, insects etc. In comparison with the normal convection drying, solar drying is more beneficial as it requires more fluid and energy cost is also high [1]. In comparison with the open sun drying, solar drying is a better option. Some of the benefits of solar drying are it increases the drying temperature and on the other hand it decreases the relative

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humidity of the products. Solar drying is a very convenient method as it constitutes specialized structure which controls the drying process and also protects the products from damages such as insects, dust and rain. In comparison with the open sun drying, the products obtained from solar drying are of better quality [2], [3].

A. Principle of heat absorption

For heat conversion, the most fundamental process which is nowadays generally brought in use is greenhouse effect. It got its name because it was first brought in application in green house projects. It helps the plants grow better especially at those places where sunlight is not sufficiently available.

The large portion of the solar energy is received from the sunlight which is basically a "shortwave radiation". This radiation when comes in contact with any liquid or solid material, the heat is absorbed by the material and it transforms into heat energy. This increases the temperature of the material and it stores this heat energy. After that, it starts conducting this heat to its surroundings such as liquids, solids or air or conduct it to any material available in contact with it and have a comparatively lower temperature. This type of radiation is termed as "long wave radiation".

The absorption of the visible sunlight at 20°C, on the surface of the ground, will emit IR lights at approximately 10µm wavelength. However, sunlight of shorter wavelength is not absorbed by carbon dioxide.

ARTICLE



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A Cherkley word

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Nonlinear Bending Analysis of Cylindrical Panel under Thermal Load

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Article History

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Keywords:

Nonlinear; Cslindrical Panel; 15. cmal Load: Laminated Composite

Abstract

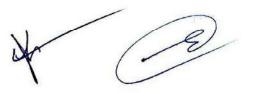
In this communication, the nonlinear bending behaviour of laminated cylindrical panels in the presence of thermal load has been studied using the finite element-based simulation package ANSYS. The efficacy of present numerical results is compared with published results. Thereafter, the effect of radius-tospan ratio (R/a) on the nonlinear static response of isotropic and laminated panels under thermal load is studied here. Moreover, the nonlinear bending deflection verses x-axis of cylindrical panels at different thermal loads is presented here that will serve as benchmark for future research.

1. Introduction

Curved panels are widely used in defence, automobile, aerospace, civil and other engineering appli-Thus, the strength and flexural stiffcations. ness of these thin-wall structures under the thermal environment is very important for engineers and researchers (Thang. Nguyen, and Lee). The generalized differential quadrature numerical method was employed for the nonlinear analysis with thermomechanical loads of moderately thick laminated cylindrical panels and considering the variation of thickness for conical panels (Naidu and Sinha). The linear bending behaviour of skew plates has been studied by employing a shear deformable triangular finite element (Yoosefian, Golmakani, and They studied the effect of thick-Sadechum). ness ratio and lamination sequence for skew plates. The geometrically nonlinear bending behaviour of composite plates with analytical approach such as Navier type and Levy type techniques has been reviewed by (Madrigal, Navarro, and Chaves). The nonlinear dynamic responses of curved panels have been investigated by employing finite element method with first order shear deformation the-

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ory considering Von-Karman's geometric nonlinearity, (Loja, Barbosa, and Scares). The buck ling behaviour of isotropic plates under compression and shear has been studied by Qiao, P., & Huo, X. (Qiao and Huo) Analytically investigated the lin ear buckling of rectangular plates under shear and compression using Rayleigh-Ritz Method (Aghdam and Falahatgar), Kantorovich Method (Yuan and Jin Shufrin, Rabinovitch, and Eisenberger) and numerically by using Finite Strip Method (Smith and Sridharan de Vargas Lisbôa and Marczak). The linear bending results of isotropic plates employing energy method has been by Liew (Saadatpoor and Azhari), and investigated the effect of boundary conditions. The static analysis of plates has been performed by using Galerkin Method (Karami, Shah pari, and Malekzadeh Yu and Shen Kumari). Static and Dynamic behaviour of flat panels has been examined by using finite element method with First-Order Shear Deformation Theory (Kumari and Say ena ZHAO, LIU, and LI). The nonlinear bend ing response of three-dimensional braided laminated cylindrical panels has been investigated using higher-order plate theory with Von-Karman's Geo-



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Analysis of Piston of Internal Combustion Engine under Thermomechanical Load

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embhaskar mech ajnvu.edu.in¹

Abstract

the main objective of this article is to study the thermal and structural performance of piston using finite element based commercial software ANSYS. Piston is modelled using SOLIDWORKS and analysis would be performed through ANSYS workbench. Optimization analysis has been performed considering three different materials such as Grey Cast iron, structural steel and aluminium alloy because these three material have good compression strength and their thermal conductivity and density will different for each one For the same amount of pressure Aluminium alloy has shown maximum deformation and equivalent strain, where you misses stress value is minimum for it. Whereas, Structural steel and Grey cast iron shows determation and strain values less than that of Aluminium alloy for same pressure load. Aluminium alloy has highest heat flux and lowest temperature on piston head under thermal load. Piston receives thermal current generated via combustion and higher heat flux ensures quick cooling of component by quick drainage of thermal energy. Grey cast iron and Structural steel has half of the value of heat this to that of Aluminium alloy Therefore. Aluminium alloy is the preferable material for the design of automobile piston among the given three materials.

Keywords: Internal Combustion Engine, Piston, ANSYS, FEA, Load Analysis

1. Introduction

Single slider crank mechanism is a four linkage single slider mechanism that is used in internal combustion engines. An internal combustion envine consists of cylinder, piston, crankshaft, piston rings, inlet & exhaust valves, and connecting rod. The component of IC engine which is exposed to combustion is piston. The main aim of automobile manufacturers and researchers has been to modify engine's performance and maximize its power output for funited fuel consumption. Piston is the main component of whole engine assembly. Various researches and modifications have been done throughout the decades to reduce wear and tears, to resist high pressure, maintain temperature generated during combustion and to increase overall lifecycle of piston and its components In the engine cylinder, during power stroke piston experiences extreme temperatures. Piston also undergoes cyclic gas pressure and inertial forces due to reciprocation. Under these thermal and mechanical stresses piston may fail. Since, this thermal and mechanical stress depends upon the properties of piston materials. So, the material preferred for the piston, cylinder, piston rings, and other related parts of an internal engine must have high thermal conductivity, high wear and tear strength. Due to the versatile nature, castability and mechanical properties of magnesium and aluminium alloys have several applications for example automotive and aerospace industries [1]

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A review on the Social Media in Healthcare

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Abstract:

Now days social media is a main platformfor healthcare providers and consular to communicate with patients and resolve their health-related issues. It is providing a platform to discuss health-related problemsusing computer-based technology, that facilitate to medical professionals for shar their ideas, thoughts, documents, audios, videos, photos, x-rays and massages. Electronic communication is a form, which is used to create online communications. Social media also providesa platform to share personal experience (patients-to-patients). asking questions and answers (professionals-to-patients). etc. Professionals and patients engage with each other through computer, tablet, smartphone via social media, web-based software / web applications. Healthcare professionals use social media to promote their services for the betterment of their patients, but the utilization of social media in the right direction is really a difficult task. Healthcare providers should give useful information consistently and respond to their queries to harvest healthcare benefits for their patients. The aim of this article is to provide an overview of the extant literature on the effects of social media: use for health-relatedissues of patients and their relationship with healthcare professionals. In this article, reviewed the bright and dark side of the social media in the healthcare field that will help in patient empowerment.

Keywords:bright side, healthcare management, online health communities, professional networking, Facebook, Twitter, YouTube, Web 2.0.

1. Introduction

Several social media tools and web applications are available for healthcare professionals, for example, social networking sites, blogs, microblogs, wikis. YouTube, Instagram, WhatsApp, google plus, LinkedIn, zoom, media sharing sites, virtual life, and virtual reality gaming environments[1]. The popularity of social media has increased drastically in medical, technical and engineering applications. These tools may be used to

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SINAL ARTICLE



Design of a Stephenson III six-bar path generating mechanism for index finger rehabilitation device using nature-inspired algorithms

Debaditya Chakraborty¹ · Ayush Rathi¹ · Ramanpreet Singh¹ · Vimal Kumar Pathak¹ · Kailash Chaudhary² · Himanshu Chaudhary³

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Abstract

The paper presents a new mechanism for an index finger rehabilitation device. The mechanism was designed based on a pre-specified trajectory obtained by performing flexion/extension experimental trials with index finger. These experiments were performed 30 times and mean of the normalized trajectory was extracted. From this trajectory, six precision points were selected and based on the obtained trajectory, a path generating optimization problem was formulated to imitate the flexion/extension. Besides, rectification constraints were posed to avoid defects that typically encounter during synthesis. The formulated nonlinear optimization problem was solved using nature-inspired and metaphor-less algorithms. It is found that the summed error between the desired and generated trajectories was very less in case of nature-inspired algorithm in comparison with metaphor-less algorithm. Then, all rectification constraints were validated. It is found that obtained mechanism is completely defect-free and is able to imitate the desired flexion/extension trajectory. Therefore, design obtained using nature-inspired algorithm may prove to be beneficial for the patients with dysfunction index finger.

Keywords Mechanism synthesis · TLBO · BWP · Nature-inspired algorithm · Finger rehabilitation

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1 Introduction

Injuries and various other kind of diseases such as stroke, motor disorders, and meningitis can cause loss or impairment of motor function in hands, which includes stroke, injury, cerebral palsy, multiple sclerosis, etc. These diseases leave the people impaired and devoid of a normal life. The neural impairment also causes difficulty in movements required in performing routine activities. Neurological disorders have become a major causes of death and disability worldwide, most number of cases of neurological disorders includes stroke (42.2%), migraine (16.3%), Alzheimer's and other dementias (10.4%), and meningitis (7.9%) [1]. Approximately, 150 billion dollars are spent in the USA every year on nerve injuries [2].

Moreover, it has been observed that function of arm is acutely impaired in a large number of patients affected with stroke [3-5]. The deficits are persistently prevalent in the distal upper phalanges of the finger. In fact, extension of finger is the function which is mostly impaired in a stoke patient [6]. Therefore, in the case of stroke patients, it is important to undergo rehabilitation postoperation to regain

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STUDY ON EFFECTIVENESS OF CLOUD COMPUTING IN IMPROVING THE PERFORMANCE OF MANUFACTURING INDUSTRIES

Pankaj Sankhla Dr. Kailash Chaudhary

Abstract

For the past few years, Cloud Manufacturing (CM) as a new manufacturing paradigm has accomplishing a huge amount of attention worldwide. Currently, many articles and review papers on Cloud Manufacturing are being published to speed up the research and to identify future trends. It is an emerging customer centric and service-oriented model to solve existing problems in traditional manufacturing. The aim of CM is to deliver and share ubiquitous on demand manufacturing service to consumers over internet which will enhance overall efficiency, reduce product cost, and allow for optimal resources. This is an innovative and web-based new paradigm which uses core information technology such as Cloud Computing, IOT, virtualization, radio frequency identification and service-oriented technology to solve complex manufacturing problems. However, the industry adoption of CM is still limited. The objective of this paper is to present fundamental concept model, participants, and architecture of Cloud Manufacturing. The paper also focuses on status of CM, benefits of implementation its model in industry and the future developments trends in manufacturing sector.

Keywords: Sustainable manufacturing, cloud computing, cyber-physical system, cloud manufacturing

I. INTRODUCTION

Cloud computing plays a pivotal role in the development of the global and sustainable manufacturing systems. Using cloud computing, product manufacturers and consumers interact with each other which helps in highly efficient rapid product development in minimum cost. A design and manufacturing cloud consists of collection of interconnected physical and virtual service pools of resources. Manufacturing industry professional need to know the characteristics of cloud computing-based manufacturing technology and its advantages as against the traditional manufacturing methods. The Internetand web-based service-oriented system for machine availability monitoring and process planning is critical for sustainable manufacturing. This study discusses cloud manufacturing related research and development activities being carried out all over the world. It also presents the major challenges of developing and utilizing cloud computing technologies for manufacturing systems and services.

Manufacturing industry has always been a pillar industry of developed economics. To enhance national wealth and power reach nations are creating a high-quality manufacturing sector. As there is an increase in competitive pressure, rapid technology development and globalization, modern manufacturing requires a flexible and dynamic management. The traditional business models cannot sustain successful innovation because the old conventional ways of organizing work and services do not meet the level of agility, creativity and connectivity that companies require so that they can remain competitive in today's environment [1]. Hence, there is a need of adequate manufacturing approach, which addresses the issues and fulfills the current market demands and requirements. This gives birth to the concept of *Cloud Manufacturing*.

Cloud Manufacturing (CMfg) is a new manufacturing business

model which is service oriented to share manufacturing capabilities and resources on a cloud platform. It merges the current informatized manufacturing technology and new information technology which transforms manufacturing resources and capabilities into manufacturing services. It builds a manufacturing service pool. CMfg is a platform where consumers can request services including product design, manufacturing, testing, management, and all other stages of a product lifecycle. Using this method, we can use the most sustainable and robust manufacturing route which results in customer centric supply chains. Modern technologies such as Cloud Computing, Service oriented Internet of Things (IOT), Virtualization, Radio Frequency Identification, Semantic web, and advanced high-performance computing technologies play a key role in CMfg. Customers could access the resources as services and manufacture their products. In this manner, they could use the distributed heterogeneous manufacturing resources for simple and complex tasks in supply chains. CMfg provides high quality, reliable and secure, relatively cheap and on demand manufacturing services to the users.

National Institute of Standards and Technology (NIST) defined Cloud Computing as a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction [35]. This short description is intended to serve as a means for broad comparisons of cloud services and deployment strategies while providing a baseline for discussion on the overall best uses for CC technology. The main factor which is restricting many industries to adopt CC technology is the security of their data for which they are mainly dependent on cloud service providers. Nevertheless, the main factor in favor of CC technology is that professionals get familiar quickly with its use as they are using IT extensively nowadays. Researchers



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Computational and Experimental Methods to Investigate Fracture Behavior of Functionally Graded Material Structures—A Critical Review

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Abstract

Functionally gradient materials (FGM) are one of the most widely used advanced materials because of their adaptability to different situations by changing the material constituents. In recent decades, the crack problems of FGMs have attracted a significant amount of attention. This paper presents a comprehensive review of developments, applications, mathematical idealizations, computational and experimental methods, and solutions that are adopted for the analysis of FGMs. In spite of the variety of methods used to date of analysis of fracture behavior of FGMs, several common themes have emerged. Many of these works provide a fundamental understanding of the basic fracture behavior of the material. An attempt has been made to classify various numerical methods used for the crack and fatigue analyses of FGMs. Finally, some vital suggestions for future scope of research in the area of FGMs are presented. It is hoped that this review paper will serve the interests of all the academicians, researchers, and engineers involved in the analysis and design of FGMs.

Keywords

Fracture Crack Numerical FEM Experimental This is a preview of subscription content, <u>log in</u> to check access.

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Abstract

Functionally graded materials are made up of predefined combination of ceramic and metals. The functionally graded materials (FGM) have been developed as high temperature-resistant and heat-resistant materials in space engineering and nuclear engineering. The FGM exhibits the resultant properties of ceramics and metal. The ceramics are involved for resistance in a high-temperature environment, while the metal contributes toward fracture toughness. The variation in strength and other properties may arise from geometry and other variable material properties like density. The studies related to energy-absorbing configurations in consideration with graded properties are of a great interest these days in research areas. These structural elements having graded properties have application in areas like vehicles, ships, safety devices and other load carrying members. The idea behind the functionally graded materials (FGM) is to have variable properties in a dimension following a particular law. The main objective of this paper is to understand the load capacity variations of such materials when graded in terms of different parameters such as diameter and thickness. In this research paper, a study is conducted on a FGM tapered frustum structure to identify the exact variation in the load capacities of such members when graded in terms of diameter, thickness, endurance strength, etc., in accordance with the empirical relations, the study on which has been previously conducted, to make it useful for designing of such members.

Keywords

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Dimensional Tolerance Analysis of Mechanical Assemblies with Symmetric and Asymmetric Tolerances

Ravikant Mordia, A. K. Verma, and Deepak Verma

Abstract Geometric and dimensional tolerances are the key factors for the proper assembly of the parts, their manufacturability, and design functions. Hence, these need proper evaluation. This paper presents automatic tolerance analysis of the dimensional tolerances by using modified worst-case and root sum square (statistical) methods. This helps in reducing production and assembly time, error and human interaction, leading to lower manufacturing cost. In contrast to the original worst case and root sum square methods which consider only symmetric tolerances and also consider sensitivity. The influences of the lower and upper tolerance bounds of the manufactured dimensions on the assembly lower and upper bounds are shown in the form of percentage contributions on graphs in the modified models. In the modified models, linear and nonlinear problems are defined by using the Taylor series expansion which is implemented in the MATLAB. Finally, a perspective overview for future research of automatic tolerance analysis for the other problems is presented.

Keywords Dimensional tolerance analysis • Worst-case and statistical methods • Linear and nonlinear variables • Symmetric and asymmetric tolerances • Upper tolerance limit and lower tolerance limit • Percentage contribution

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Numerical investigation on melting and heat transfer characteristics of phase change material in a parallelogram enclosure

Vikas Gaur¹ and S. K. Singh¹

¹Department of Mechanical Engineering, M.B.M. Engineering College. Jai Narain Vyas University, Jodhpur-342011 (Rajasthan), India

ABSTRACT

In this paper, two-dimensional numerical simulations have been carried out in ANSYS Fluent to understand the melting and heat transfer characteristics of phase change material (PCM) kept inside parallelogram shaped enclosure. The results include evolution of solid liquid interface, melt fraction variation with time, averaged PCM temperature, averaged solid PCM temperature, averaged liquid PCM temperature, sensible heat absorbed, latent heat absorbed, total heat absorbed, variation of surface averaged Nusselt number, and time variation of maximum liquid velocity etc. The results are compared with the results of rectangular shaped enclosure. The results indicate that total time for complete melting of the PCM for parallelogram enclosure is considerably less as compared to that for rectangular enclosure. This can be attributed to enhanced strength of gravity assisted natural convection currents in liquid PCM as evident by increase in maximum velocity of liquid PCM in parallelogram enclosure. itigher value of Nusselt number for parallelogram enclosure depicts in enhanced heat transfer. The results so obtained will be useful in understanding the influence of geometry on passive manipulation of melting and heat transfer characteristics of PCM for thermal storage and thermal management applications.

Keywords: Phase change material, Melting, Parallelogram enclosure, Natural convection, Heat transfer enhancement.

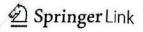
1. INTRODUCTION

Melting and heat transfer characteristics of phase change materials are useful in engineering applications such as thermal energy storage and temperature management systems. thase change materials are currently being attempted in temperature regulation of building walls, temperature management of solar photovoltaic panels (PV), thermal management of batteries to avoid overheating, as thermal energy storage units, as heat sinks in electronic devices, and in heat exchangers etc. Due to its practical significance, melting of phase change materials has motivated researchers to investigate melting and heat transfer characteristics through experimental as well as computational approaches. The melting of PCM inside rectangular containers is well documented and forms basis of research inside other shaped containers. It is revealed from past studies that inclination of rectangular containers affects the melting behaviour of phase change materials. A parallelogram shaped container can be fabricated by providing inclination to the upper and lever sides of a rectangular shaped container However, detailed study on melting and heat transfer behaviour on parallelogram shaped containers is not available in literature 'y parallelogram shaped container can be regarded as a basic form because it can be altered into rectangular or trapezoid shaped containers by changing the inclination of top and bottom sides of the container. Therefore, melting behaviour can be passively manipulated significantly by changing the shape of the container for the same amount of PCM inside the container.

2. LITERATURE REVIEW AND OBJECTIVE

Previous investigations involving melting and heat transfer characteristics of phase change materials in rectangular enclosure include both experimental works and numerical simulations. In these studies phase change material was filled inside a rectangular enclosure and one wall of the enclosure was heated while other walls were insulated. Two boundary conditions of the heated wall i.e. constant heat flux [6] and constant wall temperature [1, 10] were studied. Results were presented in the form of time progression of solid-hand interface, time variation of melt fraction, temperature distribution in PCM, energy absorbed by PCM and Number; number. Several researchers have studied the effect of inclination of enclosure on melting behavior of PCM. Various angles of inclination including horizontal and vertical orientation of container were studied. For inclined containers, heating was either provided from lower side wall [2, 4] or from upper side wall [5]. It is revealed that inclination of rectangular containers has significant effect on the natural convection in melted PCM which affects the melting behaviour of PCM. Low thermal conductivity of phase change materials affects the rates of heat transfer in the PCM and results in low melting and solidification rates. Therefore, use of high conductive metallic internal fins has been studied to improve melting rate of PCM. Results for both cases i.e attaching fins on heated wall [3] or on back side wall [1] were studied. In literature a few studies involving melting characteristics of PCM in non-rectangular enclosures [7, 8] are also attempted. The review of literature reveals that melting behavior of PCM inside rectangular containers is mostly studied as function of inclination of container and thin attachement. However no detailed study on melting and hear

Suppliers Selection Using Fuzzy AHP and Fuzzy TOPSIS Method—A Case Study of a Bearing Manufacturing Company Sp



Fradeep Ruman

Suppliers Selection Using Fuzzy AHP and Fuzzy TOPSIS Method—A Case Study of a Bearing Manufacturing Company

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Abstract

Supplier selection is one of the most important activities of an industry. The goal of present paper is to exhibit key elements of supplier selection and ranking of potential suppliers. A bearing manufacturing company was considering two criteria of suppliers selection, i.e., quality rating and service rating. In the current paper, six criteria have been considered instead of two for improving the supplier's selection process which are product quality, product cost, location, delivery time, information system and service rating. First of all, the key factors involved in supplier selection have been identified, a survey has been conducted for data collection from purchase department in the company. Fuzzy AHP method and fuzzy TOPSIS method are used to calculate the criteria weights for the suppliers' selection and to determine the ranking of the suppliers. The contribution of this study is to give improved suppliers' selection process to the company.

Keywords

•Fuzzy AHP Suppliers Selection This is a preview of subscription content, <u>log in</u> to check access.

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Abstract

Supply chain (SC) encompasses all events involved in the transformation of goods from the raw material stage to the final stage, i.e., when the goods and services reach the end client. A supply chain comprises of flow of materials, information, funds, and services from suppliers, factories, distribution centers to the end clients. Decisions regarding facility locations, supply chain planning, and logistics should be made cautiously in order to establish robust supply chain. This work is an effort to provide the firms with the models so as to help the managers to take strategic level decisions under uncertainty. A close loop supply chain (CLSC) network design that consists of forward and reverse flow is carried out. The robust optimization (RO) based modeling with both direct shipping of the products and shipping through distribution center under demand uncertainty is proposed and analyzed. The results are presented for supply chain planning strategies for an e-supply chain of case company (furniture manufacturing firm). The objective function value for robust model increases for an increase in uncertainty level. This increase in the objective function value for robust model is because of meeting the customers demand in worst case. for the case company, it was observed that for uncertain parameters (demand = 0.8), opening of total 9 MF and 4 DC can accommodate the worst case of network design. The computational results indicate that robust model is better than the deterministic one for uncertain parameters.

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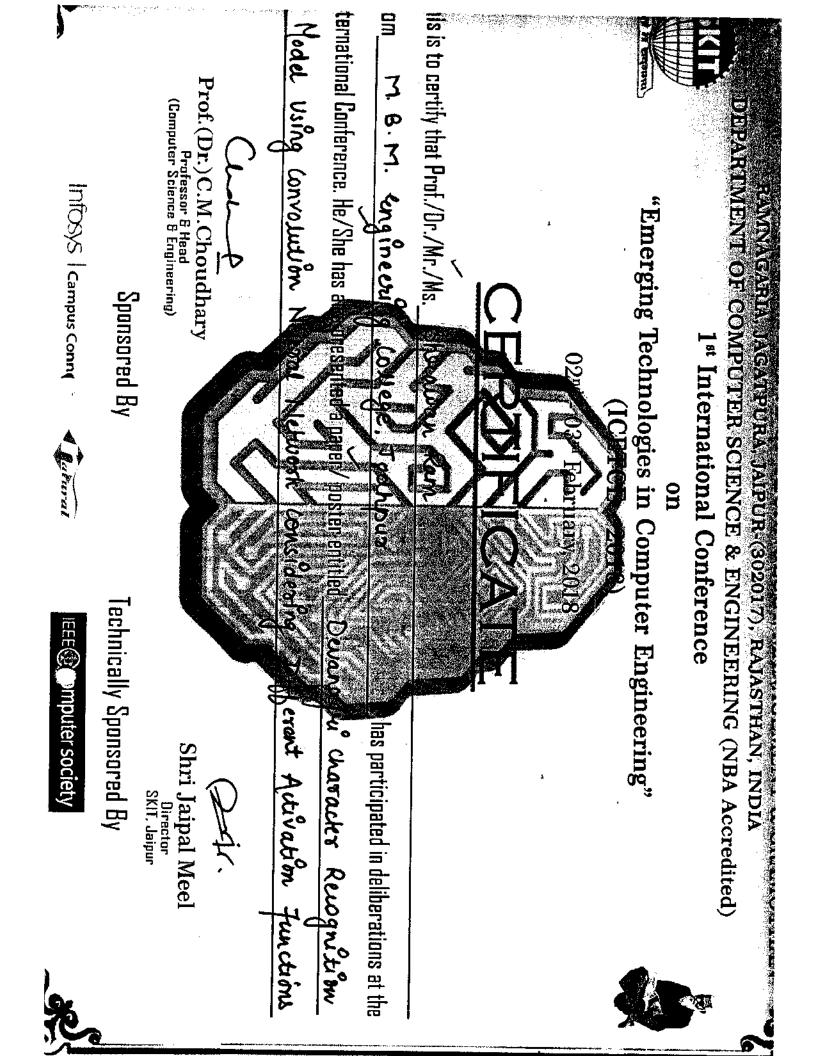
Railways workshop is responsible for periodic overhauling of coaching stock and serves as a base for manufacturing, repairing and supply parts to Sheds/Depots. With increasing demand for rolling stock, workshop needs to increase its potential in maintenance and effectiveness to satisfy the demand of passengers. At the same time, the maintenance process needs to be equipped with the ability to have lower cost with higher effectiveness. Plant layout is one of the most effective ways to reduce the cost of maintenance for the improvement in productivity. It also increases good workflow in the production route. This Paper describes existing workshop layout, coach flow analysis that will include areas and distances among different shops. After studying the present layout, it has been found that there is scope of reduction in time delay in

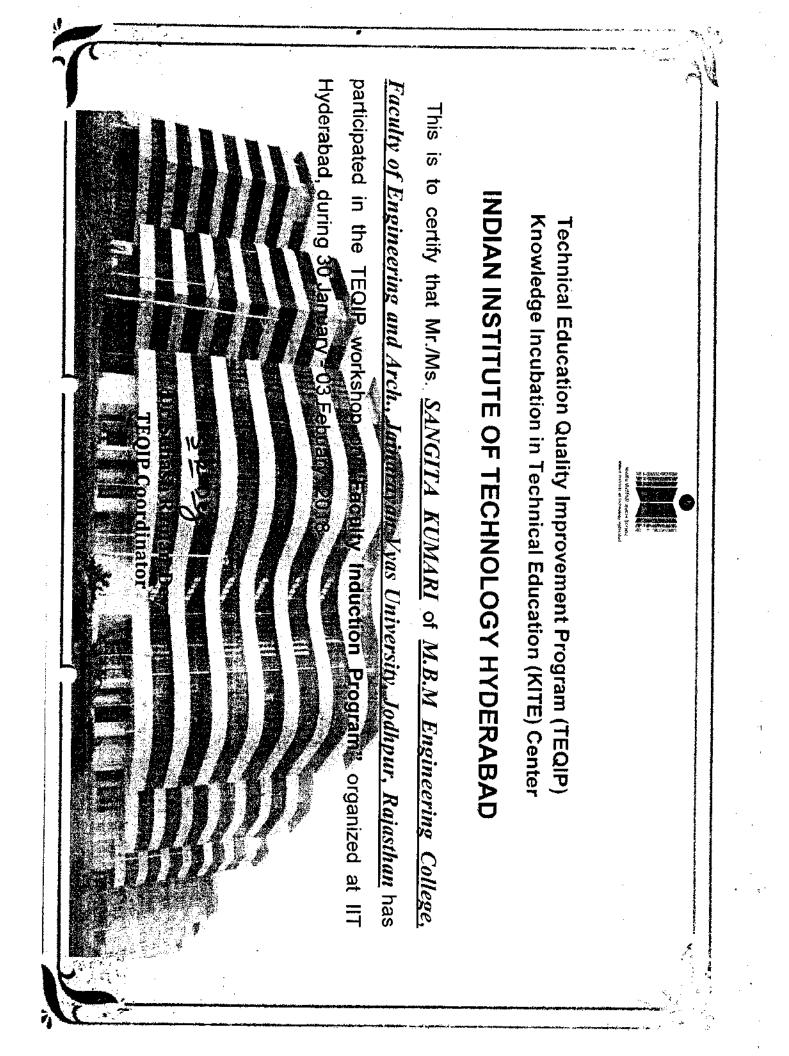
maintenance. Problems of movement of coaches in a long line, interrupted flow and useless area of the plant are existing. Considering these problems, Systematic layout planning (SLP) is the best method to improve workshop layout, which shows step-by-step improvement in layout and evaluation of layout. This method suggests a new workshop layout that improves the flow among the shops and helps to decrease movement in

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AN EFFICIENT COLOR-BASED OBJECT DETECTION AND TRACKING IN VIDEOS

Rachna Verma¹

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ABSTRACT:

In this paper, a new efficient color based object detection and tracking of a moving object in a video is discussed, which is based on a new formula, proposed by the author, to convert an RGB image into an intensity image. The proposed formula has a great discriminating ability to highlight a shade of a particular primary color in an image and suppress all other colors. This discriminating ability is used to detect an object of any primary color shade very efficiently as it eliminates many additional processing steps, such as segmentation, histogram matching, etc, used in previously reported color based trackers. In future, the proposed concepts will be extended to track objects of any color.

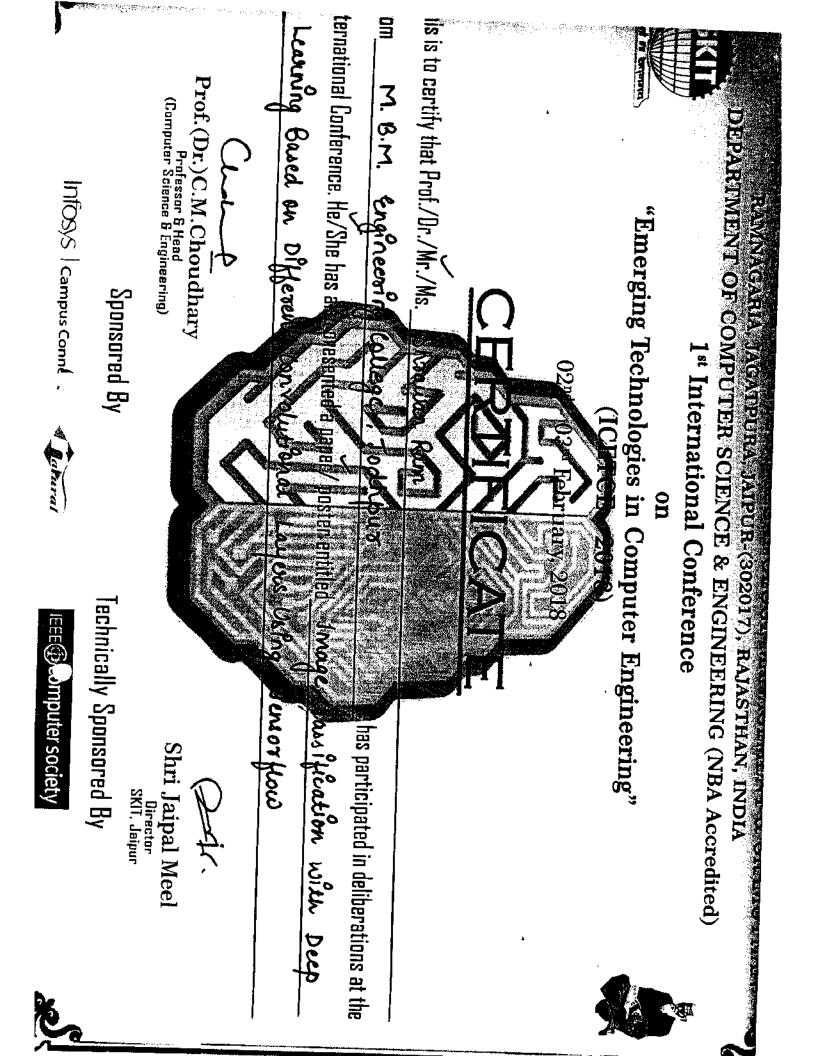
[I] INTRODUCTION

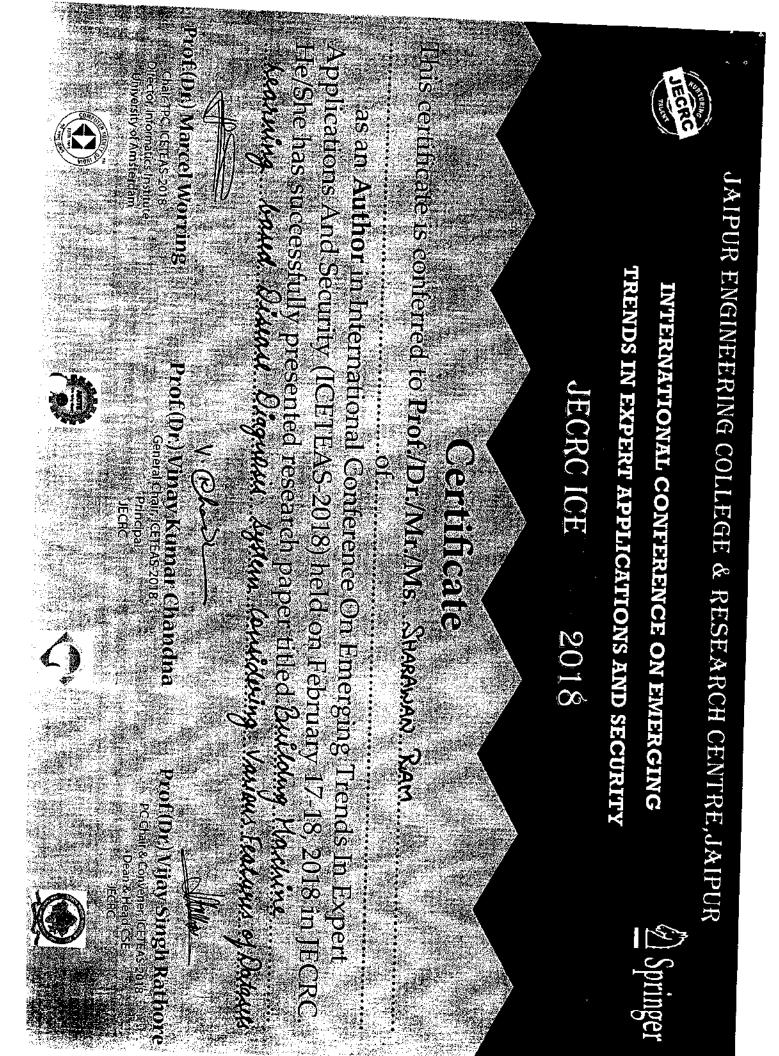
Detecting and tracking moving objects in videos and reconstructing trajectories are an active research area of computer vision [1]. The ability to detect and track objects in videos helps a machine to simulate the basic abilities of biological systems, such as the abilities to understand scenes, detect objects (static or moving), understand surrounding, recognize events, analyze crowd, count people, detect people and vehicles detection, etc. Object detection refers to finding an object of some interest in a scene, for example detecting people, vehicles, etc. in a scene. Object tracking refers to estimate the trajectory of a moving object in a scene. for example, tracking the trajectory of a moving car to find lane violation. For object detection and tracking,

Rachna Verma

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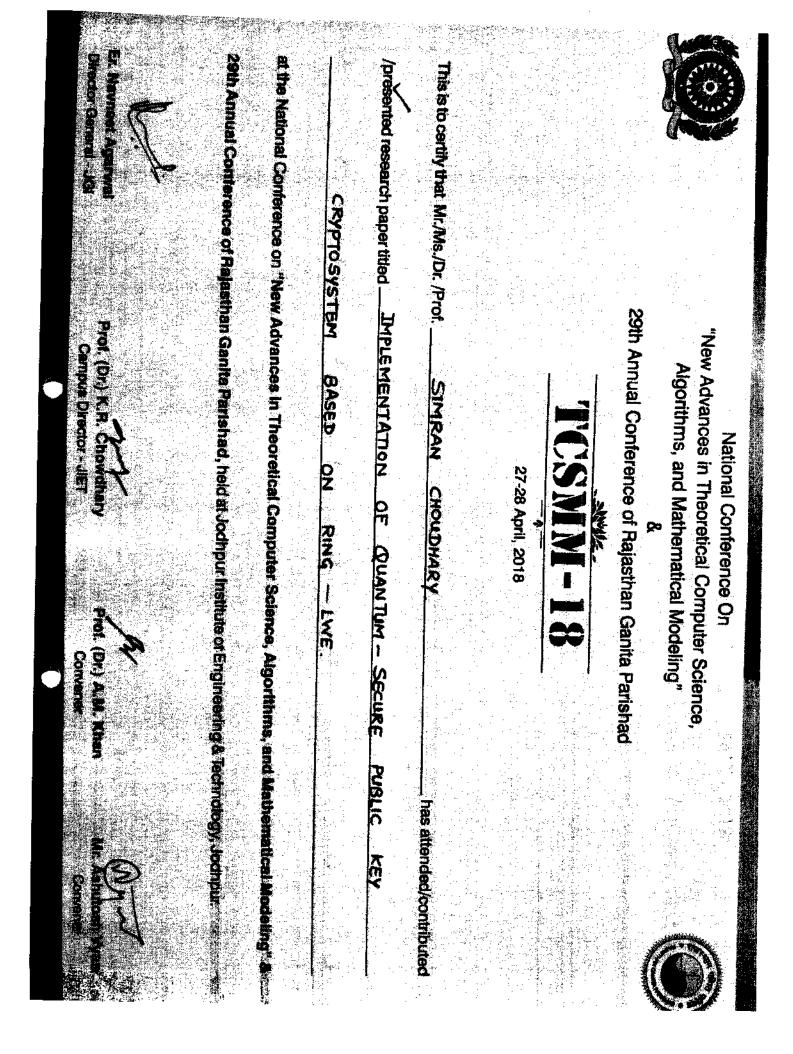




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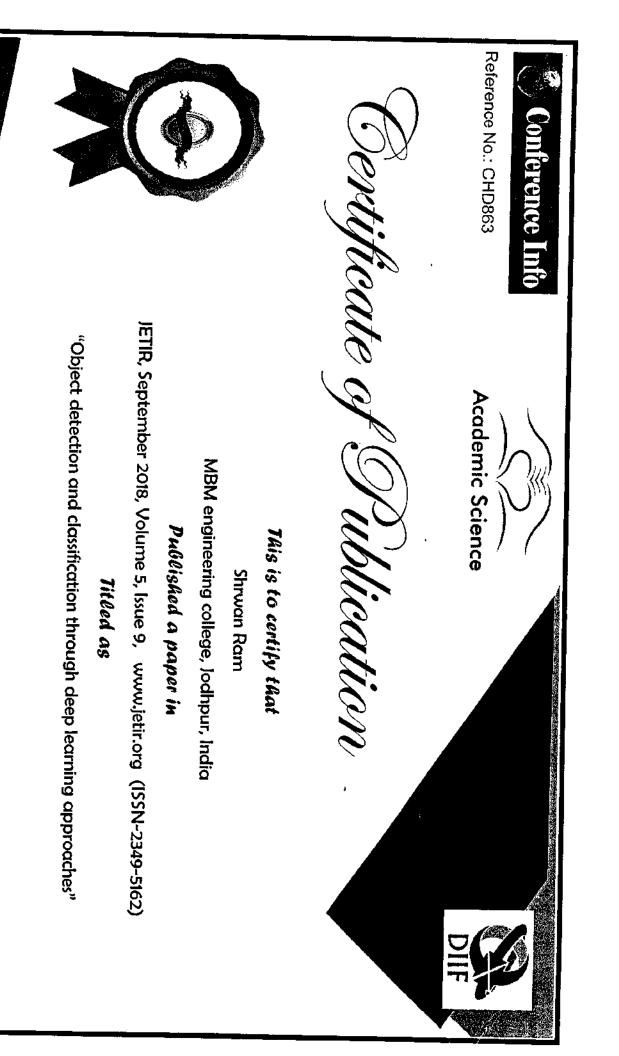
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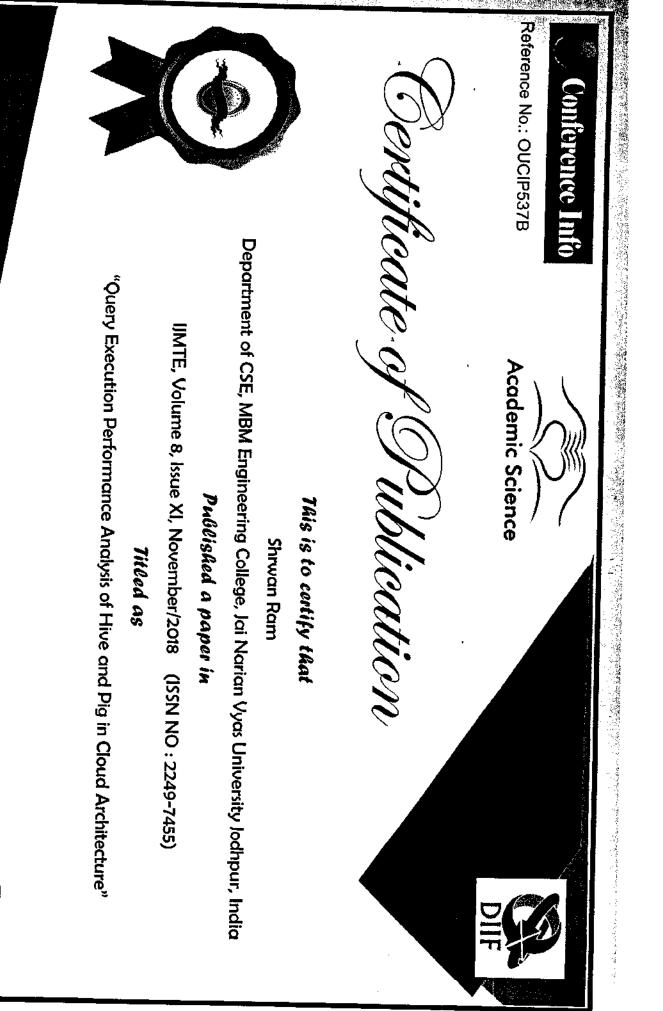
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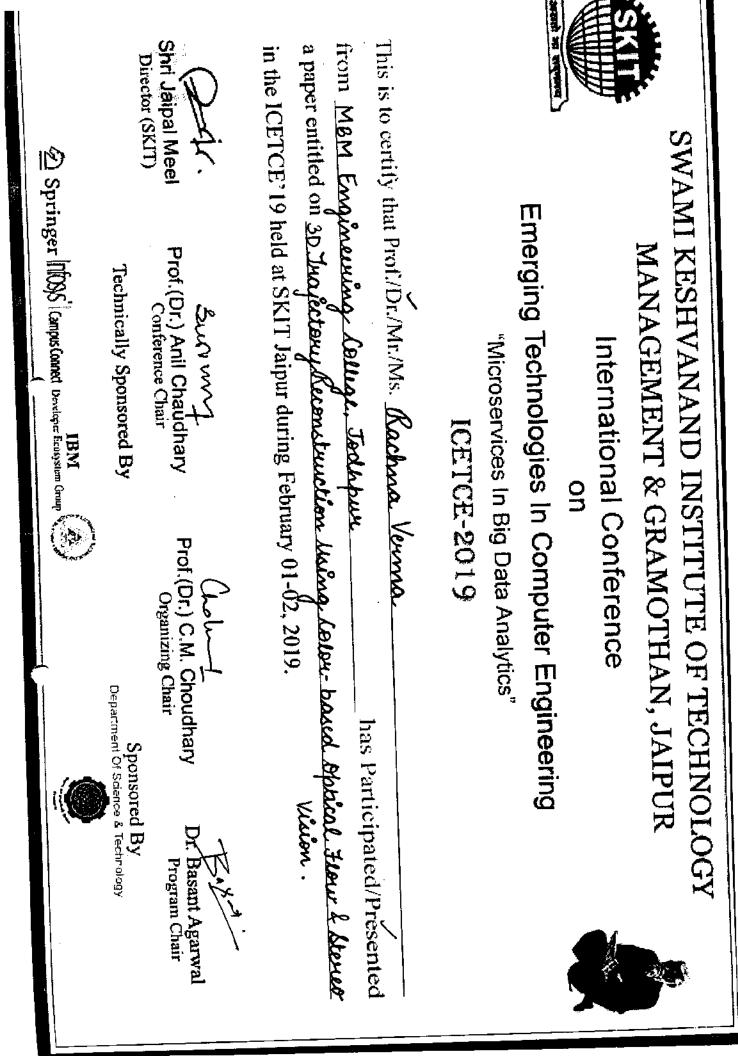


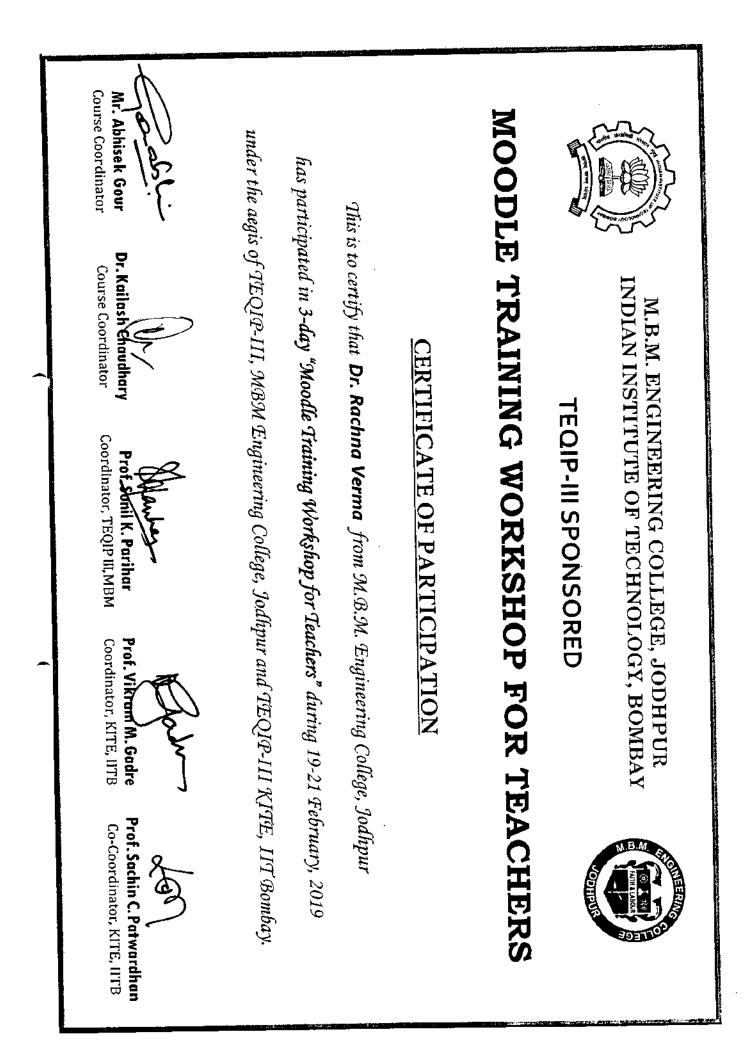


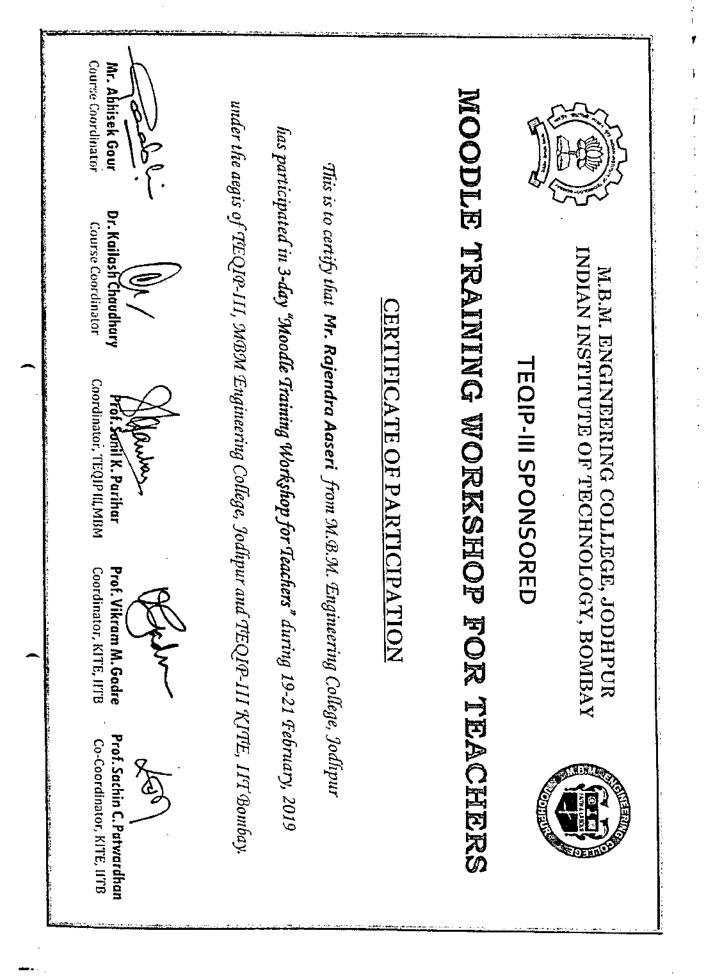
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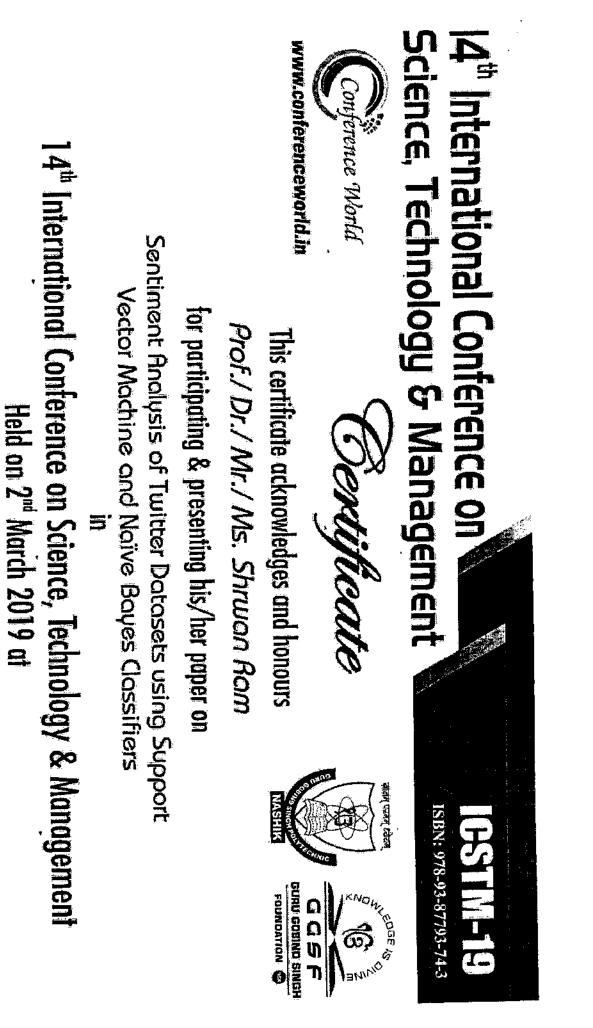


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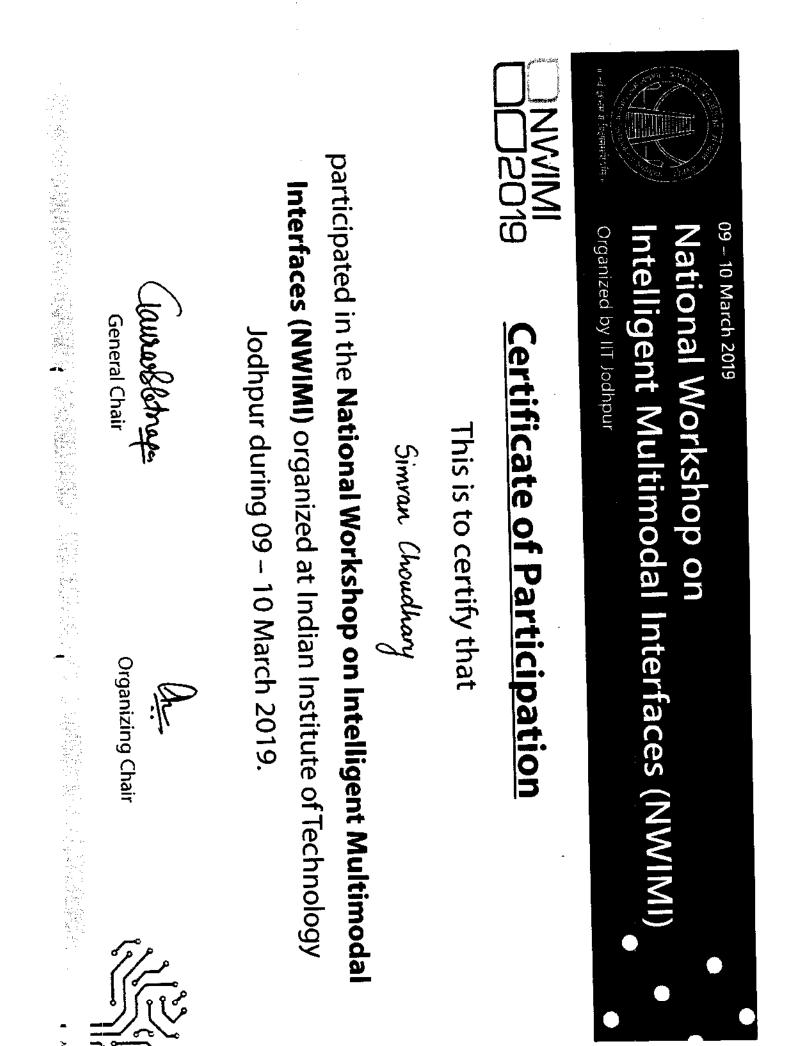
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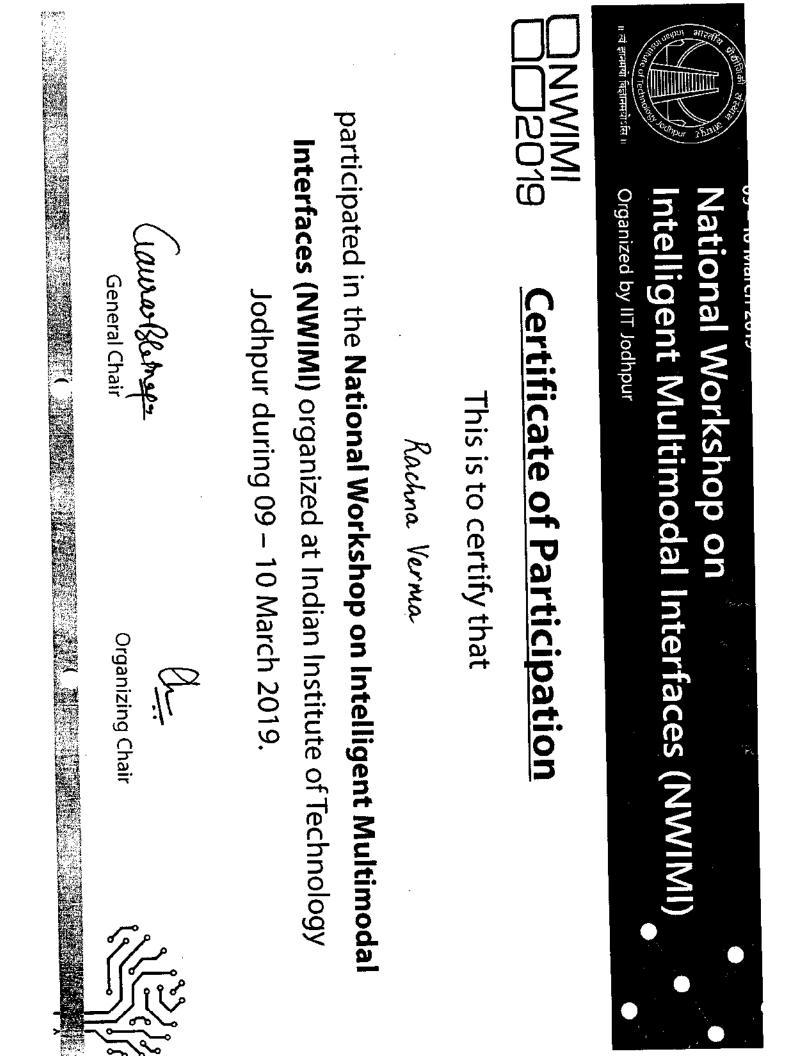
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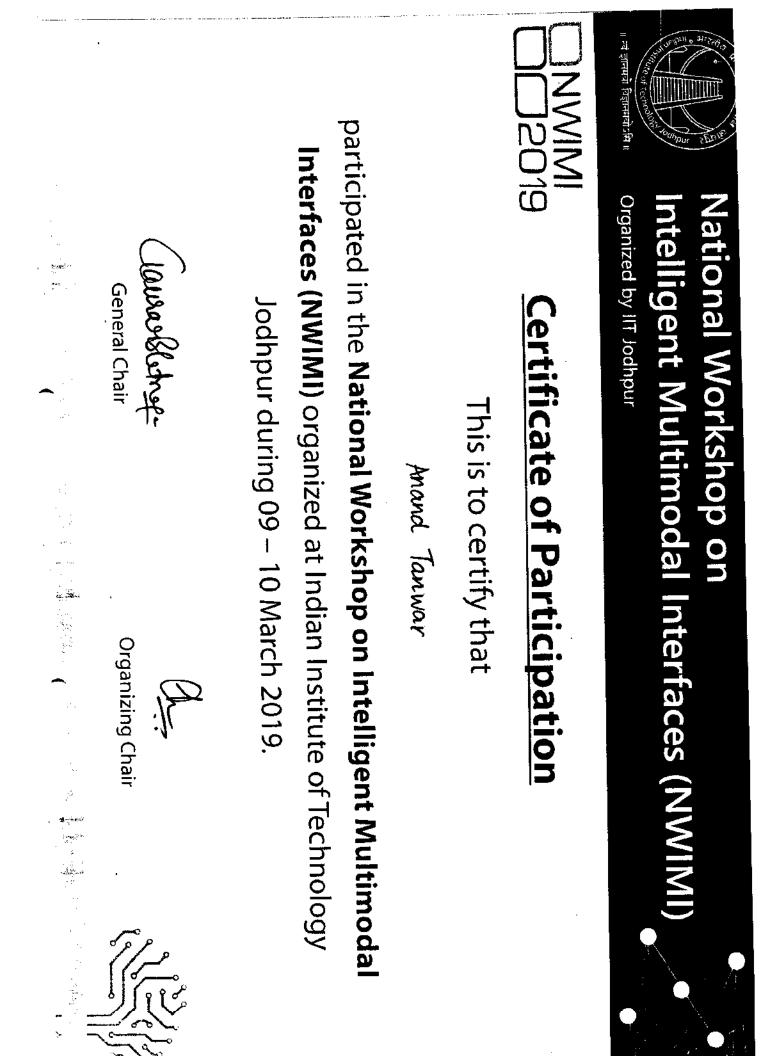
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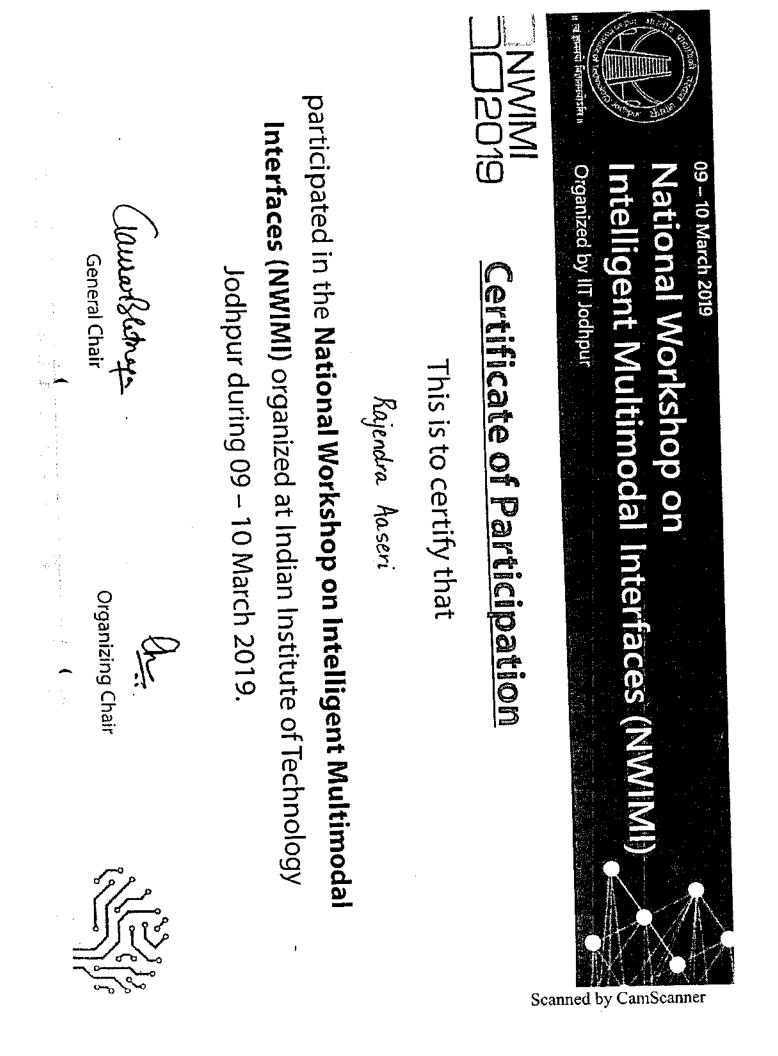
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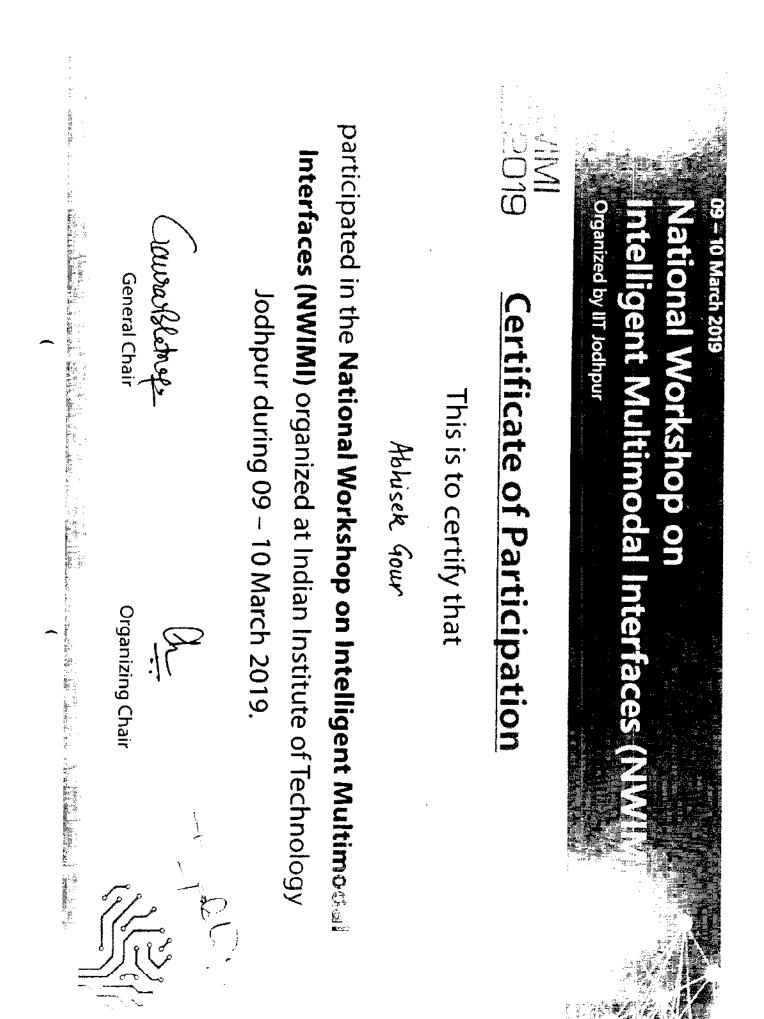








॥ त्यं च्रानमय IMMMN 61030 participated in the National Workshop on Intelligent Multimodal Interfaces (NWIMI) organized at Indian Institute of Technology Organized by IIT Jodhpur Intelligent Multimodal Interfaces (NWIMI National Workshop on 1 aunoblimate **General Chair** Jodhpur during 09 – 10 March 2019. **Certificate of Participation** Bijayalaxni Sahoo This is to certify that a Milliouhpur L AN ST MAN **Organizing Chair** in In





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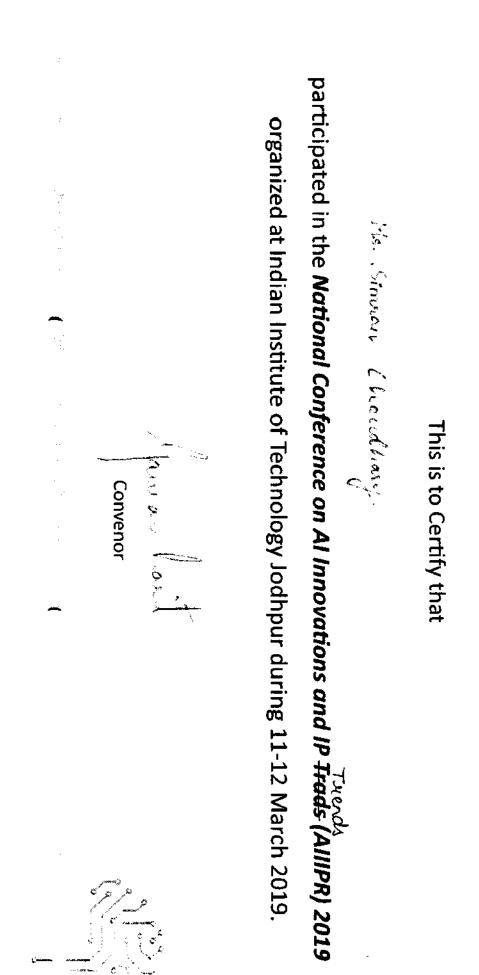
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11-12 March 2019

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National Conference on Al Innovations and IP Trends (AllIPR 2019)

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Dr ANIL Grupta, M.B.M. ENGINEERING (OLEGE

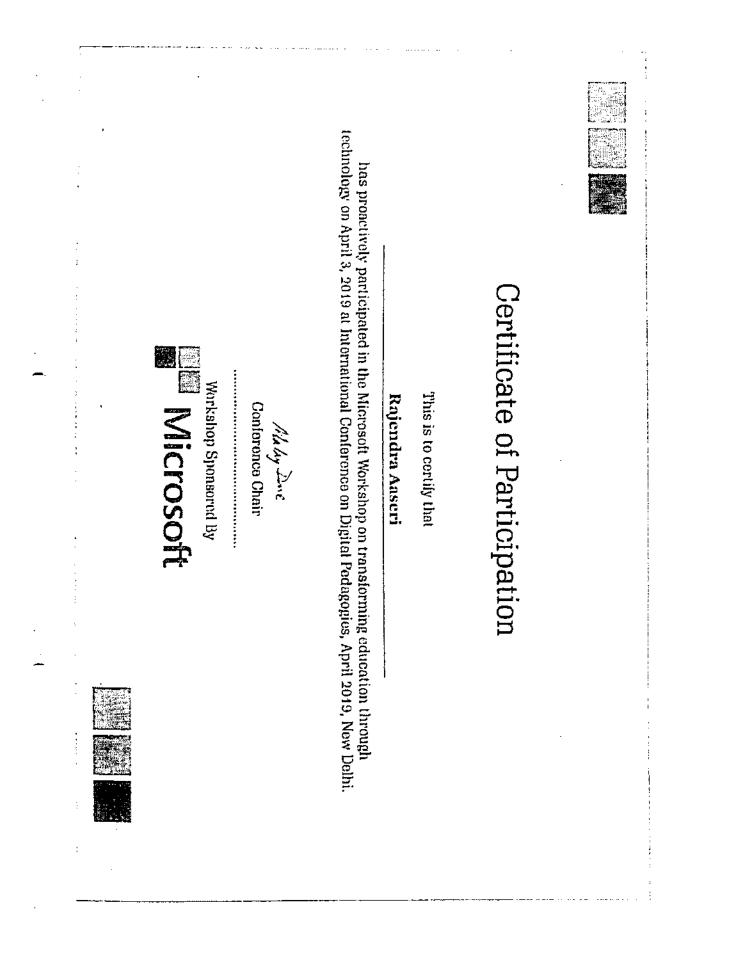
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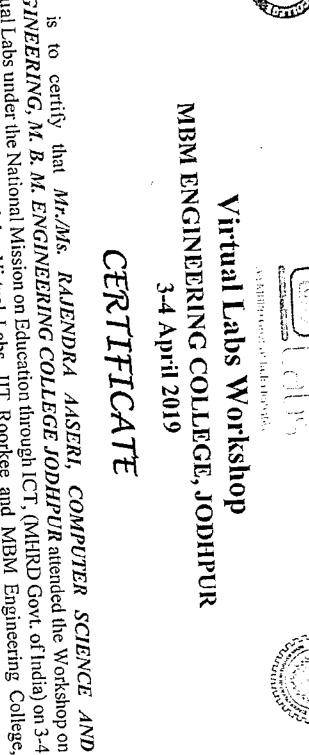
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PARIMAL AND PRATIOD CHAUDHARI CENTRE FOR LEARNING AND TEACHING INDIAN INSTITUTE OF TECHNOLOGY BOMBAY This is to certify that Anand Tanwar, MBMEC, Jodhpur Institutives, Placement on the MHRD - TEQP - 111 KITE Activity Selected Triming and Pedagogical Activities - Wake in India' Curriculur Initiatives, Placement Planning, GATE Servitization, Transition Rate Improvement and Laboratory Visits under the Knowledge Incubator under IEQP - (KITE.) Instance of the MHRD (GOVL of India (Conducted in 111 Bomba) MITE Coordinator Prof. Vikram M. Gadre Hend, PPCCLT Prof. Sachia C. Patwardhan





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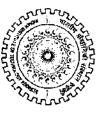
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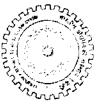
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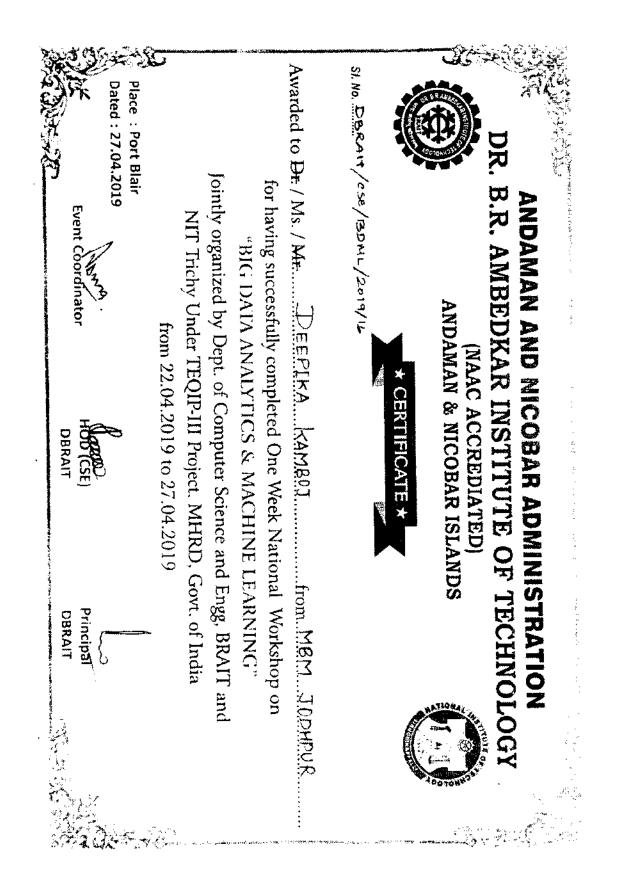


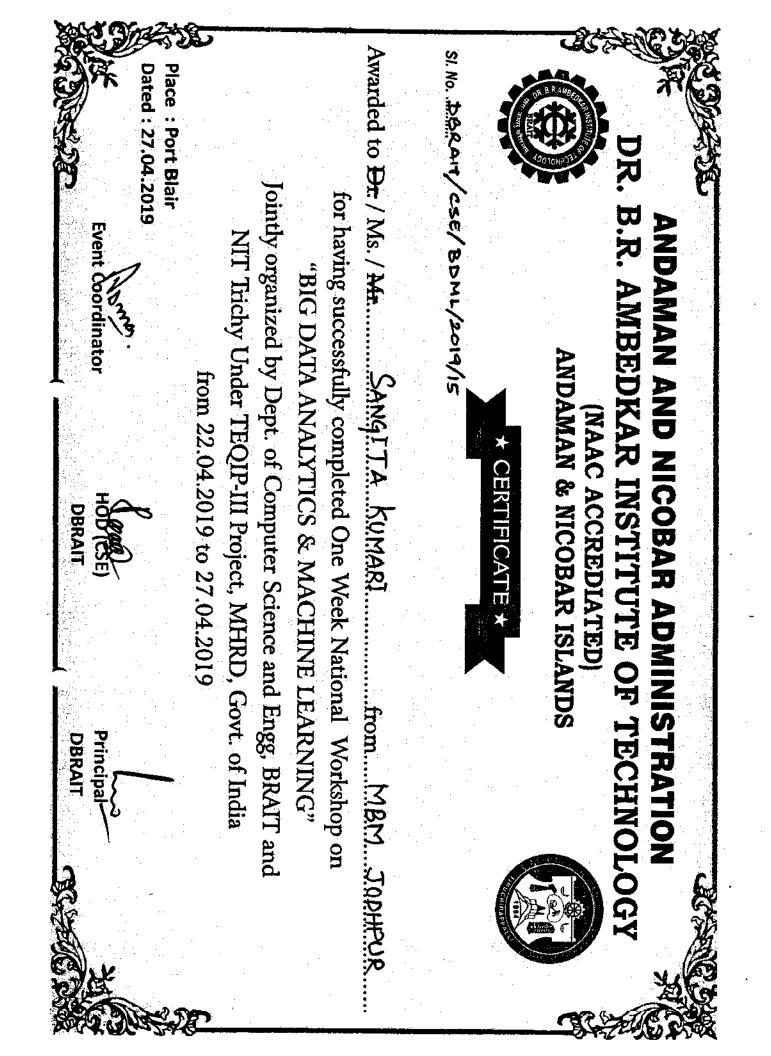
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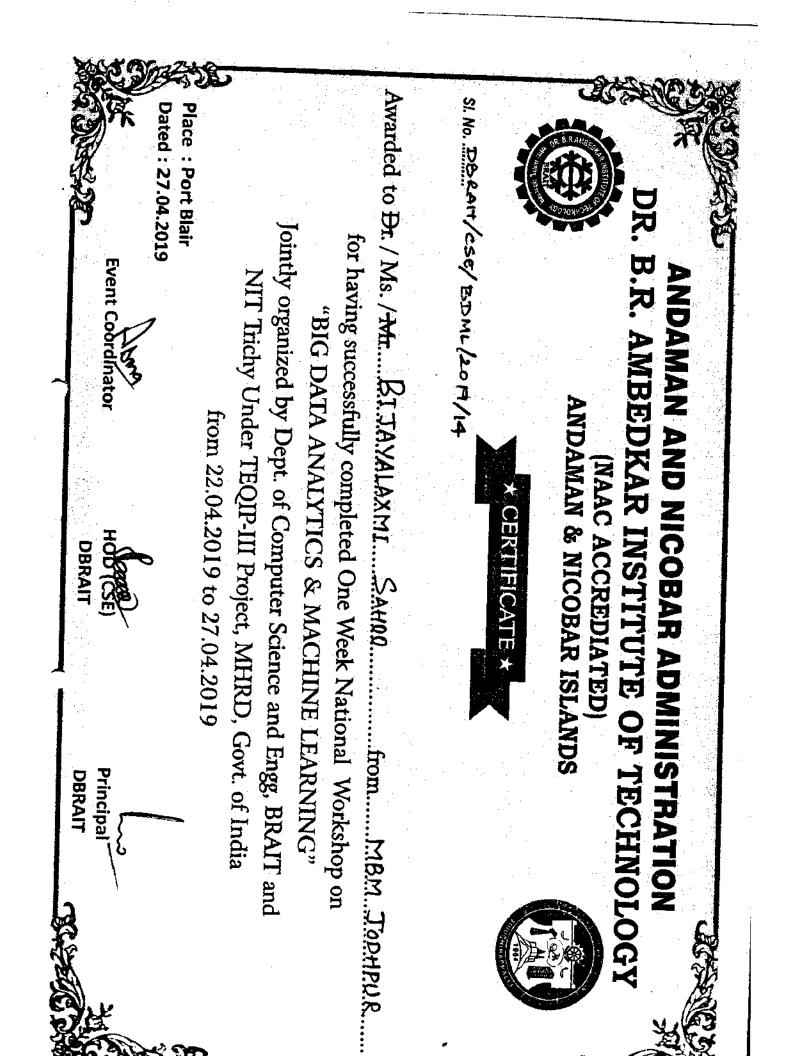
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TEQIP-III



One Day Workshop on 3D Printing & Reverse Engineering DEPARTMENT OF PRODUCTION AND INDUSTRIAL ENGINEERING

MBM ENGINEERING COLLEGE, JODHPUR 2nd MAY 2019

CERTIFICATE

held on 2nd May 2019, organised by the Department of Production and Industrial Engineering, Engineering College Jodhpur attended the Workshop on 3D Printing & Reverse Engineering. MBM Engineering College, JNV University Jodhpur. This is to certify that Mr. Rajendra Aaseri, Computer Science and Engineering, M. B. M.

Prof. Manish Kumar Ilead and Convener

Prof. Arvind Kumar Verma Convener

Naveen Suniya Coordinator



TEQIP-II



One Day Workshop on 3D Printing & Reverse Engineering DEPARTMENT OF PRODUCTION AND INDUSTRIAL ENGINEERING

MBM ENGINEERING COLLEGE, JODHPUR 2nd MAY 2019

CERTIFICATE

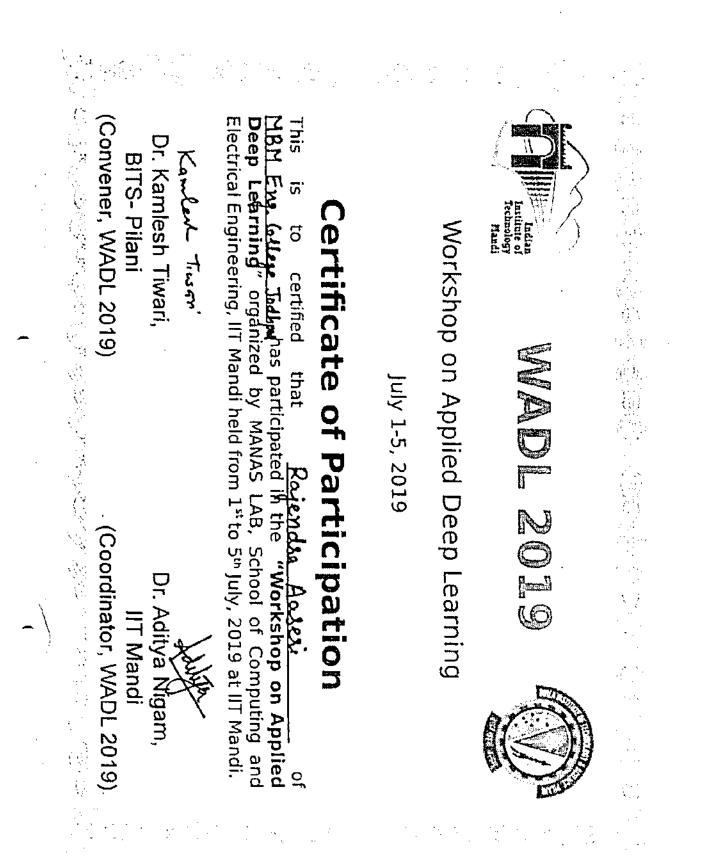
This is to certify that Mr. Anand Tanwar, Computer Science and Engineering, M. B. M. Engineering College Jodhpur attended the Workshop on 3D Printing & Reverse Engineering, held on 2nd May 2019, organised by the Department of Production and Industrial Engineering, MBM Engineering College, JNV University Jodhpur.

Prof. Manish Kumar Head and Convener

Horma

Prof. Arvind Kumar Verma Convener

Navecn Suniya Coordinator



(Coordinator, WADL 2019) IIT Mandi

Dr. Aditya Nigam,

(Convener, WADL 2019) Dr. Kamlesh Tiwari, **BITS-** Pilani

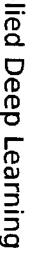
This is to certified that <u>Simpon Choudhosu</u> of <u>**SNV University**</u> has participated in the **"Workshop on Applied Deep Learning"** organized by MANAS LAB, School of Computing and Electrical Engineering, IIT Mandi held from 1st to 5th July, 2019 at IIT Mandi.

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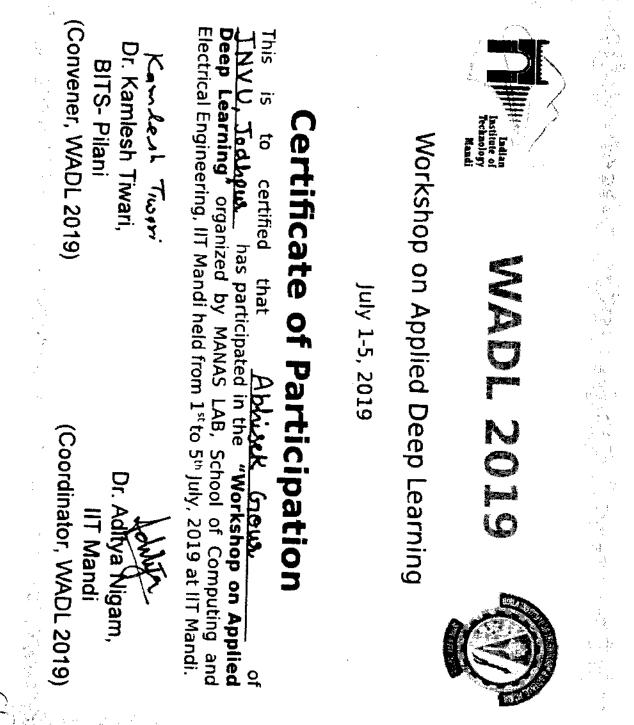








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Head (FDP Cell), ESCI fr. ft yn Kishore P-Jithta

mar harook. ANA (Reid.) Director (PSCI)



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30th -31st August, 2019 at Rajasthan Institute of Engineering & Technology, Jaipur. has attended / presented a paper titled A Calleborative Versioning Framework in 2nd International Conference on Communication & Computational Technologies (ICCCT 2019) held on This is to certify that Dr./Mr./Ms. N.C. Barwor for Model Based Version Control Systems of J.N.V. University, Jodhpu

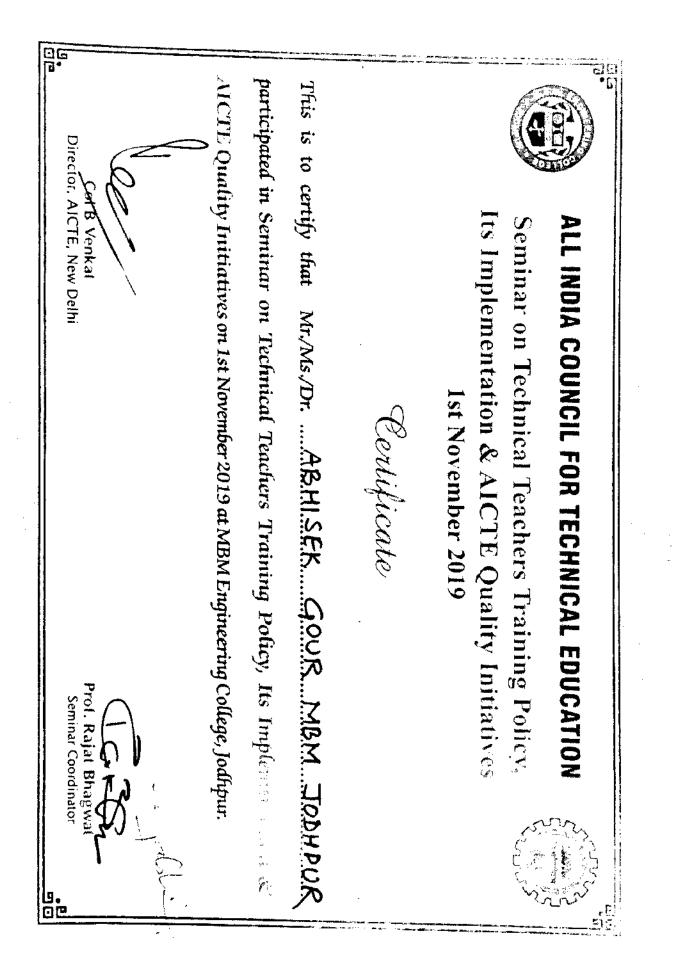


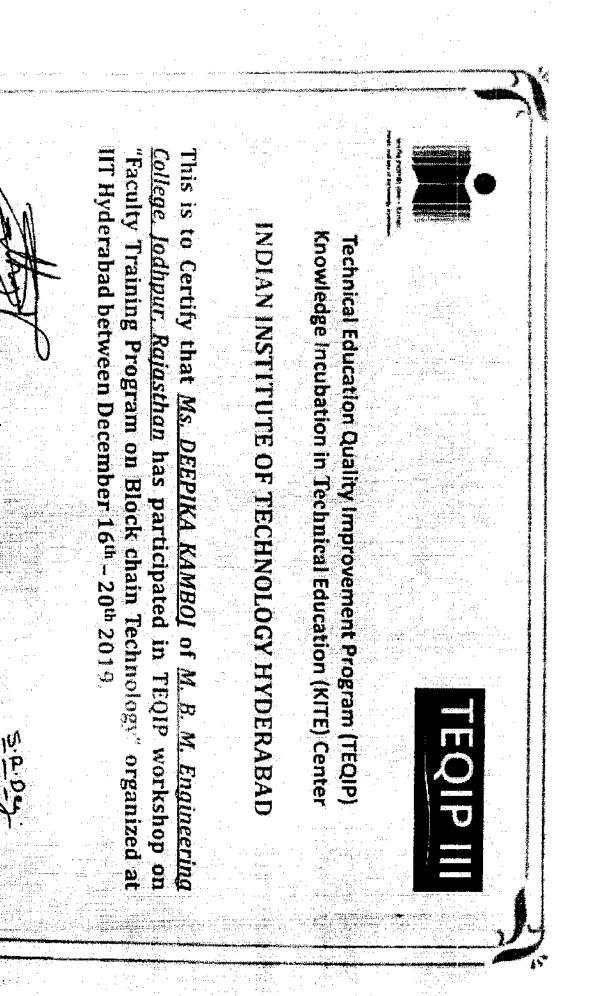
Chair/Coordinator 13 also

RTU, Kota



06 6* participated in Seminar on Technical Teachers Training Policy, Its Implementation & This is to certify that Mr./Ms./Dr. ...ANAND TANWAR, M.B.M. AICTE Quality Initiatives on 1st November 2019 at MBM Engineering College, Jodhpur. Director, AICTE, New Delhi Col B Venkat ts Implementation & AICTE Quality Initiatives **ALL INDIA COUNCIL FOR TECHNICAL EDUCATION** Seminar on Technical Teachers Training Policy, 1st November 2019 Certificate Prof. Rajat Bhagwal Seminar Coordinator f. Ár JOD H PUR





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SAMITY UNIVERSITY

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10th INTERNATIONAL CONFERENCE

THEME: CLOUD COMPUTING, DATA SCIENCE & ENGINEERING

CERTIFICATE OF PARTICIPATION

from MBM Engineering College, Jodhpuid, has presented/published research paper on A. Acview. ov. IoT: Protocole, Architecture, Technologies, Application and Research, during the 10th International Conference Confluence-2020 on the theme 'Cloud Computing, Data Science and Engineering' These to certify that De/ME/Ms. Dupika Kamber

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held on 29" - 31" January, 2020 at Amity University Uttar Pradesh, Noida.

Prof. (Dr.) Abhay Bansat Seneral Char, Coofficence 2020 Indexed ASLE Herb (CSELASET Director DRTE) Arrity Provende Bitar Peages), Modit, Sec.

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Director Grras Training Unit Gauran Salvija Gaurav Saluja

Certificate No.: 444

Place of Training: M.B.M. Engineering College, Jodhpur

held on: 30-31 Jan 2020 Workshop Program on: ML-PYTHON WORKSHOP

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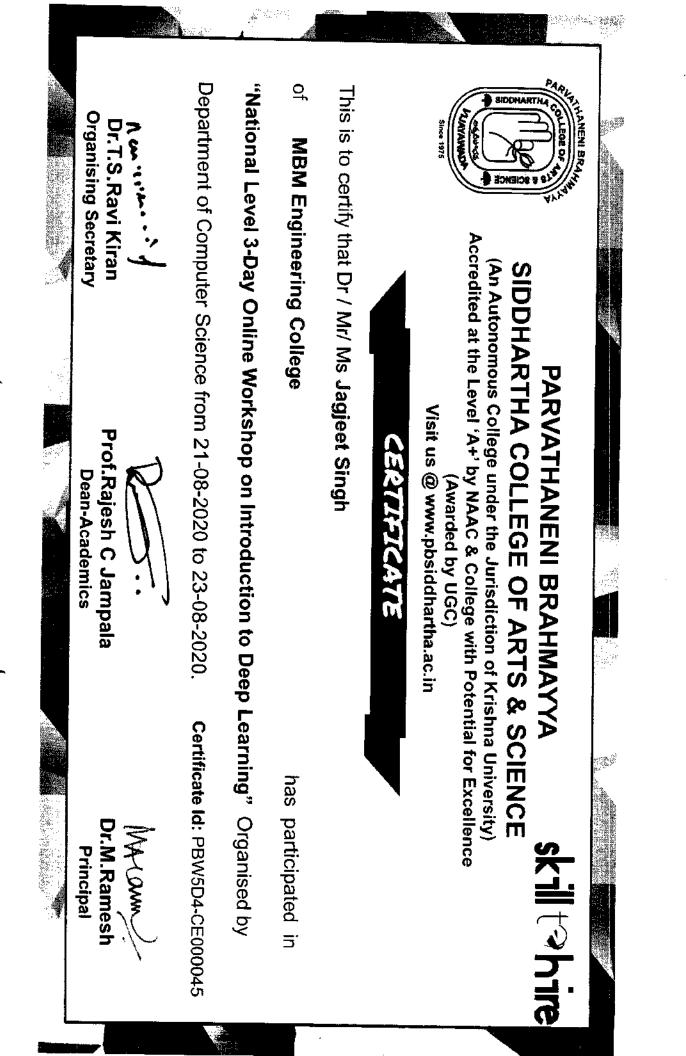
ICETCE-2020

This certificate is awarded to Prof./Dr./Mr./Ms. <u>Rachna Numa</u> for Presenting/Publishing Paper on <u>An Efficient Unstaning Algorithm</u> <u>The Simultaneously Nett Muttiple Planes In</u> in the 3rd International Conference a Point usual held at SKIT Jaipur, during February 7th-8th, 2020.

R. Jane 1 Shri Jaipal Meel Dr. Ramesh K. Pachar Prof.(Dr.) K. Subramania Patron, SKIT Principal, SKIT **IEEE** Ambassador Dr. C. M. Choudhary Organizing Chair Conference Chair NTOS S Campus Connect atural Academic Initiative

on 15" and 16" February, 2020. and paper entitled Effect of Synaptic Depression in Madulating the Response properties of Contical Neur ons. This is to certify that Prof./Dr./Er. /Mr./Ms. Shill Gubta. Faculty/Research Scholar/Student from Dept. of C.S.E., M.R.M. Eng. College, Jackpun Er. Sajjan(Sijhgh Yadav and Informatics" held at the Institute of Engineers (India), Rajasthan State Centre, Jaipur (Raj.) has presented/participated in the National Conference on"Applied Computational Intelligence Chairman, IE(I), RSC The Institution of Angineers (India) 33rd National Convention of Computer Engineers Jaipur, February 15th - 16th, 2020 and National Conference Dr. Hemant Kumar Garg Certificate Convener, IE(1), RSC Er. Gautam Raj Bhansali Hony. Secretary, IE(I), RSC ł

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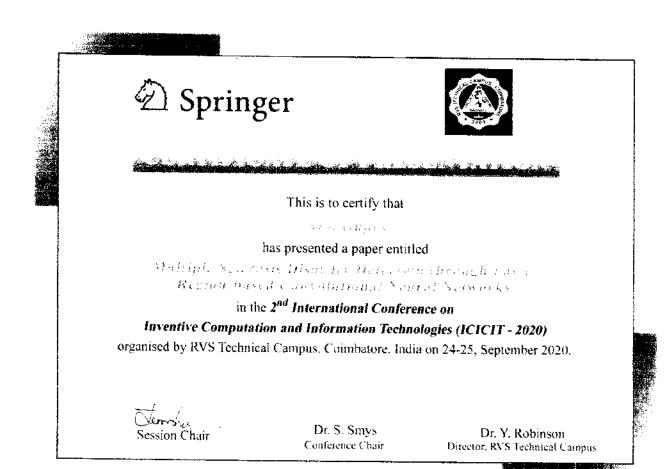
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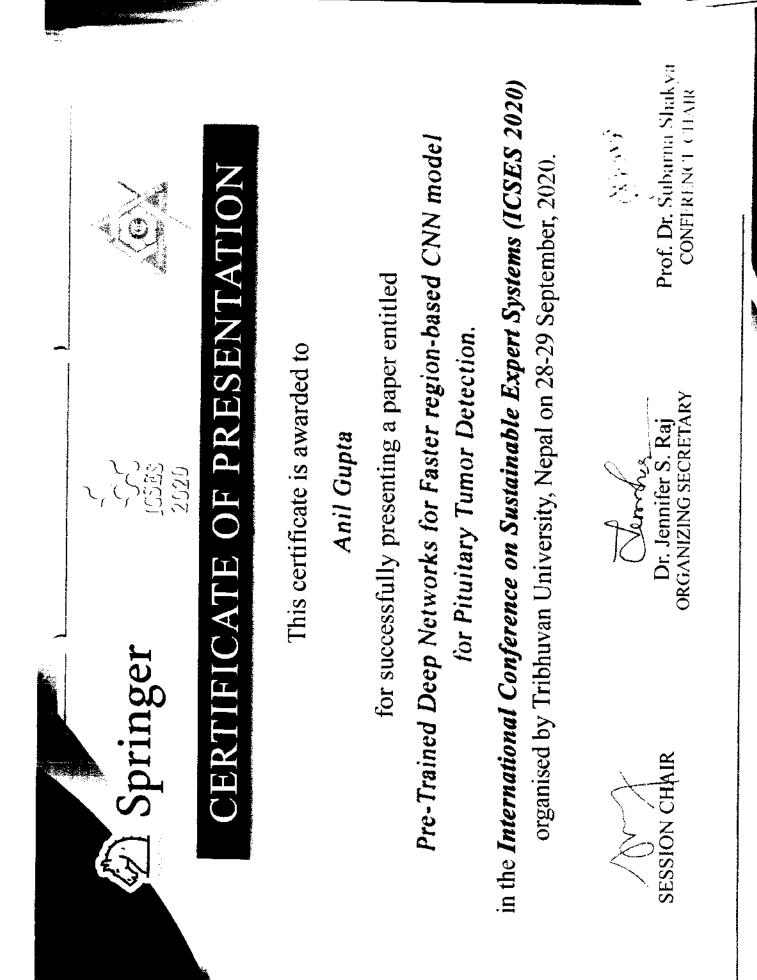
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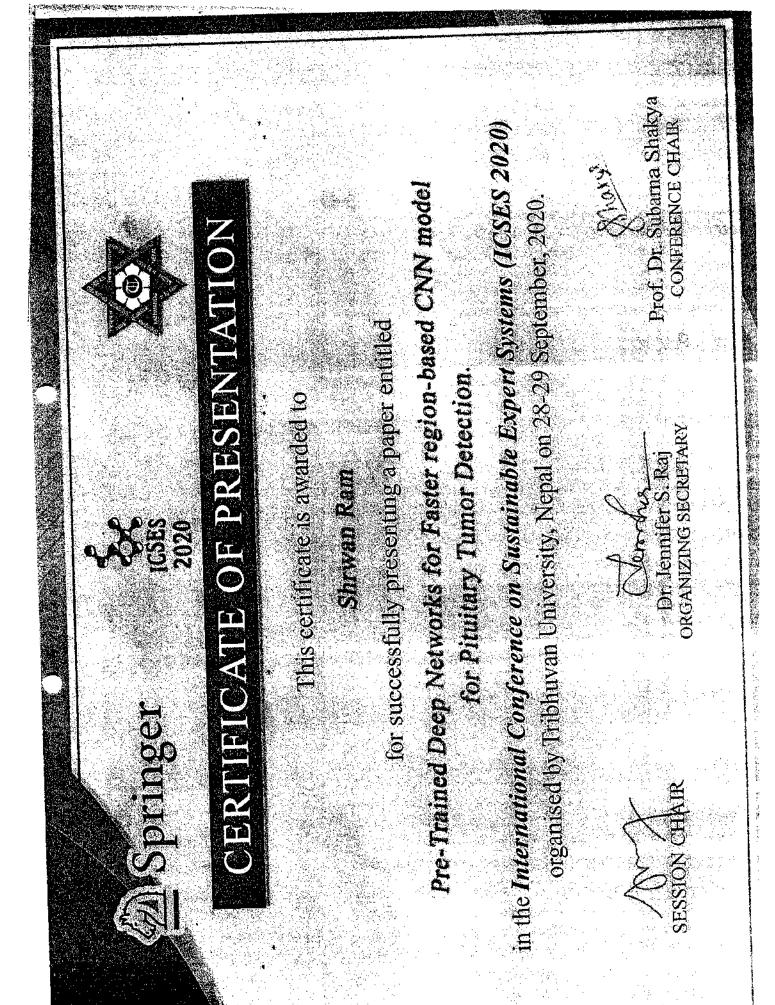
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IOP Conf. Series: Materials Science and Engineering

Classification of Pituitary Tumor and Multiple Sclerosis Brain Lesions through Convolutional Neural Networks

Shrwan Ram Anil Gupta

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Department of Computer Science and Engineering MBM Engineering College, Jai Narain Vyas University, Jodhpur. Rajasthan, INDIA

Abstract: Automatic classification of Brain Tumor and brain Lesions has become a very important step in the field of medical image analytics. The machine learning/Deep learning approaches are playing a tromendous role in the field of medical imaging classification, due to the drastic changes in the field of computing power and image analytics techniques. The deep learning, which is the subfield of machine learning, is playing the major role in the automatic classification of Magnetic Resonance Images (MRIs) having various brain abnormalities. Convolutional Neural Networks are widely used for the classification and detection of various brain disorders. In this research paper, Convolutional Neural Networks are designed with considering various learning parameters for the classification of Multiple Sclerosis Brain Lesions and Pituitary Tumor. In the proposed research, TI-weighted Contrast-enhanced Magnetic Resonance images are preprocessed with various image-preprocessing approaches such as to resize the images, to convert the images into suitable image format so that the experimental work can be performed with deep learning in the Matlab environment. The Experiment is conducted with the dataset of Multiple Sclerosis and Pituitary Tumor each of having 718 and 930T1-weighted MRI images respectively. The experimental results we achieved 99.7% classification accuracy of pituitary Tumor, and 99.2% accuracy of Multiple Sclerosis brain Lesions. The average accuracy of both classifications is 99.55%. The precision of the classification of Pituitary Tumor is 99.7, recall value is 99.7 and the fl_score of the classification is 99,7%. Similarly, the Precision of the classification of Multiple Sclerosis Brain Lesions is 99.15%, the recall value is 99.15%, and the f1_score is 99.15%. The purposed approach of the Convolutional Neural Network architecture exhibited outstanding performance as compared to other research outcomes.

Keywords- Brain Tumor, Multiple Sclerosis Brain Lesions, machine learning, Deep learning, Convolutional Neural Networks, brain disorders.

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Lecture Notes in Networks and Systems 173

S. Smys Valentina Emilia Balas Khaled A. Kamel Pavel Lafata *Editors*

Inventive Computation and Information Technologies Proceedings of ICICIT 2020

Springer

Multiple Sclerosis Disorder Detection Through Faster Region-Based Convolutional Neural Networks



Shrawan Ram and Anil Gupta

Abstract Multiple sclerosis is a leading brain disorder that highly affects the normal functions of the human body. Due to this disorder, protective coverings of neuron cells are get damaged, which causes disrupting the information flow inside the brain and other body parts. The early detection of multiple sclerosis helps healthcare practitioners to suggest a suitable treatment for the disease. The detection of multiple sclerosis is a challenging task. Many types of approaches had been proposed by the researchers and academicians for accurately detecting the brain lesions. Precisely, detecting the brain lesions is still a big challenge. Due to the recent innovations in the field of image processing and computer vision, healthcare practitioners are using advanced disease diagnosis systems for the prediction of disorders/diseases. Magnetic resonance imaging approach is used for the detection of various brain lesions by the neurosurgeons and neurophysicians. The computer vision approaches are playing a major role in the automatic detection of various disorders. In this research paper. the faster region-based convolutional neural networks approach is proposed based on computer vision and deep learning, using transfer learning for the detection of multiple sclerosis as a brain disorder. The proposed approach is detecting the damaged area inside the brain with higher precision and accuracy. The proposed model detects the multiple sclerosis brain lesions with 99.9% accuracy. Three DAGNetworks are used for training; there are Alexnet, Resnet18. and Resnet50. As compare to Alexnet and Resnet18, deep networks, the Resnet50 Pre-trained network performed well with higher accuracy of detection.

Keywords Multiple sclerosis • Magnetic resonance imaging • Brain lesions • Computer vision • Convolutional neural networks • Deep learning

S. Ram (🖾) + A. Gupta -

Department of Computer Science and Engineering, MBM Engineering College, Jai Narain Vyas University, Jodhpur, Rajasthan, India e-mail: shrawanbalach@jnvu.edu.in

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Lecture Notes in Networks and Systems 176

Subarna Shakya Valentina Emilia Balas Wang Haoxiang Zubair Baig *Editors*

Proceedings of International Conference on Sustainable Expert Systems

Springer

Pre-trained Deep Networks for Faster Region-Based CNN Model for Pituitary Tumor Detection



Shrwan Ram and Anil Gupta

Abstract Due to drastic changes in the field of technology and computing power for the last decade, it has become very casy to implement the convolutional neural networks for the classification and detection of objects from the large volume of images. Nowadays, the various deep networks with hundreds of layers are developed and implemented by the researchers for the classification of images and object detection inside the images. The Faster region-based convolutional neural network (R-CNN) is a widely used state-of-the-art approach that belongs to R-CNN techniques that were first time developed and used in 2015. Different R-CNN object detection approaches are developed and implemented by the researchers. Three approaches are developed and implemented on different platforms, and these approaches are R-CNN, fast R-CNN, and faster R-CNN. The efficiency and accuracy of the approaches are tested for various object detections inside the different images. Algorithms based on region proposals are used in R-CNN approaches to generate the bounding boxes or the actual location of the objects inside the images. The ground labels are generated through image labeling approaches. These ground truth labels are stored in a file. The features are extracted by pre-trained deep networks or the convolutional neural networks using the ground truth labeled images. The classification layer of the convolutional neural networks predicts the class of the object to which it belongs. The regression layer is used to create the relevant coordinates of the bounding boxes accurately. In this research paper, the faster R-CNN approach with retrained deep networks is used for the detection of pituitary tumor. The tumor detection performance of the detectors trained with three pre-trained deep networks is compared in the proposed approach of tumor detection. Three pre-trained deep networks such as Googlenet, Resnet18, and Resnet50 are used to train the tumor detector with ground truth labeled images.

S. Ram (🖾) · A. Gupta Department of Computer Science and Engineering, MBM Engineering College, Jai Narain Vyas University, Jodhpur, Rajasthan, India e-mail: shruwanbalach@invu.edu.in

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S. Shakya et al. (eds.), Proceedings of International Conference on Sustainable Experi Systems, Lecture Notes in Networks and Systems 176, https://doi.org/10.1007/978-981-33-4355-9_36

Dr. Rajesh Purohit Chaiman, COPIC-2015 Ner 1 hore Ms. KACHNA VERMA Automatic Clustering of Arbitrary Similar Patterns In A BRep Solid Model Database DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING M.B.M. Engineering College, Faculty of Engineering Jai Narain Vyas University, Jodhpur in the National Conference - COPIC 2015 held on Dec 23-24, 2015 Analytical Computing and Big Data Analytics Paradigms in Computing 2015 (COPIC'15): UGC National Conference on December 23-24; 2015 attended/presented a paper Gertificate This is to certify that Convener, COPIC-2015 Dr. N.C.Barwar 220 Convener, COPIC-2015 Dr. Anil Gupta the second

Dr. Rajesh Purohit Chairman, COPIC-2015				
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Network Performance Analysis of Startup Buffering for Live Streaming in P2P VOD Systems for Mesh-Based Topology

Nemi Chand Barwar and Bhadada Rajesh

Abstract This paper explores mesh-based clustering for different start video streaming in P2P systems and estimates the performance of noncluster and clustered models. These models are based on mesh-based topology of P2P streaming consisting of peer join/leave. A new approach by way of "clustering" peers is proposed to tackle P2P VOD streaming. The proposed models were simulated and verified using OMNET++ V.4. A clustered model for video streaming is proposed and simulated to consider the performance of network under startup buffering for frame loss, startup delay, and end-to-end delay parameters. The results obtained from simulations are compared for both noncluster versus cluster models. The results show the impact of startup buffering on both models is also bounded due to time limits of release buffer and playing buffer under the proposed models, which causes reduction in wait time to view video improving the overall VOD system performance. The proposed model is also able to provide missing parts (of video) to late viewers, which gives the facilities of both live and stored streaming from user's point of view, therefore it serves to be functionally hybrid and is most useful.

Keywords Peer-to-peer (P2P) + Video streaming + Video on demand (VOD)

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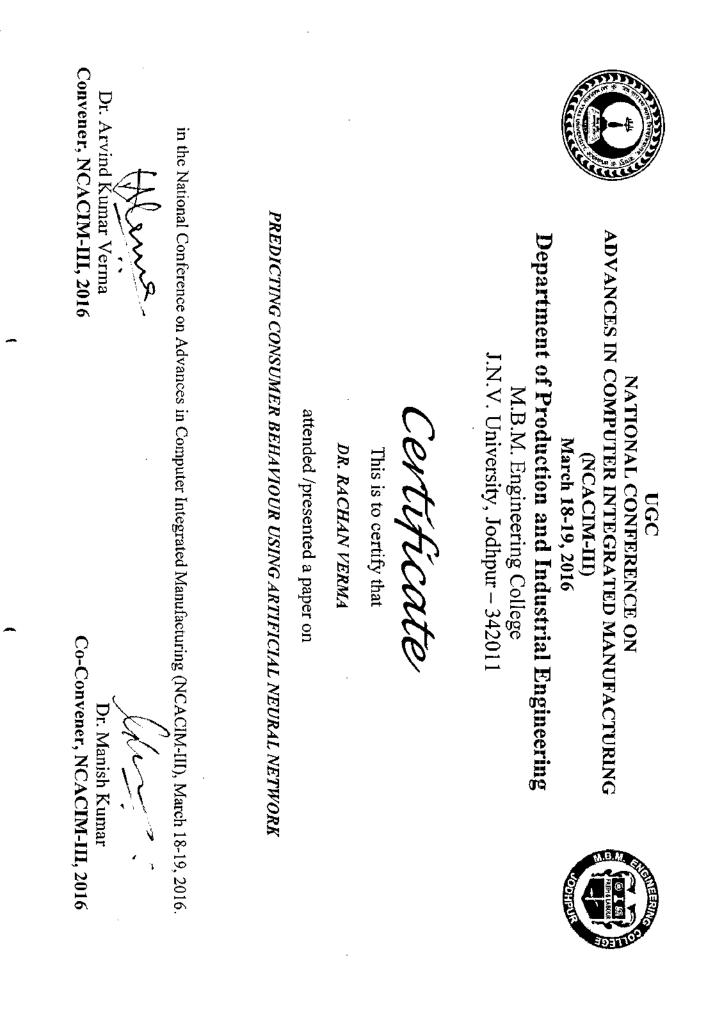
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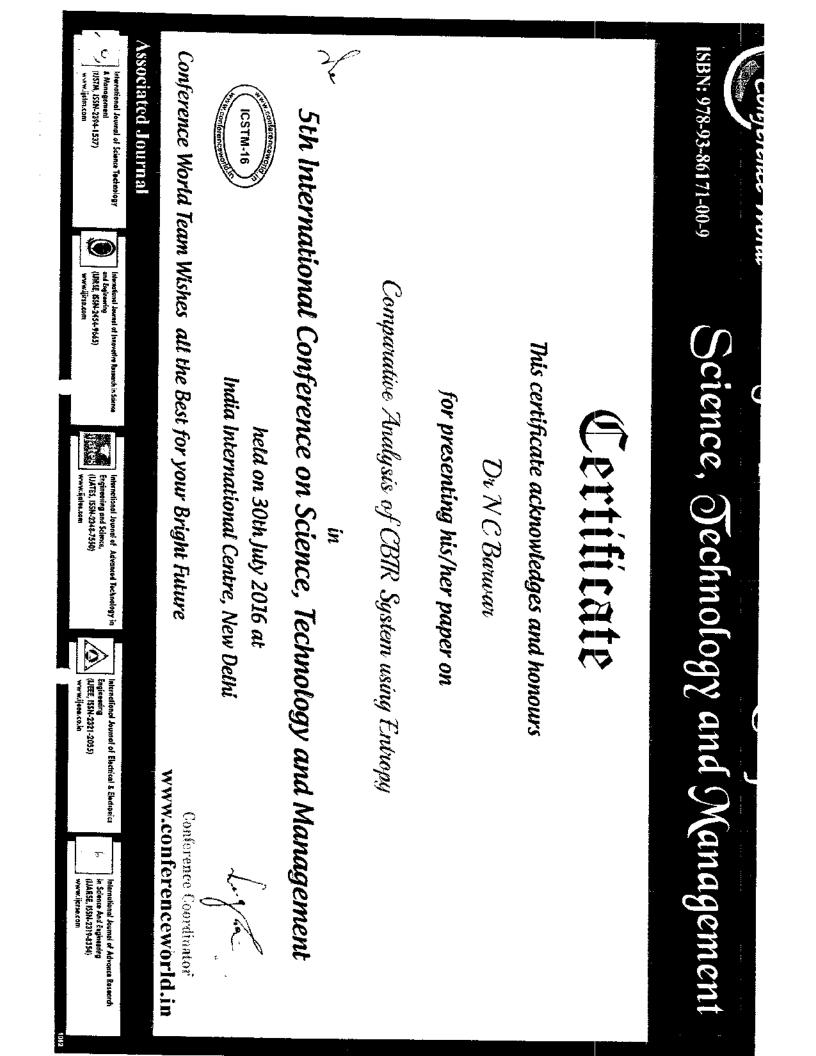
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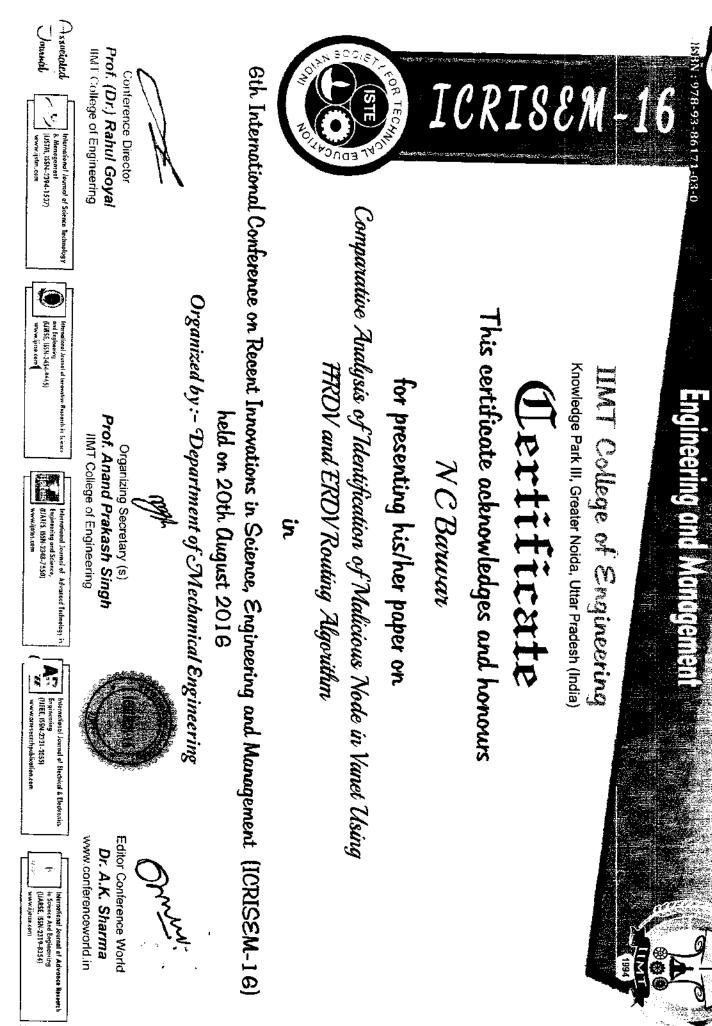
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	E Seminar	Based Artificial Intelligence (SCAI-	MBM Engg.	l-eb-	
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Conference Proceeding of 3rd International Conference on Advancement in Engineering, Applied Science and Management (ICAEASM-2017) at Centre for Development of Advanced Computing, Juhu, Mumbai, Maharashtra (India) on 20th August 2017, ISBN: 978-81-934288-1-8

A Review on Tools For Cyber Security

Suresh Kumar Jha Jodhpur Institute of Engineering and Technology, Jodhpur Prof (Dr.) Anil Gupta MBM Engineering College, Jodhpur

ABSTRACT:- Cyber security is the group of advancements, procedures and practices intended to protect networks, computers, data and information from attack, damaged or unauthorized access, cyber security or information security are the strategies of ensuring computers, networks, data and information from unauthorized access, or attacks that are gone for abuse. Principle zones canvassed in digital security are Application Security. Information Security, Disaster recuperation, Network Security.

KEYWORDS: - Cyber security, internet, wire shark, ngrep, ICT

INTRODUCTION:-In the present scenario increasing dependence on information and communication technologies (ICT), especially the Internet, for delivery of services and operations, the biggest challenges the world facing is that of cyber security. It is a complex issue which affecting many application domains and straddling many disciplines and fields. To Secure the critical infrastructures requires protecting not only the physical systems but, just as important, the cyber portions of the systems on which they rely. Given the kind of activities being carried out in the cyberspace, cyberspace merges seamlessly with the physical world. But so do cybercrimes. Backbone of cyber criminals the underground black market supported by exploit kits. packaged malware and hacks is expected to continue and evolve citing tried-and-true crime ware like Black Hole, ransomware, APTs which have been improved and refined in ways that shows the extent of professionalism and methodology for developing malwares. Cyber attackers can disrupt critical infrastructures such as financial and air traffic control systems, producing effects that are similar to terrorist attacks in the physical space. They can also carry out identity theft and financial fraud; steal corporate information such as intellectual property; conduct espionage to steal state and military secrets; and recruit criminals and others to carry out physical terrorist activities. What makes cyberspace even more attractive to criminals including nonstate actors is that attribution in cyberspace is difficult, especially given that cyberspace is borderless and cuts across jurisdictions. It allows criminals to launch attacks remotely from anywhere in the world. With this growing threat landscape, cyber-readiness of the security systems has been constantly put to test.

CYBER SECURITY RESEARCH:-Cyber Security Research is one context where the solution to deal with cyber criminals is germinating. Investment of time and resources requires fostering strategies for research and developing transformative solution to meet critical cyber security challenges involving a certain technology (e.g. cloud computing), or a particular application domain (e.g. finance), or a combination of two. To begin with the focus of cyber security research is nowadays to deal with new emerging threats and detecting the threats before they effect or cause good amount of damages. With growing number of phishing, APTs and botnet attacks, there is lot to be worked in terms of technological advancements and detection technology to meet the cyber threats of the future. These are some useful tools used in cyber security.

WIRESHARK:- Wireshark is the world's foremost and widely-used network protocol analyzer. It lets you see what's happening on your network at a microscopic level, standard across many commercial and non-profit enterprises, government agencies, and educational institutions. It is a network analysis tool formerly known as Ethereal, captures packets in real time and display them in human-readable format. Wireshark

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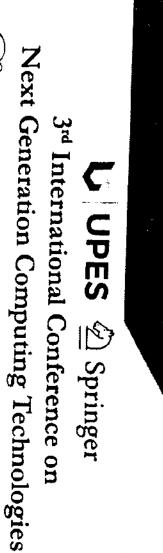
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Efficient Implementation and Analysis of Ring-LWE Quantum-Secure Key Exchange Protocol

Simran Choudhary^a, Prof. Dr. Anil Gupta^b

*Assistant Professor, Dept. of CSE, Faculty of Engineering and Architecture, Jai Narain Vyas University, Jodhpur, India

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Abstract:

Today's cryptosystems based on classical hard mathematical problems in number theory like integer factorization, discrete logarithm over the finite fields and elliptic curve vanants will become obsolcte. The quantum algorithm proposed by Shor's for RSA and Proos and Zalka's for ECDLP claimed that these hard problems can be solved in polynomial time on quantum computer While the symmetric key cryptography have mmor threat as it make use of highly nonlinear s-boxes, pboxes, cycles of confusion and diffusion. The only known threat to some symmetric cryptographic schemes like DES is Grover's algorithm. NIST [14] points out that if the key sizes are sufficient, symmetric cryptographic schemes (specifically the Advanced Encryption Standard-AES) are resistant to quantum computers. The development of quantum computer is on full pace, hopefully it might be available in a decade. Thus, it is necessary to develop efficient quantum secure public key cryptosystems to provide safe key exchange in quantum rera. In this paper we presented an efficient implementation of a Ring-Learning with errors public key cryptosystem whose security is based on intractability of hard problem on lattices And comparative analysis of proposed cryptosystem with RSA. ECDH and LWE based key exchange protocols is presented.

Keywords--Lattices, Learning with errors, Ring-Learning with errors, Reconciliation mechanism

1. Introduction

Public-key encryption is an asymmetric cryptographic technique based on one-way function. It plays an exceptionally important role in secure key exchange, pseudorandom number generation, digital signature generation and authentication. The threat of quantum computers, which break most widely used public key cryptographic primitives like RSA. Diffie-Hellman (Diffie & Heliman, 1976) and Elliptic curve Diffie-Hellman key exchange, has raised interest in symmetrical structure lattice. Lattice is a set of points in ndimensional space with a periodic structure. There are two fundamental computational problems in lattices (Goldreich, Goldwasser, & Halevi, 1997), the Shortest Vector Problem, i.e., finding a non-zero lattice vector with minimal buckdean length and the Closest Vector Problem, i.e., given a nonzero lattice vector 1, find a vector in lattice that is closest to 1. All the lattice based cryptographic constructions are fundamentally based on these hard problems. This is further emphasized by an announcement of NIST, for starting standardization of post-quantum cryptography and by the statement of NSA's Information Assurance Directorate (IAD) to "initiate a transition to quantum resistant algorithms in the not too distant future" for Suite B cryptography. The usage of lattices in cryptography started in 1996, when Ajtai (Ajtai, 1996) revealed that there are certain problems in the area of lattices that have strong security guarantees from the vorst-case hardness. Cryptography basically requires average-case intractability, i.e., problems for which random instances drawn from a specified probability distribution are hard to solve. This is qualitatively different from the worst-case notion of hardness usually considered in the theory of algorithms and NP-completeness, where a problem is considered hard if there merely exist some intractable instances. Thus, the problems that appear hard in the worst-case often turn out to be easier on the average. The Lattice-based cryptography has emerged as the most promising candidate that provides good performance in addition to resistance against both

classical and quantum cryptanalysis. It has many compelling features, like security under worst-case hardness assumptions, efficiency and parallelism. It provides advanced cryptographic constructions like identity-based encryption, fully homomorphic encryption schemes [2] and multilinear maps.

Ideal lattices and cyclic lattices are widely used in recent lattice based cryptographic constructions (Alkim, Ducas, Poppelmann & Schwabe, 2016). Learning with Errors (LWE) problem (Regev, 2005) is an average-case problem with strong security guarantee and high efficiency when parameters are properly chosen. Later its ring variant, Ring Learning with Errors (RLWE) was introduced in 2010 (Lyubashevsky, Peikert & Regev, 2013). Hardness of LWE and RLWE can be reduced to solve hard problems in regular lattice and ideal lattice (Micciancio, & Peikett, 2013) Since no classic or quantum algorithms can solve lattice problems and their versatility. I WH and RLWE are considered as important building blocks for post-quantum cryptography. Our public key cryptosystem is sample and analogous to the unauthenticated Diffie-Hellman Key exchange protocol and comes with a strong proof of security based on the Ring Learning with error problem, which is related to hard lattice problem. Ring Learning with Errors (RLWE) is a computational problem which is widely believed to be very difficult to solve. This problem is being used as the foundation for a new class of public key crypto-systems designed to withstand attack by a Quantum computer. The problem is generally described in the mathematical ring formed by polynomials of degree n-) over a finite field such as the integer's mod a prime number q. The motivation behind selecting the RI.WE-based construction in our work in contrast to the I.WEbased construction is to improve the efficiency while maintaining essentially the same level of security. A major advantage for RLWE compared with LWE is that it has a much reduced key size, and this is more desirable for real world applications due to smaller communication and storage cost. The cryptographic primitives based on the LWE problem, which has been shown to be as hard as worst-case lattice problems such as the shortest vector problem (SVP) and the shortest independent vector problem (SIVP), generally have key sizes and computation times that are at least quadratic in the major security parameter n (Peikert, 2009). The RLWE problem deals with public key sizes that are smaller by n, which in this case corresponds to the ring dimension, and polynomial multiplications that can be performed using Fast Fourier Transform in O(nlogn). The RI WE problem can be stated in two different ways. One is called the "Search" version and the other is the "Decision" version. The Search version of the problem can be stated as follows. Let $a_i(x)$ be a set of random but known polynomials from the ring of polynomials with coefficients from the integers mod q (i e. Fq), ci(x) be a set random and unknown polynomials where the coefficients are constrained to be small over the integers (i.e. less that + - an integer b with b much less than q), s(x) be a single unknown polynomial which also has small coefficients relative to the same bound, b. And $b_i(x)$ be the set of polynomials $b_i(x) = a_i(x) s(x) + e_i(x)$ Given the list of polynomial pairs $(a_i(x), b_i(x)) = a_i(x) s(x) + b_i(x)$. $b_i(x)$) find the unknown polynomial s(x). Using the same definitions, the Decision version of the problem can be stated as follows Given a list of polynomial pairs $(a_x(x), b_y(x))$ determine whether the $b_y(x)$ polynomials were constructed as $b_y(x) = a_y(x) \cdot s_y(x) + e_y(x)$ or were generated with random coefficients from the integer mod q. The RLWE problem is proved to be hard using a quantum reduction from worst-case approximate SVP on ideal lattices to the search version of RLWE. It is also proved that the RLWE distribution is pseudorandom if the RLWE search problem is hard (Peikert Regev, Stephens-Davidowitz, 2017)

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A study of Security issues towards Distributed System

Suresh Kumar Jha Jodhpur Institute of Engineering and Technology, Jodhpur Rajeev Kumar Singh Pranveer Singh Institute of Technology, Kanpur Prof (Dr.) Anil Gupta MBM Engineering College, Jodhpur

ABSTRACT

Improvement of secured and trusted Distributed system is a basic research issues. This paper is a commitment towards the summarization of work completed in this field and in addition distinguishes new research lines. A few methodologies about security angles in Distributed system have been talked about, similar to confirmation based methodologies, improvement of trust based models, get to control based approaches, and so forth. A synopsis of these issues is given in conclusion area. Aside from this, many research lines about secure Distributed system are talked about.

Keywords:-Distributed System Security, authentication, cryptography, quorum, mobile agent, trust based models, access control

1 INTRODUCTION: - We are interested in the unique security issues that arise from the requirements of two fundamental goals, interoperability and transparency, for computer networks and distributed systems. Interoperability refers to the ability to have effective information exchange between hosts and between process in systems that have heterogeneous components. The effectiveness of information exchange must be augmented with security attributes. Transparency refers to the uniform view of a system that has transparent, Distribution of computation and resources. It is worthwhile to find out the effect of transparency on the design of a secure distributed system and whether the transparency concept should be extended to include security. To address these issues let us first consider the system architecture with embedded security features. The security methods in distributed system [1, 2, 44] are the critical issues. A few components of Distributed system security are recognized, similar to confirmation, authorization, encryption and framework security. In beginning days, the security administration condition depended on single authority frameworks yet now the attention is on the advancement of per action, experts and gatherings with shared responsibilities. The general security assaults on the appropriated frameworks are spying (increasing mystery data), disguising (making suppositions on the character of clients), and message treating (changing the substance of the message), replaying the message and forswearing of administrations. The dependability of dispersed frameworks is vital in a number of situations. For expressive economy the term security is utilized to speak to the two its conventional importance as well as those thoughts conveyed by the term protection. Before talking about the variables influencing security in appropriated frameworks, a review of circulated framework design is presented and utilized as a system for ensuing examination. This paper has been partitioned into 3 sections. Segment 2 clarifies different security parts of dispersed frameworks. Segment 3 concludes the new research lines in creating secure dispersed frameworks. Section 4 is conclusion and future extension.

2. SECURITY ASPECTS IN DISTRIBUTED SYSTEMS:-

Different kinds of security approaches are used to build a secure distributed system. These are authentication based, trust based, access control based, cryptography techniques based etc

2.1 Authentication Based Security:-

Authentication is process which allows a user to confirm his identity to an application [1]. An on request way revelation calculation has been proposed to empower spaces to safely find ways in the cooperation

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Department of Geology, JNVU, Jodhpur- 2015-16

Geoscience Frontiers xxx (2015) 1-6



Research paper

⁵⁷Fe Mössbauer spectroscopy study of organic rich sediments (source rocks) from test well CT-1, Chinnewala structure of Jaisalmer basin, India

R.P. Tripathi ^{a.*}, Beena Bhatia ^a, R. Sharma ^a, K.R. Patel ^a, S.S. Meena ^a, Girish Ganwani ^a, S.C. Mathur ^b

ABSTRACT

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1. Introduction

⁵⁷Fe Mössbauer spectroscopy is particularly useful for characterization of iron bearing species because it probes the local environment of iron nuclei sensitivity. This method offers certain advantages over other conventional techniques such as chemical, optical, electron microscopic analysis etc. Indeed each technique has its own strength, but where Mössbauer spectroscopy can give results, it offers a quick reliable and simple method. Being non destructive technique in the sense that the sample either in powder form or thin slice is not altered during the experiment also in a single run, one can get information about all the iron phases present in the sample by proper deconvolution of the Mössbauer spectrum.

This technique is widely used for the study of geological samples including all types of sediments. As it is well known that oxidation state of iron metal in sediments is a measurement of oxidationreduction condition of sedimentation. It is the only technique which provides crucial information about ferrous/ferric ratio in

* Corresponding author.

E-mail address: rptphy@rediffmail.com (R.P. Tripathi). Peer-review under responsibility of China University of Geosciences (Beijing). sediments. To get better insight about the application of ⁵⁷Fe Mössbauer spectroscopy for geological samples, we refer to excellent review by Tominaga and Minai (1984). Mössbauer spectroscopy is also used widely to study organic rich sediments (source rocks) from different petroliferous basin. In fact source rocks are tiny generators of oil/gas or both. Source rock characterization is one of the important aspect for the exploration of oil/gas. To get more information about source rocks we refer to Hobson and Tratsoo (1981) and Tissot and Welte (1984).

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57Fe Mössbauer spectroscopic study was carried out on the organic rich sedimentary samples collected at

different depth intervals from newly drilled test well Chinnewala Tibba-1 (CT-1) located in Jaisalmer Petroliferous basin India. It is found that iron is mainly distributed in high spin Fe^{3+} and Fe^{2+} state in clay minerals. The plot of $Fe^{2+}/(Fe^{2+} + Fe^{3+})$ indicates the presence of poor redox conditions in the samples.

Results obtained are also compared with those already reported in the literature. This comparison shows

that there may exist a correlation between prospecting of the basin, the redox environment in sediments

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and the nature of iron bearing minerals distributed in the sedimentary sequence

The mineral matters present in source rocks also contain iron bearing minerals which can be characterized by Mössbauer spectroscopy.

In an early work Morup et al. (1985) have studied the chemical state of iron in the organic rich sediments from Danish North Sea offshore and onshore wells. They have shown that in the offshore sediments, iron was mainly present in most of the samples in the form of Fe^{2+} in clay minerals and pyrites. In some samples siderites/ ankerite was also present. This distribution of minerals suggests that North Sea offshore sediments were deposited in highly reducing environment. It is worthwhile to note that offshore region is major oil field of North Sea. In view of above study the detail study of chemical state of iron in subsurface sediments for four of inferent petroliferous basin of India was carried out by our group

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Open Access

Shallow Marine Trace Fossils from Mandai Formation of the Barmer Basin, District-Jaisalmer, Western Rajasthan, India

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Abstract

Thirteen well-preserved trace fossil species namely Thalassinoides horizontalis. Thalassinoides suevicus, Ophiomorpha nodosa, Ophiomorpha borneensis, Palaeophycus heberti, Palaeophycus tubularis, Planolites, Planolites montanus, Planolites beverleyensis, Planolites, Siphonites, Paleeophycuna, and Phycodes palmatum have been reported from Mandai Formation of the Barmer Basin at Mandai area, western Rajasthan, India. The present study area is located about 15 km southwest of Fatelgarh town on Fatelgarh-Jinijinyali tar Road. The Mandai Formation is 27 m thick lithostratigraphic unit deposited in the north-western part of the Barmer Basin and overlies on Early Palaeocene Bariyara -Dharvi-Sajit Member of the Akli Formation and overlain by Giral-Thumbli Member of Akli Formation of Early Eocene. The Mandai Formation has mixed siliciclastic, minor carbonate and phosphorite facies and its starts with bioturbated medium to fine grained ferruginous sandstone at the base. These trace fossils are preserved of full relief in yellowish to dark brown medium to fine grained ferruginous sandstone and greyish yellow coarse and coarse to medium grained calcareous sandstone. The entire ichnogenera shows shallow marine depositional environment of Mandai Formation of Barmer Basin. No age can be assigned on the basis of these trace fossil as they have long range (Cambrian to Recent).

Keywords: Shallow marine; Trace fossils; Mandai formation; Barmer basin; Jaisalmer and Western Rajasthan

Introduction

Barmer Basin is mainly Tertiary basin, opened as narrow, roughly N-S trending linear graben and it has a maximum length 100 km; while the width is about 50 km [1]. Biswas et al. [2] opined that Barmer Basin considered as northern extension of Cambay Basin connected through the Sanchore Basin. The Barmer Basin is floored by Malani igneous suite, Lathi sandstone and Jaisalmer Formation [3]. The sediments of the Barmer Basin are classified into eight formations viz: Sarnu Formation. Fatehgarh Formation, Mandai Formation, Barmer Hill Formation, Akli Formation, Mataji ka Dungar Formation, Kapurdi Formation and Uttarlai Formation. The Sarnu Formation is represented by red siltstone and sandstone with plant fossils, the Fatehgarh Formation comprises siltstone, ferruginous sandstone, phosphatic sandstone having significant microvertebrates- magnetic spherule bearing bone bed and gastropod bed [4,5], the Mandai Formation is represented by bioturbated ferruginous sandstone and calcareous sandstone, medium to coarse grained sandstone, phosphatic bivalves bed, fine to medium grained sandstone, coarse grained sandstone and pebbly sandstone [6], the Barmer Hill Formation comprises sandy sandstone with chert and poorly preserved plant fossils and well -preserved Asthenopodichium wood bearing trace fossils [7], the Akli Formation is represented by bentonite, clay, lignite and ferruginous sandstone with gastropods, microvertebrates and plant fossils [8], the Mataji ka Dungar Formation is dominantly composed of coarse grained sandstone, ferruginous sandstone and clay and bentonitic clay at the base [6,9], the Kapurdi Formation is represented by fuller's-Earth, gypseous clay, bioclastic limestone and marl with plants fossils, crabs, shrimps, turtles, fishes and gastropods [10] and the Uttarlai Formation comprises salt, gypsum, gypseous clay and sands [1]. Many trace fossils have been already reported from the rocks of the Barmer Basin by various researchers such as Borkar et al. [11], recorded Thalassinoides, Planolites and Planolites Montanus from Fatehgarh Formation; nearshore - shallow marine trace fossils from Fatehgarh Formation reported by Parihar et al. [7,9] and trace fossils from Mandai Formation reported by Parihar et al. [12]. The present investigation here deals with detailed study of shallow marine trace fossils from Mandai Formation of Barmer Basin at Mandai area viz; Ophiomorpha nodosa, Ophiomorpha borneensis, Palaeophycus heberti, Palaeophycus tubularis, Planolites annularis trace fossils found in yellowish to dark brown medium to fine grained ferruginous sandstone and Thalassinoides horizontalis, Thalassinoides suevicus, Planolites, Planolites montanus, Planolites beverleyensis, Siphonites, Paleomeandron and Phycodes palmatum trace fossils are occurred in greyish yellow coarse and coarse to medium grained calcarcous sandstone in the lower phosphatic – carbonate dominated sequence of Mandai Formation. The objectives of present paper (i) To first reports of 13 trace fossils from Mandai Formation of the Barmer Basin, (ii) To the systematic ichnology of trace fossils and environment of deposition of trace fossils bearing facies of the Mandai Formation of Barmer Basin, Western Rajasthan, India.

Geology of the Study Area

The Mandai Formation is located about 15 km south -west of Fatehgarh on Fatehgarh-Ihinjinyali tar Road (Figure 1). The Mandai Formation is 27 m thick lithostratigraphic unit deposited in the north -western part of the Barmer Basin. The various lithounits of the Mandai Formation forms low to high ridges and hillocks in and around Mandai Village. The Mandai ridge running from south of the Jaton ki Dhani and up to Mandai in the south and the overall strike length of ridges is about 10 kms (Figure 2). The Mandai Formation

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Beview Articl

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Near Shore - Shallow Marine (*Ophiomorpha* and *Margaritichnus*) Trace Fossils from Fatehgarh Formation of Barmer Basin, Western Rajasthan, India

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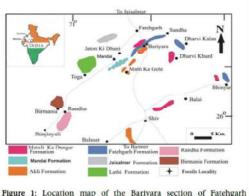
Abstract

Two trace fossils namely Ophiomorpha and Margaritichnus have been reported from the Bariyara section of the Fatehgarh Formation of Barmer Basin. Here the Margaritichnus trace fossil sp. is the first record from the western Rajasthan. The present study area is located about 6 km south of Fatehgarh town and 70 kms north of Barmer on Bramer-Jaisalmer road. The Ophiomorpha trace fossils are found in white fine grained calcareous sandstone from lower siliciclastic sequence while Margaritichnus trace fossils occurs in dark brown medium to fine grained ferruginous sandstone of middle phosphorite - siliciclastic sequence of the Fatehgarh Formation of Barmer Basin. The Ophiomorpha trace fossils were considered as crustaceans and shrimps whereas Margaritichnus were mainly produced by worm-like deposits feeders such as sipunculids and priapulids or possibly hydrozoa. The ichnological and sedimentological investigations suggests near - coastal shallow marine depositional environment for the Fatehgarh Formation of the Barmer Basin. It is difficult to attribute a more specific age of Bariyara section of Fatehgarh Formation because of the long stratigraphic range of Margaritichnus (Permian-Cretaceous) and Ophiomorpha (Permian-Recent) as attributed the Fatehgarh Formation to the Cretaceous age on the basis of microvertearte assemblages recorded from the same Bariyara section.

Keywords: Near-shore; Shallow marine; Ophiomorpha; Margaritichnus; Trace fossils; Fatehgarh formation; Barmer basin; Western Rajasthan

Introduction

Barmer Basin is the Mesozoic-Tertiary basin extends for about 100 kms in north-south direction and 50 kms in east-west as its maximum width [1]. It is tectonically a graben bounded in north by Fatehgarh fault, in east by Sarnu fault and in west by Barmer Faults [2]. The horst is in its eastern flanks is made up of Jodhpur sector of Malani Igneous Suite and its north -western flanks is made up of Devikote High [3]. Datta [4], Biswas [5], Biswas et al. [6] opined that Barmer Basin considered as northern extension of Cambay Basin and southern extension of main Indus Basin. The rocks of the Barmer Basin are grouped into seven namely, Sarnu Formation, Fatehgarh formatiom, Barmer Hill Formation, Akli Formation, Mataji ka Dungar Formation, Kapurdi Formation and Uttarlai Formation. The Sarnu Formation consists of siliciclastic facies with plant fossils of Early Cretaceous age, the Fatehgarh Formation is represented by siliciclastic and phosphorite rocks having significant microvertebrates - magnetic spherule bearing bone bed and gastropod bed of Late Cretaceous age [1,7] the Barmer Hill Formation consists of siliciclastic rocks with poorly preserved plant fossils and well -preserved Asthenopodichium wood bearing trace fossils of Palaeocene age [1], the Akli Formation is consists of bentonite, clay, lignite and siliciclastic rocks with gastropods, microvertebrates and plant fossils of Palaeocene to Early Eocene age [8], the Mataji ka Dungar Formation is represented by clay and bentonitic clay at the base and fining upward sequences of siliciclastic rocks of Middle to Late Palaeocene age [9,10]. The Kapurdi Formation is consists of fuller's Earth, gypseous clay, bioclastic limestone and marl with plants fossils, crabs, shrimps, turtles, fishes and gastropods of Early Eocene age [11]. The Uttarlai Formation is represented by salt, gypsum, gypseous clay and sands of Quaternary age [12]. The Barmer Basin is floored by Malani igneous suite, Lathi sandstone and Jaisalmer Formation [3].



Formation of Barmer Basin showing trace fossils locality [10].

The rocks of the Barmer Basin studied for ichnological aspects by various workers and many trace fossils are already recorded such as

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Changes in Optical Behaviour of Iron Pyritohedron upon Microwave Treatment

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Abstract. We have utilized the volumetric heating of materials by microwave energy absorption for investigating the changes in the optical behavior of a well characterized natural crystal of iron pyritohedron (FeS₂). For microwave treatment virgin central core pieces of the FeS₂ crystal were ground to fine powder and then heated in a microwave oven for half an hour. Powder XRD measurements confirmed that the microwave treatment on FeS₂ does not affect the face centered cubic structure of FeS₂. The UV-Visible optical spectrum of the microwave treated FeS₂ display a narrow optical absorption peak at ~315 nm, on the other hand in the UV-Vis spectrum of pure FeS₂ a broad absorption band with a maximum centered ~310-330 nm was observed. The band gap energies for pure and microwave treatment results in a blue shift in the absorption edge and enhancement in the band gap energy.

INTRODUCTION

In recent years, transition metal chalcogenides have attracted considerable attention due to their excellent optical, electrical, magnetic, and transport properties. The nontoxic semiconductor iron pyrite (FeS₂) is one of the most promising technological material with strong light absorption, high natural abundance and low cost but with a lower than optimum band gap of 0.95 eV and nonmagnetic nature [1-2]. Iron pyrite is extremely common mineral, and occurs in virtually all geological environments. It can form well crystallized specimens and occurs as cubes, pyritohedrons and octahedrons and combination of these forms also occur. In the literature, number of controversies exists on its non-stoichiometry, optical, electrical and magnetic properties. The feasibility to enlarge the band gap and induction of ferromagnetic ordering through elemental doping or creating defects in un-doped bulk and nanocrystalline FeS₂ needs to be explored [1-4].

The emerging technique of volumetric heating of materials by microwave energy absorption is an effective way for fast sample preparation at relatively low temperatures, for defects creations in materials and also for tuning the physical properties of materials [5].

Here, we report a comparative study on the effect of microwave annealing on the structural and optical properties of sulphur rich natural crystal of Iron Pyritohedron (Iron Pyrite:FeS₂).

EXPERIMENTAL DETAILS

A natural crystal of iron pyrite pyritohedron was obtained from soap-stone mine located in the Udaipur region of Rajasthan, India. The iron pyritohedron shaped crystal was consists of twelve sides polyhedron that has all sides

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RESEARCH PAPER	Geology	Volume : 6 Issue : 4 April 2016 ISSN - 2249-555X IF : 3.919 IC Value : 74.50
A DE RECEIRE	Augmentation	nt of Impact of Groundwater Structures in Granitic Terrain of antpura Region of Jalore District, Rajasthan
KEYWORDS	Ground	dwater, Augmentation, Igneous Rocks
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ABSTRACT Groundwater is the water located beneath earth's surface in soil and rocks pore spaces and in the joints and fractures of rock formations. Groundwater is the primary source of potable water supply in rural India. Deforestation and the resulting soil erosion hamper the recharging of the groundwater therefore groundwater levels are decreasing country wise in almost entire India. There is severe groundwater depletion problem in Rajasthan state too.

Hundreds of groundwater augmentation structures have been constructed in last 10-15 years in the Jalore district of Rajasthan by State Watershed Department and other agencies. We have studied only those structures which are in granitic terrain of Ramsin and Jaswantpura region of Jalore district. Our study aims to analyse the significance of water augumentation structures regarding changes in groundwater table of villages Baitarana, Bithan and Punak Khurd of Ramsin region and Rathpura of Jaswantpura region. It is revealed that these structures which were constructed in hard rock or granitic terrain are useful for local villages. They are providing water for their cattle and are also recharging their nearby wells. Therefore, we are of the opinion that the groundwater augmentation structures be preferred in rocky, fractured and jointed igneous terrain to recharge the aquifers.

Introduction

Groundwater is the primary source of potable water supply in rural regions of not only Rajasthan but all over India too. It is not readily available in most parts of India due to hard rock shield, which covers 70% of the country. Central and southern part of the country consists of a peninsular slab where surface water is scarce or seasonal and the groundwater is deep (Ramakrishnen, 1998; Radhakrishna, 2006). The similar situation prevails in Malani igneous and other metamorphic rocks of Rajasthan (Subhajyothi, 2013).

Deforestation and the resulting soil erosion hamper the recharging of the groundwater. Hence, in India groundwater levels are decreasing countary wise. Groundwater levels are further affected in drought- prone regions and in places where there has been over pumping for agricultural or industrial needs, or where there are just too many people using the available water. Although, many states are affected, there is serious groundwater depletion problem in Gujarat, Rajasthan, Uttar Pradesh, Andhra Pradesh and Madhya Pradesh.

Igneous and metamorphic rocks possess negligible primary porosity but attain porosity and permeability due to fracturing and weathering. In metamorphic rocks groundwater yield also depends on the rock type and grade of metamorphism (CGWB, 2006).

In Jalore district, Quaternary age alluvium and wind blown sand cover vast area. Only 5 to 10% of the total district area (10640.00 sq. km) has rock exposures. Ramsin village falls in Bhinmal Tehsil of the district. The granitic aquifers around Ramsin Jaewantpura region geologically belongs to Erinpura Granite and Malani Group of igneous rocks. These rocks obtain porosity and permeability due to fracturing, jointing and weathering. The water augmenting structures are constructed on near by drainages.

The Study Area - Jalore District:

Jalore district is located between 24° 37' and 25° 49' North latitude and 71°11' and 73° 05' East longitude. As stated above the district has a geographical area of about 10640 sq.km. It is bounded by Barmer district in the north -west, by Pali district in the north- east, by Sirohi district on the south-east, and by Banas- Kantha district of Gujarat state in the south (Fig.1). The district is comprises of seven tehsils viz: Jalore, Ahore, Bhinmal, Sanchore, Raniwara, Sayala and Bagora and also seven blocks viz: Jalore, Ahore, Bhinmal, Sanchore, Raniwara, Sayala and Jaswantpura.

Hydrogeology

Groundwater occurs under unconfined condition in saturated zone of rock formation. Its occurrence is controlled by topography, physiography and structural features of the geological formations. The movement of the groundwater in hard rock areas is governed by size, openness, interconnection and continuity of structural weak planes while in unconsolidated rocks groundwater movement takes places through pore space between grains. (CGWB,2008) Water bearing properties of different aquifers belonging to rocks of Precambrian age are briefly described below.

Granite & Rhyolite: These aquifers occur predominantly in Jalore, Jaswantpura, Bhinmal and Raniwara blocks. Malani rhyolite encompasses small area in Raniwara block. Granite and rhyolite together cover nearly 8% groundwater potential area. Few intrusives are also found which have low permeability. Groundwater is retained in weathered zones, fractures joints etc in these granites & rhyolites. Depth in open wells tapping these aquifes ranges from 20 to 50m. Yield of wells varies from 20m /day to 188m /day. The depth to water level in the area tapping the aquifer ranges from 11m to 31m.

Phyllite: The aquifer occur predominantly towards Jas-

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Dimensional Stones: Weathering Nature and Technical Properties

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Abstract: Rocks are naturally occurring aggregates of minerals. Most of the rocks are consist of many minerals but some are monomimeralic. Rocks which are consist of one or more minerals called stones. Stone is a basic building material used by man from prehistoric time. It is clearly evident by statues and monuments of historic times. Even today stones are used for elegance, beauty, durability and decoration of architectural work in houses, hotels, monuments, temples and palaces. A thorough knowledge of mineral composition, weathering nature, geological and engineering properties and accordingly selection of stone will surely increase life of the rock and the building too. Not only this but the screening among different colour of stones will be good for an area remaining under certain conditions of sunlight and what type of stone should not be used for a kitchen's plate-form. Which stone will be suitable for exterior or interior of a building? The paper is aimed to give an idea of all these characteristics of dimensional stones to common users.

Keywords: Dimensional stone, monomineralic, technical properties, weathering, buildings.

1. Introduction

With increasing prosperity among citizens of India they want to utilize their money for constructing best quality houses for their comfortable abode. Not only abode they are constructing very beautiful temples and other monuments too. However most of the peoples while selecting dimensional stones for their use, generally they give more preference to attractiveness of the stones colour and texture than to geological and engineering properties. Any rock specially cut or shaped in different sizes are termed as 'Dimensional Stones' for example granite, gabbro, dolerite, sandstone, limestone, marble, serpentinite (commercially known as green marble) gneiss etc. Decorative stones are those utilized for exterior and interior decorations of various high profile buildings. In India the geological time-scale encompasses rocks like granite, marble, sandstone and limestone mostly used in constructing buildings. Rajasthan is especially rich in these building stones and particularly in marbles (Rathore et al. 2000, Roy & Jakhar, 2002).

Not only modern building but also we have to take care for the heritage buildings from weathering effects. The heritage buildings are buildings that for various factors society have decided that they shall be preserved for periods as long as possible. Heritage buildings are seriously endangered by environmental agencies such as moisture, acid rains, intense solar radiation, temperature, vibrations and prevailing winds which change their physical characteristic. The major effects of environmental agencies include discolouration, abrasion, cracks and fungal growth

All users of stones are not technical persons hence they are guided here through this paper by giving some ideas about nature and properties of dimensional stones. For example if one wish to use tiles of stone for flooring where peoples allowed walking bare foot only. Then white colour marble or white colour tiles will be suitable because white colour will reflect maximum light back and your floor will remain cool. Green marble (septentinite) may not be used for exterior decoration because it is highly susceptible to environment and it will get dull by losing its luster very soon. Marble or limestone may not be used for kitchen's plate-form because it is composed of carbonates which react with citric acid of lemons and other acidic materials used in kitchens. Same way marble or limestone should not be used for bathroom tiles because bathrooms remain wet for long time and also washed by chemicals of acidic nature which will start weathering in the marble and limestone.

2. Weathering

Weathering is the breakdown and alteration of rocks and minerals at or near the Earth's surface. The extent and style of weathering is mainly controlled by climate. Water is extremely important for weathering. The more water present, the faster weathering occurs. Temperature is also important for weathering. Warmer temperatures also promote faster reactions, so chemical weathering is more effective in warm climates. Thus, warm, humid climates tend to have the most rapid weathering on rocks.

There are three broad categories of mechanisms of weathering: physical, chemical and biological.

Mechanical or Physical Weathering: Mechanical (physical) weathering breaks down stone into smaller fragments without altering or change in their chemical composition. It is process of slow natural disintegration of rocks (Singh, 2008) and also depends on nature of minerals of which the rock is composed. An example of this is fractures in rocks. Temperature variation can cause mechanical weathering. As Minerals expands and contracts with the variation of temperature, freezing and melting cycles can result in cracks and other damage to stones of any building. A list of the following common rock-forming minerals is given to have an idea in order from most resistant to least resistant minerals to physical weathering (i.e. hardest to softest): quartz, orthoclase, muscovite, biotite, plagioclase, olivine, pyroxene, amphibole, calcite

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RESEARCH ARTICLE

MULTIPLE USE OF DESICCATED LIK RIVER OF THE THAR DESERT IN WESTERN RAJASTHAN

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ARTICLE INFO	ABSTRACT
Article History: Received 04° February, 2016 Received in revised form 33° March, 2016 Accepted 09° April, 2016 Published online 10° May, 2016	It is well established through studies of diverse parameters that there are a number of palaeochannels exist in the Thar Desert of western Rajasthan. These palaeochannels are good sites for plantation. Plants through their transpiration process increases in content of water vapour in the atmosphere leading to precipitation in form of rain. The rain will reduce frequency and intensity of draught and will convert dry land into greenery which will check further extension of the desert. Other then wood we will get a number of products from plants too. The primary aim of the present study is to find out
Key words:	the possible cause of the contribution of palaeochannels for well being of local residents of the area.

Desiccated Lik River, Palaeochannels, Plantation, Drought, Desert, Western Rajasthan

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INTRODUCTION

The Thar Desert exists mainly in western part of the state and occupies an area about 57% of the total area of the state. The region is and and having low rainfall. The average annual rainfall varies between 150 and 400 mm. The maximum temperature goes up to 50°C (average 40 - 45°C) in summers and minimum air temperature range between 1- 2°C (average 10-12°C) in winters. It has been inferred that sometime in the past the desert was a green land recharged by a very mighty Himalayan river "Sarswati' flowing through western Rajasthan and meeting Arabian Sea. Sarswati is described as a mighty and holy river of India in the Vedic period literature like Rigveda, Yajurveda, Ramayana, and Mahabharata etc. (Kochhar, 1997). The river become extinct about 1500-2000 B.C. Numerous workers (Kar, 1988, 1999; Roy and Jakhar, 2002; Bhardwaj, 1987; Bhadra et al., 2009; Thussu, 1999; Valdiya, 2002; Kar, and Ghosh, 1984; Yashpal et al., 1980; Bakliwal, and Grover, 1988; Sahai, 1999; Gupta et al., 2004; Rajawat, 1999) have worked on palaeochannels of the Sarswati and its tributaries in western Rajasthan. They have been recognised by scientist of different disciplines on basis of data gathered by them including remote sensing imagenes, geomorphic features, occurrence of fluvial deposits and ground checks. These palaeochannel are oriented in NE-SW to N-S direction

*Corresponding author: Jakhar, S. R., Department of Geology, Jai Narain Vyas University, Jodhpur, Rajasthan, India. However some of palaeochannels cum desiccated rivers were flowing almost parallel to NW-SE direction i.e. almost right angle to the path of present Arabian monsoon which is trending in NE-SW direction in Rajasthan. The palaeodrainage map prepared by Regional Remote Sensing Centre, Jodhpur is shown in figure 1. The Lik River (Fig. 2A and B) is desiccated one and lies in Jaisalmer and Barmer districts of Rajasthan. The orientation of the river is almost NNW-SSE (Jakhar, 2010)

Lik River and Plantation

To start within a palaeochannel for plantation, the Lik River may be chosen for experimental work. The Lik river is a western tributary of the ephemeral river Luni. The river originates from rhyolitic mounds (Roy and Jakhar, 2002) exposed west of village Bhaniyana (Fig. 2A and B). It traverses more than hundred kilometres distance to join the Luni River near Balotra in Barmer district (Fig. 2A and B). The river has not witnessed continuous water flow in the living memory. With lapse of time the meandering river lost its identity as its course is obstructed by the moving sand dunes. In its entire course it passes through hard and weathering resistant volcanic rock rhyolite. The river is more or less wider than halfkilometre throughout its course. The human habitation have encroached the sight of the old and abandoned channel of the river. It is a good site for plantation because state Government have already started laying pipeline to bring drinking water from Indira Gandhi Canal to Pokaran and then to Bhaniyana, Phalsund and Balotra area (Fig. 2A and B, Photo 1).

Calcium Carbonate and Derived Products

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Abstract: Calcium carbonate is one of the most versatile and widely distributed mineral. Various forms of this mineral with variety of chemical composition, though differing to only minute level, make it highly attractive for various applications. These minerals not only differ in chemical composition but also physical forms; such as amorphous, calcite etc. This article deals with a comprehensive but brief over view of calcium carbonate and its applications.

Keywords: Calcium carbonate, lime stone

1. Introduction

Calcium carbonate, or CaCO3, comprises more than 4% of the earth's crust and is found throughout the world. It's most common natural forms are chalk, limestone, and marble, produced by the sedimentation of the shells of small fossilized snails, shellfish, and coral over millions of years. Although all three forms are identical in chemical terms, they differ in many other respects, including purity, whiteness, thickness and homogeneity. Calcium carbonate is one of the most useful and versatile materials known to man. Calcium carbonate (CaCO₁), in the form of chalk, limestone (figure 1A, 1B & 3), marble (figure 2 & 5)and calcite (figure 4) is one of the most widespread mineral of the earth Chalkis a fine, microcrystalline material, which has been used as a tool for writing, for last thousands of years. As a school boy, might haveencountered calcium carbonate one basedblackboard chalk-sticks.Term chalk has been used for the friable limestone which is composed of microscopic remains of marine organisms and on crushing gives fine powder. It is also used in the manufacture of paint, distemper, filler in rubber goods, etc. Normal soil, besides silica and silicates, is rich in carbonate-minerals (~4%); particularly those of calcium and magnesium. Natural water (ground, rivers and lakes, and sea) contains varying amount of calcium carbonate, which is reversibly solubilised (Eq.-1) as bicarbonate on absorbing atmospheric carbon dioxide and which causes water hardness

 $C_{a}CO_{3} + H_{2}O + CO_{2} = C_{a} (HCO_{3})_{2} (Eq.-1)$

Even the pearls, which are produced in certain shelled seaanimals, are mainly composed of calcium carbonate. These are highly valued due to their limited natural occurrence. Pearls are used as gems in ornaments. Cultured pearls are now produced by harvested shelled animals.

Crystalline calcium carbonate; calcite is also known as 'calcspar. The calcite crystal generally is considered a rhombohedron because of its cleavage properties. Cleavage is what causes crystals to angle where the bonding forces are weak and are apt to break into planes. Calcite is unique in that its cleavage takes three distinct directions. Specific gravity range is 2.71-2.72. Melting point is about 825°C. It decomposes, giving off CO2 leaving CaO (or lime), which melts at about 2570°C. Colourless white but also various shades like pink, brown etc. depending upon the impurities present Fracture varies, depends upon structure. Its different varieties are, transparent to opaque. It is brittle. There are more than 300 forms of calcite crystals. Another important property of the calcite crystal is its property of double refraction. Double refraction occurs when a ray of light travels through a medium and is split into two different beams, one traveling slowly, one traveling fast. The two different beams are bent at two different angles of refraction. As a result of this property a person looking through calcite sees two images. This property of double refraction is a feature valuable to a number of optical applications. Calcite is often very pure however; sometimes part of the calcium is replaced by magnesium, iron or manganese. It is often mixed with impurities, such as silica, clay, organic matter, limestone or hematite.Calcite occur in a great variety of forms, the more important of which are as follows: dogtooth spar, which occurs in acute, scalenohedral crystals; nailhead spar, which occurs in flat rhomohedral crystals, satin spar (term also used for a variety of gypsum), which is fibrous and has a silky luster, iceland spar or ordinary calcite deposited from solution as vein fillings etc. The only form of calcite or crystallized calcium carbonate which has properties and uses distinct from other forms and for which there are no entirely satisfactory substitutes in the finest of optical instruments is Iceland Spar. Transparent calcite was discovered in Iceland and become widely known, hence the name 'Iceland Spar'. Iceland spar is the name given to a pure crystallized form of calcite which is highly transparent and free from defects to be used in the manufacture of optical instruments. The properties in Iceland spar of value are transparency, double refraction or very high birefringence and ability to polarize light. Aragonite has the same chemical composition as calcite, but it crystallizes in the orthorhombic system, often in radial, columnar, or fibrous aggregates. It has a hardness of 3.5 to 4, specific gravity 2.9 to 3; imperfect prismatic cleavage; and conchoidal fracture. Commercially, it has no distinctuses. It is however, an unstable mineral, found mainly associated with gypsum beds and the tests of reef building corals. The Nicol prism which finds applications in the microscope and polariscope is the most common use. It is used in eyeglasses and for windows in trains, planes, and autos to remove a

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Tripathi

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Lithostratigraphy of Bar-Mohra Khurd-Raira Khurd Area of Pali District, Rajasthan and their Relationship with the Soil and Vegetation

Beena Tripathi, G. Singh

Abstract

The paper deals the study a metasedimentary sequence, overlying schistose formation of Sendra Formation of Delhi Supergroup and the underlying Banded Gneissic Complex of Pre-Delhi age, in Birantiya Khurd -Raira Khurd areas in northwestern Rajasthan. The sequence is important due to its heterogenous lithologic association. It shows by different type of conglomerates imbedded in quartzofieldspathic schist. The process of soil formation by breaking up the rock particles and organic matter from weathering and erosion of subterranean parts are influenced by different biological activity. This sequence has been defined as the 'Bar conglomerate horizon' in this paper. The solis derived from the parent rocks which sustain different vegetation, depends upon the climatic conditions. Hence, the nutritional status is required to be studied from the point of view of sustenance of flora in the area. There is no clarity, so far, regarding the exact chronology of deformation in the area. At the same time, the lithostratigraphic history of the area also needs a further revision. In view of the above, the Bar-Mohra Khurd-Raira Khurd area have been studied extensively and results are presented in this paper.

Department of Geology, JNVU, Jodhpur- 2016-17

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High Heat Producing Radioactive Granites of Malani Igneous Suite at Northeast of Jodhpur, Northwestern India

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ABSTRACT

The Malani igneous suite, a terrain showing crustal formation as late as in Neoproterozoic, shows some pink and grey granites in the northeast of the desert city of Jodhpur, in northwestern, India. The average heat generation value of 15.925 HGU for these granites that is much higher than the average known value (3.8 HGU) for the continental crust has been reported here. The concentration of uranium determined is four times higher than the average continental crust. Thorium is still higher than U and K. The radioelement concentration (Ur) varies from 15.58 to 73.48 in the granites with an average of 45.671, clearly indicates a 'hot crust'. Hence it is favourable for the formation of mineralization of HFS elements like, Nb, Ce, REE and U and Th, which need to be explored in the terrain as an economic deposit.

INTRODUCTION

The crustal evolution in the history of earth has occurred in two stages. The first stage involved upward vertical migration of magma produced by partial melting of pyrolitic composition of the mantle and the ocean floor igneous rocks have been produced at the ridge, but once these igneous rocks had been differentiated and emplaced. forming the oceanic lithosphere, the horizontal motion became operative as the lithosphere was carried away from the ridge as the second stage when island arc igneous rocks have been formed above the sinking oceanic lithospheric slabs containing the early produced igneous rocks (Patwardhan, 2010). The heat required for greater partial melting of the upper mantle was largely provided by the exothermic reactions involved in the radioactive decay of unstable isotopes of U, Th and K. The heat generated by such decay progressively decreased with time, ever since the earth's existence. The heat energy for the first stage of fractionation might also have been contributed by the profuse meteoritic bombardment and impact cratering, if one draws analogy with the lunar surface which preserves its early history (Bhandari, 2009). It appears that due to the excessive heat generated by radioactive decay and the meteoritic impacts, more than 65% of the total continental crust was already formed during the period 3.2-2.5 Ga (Roy, 2009).

High heat production (HHP) granites (Kochhar, 1989; 2012; Sharma, 1994; Srivastava, 2003; Shrivastava et al. 2013) are those evolved cale-alkaline granites which have comparatively higher content of Th, U, K and total REE and responsible for nearly half of the crustal heat flow (Morgan and Sass, 1984; Plant et al., 1985; Morgan, 1985) through radiogenic decay of isotopes of Th, U and K, of which uranium is the dominant heat producing element. Therefore, the granites with nearly four times or more uranium than the general abundance (3.5 ppm; C1atk et al., 1990, 4 ppm: Rogers and Adams, 1969) are considered as HHP granites. Such granites act as 'heat engine' and prolongs the circulation of ore bearing hydrothermal fluids (Fehn et al., 1978; Kimberley, 1978), which ultimately may lead to the formation of a mineral deposit.

The Malani igneous suite is an unique terrain which shows crustal

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evolution as late in Neo-Proterozoic and these granites are part of the igneous activities of the Malani Igneous Suite (780 Ma-660 Ma) (Bhushan and Chandrasekaran, 2002; Roy et al., 2012; Kochhar, 2012). The field relationship of these granites favour its Malani age rather than Erinpura (Shrivastava et al., 2013).

In the present paper, granites of northeast of Jodhpur have been studied for the evolution of their high heat production value, with a possibility of economic deposit formation. The study area fies between latitudes 26°16'57" to 26°26'52" and longitudes 73°28'54" to 73°44' 10" which is almost 60 km NE of Jodhpur and constitute peripheral semicircular ring, having a diameter of 45 km with Jodhpur city at its centre and show isolated outcrops of these granites in the desert sand.

FIELD AND PETROLOGY

Geomorphologically, the higher topography is occupied by grey granites and the lower has been covered by desert sand and alluvium. In between the two, there is presence of pink granite. Both, the pink (Plate 1: Fig A) and grey granites (Plate 1: Fig B) which appear different in the field, at least because of colours, have very similar petrology. It is observed that there is presence of equal amount of all the three essential minerals namely, quartz, orthoclase and plagioclase (Plate 1: Fig C), with small amount of biotite (Plate 1: Fig D). Some euhedral isotropic ores are also present in small amounts (Plate 1: Fig D). The interesting and dominating texture in these rocks is graphic texture (Plate 1 Fig F). Various sizes and shapes of quartz especially cruciform are commonly present (Plate 1: Fig H). There is presence of cauliflower-type graphic texture. Occasionally large and small 'myremekite' are also present, showing vermicular growth of quartz and sodic plagioclase adjacent to potash feldspar. The process responsible for such solid solution structure, essentially seems to be secondary. The overall texture is holocrystalline, ranging in grain size from medium to coarse (Plate 1: Fig E). Generally, orthoclase is coarse grained. Feldspars are invariably altered to clays (Plate 1: Fig G).

GEOCHEMISTRY

To represent the whole granite body, fifteen granite samples were collected from different locations. In the laboratory, the rock samples were crushed to make a fine powder of 53 micron or smaller size, before coning and quartering of each of the samples. Major oxides have been determined using XRF. The trace and rare earth elements have been determined by ICP (MS). Both the analysis have been performed in the laboratories of the Wadia Institute of Himalayan Geology, Dehradun, India.

Energy-dispersive X-ray Fluorescence has been used with isotopic excitation source ¹⁰⁹Cd/30 mCi and Si/Li detector system, 30nm² x 3 mm, having resolution for 5.9 keV radiations of 200 eV. It was coupled to series 90 MCA of Canberra Industries. The configuration of XRF system is of SIEMENS SRS 3000 sequential X-ray spectrometer with end window Rh X-ray tube. For major oxide analysis pressed power pellets have been used. For major oxides, the operating conditions include no filter, vacuum path, 20/40 kV and for trace elements, no "Science Stays True Here" Advances in Ecological and Environmental Research, 195-210 | Science Signpost Publishing



Discovery of Trace Fossils from Lower Odania Member of Lathi Formation of Jaisalmer Basin, Akal area, District- Jaisalmer, Western Rajasthan, India

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Abstract: The Lathi Formation is the oldest lithostratigraphic unit unconformably overlying rocks of Malani Igneous suites. Birmania Formation, Marwar Supergroup and Bhadhura Formation and overlain by lower Hamira Member of Jaisalmer Formation of the Jaisalmer Basin. It is well developed mainly in the vicinity of Lathi, Odania, Thaiat and Akal area and divided into two members *viz*; Lower Odania Member and Upper Thaiat Member. The present investigations here documented eight trace fossils namely *Thalassinoides suevicus, Thalassinoides paradoxica, Ophiomorpha nodosa, Ophiomorpha borneensis, Palaeophycus heberti, Palaeophycus tubularis, Gyrocrote* and *Phycodes palmatum* from grayish yellow coarse to medium grained calcareous sandstone of Lower Odania Member of Jaisalmer city on NH-15. The complete section is about 22m thick comprises glauconitic sandstone at the base, calcareous sandstone, petrified wood bed and ferruginous sandstone with box works and concretionary structures. These trace fossils are well -preserved and abundant in nature in Akal area and ethologically they represents domichnia and fodinichnia. The ichnological and sedimentological investigations suggest near-shore to shallow marine depositional environment of trace fossils bearing calcareous sandstone of Akal area. No age can be assigned on the basis of these trace fossils as they have long range (Precambrian to Recent).

Key words: Trace fossils, Odania Member, Lathi Formation, Jaisalmer Basin and Western Rajasthan

1. Introduction

Jaisalmer Basin is the mainly Mesozoic -Tertiary basin which is floored by Malani igneous suite, Marwar Supergroup, Bhadhura Formation on surface (Pareeek, 1984 and Roy & Jakhar, 2002) and Permo-Triassic Bhuana Formation in sub-surface (Bhandari, 1999 and Roy & Jakhar, 2002). The sediments of the Jaisalmer

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ORIGINAL RESEARCH PAPER

Geology



To Study on Physico-Chemical Analysis of Soil Around Bar-Dipawas- Lawacha-Kalab Kalan Section of Raipur Area of Pali District, Rajasthan, India

KEYWORDS

enriching the soil, urbanization, industrialization, indiscriminate mining, sandy and loam, Delhi Supergroup, Pali district, Rajasthan

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ABSTRACT Minerals and organic matter are the main constituents of soils. The process of soil formation by breaking up the rock particles and enriching the soil with organic matter from aerial and subterranean parts are influenced by biological activities. River sands, gravels, cobbles, pebbles, and boulders are the main and chief sources of soil. In India, arid eoils cover about 20 million ha area covering Rajasthan, Gujarat, Punjab and Haryana and meet of the soils are arid soils (Dregne, 1976). The ever increasing population, urbanization and industrialization have led to generation and industrial purposes. The investigated area is located in the great Indian Thar Desert of Rajasthan, where soil of the Raipur- Pali area is of sandy and loam type with medium grained texture. The natives and relating to the indigenous inhabitants of the Bar, Dipawas-Lawacha area of Pali district suffer and bear adverse challenges of climatic conditions along with some specific aspects related to market on rock types and soils which are used as a building material and different mineral deposits used in different industries. Its importance has not only been felt for the inhabitant but, for our country too and to the civilization at large. Sporadic small and huge rock exposures and various litho units ranging about 50 m to 200 m or even more than this are present in different locations of study area.

Introduction

The roads and highways along the road sides and river valley slopes innumerable rock cutting and open cast mining generated granules and debris, occurring in the form of soil and fine clay. Heavy vehicles etc generation micro-seismic waves which add to the instability of the soil particles which are already unstable due to road cutting. During rainy season, the water that flows on the surface and simultaneously penetrated inside the fractures, pores, cavities and fissures which create devastating results. These structures are formed with partial dissolution and erosion of rocks.

The rocks of Bar-Lawacha-Dipawas area of Pali district are included under three main tectonic divisions of Delhi Supergroup from southwest to northeast viz. Banded Gneiss Complex (BGC), Barotia Formation (Barotia sequence of Heron, 1953) and Sendra Formation (Sendra complex of Heron, 1953). All the three tectonic divisions are well displaced in the study area and the same names have been followed in this paper. The BGC is made up of Precambrian basement in the southwestern side and the lower most tectonic unit of the area. It is separated from the overlying rock of the Barotia Formation with an unconformity (Gangopadhyay, P.K. and Lahiri, A. 1983).

The Barotia Formation consists of Bar Conglomerate Horizon, Calc amphibolite schist, Quartzitic schist and Calc-schist with intercalated Quartzite schist. Bar Conglomerate Horizon is further divided into Quartzofeldspathic

Heron (1953) Intrusive Intrusive granite is not exposed in the investigranite gated area

Sendra Com- plex	Sendra Forma- tion	alternate	phibolite gneiss with e bands of mica schist ated quartzite		
Nan- dana Crystal- line Lime- stone	Dolomite	1			
		Calc-schist with intercalated quartzite schist			
		Quartzite schist			
Barotiya Se- quence tion		Calc amphibolites schist			
	Barotia Forma- tion	Bar Con- glom- erate Horizon	Kyanite schist		
			Staurolite schist		
			Garnetiferous mica schist		
			Bar Conglomerate schist		
			Quartzofeldspathic mica schist		
Uncon- formity	Unconformity		Innea Serrat		
Banded Gneissic Com- plex	(B.G.C) Granitic	: gneiss			

Schist, Bar conglomerate schist, Garnetiferous mica schist, Staurolite schist and Kyanite schist. The overlying Sendra Formation constitutes the northeastern part of the study area. Dolomite (equivalent to Nandana crystalline lime-

ORIGINAL RESEARCH PAPER	Geology	Volume : 6 Issue : 12 December : 2016 ISSN - 2249-555X IF : 3.919 IC Value : 79.96			
A REAL PROPERTY OF A DEPARTMENT	To Study on Soil Nutrient and Physico-Chemical Analysis of Soil in Bar-Phatakhera-Raipur Section of Pali District, Rajasthan, India.				
KEYWORDS	Soil enriching, soil nutrient, rock material, Delhi Supergroup, Pali district, Rajasthan.				
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	Vikas	Bhagasra			
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soil enriching with organic matter from aerial and subterranean parts and are influenced by biological activities. The role of the vegetation is relatively less in arid zones because of the scanty sparse canopy cover and the poor development of aerial parts but the root systems often exhibit exceptional development and have the greatest influence of the cracking of the rocks influencing soils formation processes. The parent rocks had definite relation with the soil nutrient and material which supports the vegetations. But in western Rajasthan the studies of relation between parent rock material and soil and further correlation of these aspects with different types of vegetations e.g. herbs, shrubs and trees supported by the soil is guite deficient. The present paper, therefore, highlights by the fact that the vegetations including herbs, shrubs and trees and most importantly the herbaceous vegetation vary from soil to soil depending upon minerals present in the soil and these minerals are derived from the parent rock materials. The present investigation may bridge this gap in the Aravalli hill ranges occurs in semi ard region. Therefore, the objective of this paper are 1) to study the type of soils formed under the influence of parent rocks found in and around the Bar region of Delhi Supergroup; and i) to investigate nutrient availability and different characters in soil for finding out its relation with the different type of vegetations it supports. River sands, gravels, cobbles, pebbles, and boulders are the main and chief sources of soil.

The unique desert and semi-desert locations of Rajasthan having difficult geoenvironment and particular kind of cultural and economic aspects makes it a distinct and characteristic state. Rajasthan is a predominantly mountainous as well as desert state and is home to many endemic, endangered and threatened species, which affects the socio-economic condition of the existing natives of the state. Great diversity in climate and wide variety of topography has further distinguished Rajasthan from other states. The lifestyle of the people is purely rooted in the traditional values. Rajasthan is also well known for its rich culture, lifestyle and natural resources.

The roads and highways along the road sides and river valley slopes innumerable rock cutting and open cast mining generated granules and debris, occurring in the form of soil and fine clay. Heavy vehicles etc generation micro-seismic waves which add to the instability of the soil particles which are already unstable due to road cutting. Devastating results occurred during rainy season, water flows on the surface and simultaneously penetrated inside the fractures, pores, cavities and fissures. These structures are formed with partial dissolution and erosion of rocks. Agriculture is common land use of the area, mostly of single crop nature in Dipawas and in Lawacha villages. Double crop areas are found in patches especially in Phatakhera and Kalab Kalan villages. There are two major categories present as wasteland i.e. "Land with scrub" and "Land without scrub". Whatever reserve forest area left over is confined around Kalab Kalan village i.e. Bagri Kalaliva Reserved Forrest. It is huge reserved forest but a very limited investigated area is under the forest cover in the region. These are subsidiary trophic i.e. full of nutrition type of dry tropical forest that are widely scattered over hillocks and ridges. Beena and Singh (2015). To prevent erosional processes plantation has been done on Kalab Kalan hills by the Department of forest, Government of Rajasthan, India.

Geology of the area

The rocks of Bar-Phatakhera- Raipur area of Pali district are included under three main tectonic divisions of Delhi Supergroup from southwest to northeast viz. Banded Gneiss Complex (BGC of Heron, 1953), Barotia Formation (Alwar Group) and Sendra Formation (Ajabgarh). All the three tectonic divisions are well displaced in the study area. The BGC is made up of Precambrian basement in the southwestern side and the lower most tectonic unit of the area. It is separated from the overlying rock of the Barotia Formation with an unconformity (Gangopadhyay, P.K. and Lahiri, A. 1983).

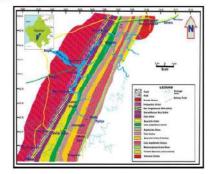


FIG. GEOLOGICAL MAP OF BAR-PHATAKHERA-RAIPUR SECTION OF PALIDISTRICT (RAJ)

Mineral Content of Soil

Gupta (1958) studied on the desert sands of Rajasthan and found a varying amount of easily weatherable minerals, such as, hornhlende, feldspars, kyanite and mica, which seemed to be Aeolian in origin. The clay minerals in the soil of Rajasthan contain illite (mica, smectite, vermiculite, kaolinite and chlorite). In this, first four are dominated in sandy soils, whereas grey loam soil contains attapulgite as the additional mineral (Table 1).

While working in Yamuna alluvial plain, Haryana Shanwal et al. (1989) found mica is the predominant in soil followed by kaolinite, chlorite, vermiculite and smectite in a decreasing order. They considered that the presence of fibrous mineral was due to aeolian material from Rajasthan and not as alluvial

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INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

ANALYSING THE SOIL NUTRIENT AND PHYSICO-CHEMICAL CHARACTERISTICS OF SOIL IN BAR-MOHRA KHURD-KALAB KALAN SECTION OF PALI DISTRICT, RAJASTHAN, INDIA

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ARTICLE INFO	ABSTRACT		
Article History: Received 03 rd September, 2016 Received in revised form 15 th October, 2016 Accepted 10 th November, 2016 Published online 30 th December, 2016	Minerals and organic matter are produced by weathering and breaking up the rock particles. The soil enriches with organic matter and minerals from aerial and subterranean parts. These are the main and important constituents of soils, which are influenced by biological activities. The role of the vegetation is relatively less in arid zones because of the scanty sparse canopy cover and the poor development of aerial parts but the rock systems often exhibit exceptional development and have the greatest influence of the cracking of the rocks influencing soils formation processes. The parent rocks had definite relation with the soil nutrient and material which supports the vegetations. But in western		
Key words:	Rajasthan the studies of relation between parent rock material and soil and further correlation of these		
Soil enriching, Soil nutrient, Rock material, Delhi Supergroup, Pali District, Rajasthan.	aspects with different types of vegetations e.g. herbs, shrubs and trees supported by the soil is quite deficient. The present paper, therefore, highlights by the fact that the vegetations including herbs, shrubs and trees and most importantly the herbaceous vegetation vary from soil to soil depending upon minerals present in the soil and these minerals and derived from the parent rock materials. The present investigation may bridge this gap in the Aravalli hill ranges occurs in semi arid region Therefore, the objective of this paper are to study the type of soils formed under the influence of parent rocks found in and around the Bar region of Delhi Supergroup. Another region is to investigate nutrient availability and different characteristics of soil for finding out its relation with the different type of vegetations it supports.		

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INTRODUCTION

Rajasthan is a predominantly mountainous as well as desert state and is home to many endemic, endangered and threatened species, which affects the socio-economic condition of the existing natives of the state. The unique desert and semi-desert locations of Rajasthan having difficult geoenvironment and particular kind of cultural and economic aspects makes it a distinct and characteristic state. Great diversity in climate and wide variety of topography has further distinguished Rajasthan from other states. The lifestyle of the people is purely rooted in the traditional values. Rajasthan is also well known for its rich culture, lifestyle and natural resources. The roads and highways along the road sides and river valley slopes innumerable rock cutting and open cast mining generated granules and debris, occurring in the form of soil and fine clay. Heavy vehicles etc generation micro-seismic waves which add to the instability of the soil particles which are already unstable due to road cutting. Devastating results occurred during rainy season, water flows on the surface and simultaneously penetrated inside the fractures, pores, cavities and fissures.

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Multiple Deformation of Bar Conglomerate around Bar, Birantiya-Khurd and Giri Section in Northwestern Part of Pali District, Rajasthan

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Abstract

The north-south trending conglomerate belt of Bar, Birantiya and Giri occurs between the granitic gneisses of Banded Gneissic Complex (BGC) and garnetiferous mica schist of Bar conglomerate horizon. The conglomerate belt is intruded at several places by pegmatite veins. The pebbles of Bar conglomerate were deposited with no gravity driven deformation. These pebbles are good strain markers of the prevailing shear strain. About 80% of the pebbles changed their shape and size from spherical to oblate during second deformation phase. The deformed pebbles range in size from ~ 2.5cm to >80cm. Field evidences indicate that the deformational sequence penetrated up to third deformation phase, where few pebbles of Bar conglomerate horizon were further deformed and folded symmetrically. The fourth phase of deformation resulted in the formation of diagonal shear zones along the pegmatite veins at Giri dam as well as near Ramdev temple, which gave rise to zonal crenulations. Thick and thin exposures of pegmatite veins presentin fringes are post tectonic in nature. **Keywords:** Bar conglomerate, Deformation, Heterogeneous strain, Ductility contrast, Delhi Supergroup, Pali District, Rajasthan.

Department of Geology, JNVU, Jodhpur- 2017-18





Discovery of High Heat in Neo-Proterozoic Granites of Malani Igneous Suite at Binawas, Jodhpur District, Rajasthan, India

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Abstract

The MalaniIgneous Suite show crust formation as late as in Neo-Proterozoic times, comprising pinkand grey granites in the Binawas area of Jodhpur district, Rajashan, India. This study reports the average heat generation value of 8.358 HGU (Heat Generation Unit) for granites, which is higher than the average value of 3.8 HGU for the continental crust. The heat required for the partial melting of upper mantle was largely provided by the exothermic reactions involved in the radioactive decay of unstable isotopes of U, Th and K. High heat production (HHP) granites are evolved alkaline granites that have higher contents of Th, U, K and total REEs. These rocks are partially responsible for crustal heat flow, where the concentration of uranium determined is twice the average continental crust. Therium is still higher than U and K. The radioelement concentration (UT) varies from 15.98 to 45.50 in the granites withan average of 24.498, which clearly indicates a hot crust. Hence, the HHP granites need to be explored for economic deposits of U, Th and other HFS elements.

Keywords: Rare Earth Element, HHP Granites, Malani Igneous Suite, Uranium deposit, Hot Crust.

Introduction

The crustal evolution started during Haden Eon, involved upward vertical migration of magma produced by partial melting of pyrolitic composition of the mantle. The ocean floor igneous rocks have been produced at the ridge. The exothermic reaction involved in the radioactive decay of unstable isotopes of U. Th and K mainly provide required heat for the partial melting of the upper mantle. The heat generated by such decay was very high during the first two billion years (4.5 - 2.5Ga) (Valdia, 2010), which progressively decreased with time. This heat was responsible for the highly dynamic stage of the Earth during the Archean times, when basalt generation from the mantle (vertical movement) and its further transformation to felsic and silicic continental crust (horizontal movement, subduction and re-melting) proceeded at much faster rates as compared to the present rate of plate movement. The heat energy for the first stage of fractionation might have also been contributed by the profuse meteoritic bombardment and impact cratering (Bhandari, 2009). It appears that due to excessive heat generated by radioactive decay and meteoritic impacts more than 65% of the continental crust was formed during 3.2 - 2.5Ga and about 80% of the total continental crust was formed around 2.5Ga (Roy, 2009).

High heat production (HHP) granites (Kochhar, 1989, 2012; Sharma, 1994 and Srivastava, 2003; Shrivastava et al., 2013, 2014) are evolved calc-alkaline granites that have comparatively higher content of Th, U, K and total REE and responsible for nearly half of the crustal heat flow (Plant et al., 1985; Morgan and Sass, 1984; Morgan, 1985) through radiogenic decay of Th, U and Kisotopes, of which uranium is the dominant heat-producing component. Therefore, the granites with nearly four times or more uranium than the general abundance (3.5ppm, Clark et al., 1990; 4ppm, Rogers and Adams, 1969) are considered as HHP granites. Such granites act as 'heat engine' and prolongs the circulation of ore forming hydrothermal fluids (Fehn et al., 1978; Kimberley, 1978), which may ultimately lead to form a mineral deposits.

The Malani Igneous Suite is a unique terrain, which shows crustal evolution in late Neo-Proterozoic. The granites are part of the igneous activities of the Malani Igneous Suite (745-680Ma)(Roy et al., 2012; Bhushan and Chandrasekaran, 2002; Kochhar, 2012). The field relationships of these granites favour its Malani age rather than that of Erinpura (Shrivastava et al., 2013). In the present work, the granites of Binawas

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The wood-boring trace fossil Asthenopodichnium from Palaeocene sediments of the Barmer Hill Formation, western Rajasthan, India

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The present study documents the wood-boring trace fossil Asthenopodichnium from the Palaeocene sediments of the Barmer Hill Formation (BHF) in the Barmer Basin, Western Rajasthan, India. The Asthenopodichnium trace fossils are loosely to tightly packed, pouch-like burrows or almond-shaped structures identified as Asthenopodichnium lignorum, whereas lozenge and J-shaped structures are designated as Asthenopodichnium lithuanicum. The A. lignorum trace markers are considered to be the feeding and dwelling burrows produced by wood rotting fungi, whereas A. lithuanicum are interpreted as feeding and dwelling burrows produced by Mayfly nymphs and larvae. The sedimentological and palaeontological studies of trace fossil-bearing horizons of BHF suggest freshwater fluvial sedimentary environment with humid to sub-humid climate.

Keywords: Asthenopodichnium, freshwater environment, trace-fossils, wood-rotting fungi.

GLOBALLY, the oldest wood-boring trace fossils were reported from the Carboniferous and Early Permian sediments1-7. Later, the diverse insect records matching the number of modern insect families were reported from Cretaceous and Neogene deposits of Germany^{8.9}. All these reports were from marine sediments. However, very little is known about wood-boring trace fossils from freshwater environment. Initially, the ichnogenus Asthenopodichnium and ichnospecies Asthenopodichnium xylobiontum were described from Late Neogene wood in Austria¹⁰. The pouch-like Asthenopodichnium woodboring trace fossils have also been reported as A. lithuanicum, from Neogene coal layer in northeastern Lithuania11 and A. xylobiontum from Late Cretaceous Wahweap Formation, Utah, USA12. Subsequently, A. lignorum was recorded from Early Miocene of Didot Island, New Caledonia¹³ and from the Upper Cretaceous Kirtland Formation of San Juan Basin, New Mexico14. The wood-boring Asthenopodichnium trace fossils from these localities are small, U-shaped or pouch-like burrow structures in wooden, organic-rich siltstone or on bone substrates^{10,11}.

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A New Doubtful Microfossil from Pyrite Deposit at Amjhore Bijaigarh Shale, (Upper Mesoproterozoic) Vindhyan Supergroup, India. K.L.Shrivastava, Virendra Gaur, Shinju Sathyadeva and C.P.Khichi, Department of Geology, Jai Nararin Vyas University, Jodhpur, 342005 India. (*E: klsgeology@yahoo.co.in*)

The Precambrian, thought in the beginning to be devoid of fossils, soon vielded diverse evidences of life that existed during this Eon. The Vindhyan Supergroup, has been an issue of global debate for its discordant 'radiometric-' and 'paleontological'- ages throughout the stratigraphic horizons. We are reporting a doubtful microfossil, which was identified during the course of ore microscopic study of pyrite recovered from the pyrite mine at Amjhore. Bihar, India. The host horizon of the sample is a massive pyrite bed, almost one meter thick, embedded in carbonaceous shale of Bijaigarh Shale Formation of Kaimur Group. The Kaimur Group is lower most group of the Upper Vindhvan Supergroup. The microfossil (?) is fully pyritized. In fact, pyrite as a mineral, always shows a prompt habit to fill the organic sacs or any other similar structure available in the geological environments. It seems important that the microfossil (?) in question, possibly belong to the upper part of the Mesoproterozoic time

The microfossil (?) in polished section (Fig 1: A and B) is showing a circular structure (diameter almost of 5µ), the outer- and inner walls of which are filled mainly with the organic matter, while the intermediate space is filled with the unconsolidated pyrite granules or/and microcvsts. The outer wall shows wavy structure. These waves possibly have a fixed wave length. The microfossil (?) which is compressed in the left side show that the regularity of the wavy pattern have also been modified because of compression. In this two dimensional view of the microfossil (?) there is one opening or aperture of almost rectangular shape. The aperture is without any collar. The size and circular shape of the microfossil (?) favours it being a microfossil. The presence of a doubtful aperture or opening and clearly available double wall structure is further giving strength to the possibility. The structure is totally pyritized and embedded in poorly compacted pyrite mass, which is having many microcysts and microgranules of pyrite. The filling of pyrite inside the walls of the organism (?) is greatly compact and well crystallized.

Specially, in the last two decades, the Vindhyans attracted worldscientists to study the earth's 'early-life' as well as fixing the 'biostratigraphic position' of its 9000 m thick sequence (Rao and Neelkantam, 1978, Prasad and Verma, 1991) that assumed to have crossed 1400 to 550 Ma time – span radiometrically (Kathal and Patel, 2015). Sharma (2003) reviewed the age of the Vindhyans based only on the 'paleontological data'. Azmi et al. (2007), however, reviewed the age of Vindhyans of the central India, highlighting the inconsistency in 'radiometric-' vs 'fossil-records' also by providing a table with extensive details.

Sharma and Kumar (2012) provided a 'Bibliography' on the Vindhyans with 'excessive comments' on the status of fossils recovered till then. The K Ar age of the phlogopite of the Majhgawan pipe is 1140±112 Ma (Paul et. al. 1975). The Rb-Sr isochron age of lamproite body is 1067.31 Ma (Anil Kumar et al. 1993). Intrusion of the kimberlite pipe in the Rewa group (Middle group of Upper Vindhyan) shows that the Upper Vindhyan succession must have been started before 1100 Ma. With extensive discussions, Valdiya (2010) concluded that the lower part of the Upper Vindhyan succession possibly extends down into the Upper Mesoproterozoic. As the present microfossil (?) is part of the Bijaigarh Shale, a middle member of the Kaimur Group, which itself is lower part of the Upper Vindhyan Supergroup; the

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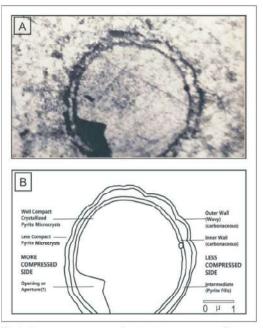


Fig.1. (A) A pyritized (?) microfossil in Polished Section. (B) Linediagram showing details of the wall of the microfossil (?).

present status of knowledge states that the microfossil (?) seems to have an age older than 1100 Ma.

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Mössbauer Spectroscopic Study of Phosphatic Sediments Collected from Fatehgarh Formation of Northern Barmer Basin, Western Rajasthan

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ABSTRACT

A unique thin ferruginous layer sandwiched between phosphatic sediments of the Fatehgarh Formation representing northern periphery of the Barmer basin, India. Magnetic separation of this layer yielded presence of magnetic glassy spherules of millimeter size. In the present investigation, Mössbauer and XRD study of twelve phosphatic sediments including ferruginous layer of Fatehgarh Formation was carried out. For the first time, a very unusual and complex pattern of Mössbauer parameters attributed to an unusual thermal history in late Cretaceous phosphatic sediments of the Barmer basin has been shown.

INTRODUCTION

Barmer basin was formed when the Indian craton broke up, towards the end of Cretaceous and led to the formation of the Cambay rift and constituent basins in north western part of India. Barmer basin is one of the constituent basins. It is a narrow north-south trending graben that comprises sediments of middle Jurassic to lower Eocene age (Mathur et al., 2006; Compton (2009). The basin's presence was suspected from gravity and in the late 1980s but not confirmed until 1999 from seismic, magnetic and drilling data that the basin is a lacustrine failed rift. The Cretaceous to Paleocene sediments of northern part of Barmer basin are named as Fatehgarh Formation and are best exposed at Lordi Nala in the vicinity of Fatehgarh (26° 26.087'N, 071°12.519'E). For details about the geology, origin of major oil reservoir in the Fatchgargh Formation is discussed in detail by Compton (2009) and Dolson (2015). Further, the importance of Fatehgarh Formation has become more significant recently by the reporting of rich assemblage of biota (Mathur et al., 2006), magnetic spherule (Mathur et al., 2005a &b) and tectonics and sedimentation (Mathur and Kumar, 2003). Further, the discovery of oil and gas in the Barmer has proved to be the most significant global discoveries in the decade 2001-2010 (Compton, 2009).

While studying sediments from Fatehgarh Formation, a few centimeters thick (3-5cm) ferruginous limonitic layer (yellow-brown) sandwiched between phosphatic sediments is encountered (Mathur et al., 2005a). Except this layer no limonitic layer is present in the entire Fategarh Formation sedimentary sequence. Interestingly, the sandstone sequence below this layer are characterized by fluvial deposition while the bedded phosphorite deposit above this layer deposited in marine environment (Gour, 2005; Mathur et al., 2006). The abrupt change in the nature of sediments indicates that around this layer some sudden climatic change might have taken place during a very short period of

time. Several rock samples were collected from this ferruginous layer. Out of these samples some of samples were maccrated separately. A powerful hand magnet was used to separate magnetic fraction from the rock matrix. It was found that considerable fraction of magnetic part consists of large number of mm sized spherules along with the fine dust magnetite. It was also found that this limonitic layer is anomalously rich in Maastrichtian mass extinction fossils e.g. Igdabetis species along with Semionodontid, Lepisosteusindicus, Enchodontidaeindet, Labiridaeindet along with fossils of crocodile, turtle and dinosaur. These fossils are not present in sediments lying above this layer. For detail description (Mathur et al., 2005a, b; 2006) can be referred.

It is worth pointing that spherules can be formed in several ways e.g by volcanism (always rich in Ti content), as an ablation product of meteorite, melting of interplanetary dust(IDP) e.g it happened at the Cretaceous-Tertiary Boundary (KTB). KTB spherules contain anomalously large concentration of PGE elements and Ni. Spherules can also be formed due to digenesis of minerals but they will not be confined to thin layer only and show wider range of distribution. Spherules could also originate from anthropogenic source. Recently Niyogi et al. (2018) have reported the chemical composition of spherules of anthropogenic origin. These spherules are rich in silica content. In their study they found that the spherules are predominantly silica-rich (SiO₂: 70.96-74.13 wt.%). These spherules are devoid of Ni and Ti. Since there was no anthropogenic activity in Cretaceous era, the origin of Fatehgargh spherules due to anthropogenic activity is ruled out.

Recently Parthasarathy et al. (2019) have reported for the first time the presence of micro spherule from the infratrappean Gondwana sediments below Killari region of Deccan LIP, Maharashtra (India). This is very significant study in context of KTB event and its effect on the mass extinction in this part of the earth. It is worth pointing that Mathur et al. (2019) have already established the volcanic origin of Fatehgarh spherules. The titanium rich Fatehgargh spherules are devoid of PGE elements and Ni but contain anomalously large concentration of elements which are found in spherules of volcanic origin. In one of the earlier study our group have already reported detailed Mössbauer spectroscopic study of magnetic fraction extracted from this ferruginous layer and samples of rock matrix from which spherules were macerated (Mathur et al., 2005b). In present investigation Mössbauer spectroscopy is extended to study the samples of phosphatic sediments as a function of depth lying below the ferruginous layer to see the variation in the iron minerology with respect to ferruginous layer. Before discussion of results, it is

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Aspidella: the Ediacaran body fossil from the Jodhpur Sandstone of the Marwar Supergroup, Sursagar area, Jodhpur, western Rajasthan, India

Aspidella: un fósil de cuerpo blando ediacárico de la Arenisca de Jodhpur (Supergrupo de Marwar), área de Sursagar, Jodhpur, Rajasthan occidental, India

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ABSTRACT

This paper describes well-preserved Aspidella remains, the Ediacaran body fossils from the Jodhpur Sandstone of the Marwar Supergroup in Sursagar area, Jodhpur, western Rajasthan, India. They show distinct morphological features previously described in other famous Ediacaran fossil sites, such as the Fermuse Formation of Newfoundland, South Australia and White Sea of Russia

Keywords: Aspidella; Jodhpur Sandstone; Ediacaran; Rajasthan; India.

RESUMEN

Se describen en este trabajo los restos bien conservados de Aspidella, fósiles de cuerpo blando ediacáricos de la Arenisca de Jodhpur (Supergrupo de Marwar) el área de Sursagar. Jodhpur, al oeste de Rajasthan. India. Éstos muestran características morfológicas características descritas anteriormente en otros famosos yacimientos fósiles ediacáricos, como los de la Formación de Fermuse (Terranova), Australia meridional y el Mar Blanco de Rusia.

Palabras clave: Aspidella; Arenisca de Jodhpur; Ediacárico; Rajasthan; India.

Introduction

Results

The present paper describes well-preserved *Aspidella* remains, the Ediacaran body fossils from the Jodhpur Sandstone of the Marwar Supergroup in Sursagar area, Jodhpur, western Rajasthan, India. The Jodhpur Sandstone is the basal and significant group of the Marwar Supergroup (MSG). The Marwar Supergroup was earlier described as Trans-Aravalli Vindhyans as it is occurring on the western side of the NE-SW trending Aravalli Mountains, and occupies a large area in the northwestern Rajasthan (Pareek, 1984; Chauhan *et al.*, 2004). It is up to 1000 m thick, unmetamorphosed

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New Record of Ediacaran Biota from the Jodhpur Sandstone of Marwar Supergroup, western Rajasthan, India

Nuevo registro de la biota ediacárica en la Arenisca de Jodhpur (Supergrupo de Marwar), Rajasthan occidental, India

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ABSTRACT

In western Rajasthan, India, the Jodhpur Sandstone of the Marwar Supergroup has yielded a new Ediacaran fossil assemblage comprising macroscopic well-preserved specimens of *Aspidella*, *Hiemalora*, large Ediacaran discs, *Tirasiana disciformis, Medusinites asteroides, Anfesta*-like Ediacaran body fossils and microbial mat structures (*Arumberia banksi, Kinneyia* mat structures, wrinkle mat structures and other mat structures). The fossil record allows suggesting a broad correlation with the Fermuse Formation, Newfoundland, South Australia, White Sea of Russia and Norway, and regionally correlated with the Bhander Group of Vindhyan Supergroup and Krol Group of Lesser Himalaya

Keywords: Jodhpur Sandstone; Soft-bodied metazoans; Mat structures; Ediacaran.

RESUMEN

En el oeste de Rajasthan, India, la Arenisca de Jodhpur (Supergrupo de Marwar) ha librado un nuevo conjunto fósil ediacárico que comprende especímenes macroscópicos bien conservados de *Aspidella*, *Hiemalora*, grandes discos ediacáricos, *Tirasiana disciformis*, asteroides de *Medusinites*, fósiles de cuerpo blando ediacáricos similares a *Anfesta* y estructuras de tapices microbianas (*Arumberia banksi*, estructuras microbianas de tipo *Kinneyia*, estructuras microbianas arrugadas y otras estructuras microbianas). El registro fósil permite sugerir una amplia correlación con la Formación de Fermuse, Terranova, Australia meridional, el Mar Blanco de Rusla y Noruega, y la correlación regional con el Grupo de Bhander (Supergroup de Vindhyan) y el Grupo de Krol del Himalaya Interior.

Palabras clave: Arenisca de Jodhpur; Metazoos de cuerpo blando; Estructuras microbianas; Ediacárico.

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A MOSSBAUER STUDY OF UNUSUAL GOLDEN COLOUR MICA FROM HIGH HEAT PRODUCING GRANITE OF MALANI IGNEOUS SUITE, NORTH-WEST, INDIA

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Abstract

Mossbauer study of an unusual golden coloured mica from the high heat producing granite, Malani Igneous Suite has been performed at 300° K. Result shows presence of the unique four Fe¹⁺ doublets for the first time ever in any mica. The four Fe¹⁺ doublets occur probably because of the presence of a mixed type of octahedral layers, one like that in the common mica and the other containing impurities.

Keywords: Mossbauer, Golden Mica, High Heat Producing Granite, Malani Igneous Suite

1. Introduction

Mossbauer studies have been performed to understand many aspects of geological sciences; for example coal (Tripathi and Shrivastava, 1990; Shrivastava et al., 1992) Petroleum (Tripathi et al., 1998, 2009) Meteorites (Shrivastava, et al., 1997; Tripathi, et al., 2000) and Polymetallic Nodules (Shrivastava et al., 2009).

The Malani Igneous Suite in north-west India comprises of many high heat producing granites (HHP) (Shrivastava et al., 2013, 2014, 2017, 2018). The golden coloured mica has been recovered from one such HHP granite occurring near Binawas, located about 45 Km east of the city of Jodhpur.

It occurs as an accessory mineral of almost 6 mm diameter and pentagonal in shape. The essential minerals in the host granite observed in hand specimen are quartz, orthoclase and plagioclase. Biotite represents an accessory mineral with flakes almost of the same size as of the golden coloured mica. The golden coloured mica offered the opportunity to determine the Mossbauer spectroscopic parameters and spectra for comparison with the common mica.

2. Experimental

For Mossbauer spectroscopic studies absorbers were prepared by sandwiching the sample powder ($\simeq 50$ mg cm²) of golden mica between two thin paper discs of 25mm diameter in a sample holder. The Mossbauer spectroscopy consisted of an electro-mechanical drive in a constant acceleration mode. A proportional counter with accessory electronics was backed by an 1k channel analyser. The radiation source was 10m Ci, "Co in Pd matrix. The spectrum was recorded at 300°K (room temperature) in transmission geometry. The spectrum was analysed using a program in which the spectrum was assumed to be the sum of Lorentzians. Isomer Shift (IS) was observed with respect to centroid of the standard (25 µm) α -iron foil absorber. The solid line in the spectrum corresponds to the computer fitted curve while hollow squares represent the experimental points.

Result and Discussions

The Mossbauer Spectrum of the unusual golden coloured mica is presented in Fig. 1 and the Mossbauer parameters are given in Table 1. The minimum value of χ^2 (goodness of fit parameter) was obtained assuming the presence of four quadropole doublets. The attempt to fit more or less than for quadrupole doublets will always result in poor values of ² (2.0 per degree of freedom).

In Table 1, IS and QS values corresponding to Fe³⁺ suggest that Fe³⁺ present at octahedral sites is in the high spin state. There are four Fe³⁺ doublets present, marked as I, II, III and IV in Fig. 1.

Previous investigations carried out on both, dioctahedral and trioctahedral mica have indicated the presence of maximum two Fe³⁺ doublets in octahedral sites, one with a large QS value centred around 1.00 mm

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A LABORATORY STUDY OF CONDUCTIVITY OF PYRITES FROM EARLY DIAGENESIS TO HIGH GRADE METAMORPHIC GEOLOGICAL CONDITIONS

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Abstract

A sophisticated procedure and technique have been adopted in the laboratory to determine conductivity of the mineral pyrite by developing a suitable conductivity cell. The pyrite samples showing a range of temperature and pressure in geological environments have been collected from two different mines. Sedimentary pyrite showing early, middle and late diagenesis were collected from a pyrite mine at Amjhore. Metamorphosed pyrites are from the Dariba-Rajpura polymetallic sulphide mine covering the range of mild to high grade metamorphic association. It is concluded that conductivity of the pyrite samples determined in the laboratory is inversely proportional to the original temperature of their formation under geological conditions.

Keywords: Pyrites, Conductivity, Sediment on pyrite, Dariba-Rajpura mine, Temperature-Pressure

1. Introduction

The electrical properties of pyrite have been investigated since 1928 and reviewed several times (Harvey, 1928; Smith, 1942 and 1947; Tellces, 1950; Parasnis, 1956; Fischer and Hiller, 1956; Hill and Green, 1962; Vaughan and Craig, 1978; Seehra and Seehra, 1979). Smith (1947) had suggested that pyrite formed at high temperatures were more thermometrically positive than those formed at low temperatures under natural geological conditons. Later, Fischer and Hiller (1956) had proposed that this correlation will only be qualitative and dependent upon the trace elements incorporated in the pyrite lattice. these presumably, also being dependent upon the temperature of formation of pyrite. Hill and Green (1962) had further used thermoelectricity and resistivity to correlate only two types of pyrite samples formed at low and high temperatures in geological environments. Hill and Green (op.cit.) had also indicated a tentative correlation between Cu and/or Mo content in both pyrite types with their high resistivity.

None of the earlier studies, however, could cover the wide geological range of the origin of pyrites in terms of increasing diagenetic stages or metamorphic grades. Moreover, in most of the previous attempts, either sophisticated techniques and procedures were not available or had not been used. Also earlier studies had not given consideration to the associated base metal mineralization with pyrites. In the present work a study of conductivity was performed on pyrite samples which have been collected from a wide range of geological conditions covering early diagenesis to high grade metamorphism. The samples also represent association with rich, poor or no mineralization of base metals.

2. Theoretical Background

The energy band theory of solids is developed from the concept of nearly free electrons moving in the periodic potential of the atom cores which is a well known fact in physics. This is achieved because when a group of atoms is brought together to form a solid, the individual electronic energy levels of the separate atoms 'over lap' to form bands of closely spaced energy levels. The study of electrical properties of any solid provides information on the electrical conduction mechanism. The simple band for solids has shown the existing difference between insulator, metal and semiconductors (both, intrinsic and extrinsic).

Metals exhibit high conductivity, which is associated with the overlapping of valence band and conduction band (for a partly filled band). At room temperature the conductivity is largely dependent on impurities and lattice defects in metals and there is no forbidden energy gap between valence band and conduction band.

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LEAD NITRATE TELEOST CHANNA PUNCTATUS AFTER 24 HOURS OF EXPOSURE TO HISTOPATHOLOGICAL CHANGES IN THE KIDNEY OF A FRESHWATER

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(Accepted 23 March 2018)

in renal tubules and vacuolization in mesenchymal cells of the kidney of Pb(No2),- treated fish, Channa punctanus. However, in C and pH at 7.5. No food was given to the fishes after treat. It was observed that there appears to be slightly degenerative changes measured about 30 ± 0.5cm in length and 225 ± 1 gm in weight. They were kept in water with temperature maintained at 28.5 (Bloch) following the administration of Pb(No₃), (concentration 5.15mgl⁻¹) for 24 hrs. Fishes under taken for experiments ABSTRACT : Present studies include the toxicity induced changes in the kidney of a freshwater fish, Channa punctatus

Key words : Channa punciatus, Pb(No3), histology.

NUTRODUCTION

this in mind this work has been done to find out better now are not showing any direct conclusion so keeping Fernandes et al, 2016). However, results carried out till Puvaneswari, 2013; Dutta et al, 2015; Mary et al. 2015; workers only (Jha et al. 2012; Mohanambal and haematological changes have been described by the few nitrate in relation to biochemical, histopathological and the lead nitrate toxicity in fishes. Study of toxicity of lead Shrivastava, 2006) but still there is less known data about (Banerjee and Bhattacharya, 1994; Gupta and histopathological work has been done by various scientists for human being (Shukla and Tripathi, 2012). Some transfers the nephrotoxins as it is widely used in the food affected creatures of such contaminated water which al, 1980). Among the aquatic fauna, fishes are the most gastro-intestinal, renal, and nervous systems (Gerber et intoxication may cause anaemia and disorders of the Seth, 2000; Kar et al, 2008; Begum et al, 2009). Lead which affects the aquatic flora and fauna (Kumar, 1989; the cartherust and may contaminate aquatic environment the metabolism of living organisms. It occurs naturally in polluting element which can cause major impairments to Lead nitrate is considered as a heavy metal toxic

MATERIALS AND METHODS

30 cm of length and 225 gm in weight were brought from The two fishes, Channa punctatus of approximately

control and second one fish was exposed to lead nitrate experiment. One of the fishes was not treated as it is the laboratory for 2-3 days and then treated for the the local fish market. These fishes were acclimatized in

DPX for permanent preparation. Hacmatoxylin and Eosin for result and then mounted with decreasing order of alcohol series and then stained with These slides were transferred into the xylene and then microtome with 5-10 µ and then spread on the slides place. These blocks were cut with the help of rotary finally into the wax and then block preparation takes bue notation xew + energy neutron notation energy + torio strics (30, 50, 70, 90 and 100%). 100% alcohol solution and processed for paratifin embedding through Afterwards, tissues were washed in the 0.6% saline 10% neutral formaline solution for next 12-24 hours. taken out. The pieces of the kidneys were kept in the given to the fish and then the kidneys from the fish were Before sacrificing the fish, a local anaesthesia was

RESULTS AND DISCUSSION

dose 5.15 mgl 1 for 24 hours.

degenerative changes in proximal tubules (PT), distal pathological changes (Plate 1, Fig. 1). Slightly treated fish, Channa punctatus showed marked In the present study, lead nitrate in kidney of 24 hrs

severe necrosis and spaces in Bowman's capsule were vacuolization of mesenchymal cells (MEC), which include

under (DT) and collecting tubules (CT) and

RUSEARCH COMMUNICATIONS

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donial³ and from the Upper Cretaceous Kirtland Formation of San Juan Basin, New Mexico¹⁴. The wood-boring Asthenopodichnium trace fossils from these localities are small. U-shaped or pouch-like burrow structures in wooden, organic-rich siltstone or on bone substrates^{10,11}.

Formation, Utah, USA¹², Subsequently, A. lignorum was recorded from Early Miocene of Didot Island, New Cale-

boring trace lossils have also been reported as A. lithuanicum, from Neogene coal layer in nortreastern Lithuania¹¹ and A. xylobiontum from Late Cretaceous Wahweap

Austria¹⁰. The pouch-like Asthenopodichnium wood-

xylobionum were described from Late Neogene wood in

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freshwater environment. Initially, the ichnogenus As-

mon allow about wood-boring trace fossils from

Cretaceous and Neogene deposits of Germany^{3,9}. All these reports were from marine sediments. However, very

number of modern insect families were reported from

ments1-7. Later, the diverse insect records matching the

reported from the Carboniferous and Early Permian sedi-

GLOBALLY, the oldest wood-boring trace fossils were

Keywords: Asthenopodichnium, freshwater environ-

BHF suggest freshwater fluvial sedimentary environ-

to enotional guinead-liseof one trace forma libride libride of

ing and dwelling burrows produced by Mayfly nympton and parae. The sedimentological and parae.

fungi, whereas A. lithuunicum are interpreted as feed-

ing and dwelling burrows produced by wood-rotting

lignorum trace markers are considered to be the feed-

nated as Asthenopodichnium lithuanicum. The A.

whereas lozenge and J-shaped structures are desig-

tures identified as Asthenopodichnum lignorum,

packed, pouch-like burrows or almond-shaped struc-

thenopodichnium trace fossils are locsely to tightly

Barmer Basin, Western Rajasthan, India. The As-

ments of the Barmer Hill Formation (BHF) in the

-ibse sussessed and more muintainopointers lizzo

The present study documents the wood-boring trace

C. P. Khichi¹, A. Soni¹, Saurabh Mathur¹ and

S. C. Mathur', N. S. Shekhawat', S. L. Nama²,

Formation, western Rajasthan, India

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"Department of Noology, Jan Watain Vyas University.

lliH nomned of the Barmer Hill

The wood-boring trace fossil

Libril, 242 005, India

V. S. Parihar^{1.*}

Department of Geology, and

ment, trace-fossils, wood-rotting fungi.

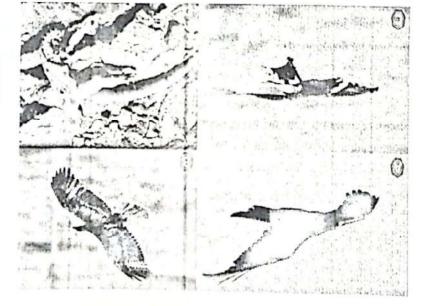
ment with humid to sub-humid climate.

CURRENT SCIENCE, VOL. 114, NO. 7, 10 APRIL 2018

Bird-o-soar

BONELLIS EAGLE

Records of predation on Varanus griseus and Ptyonoprogne concolor by Aquila fasciata in Agolai, Jodhpur, India



IUCN Red List: Least Concern (BirdLife International 2016)

21 May 2018

LIO #

Images of Bonellitis Eagle at Agolai, Jodinpur. (A) ventro-lateral view (B) dorsal view from top (C) a fresh predation of Dusky Crag Martin catch in flight (D) another predation of a Desert Monitor was sighted near to the Bonellific Eagle nest

Prey-predator interactions are rarely observed in the field, and most attempts to identify and quantify their occurrence have focused on a narrow range of species. Raptors typically hunt and kill their prey. Small lizards and trogs are preyed upon by a great variety of animals (Duellman & Trueb 1986; Greene 1988; Zug 1993). Here we have recorded a predation upon Desert Monitor Varanus griseus and Dusky Crag Martin Ptyonoprogne concolor by Bonelli's Eagle Aquila fasciata in Thar Desert of Rajasthan.

Bonelli's Eagle is known to be a characteristic local and scarce resident breeding raptor species in countries surrounding the Mediterranean Sea and the Middle East (Gensbol 1987; Rocamora 1994). This raptor is also found commonly in the

> eave [Class of Birds]

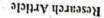
Accipitriformes [Order of diurnal birds of prey]

Accipitridae [Family of Hawks and Eagles]

Aquila fasciatus [9lgs∃ s'illeno8]

Species described by

Volume 3, Issue 1, pp: 71-76, 2018 International Journal of Zoology and Applied Blosciences



CONSERVATION EFFORTS FROM RAJASTHAN, INDIA NEAR THREATENED TO LEAST CONCERN: BLACKBUCK

Ram Prakash Saran¹ and Renu Meena^{2*}

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VBSTRACT

among 19 districts. The total population of blackbuck in Rajasthan including protected area is estimated to be over thirty carlier Near Threatened category. In India, blackbuck is distributed across 15 states and in Rajasthan; it is distributed including Rajasthan have placed blackbuck in the Least Concern category in Red Data Book published by IUCN from an almost threefold upsurge in blackbuck population in this region. Due to conservation efforts across the country conjoint. The mutual efforts of Forest Department, Rajastinan and local communities for the protection of wildlife lead to Rajasthan is land where conservation is religion. In many sites peaceful cohabitation between humans and wildlife is

hunting out of season, and killing endangered animals. have been convicted of offences related to poaching, endangered. Since the Act was developed, many people widespread and led to each of these species becoming elephants, blackbucks, Gazelle and leopards was the Act, hunting of threatened species such as tigers, cnsure the protection and management of wildlife. Prior to incidental thereto. The act provides the basic framework to plants and for matters connected therewith or ancillary or The act provides the protection of wild animals, birds and wildlife legislation in India, came into existence in 1972. The Wildlife (Protection) Act, a landmark in the history of

For multiple reasons, Rajasthan has perhaps one of India's nature for its sustainable use and ecological significance. of native people living around these sites which protects the wildlife and largely it is the result of combined efforts some extent this is possible due to traditional acceptance of peaceful coexistence between humans and wildlife. To frequently come across numerous sites that portray a we pass through the length and breadth of India, we and other elements of nature like the sun and the moon. As In India, people respect trees, animals, forests, rivers

Government College, Kota -324001, Rajasthan, India, Email: renumeena@outlook.com Corresponding author: Ms. Renu Meena, Research Scholar, Department of Zoology,

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Keywords: Antelope, Community, Forest, Population, Protection.

NOLLODUCTION

a safe haven. even the endangered Great Indian Bustard, find the village chinkaras, and birds like vultures, partridges, peacocks and that exists in their villages. Animals like blackbucks and living being on earth. So they protect the entire ecosystem consider trees as sacred, but their empathy extends to every tree species. Various local communities including Bishnois used primarily for grazing of wildlife with the protected The state has the "orans", sacred pastures and woodlands land, have characterized the state (Meena et al., 2017a). Several types of sacred spaces, mostly in forest and pasture most widespread traditions of community conservation.

posching of blackbuck are prohibited under Schedule I of of Wild Fauna and Flora (CITES). In India, hunting and Convention on International Trade in Endangered Species uend (IUCN 2017) and is included in Appendix III of the this animal as-Least Concern with increasing population and the order Cetartiodactyla. The IUCN Red list has listed classified under the subfamily Antilopinae, family Bovidae Kåla Hiran in Hindi. Taxonomically blackbucks are member of the family Bovidae. It is called by the name stylish gazelle-like antelope regarded as the best-looking Blackbuck (Antilope cervicapra) (Linnaeus, 1758) is a



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Distribution, ecology and conservation status of blackbuck (Antilope cervicapra): An update

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Abstract

Introduction

Taxonomy

communities and forest department of India, the population is increasing in various habitats. They feed on fresh tender leaves, grass, crops, cereals, vegetables and leaves of shrubs and trees. Due to combined efforts of Seasonal food availability and its quality, the sun elevation and temperature of the area are important factors for foraging activity. variation in its diploid chromosome number. The Blackbuck is native to India and can be seen in the majority of Indian grasslands. sharp sexual dimorphism - adult males are dark with long spiral horns while female and fawn are yellowish brown. They show Blackbuck is the most elegant member of the antelope family. It has long association with Indian culture. Male and females have

Keywords: breeding, genetics, mythology, taxonomy, threats

:sajaadsqns	1. Antilope cervicapra cervicapra
:satoads	brigosicios equinta
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:Anmeldus	Antelopinae
:Alime?	Borridae
Order:	Artiodactyla
:sselassi	Eutheria
:ssuloduð	Theria
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:unjája	Chordata
:mobgail	eileminA

Fig 2: Systematic position of blackbuck

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India has two subspecies of blackbuck namely [8]

1. Antilope cervicapra cervicapra [9]

.eibnl lo sheq in Tamil Nadu and Karnataka in south and Bengal in eastern divergent, with a relatively open spiral. It is distributed mainly narrowed above the eye. Homs are relatively short, not very.» side running all down the limbs to the hoofs, white eye- ring short and fine hair. In males body colour is dark of the upper It is smaller in size as compared to second subspecies. It has

segments; white eye-ring broad all around the eye. Homs little or no extension of the dark colour from the upper limb breeding season, with a grey sheen; shanks largely white, with It is larger, with longer, roughened pelage; males, in the 2. Antilope cervicapra rajputanae [10]

species belonging to the genus Antilope 14. 51. The generic subfamily antelopinae. The blackbuck is the only living

Blackbuck belongs to order Artiodactyla, family bovidae and

Fig 1: Common name of blackbuck in different Indian languages

Blackbuck: Common names

and krishnasaar (in Hindi); krishna jinka (in Telugu); and Indian antelope (in English), kadiyal, kala hiran, krishna mrig and Andhra Pradesh. Common names for the blackbuck are the male. Blackbuck is the state animal of Punjab, Haryana brown to black colour of the dorsal (upper) part of the coat of subcontinent [1]. The general name "blackbuck" refers the dark ungulate species of antelope native and endemic to the Indian The blackbuck (Antilope cervicapra) is a medium-sized

italai maan, velimaan (in Tamil) (Figure 1) [2. 3].

Marathi: Kalweet

Gujarati: Kaliyar/Redi

Telugu: Krishna jinka

nsem ileV ,neem islan :limeT

Hindi: Kala hiran, Krishna Mrig

equipation Antelope

goat") [6,7]. The systematic position of blackbuck is Figure 2. composed of the Latin words cervus ("deer") and capra ("sheantalopus ("homed animal"). The specific name cervicapra is name of Antilope cervicapra is derived from the Latin word

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Research Article

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DIFEPTIDYL PEPTIDASE-IV IMHIBITION AND EX-VIVO ANTIOXIDANT POTENTIAL DIFEPTIDYL PEPTIDASE-IV IMHIBITION AND EX-VIVO ANTIOXIDANT POTENTIAL

maß Breef Hear Singh and Heera Ram

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ABSTRACT

inhibitors with antiperoxidative potential and can be developed as therapeutic molecules for type 2 diabetes type 2 diabetes mellitus. The result of present study reveal that extracts of WS and TFG contains novel DPP-IV possess some novel DPP-IV inhibitors like phytocompounds and can be developed as therapeutic molecules for the T. Joenum. The result of present study ravel that W. sommifera, T. Joenum and B. purpurea plant extracts purpurea extract was reported to inhibit DPPH free radicals and inhibited erythrocytes haemolysis in higher than B purpured (63.5±0.78%) as compared to standard drug i.e. sitagliptin (96.5±1.26%). II. (887.0±2.58) baruquq B In (%80.0±0.20) munsol. T lo tedi nent inerter extent than that of T. Joenum (0.54.0±0.98%) and investigated for their potential to serve as a natural source of DPP-IV inhibitors. Methanolic extract (1 mg/ml) of we isolated the different bioactive fractions from Withania somnifera. Trigonella foenum, Bauhinia purpurea were phytosteroids etc, act as DPP-IV inhibitors, which is a novel potential for the treatment of type 2 diabetes mellitus; study, we were isolate and quantified some of the phytocompounds such as alkaloid, flavonoids, phenolic and compounds of natural derive could be, at least moderately, explained by the inhibition of DPP-IV. In the present protection against chronic disease. The efficiency of certain antidiabetic plants contains some bioactive drugs discovery. Photochemical have been found to possess a wide range of activates which may help in as particularly remedy for diabetes by local people through utilizing traditional knowledge and are source of new liaw ar sinomiar plants peculiar kinds of phytocompounds uses for various kinds of ailments as well

KEYWORDS: Dipeptidyl Peptidase-IV inhibition. Erythrocytes hemolysis, Phytocompounds, Antioxidant, Type 2 diabetes mellitus.

been in existence for several centuries.[6] oved inenU bne edbbic, Siddha and Unani have been in vague from ancient times. The indigenous system several medicinal plants to cure specific ailments has communities. In India, the use of different parts of importance in health care of individuals and which is valued by human beings because of their great defensive molecules give plants their medicinal value quinines), and flavour (Capsacin),^[5] However, these plant odour (terpenoides), pigmentation (tannins and and herbivores. However, some of which may involve in molecules against predation by microorganisms, insects substances (Metabolites) are used by plants as defensive olitemote bosisonings of T letor of 10 %01 and seel least 12.000 have been isolated, a number estimated to be the dointy of the metabolites, of which at Plants have a vast ability to synthesize aromatic

The purpose of standardized extraction procedures for crude drugs (medicinal plant parts) is to attain the

INTRODUCTION

explained by the inhibition of DPP-IV [1-3] extracts of natural origin could be, at least partially, diabetes and the effectiveness of certain antidiabetic IV) inhibitors are potent mediators for the therapeutics of clinical therapy regimens. Dipeptidyl peptidase IV (DPP. efficacy to synthetic oral hypoglycemic agents used in as particularly to DPP-IV inhibition with comparative floras have been confirmed to have antidiabetic activity the new bioactive drugs isolated from hypoglycemic Additionally, through the previous few years, some of have established the assistances of medicinal plants. patients around worldwide and many scientific studies Conventional herbal remedies have been used by T2DM amending metabolic irregularities. Similarly, the adjourning the development of diabetic problems and therapeutics of type 2 diabetes mellitus (T2DM) by Medicinal plants play an imperative role in the

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RESEARCH ARTICLE

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erate star

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Kroepted 19 December 2017 Fevised 22 November 2017

KEYWORDS

5101 testicular histo-architecture; density; sperm motility; reproductive toxicity; sperm Diclofenac sodium; male ment altered reproductive metabolic status, androgenic activities and histo-architecture of the testis of and renal function parameters significantly. In conclusion, it may claim that diclofenac sodium treatseminiferous tubules, particularly in higher doses. Diclofenac sodium treatments also altered hepatic fenac exhibited varying degrees of degeneration testis, abnormal histo-architectures, and shrinkages in resticular cell population dynamics were lowered in a dose-dependent manner. Administration of diclobre visits more count, sperm density (in epididymis and testic), sperm motility and tives. Diclofenac sodium treatment significantly (p ≤ 0.001) reduced weights of testis, epididymis, ventral dynamics, serum biochemistry, histopathology, and hematology were investigated as per aimed objecrespectively for 30 days. Alterations in body and organ weight, sperm and resticular cell population muibos censol to pa/pm0.1 bns pa/pm0.0.0 (control) or local participation of diclofenac sodium, sodium on a male reproductive system of rats. Four groups of healthy adult fertile male rats were environmental issues. The present study was aimed to assess the dose-dependent toxicity of diclofenac and inflammation. It is also particularly associated with its adverse effects on avian fauna and linked to Diclofenac sodium is widely used in the non-steroidal anti-inflammatory drug in the treatment of pain

male rats and induced hepatotoxicity and renal toxicity.

Introduction

ductive system of vertebrates including rodents is not prop-Whereas, the influence of diclofenac sodium on a male reproation (Oaks et al. 2004, Hussain et al. 2008, Jain et al. 2009). vulture's species and claimed for vulture population declincaused toxic effects on the hepatic and renal tissues of been proved through several studies that diclofenac sodium Hussain et al. 2008, Jain et al. 2009, Chen et al. 2014). It has for avian fauna as well as other vertebrates (Oaks et al. 2004, nesulloq lesnamorivna prinatenti e se bagrama sed sen et al. 2010, Aprioku et al. 2014). On the other hand, dicloteprocess of angiogenesis and apoptosis stimulator (Mayorek especially COX-2 and it has been reported to decrease the thesis through inhibition of cyclooxygenase (COX) enzymes; 2012). Diclofenac acts by diminishing prostaglandin (PG) synsurgery pains, trauma, and dysmenorthea (Thanagari et al. arthritis, degenerative joint disease, ankylosing spondylitis, complications such as treatment of inflammation, theumatoid 2016). In clinical practices, it is primarily used in multiple gesic agent (Small 1989, Malhotra et al. 2013, Vohra and Raut -lene bne vrotemmeitni-itne lebiotete-non beeu vlnommoo edt Diclofenac sodium, a phenyl acetic acid derivative, is one of

interestingly, it has been reported that exposure to drugs, etty invested (Moskovitz et al. 1987, Adegbegi et al. 2014).

the toxicological point of view, it is very important to know duction (Thanagati et al. 2012, Vohia and Raut 2016). From toxicants, analgesics might have caused alterations in repro-

C 2018 Informa UK Limited, trading as Taylor & Francis Group sibni "nentreden "Tooste undreden generen in 🖸 Department of Zoology, Jai Narain Vyas University, Jodhpur 342001, Rajasthan, India

sodium administration was not investigated, so far on male Ashmawy 2013). Furthermore, the influence of diclofenac -I3 bne (webbem-I3) (Siciency endeavy and Elpound which inhibits secretion of gonadotrophin indirectly the pituitary luteinizing hormone incentive; any drug or coment. Whereas, the biosynthesis of androgens is regulated by that the function of the testis is primarily androgen dependrelatively noticeable (Moskovitz et al. 1988). It is renowned, or indirectly where the mechanism of action diverges classes of substance affect spermatogenesis likewise straight the testis is compliant or not reversible. The substances or ductive system in overall and exactly whether the function of this motive, one must know the effect on the male reptothe disturbance depend on the process being distupted. For reproductive status because the severity and reversibility of the mechanism by which chemicals or drugs interfere in male

muibos seried out to assess the influence of diclofenac sodium

reproductive health and profiles. Therefore, the present study

dose-dependent effects, if any. on male reproductive profiles of rats and to ascertain the

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Experimental animals

by examination of reproductive profile obtained from the used for present study. All animals were proven for fertility Healthy adult male albino rats, weighing 150-200g were

Research Article 1117-1790 - Inilig 1680-001Z - DUII00

Vol 11, Issue 10, 2018

KABBITS, AN EXPERIMENTAL STUDY CARDIOVASCULAR SYSTEM, TOXICITY, AND HEMATOLOGY ON HYPERLIPIDEMIC DROLECTIVE EFFECT OF CUMIN (CUMINUM CYMINUM L.) SEED EXTRACT ON

THORUTA NORSA , NAHOUD ATA HOROTOM

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Breelved: 18 May 2018, Revised and Accepted: 22 June 2018

LOVHISHV

rypertipidentic rabbits. Objective: The present study is related with the assessment of anti-atheroscierotic efficacy of 70% EtOH extract of cumin seed in dist-induced

At the end of experimental period, the serum biochemical, hematological, and histological analysis of thoracic aorta was done. (ethanolic extract) of cumin seed extract for 45 days (Group III). Another set of animals was treated with atorvastatin, the standard drug for 45 days. Methods: Rabbits were rendered hyperlipidemic by oral administration of cholesterol for 15 days. Then, the animals were treated with 70% Ecol

Erron and atorvastatin decreased the plaque size and restored the luminal size of the aorta to normal. in a normal range. Histological analysis showed that cholesterol administration caused a narrowing of the aortal lumen while treatment with 70% Results: The cumin seed extract w served to contain hypolipidemic effect by reducing plasma cholesterol, low-density lipoproteins, and triglycerides level. While toxicological annues suggest no adverse effect on renal and liver function tests, hematological parameters were also observed

Agolotemod bne Agolotid Autimationd murae no rollo ovilited Conclusion: The present study suggests that commonly used cultuary spice cumin seed possesses hypolipidemic and cardioprotective effect with a

© 2018 The Authors. Published by Innovare Academic Sciences Put Ltd. This is an open access article under the CC BY license (http://creativecommons. Keywords: Atherosclerosis, Hyperlipidemia, Cumin seed, Cardioprotective.

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system, aromatic plants have always been important and being used lenisibon inhibiting constituents [8]. In traditional medicinal hyperlipidemia as they have been reported to possess lipid digestion plants and their ingredients can act effectively for the management of herbal medicines for some aspects of primary health care [7]. Dietary Studies suggest that 4 billion people (about 80% population) prefer less or none side effects and the answer relies on herbal medicines. expensive, Hence, there is a need to find an effective, reliable drug with is an important treatment [6], but these surgical alternatives are very suggested to undergo cardiovascular surgery. Cardiovascular surgery If the condition of atherosclerosis goes more severe, the patients are .[2] aimente and the state of t associated muscle symptoms), rarely rhabdomyolysis, statin-induced -niters) agemeb reluce muscular damper station -ning effects [4]. Side effects of statin are labeled as statinpleiotropic effects and thus long-term consumption of statin causes isoprenoid compounds, so the inhibition of this enzyme results in lebiorate, which acts as a precursor of many other non-steroidal liver [3]. However, as the main end product of HMG-GoA activity is level by competitively inhibiting HMG-CoA reductase enzyme in the and reliably used drug as it directly lowers the serum cholesterol bile acid resins. Among these remedies, the statin is the must widely involves statin (HMG-Co-A reductase inhibitors), fibrates, niacin, and endothelial cells, lymphocytes, monocytes, and smooth muscle cells [1]. Cardiovascular disease (CVD) contract or atherosclerosis past years [2]. Current allopathic drug theory of a destribution gnibulant liew lasses and an earlous cell types in the vessel wall including of the arterial intima, which occurs due to an intricate interaction of noisnedya guol-abcaab a savioval sizeralazoradia to noitatinit yliadolg Wibidrom bue Wilerrom to nosean guibeal aff sailrahm zizoralizoratio

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Committee (Reg No.: 1646/GO/Re/12/CPCSEA).

in desiccation for future use in experiments.

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METHODS

sych 21 rollio powder at the dose of 500 mg/kg.b.wt./ab/usolved in 5 ml of coconut Rabbits were rendered hyperlipidemic by the oral dose of cholesterol time to the state of the state

lecidal protocol was approved by the Institutional Animal Ethical

standard pellet diet and fresh green vegetables and drinking water. The

25°C temperature, and 40-50% relative humidity and were fed with

-02, solute wire gauge cages in a room with 12:12 h light-dark cycle, 20-

I days before the onset of the experiment. Animals were kept in clean,

obtained from the certified institute. Animals were acclimatized for

New Zealand white rabbits weighing between I and I.25 kg were

dried to obtain the brown-colored sticky extract. The extract was stored

the extract. After complete removal of ethanol from the extract, it was

and temperature and then distilled to remove excess of ethanol from

Soxhlet apparatus for 24 h. The extract was treated under low pressure

the local market. 70% of ethanolic extract was prepared with the use of

Dried and cleaned seeds of the C. cyminum (Linn.) were bought from

adherosclerotic effect of cumin seed extract on cholesterol-fed rabbits.

present work is focused on exploring the cardioprotective and anti-

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for a long time [9]. Cuminum cyminum Linn, is one of the important

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ТІНОЯЛЧ ХОНІТ*, АЗНОК РОВОНІТ

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Received 21 May 2018, Revised and Accepted. 11 July 2018

LDVH1SHV

Objective: The present study was designed to examine the anti-hypothyroid activity of Withania somnifera (Ashwagandab)'s leatextract on 6-n-propyl-Z-thio-uracii (PTU) induced hypothyroid rats

Method: Ethanolic extracts of W sommlern leaf and Eltroxin were administrated to PTU induced hypothyroid rats. The animals were dwided into control. PTU treatment. W sommlern leaf extract treatment, and Eltroxin treatment groups for 60 days. The serum T, and T, were estimated, and bioedsemical and homatological parameters of the blood serum were also evaluated.

Results: PTU induction caused a significant decrease (ps0.01) in T, and T, level when compared with the control group. Adverse effects of PTU were also observed in blood sugar, cholesterol, alkaline phosphate, protein, albumin, globulin, liver function test, and renal function test, parameters. Nonsignificant changes in LFTRFT and Other parameters were observed. W50minitera's feaf extract and Elinoxin treatment, group recovered both of the thyroid hormone secretion as compare to control.

Keywords: 6-n-Propyl-2-thio-uracil, Hypothyroid, Withania sommifera, Eltroxin.

© 2018 The Authors, Published by Innovare Academic Sciences Pvt Ltd. This is an open access article under the CCBY license (http://creativecommons.org/licenses/by/4, 0/) DOI: http://dx.doi.org/10.1273/ajpcr2018/1111.27424

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grading of bomie si yburs sidf, ster blorythogyd boahai UT9 or trading teal avaluations. W to faulte after an unsurround a manufaulting of W summieru leaf extract on hypothyroidism. Therefore, we have cure hypothyrothism. This study is designed to evaluate the effect of aboving an bose are uniformation and the stood .[41,E1] sastessib roors have a compound name withanolides which can cure many of animal, and it can increase the sectors T₁ and T₁ significantly. Its of the body too [12]. Withinia somnifera can effect on antioxidants These extracts have antioxidants and these can affect the metabolism [11] sizoralizarial earlier diseases like athenosciencies [11]. [10]. These plant products can control the basal metabolic rate of the and low toxicity as compare to synthetic drugs, e.g., Bamboo shoot tay been derived from various plants, having anti-thyroidal activity punoduna antipeoid letava2 brutol osla si misibiory/hogy/n a sipuborq ruelq to strothe off no nonegueorni emos hus methorythodyt euro hypothyroid treatment. Ayurveda suggests that some plant products of the standard from the stand most guited of the standard for the aront suff. [9] yeahod of to thighwy yood owned and in escorant me bue tilgiow yood in noiso touses the reduction in body weight and oilt se dans zuegao leity aft agemeb ma nixoryth. J. straffa abis agusa usage of the synthetic drug can cure the hypothyroidism, but they thyroid hormones secreted by the thyroid gland [8]. Long duration for hyperthyroidism because it can decrease the amount of both controlled [7], Whereas, 6-n-propyl-2-thio-uracil (PTU) is prescribed T, and T, level in blood serum so that thyroid gland activity can be is recommended for hypothyroidism, actually, this drug elevates the thyroid hormone metabolism is observed [6]. Synthetic leveloyroxine int agnetic [5]. Even during pregnancy time, a significant change in function [4]. Hypothyroidism causes the disturbance in body weight defect [3]. Thyroid hormone is a powerful modulator of cardiac lenomrod signize nedr rather notzenuteyb lenomrod xalqunos a si methory the normal need of the body [2]. The hypothyrothism It is defined as a condition when the level of the thyroid hormones Hypothyroidism is one of most the common endocrine disorder [1].

METHODS out whether W sommiftera leaves can increase Serum $T_{\rm s},T_{\rm s}$ level and affect the thyroid gland activity positively.

Extraction of plant material

W sommjøru plant's leaves were collected from Jodhpur Rajasthan state, India, and scientific identification was done in the Department of Botany, Jai Marai Vyas University Jodhpur. These leaves were extracted with 70% ethanol for 24-36 h by Soxhfet extraction method. Then, ethanol was separated under reduced pressure to obtain a blackash dark brown crude residue which was dissolved in distilled water and orally administrated to the animals.

stemine laboly

Wistar rate (150–250 g) were purchased from Cortrified Institute Protocols for animal care, maintenance and experiments were followed given by Animal Ethical Committee (1AEC, Reg ne. 1646/GO/Re/12/ polypropylene cages containing corn-cob bedding and maintained at approximately 25–28° F on a 12-b light/dark cycle. For the animal adaptability, all rats had been fed for 1 week before the experiment. Rats wererandomly divided into four groups.

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Hypothyroidism was induced in cuthyroid rats by administration of PTU at the dose of 10mg/kg in drinking water as well as orally for 30 days.

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Effrontin was used as a standard drug to cure - hypothyroid that was orally administrated at the dose of 0.5 µg/100 g hody weight dissolved in 50 mL of distilled water.

WING JOURSAL OF PRARMACEUTICAL AND CLINICAL RESEARCH

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Vol 12, Jssue 1, 2019

АРРКОАСН ACACIA SENEGAL BARK EXTRACT IN REGULATION OF HYPOTHYROIDISM: AN EXPERIMENTAL

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Received: 24 July 2018, Revised and Accepted. 04 September 2018

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6-n-propyl-2-thiouracil (PTU)-induced hypothyroid albino rats. in the street of the multiple of the second process of the street of the street of the street of the second street

thyroxin levels, organ's weight, and serum biochemistry were carried out were divided into control, PTU, and A serregist back extract treated and standard drug Elitoxin-treated groups for 60-day experimentation. The serum stemation of a structure of a senegal back was given to PTU-induced hypothyroid albino rats at the dose of 500 mg/kg body weight. The animals

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Keywords: Acacia senegal bark, Hypothyroid, 6-N-propyl-2-thiouracil, Eltroxin.

org/hccnscs/by/4.0/) DOI http://dmh.doi.org/10.22159/appcr2019.v1211.28709 © 2019 The Authors Publiched by Invested and Sciences Pvt Ltd. This is an open access article under the COBY license (http://creativecommons.)

NOLLOGOBLINI

to draver congenital hypothyroidism that affects the growth of thyroid hormone metabolic disorder which occurs during pregnancy gain, and poor ability to concentrate [4]. It is also the most common of signs and symptoms such as depression, anxious mood, weight remains normal or decreased [3]. Hypothyroidism has a number (T) aninorythohourt bue (T) aninorythohourust muses to level is recognised with increased level of serum TSII in the blood, but the or hypothyroidism. Mild thyroid failure or subclinical hypothyroidism syncoloni si nonevele sidi bne elevele of strats H2T mures lo level edi hypothyroidism. When the thyroid gland does not function property. according to the level of endocrine dysfunction as primary or central on the basis of occurrence with time as congenital or acquired, and basiriogates et meibiorythodyth, meibiorythodyth travo of featinfadue 4.6% prevalence of hypothyroidism. It may extend from mild or mode si anoth half balancey III stated that there is about treated by a synthetic thyroid hormone. The Third Vational Health bue boold off ai lovel another thyroid hormone level in the blood and si meibiorytem failure or subclinical condition [2]. Hypothyroidism is or proj keu upinyw europaxku jo arejs realo si majoryhuodyh In India, approximately 42 million people suffer from thyroid disease. [1] nottebraten diworg leaizyd hue leanan it gnifuzer nottebborg yield low trifodothyronine (,T) and tetraiodothyronine (T,) hormone double (H2T) onormoid gaudelumits-biorget to lovel transitius and of men. It is not only caused by cluster of iodine deficiencies but also due ncil) nomow stroidis da which allests more women that

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st area to cure diseases without any side effects. Thus, there is On the other hand, there are many plant products suggested by stood oper stand of the stand o -gnot out ze flow ze [d] flozfi oznovih odt nudt letnomrtob od ven doidw sgurb offodfave for studied as a substitute for synthesis of ages which si sostosip to ybomor oth in sincig to yrissoon oft inosorg is

guralized mutas drive basylene albino rats as a working model, if any Serum T, and T, levels were in merbiorythogyd beaubini-(UT9) haeniodd-S-lygorg-a-8 no faetiye shed loganes. A to isequitation seques with the impact of A-senegal bark thyroid hormone is still not known properly. Keeping these things in and also antidiabetic property [10], but its effect on alorsed-time Indorstantine [8] abruow has zotozbad ficart of beau bue sinchizoitan emitinos shed logonos. A tudi bartoqor osli, sew it [7] shiolosife bus , annuque , annula, , and alkoloida [7]. It of the Thar Desert Hz bark, seed, leaves, fruit, and gum contain Remark, and Rfaudrahaa, is found in drought or and regions Acuela senegal L (Fabaceae) tree, commonly known as Gum Arabic. han stoolly obre on to asol drive gurb rank wan a golovob of boon a

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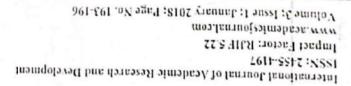
Extraction of plant material

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Reg. No. 1646/60/Re/12/CPCSEAL DEAD involution of the second structure of the protocol (DEC) palates supplemented with multivitation and water ad history. The but traits believed to balanced distribution when and bun ideal à 21.21 daw 3200-04 in vibinand (0°1±45) suareseques kept in polypropylene cages measuring 12"*10"*8" under controlled arow elemint. Johorn gundrow en bosu erow g.025-021 mode gundgiow aneas yolved ongoing to subsystem rates, size onidic flubs while the

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Possibilities to establish ecotourism for the conservation of biodiversity in Viratra Mata Oran, Barmer

Vishu Vaishnav, K Kumar, Dr. GR Parihar

Department of Xoology, Faculty of Science, LW.V. University, Jodhpur, Rajastian, India

Abstract

Feotourism comes with a guaranteed promise to promote visits to natural areas, to make a good contribution towards biodiversity, econocrabing, learning about the natural resources. We can protect and preserve nature. This paper summarizes a case study on Virtura Man. Dame: Barmer whether there is possibility to establish ecotourism and to what will be success rate of the same. The Virtura Man. Dame: Barmer whether there is possibility to establish ecotourism and to what will be success rate of the same. The of ecotourism in Virtura mata Oran, Barmer, Conclusions have been drawn by properly analysing the data and expressing it into of ecotourism in Virtura mata Oran, Barmer, Conclusions have been drawn by properly analysing the data and expressing it into study uses a random sampling method to gather the data for a careful group interview and observations to evaluate the possibilities of ecotourism in Virtura mata Oran, Barmer, Conclusions have been drawn by properly analysing the data and expressing it into soft sheet format. Mong with that images are also provided to support the conclusion drawn.

Keywards: ecotourism, biodiversity, conservation, communities

Introduction

Ecotogrism is an economically, socially and environmentally sustainable activity that reliably and genuinely connects visitors with natural and cultural landscapes resulting in valuable exchanges among these landscapes, the community, and the visitor. Fourian that involves traveling to relatively unobatineted natural areas with the specified object of studying and enjoying the securety and its flora and fauta, as well as any existing cultural traits found in these areas may be well as any existing cultural traits found in these areas may be well as any existing cultural traits found in these areas may be

called Ecotontism. (Ahmed, 2013) ^[1] Ecotonism is an enlightening matural travel experience that contributes to the conservation of ecosystem while representing the integrity of the host community (Seace et al., representing the integrity of the host community (Seace et al.,

na explanation of matural environment and to matural sectoration of matural environment (2001) ⁵³

2020.01 Moist toarigm in tentural areas today is not ecologicat and is more therefore, suppertable. Ecological is well-known by lis emphasis on conservation, education, transfer concern and emphasis on conservation, speculation, and active community contribution.

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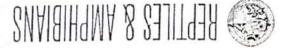
Polision border. It is also considered as the second largest

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and located between altitude 234m. latitude 25° 27° to 48.2N

The Viratra Mata Oran, Dhok village hus 1859 hoctors area

Fducational modules for both the traveller and local



Some Snakes of the Arid and Semiarid Regions of the Thar Desert in Rajasthan, India

Rakesh Kumawar¹ and Ashok Purohitz

Department of Noology, Jai Marain Vyas University, Jodhpur, India, 5+2001 (mieshophia@gmail.com [corresponding aution] "Department of Noology, Jai Marain Vyas University, Jodhpur, India, 542001 (purohit+11@redifficual com)

Khajuwala, and Mokha; sites in Jaisalmer District were Polchran, Jaisalmet, Lathi, Desert National Park, and Mohangarh; and in Jodhpur District, sites were Jodhpur, Balesar, Dechu, Lohawat, Osian Bilara, and Bap. We characterized habitats as stabilized dune, barren dune, grassland, agricultural fields, rocky terrain, Indira Gandhi Canal area, and urban land (Fig. 2). All strakes were examined, identified using the available literature and diagnostic keys (Smith 1943; Whitaket and Captain 2004; R.C. Shatma 2007), and released in suitable nearby habitat.

During the study period, we recorded 219 snakes of seven species (four families) with principal areas of occurrence in desert habitat. Relative abundance and habitat associations are illustrated in a matrix plot (Fig. 3).

> H abitats in the arid terrain of the That Desert of Rajasthan trange from agriculturally productive areas to true desert (K.K. Shatma and Mehra 2009). Although these conditions provide suitable conditions for many species of snakes, available information on distributions and habitat selection is available information on distributions and habitat selection is et al. 2015).

> Herein, we provide locality records and data on the habitat of seven species of snakes encountered during time-constrained searches conducted by two or three persons at 19 sites in three districts (Fig. 1) every three months from September 2015 to August 2019. Sites in the Bikaner District were Bikaner, Kolayat, Shridungargath, Poogal, Jorbeer-Gadwala Conservation Reserve.

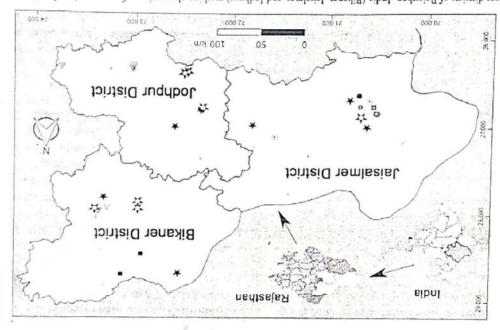


Fig. 1. Map of three districts of Rajasthan, India (Bikanet, Jaisalmet, and Jodhput) marking observations of seven species of sankes in arid and semiarid regions of the That Desert: (*) Sindh Awl-headed Snake (Lytothynebus paradoxus). (*) Clossy-bellied Racet (Planyteps ventromatulatus). (*) Red-sported Royal Snake (Spalrosophis arenarius). (*) Black-headed Snake (Spalerosophis arriveps), (*) Afro-Asian Sandasake (Planyteps ventromatulatus). (*) Sindh Royal Snake (Spalrosophis arenarius). (*) Black-headed Royal Snake (Spalerosophis arriveps), (*) Afro-Asian Sandasake (Planyteps ventromatulatus). (*) Sindh Saw-scaled Viper (Echis carimatus sochureks), and (*) Sindh Krait (Bungarus sindamus). Created using QGIS desktop version 2.2.0 (Open Source Geospatial Foundation (OSGeo]).

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Analysis of Soil Quality Using Physico-Chemical Parameters with Emphasis on Fluoride from The BackfilledMining Areas of Sanu Mines, Jaisalmer, Rajasthan, India.

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Abstract: Soil samples from were collected for analysis from the dumping areas of Sanu mines, district Jaisalmer, Rajasthan. Inhabitants, cante and some crop species which are sensitive to fluoride toxicity of this tehsil suffer from fluorosis. Soil samples were collected ton meter was used for estimation of fluoride. Fluoride ion concentration in soil Selected ion meter was used for estimation of fluoride. Fluoride ion concentration in soil samples varied from 1.0pm to 8.23ppm.

Keywords: Fluoride; Physico-Chemical; Parameters; Subsoil Water; Soil Dumps

I. INTRODUCTION

required for building of protein, photosynthesis, fruit quality and reduction of diseases and matter required for the growth of plant. Potassium is used for flowering purpose, it is also physicochemical properties such as moisture content. Nitrogen, phosphorus and organic depends on the concentration of N, P, K, organic and inorganic materials, conductivity. The texture, bulk density, chloride, fluoride and % moisture content. The fertility of the soil Nivogen (N), Phosphorus (P2O3) and Potassium [K2O]. pH, Electrical conductivity, soil is carried out for the studies of various parameters like total Organic Carbon, Available that are sensitive to changes can be used as indicators to improve soil quality. Analysis of soil in soil and the only way we can develop specific fertilizer recommendations. Soil properties important Sumitima [2]. Soil testing is the only way to determine the available nutrient status chemical properties influence the behaviour of soil and hence, knowledge of soil property is depth to surface of the earth, and provides a medium for plant growth Thakre [1]. Soil physicdefinite chemical, physical, mineralogical and biological properties, having variability from rocks, alteration of soil strata, consisting of inorganic and organic constituents, possessing layer of plants. Soil developed as a result of paedogenic processes through weathering of Soil is a vital component, medium of unconsolidated nutrients and materials, forms the life

photoconter required for the growth of plant. Potas required for building of protein, photosynthes phosphate is used for growth of roots in plants.



Revegetaion at Restored Disturbed Mining Area of Giral Mines, Barmer, Rajasthan, India.

N'SYROUGH

² Department of Zoology, Faculty of Science, for Narain Vyas University, Jodhpur 342 005, India ² Dept. of Zoology, Faculty of Science, for Narain Vyas University, Jodhpur 342005, Rajasthan, India. Email: anti-bania@gmail.com, vimi_sheoran@ydhoo.com Email: anti-bania@gmail.com, vimi_sheoran@ydhoo.com

A. Bawa

Wide-ranging lignite mining in the Indian (Thar) Desert inaugurated within the historical time. Associated mining of this treosured resource there have been noticeable, important environmental impacts. The subsequent land degradation has provoked concern from both public communy and governing badies. This research evaluates the success of restoration plane applied to revegetate a restored disturbed lignite mine area, near the village of that in western Rajosthan State Restoration surgees with presh regional disturbed lignite mine area, near the village of that in western Rajosthan State. Restoration surgees with presh regional statisticates of aband. (2) use of their limitations of this northwest indian hotsurgees with presh regional statisticates of aband. (3) use of their limitations of the marks and cover the backfilledsurgees with hesh regional statisticates of aband. (3) use of their weater storage systems (3) sci. profile alteration surgees with hesh regional statisticates of aband. (3) use of their limitations of self-perpetuation and their statisticates indicate the resulting vegetative cover will be capable of self-perpetuation under nature and sets. The average content of organic carbon methods; (4) plant establishment methodogrees, and (5) the selection. J appropriate native species (1) reces, shrubs and surgees with hesh results indicate the resulting vegetative cover will be capable of self-perpetuation under nature and the seconditions. The average form of a lignite carbon development of angle and carbon second to all and indice the about a set of abard. The selection of and the selection of an and second of angle and surgees are the result of a statisticative cover will be capable of self-perpetuation under nature and the average content of angle in an nature and has high electrical conductance. The average content of anglen and the result of restored approximate and a selective statisticative cover will be average content of anglen in and the restored approximation and restored

on the long-term intensive core of restoration backfilling restoration, environment, restoration success, rain water harvesting system. האראסינלא: Lignue mining, revegetation backfilling, restoration, environment, restoration success, rain water har

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Mining includes destruction in the environment, construction of deep swallow holes, damage biodiversity, contamination of soil, groundwater, and soil surface by chemicals from mining processes. Mining disturbs the natural environment and soil struts. Mining areas stored by lew methods like revegetation, preserving the usually require the removal of vegetative cover combined with the stripping of topsoil, overburden, and vegetative cover combined with the stripping of topsoil, overburden, and induge materials. These activities, along with the construction of access roads, usually result in severe induge materials. These activities, along with the construction of access roads, usually result in severe induge materials. These activities, along with the construction. Without proper management and disturbance or destruction of soil structure, landscapes, and vegetation. Without proper management and tregulation, additional adverse impacts change the habitat. India ranks third in the world in coal and lignite production and vegetation. Without proper management and proper management and proper management and production and disturbance or destruction of soil structure, landscapes, and vegetation. Without proper management and regulation, additional adverse impacts change the habitat. India ranks third in the world in coal and lignite production and materials.

of the total annual giobal production (IHM, 2001). Vegetation cover is a crucial component of terrestrial ecosystems, especially in arid and semi-arid regions, which must be sustained by sufficient water (Hadley and Szarek, 1981; Lehouerou, 1984). The vegetation dynamics concerning space and time are, therefore, primarily dominated by the availability of water (Elmore et al., 2006; Li et al., 2001]. Due to the exaggerated mining activities during the most recent 10 years, the Gital area is mostly had dried up after excavation, which, consequently, led to a severe decline of vegetation cover area is mostly found tried up after excavation, which, consequently, led to a severe decline of vegetation cover and drastic changes in plant community structures along the underground water and artificial pond area of and drastic changes in plant community structures along the underground water and artificial pond area of

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in Correlation with Meteorological data Seasonal Incidence of Insect Pests on Mungbean (Vigna radiata)

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Meyr), galerucid beetle (Madurasia obscurella, Jacoby) and

and Maruca testulalis, Geyer), torhicid moth (Cydia ptychora,

phaseoli, Tryon), pod borers (Helicoverpa armigera, Hubner

Fab.), green bug (Vezara viridula, Linn.), stemfly (Ophiomyra

(Bemisia tabaci, Genn.), semilooper (Plusia orichalcea,

moth, Pruthi), thrips (Caliothrips indicus, Bagnall), whitely

insect pests noted on mungbean involve jassid (Empoasca

Bemisia tabaci was major pest during summer season. The

Ophiomyia phaseoli on mungbean and urdbean of which

Bemisia tabaci, Empoasca kem, Aphis craccivora and

(Panchabhavi and kadam, 1990) Dar et al. (2002) reported

pests act as a limiting factor in production of mungbean

elevated losses to the crop and its production. Hence insect

Many insect pests attack mungbean crop causing extremely

in Correlation with Meteorological data. Agricultural Science Digest

Seasonal Incidence of Insect Pests on Mungbean (Vigna radiata)

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L Gehlot, A.K. Prajapat

TOARTERA

in India. Various species of insect pests are infested to mung bean crop and cause very harmful effect to crop and farmer. These pests witamin and mimerals therefore human uses it in various ways in food. Mung bean crop cultivated in kharil, rabi and summer season Background: Mung bean is important pulse crop in India due to its nutritional value. Its grain contains protein, fat, carbohydrate,

recorded by counting number of pests on 2 upper, 2 middle and 2 lower leaves of a plant whereas population of aphid was recorded Randomly selected 20 plants from weekly interval to record population of insect pests. The population of Jassid and whitefly was during kharit season 2019. Mung bean was grown on a plot size of 25 m x 25m with 50 cm row to row and 20 cm plant to plant spacing. Methods: Field experiment was carried out for the study of seasonal incidence of insect pasts on RMG-62 variety of green gram decrease productivity and quality of mung bean

listrist dive notelation with maximum aperession of the persent of the persent of the maximum aperation with taining the persent of the perse whitefly had positive correlation with humidity, whereas jassid population had positive correlation with minimum humidity and negative and Diaphania indica. The population of aphid, jassid and whitely positively correlated with temperature. Population of aphid and also infested green gram, these were Mylabris pustulate, Helicoverpa armigere, Trichoplusia ni , Lampides beeticus, Spoladea recurvalis to severy size of insect peaks (10.1 jassid) fisher of insectively. Simultaneously size species of insect peaks leaves/plant, respectively. Peak mean population of aphid, jassid and whitefly reached during 36th standard week with 10.2 aphid/ 0/yfletinw 1.5 bne tneld/sevesi 8/biszel 6.0 diw dew brebnets 22" standard during 32" standard week with 0.0 jassid/binde e.0 Result: The mean population of aphid, jassid and whitefly were recorded incidence of aphid started during 33" standard week with by counting number of aphid on 10 cm twig/plant.

Key words: Aphid, Insect pests, Jassid, Mungbean, Sessonal incidence, Whitefly

NUTRODUCTION

biscuits (Sehrawat et al. 2013). fresh sprout, seeds used for making soups, bread and carbohydrate (Hussain et al. 2011). It is also consumed as Mungbean grains contain 24.2% protein, 1.3% fat and 60.4% to presence of protein, vitamin and mineral (Das et al. 2014). It is used as fresh green pods, dry seeds as vegetables due (8002 le le dev chickpea and pigeon pea (Ved et al. 2008). Aungbean or green gram, Vigna radiata is important pulse

17.19 lakh hectare area and production is 7.42 lakh tones in India during 2017-18. In Rejesthan, mungbean grown in per cent of production is largest mungbean producing state and Telangana. Rejasthan with 42.23 per cent area and 39 Karnataka, Tamil Nadu, Gujarat, Andhra Pradesh, Odisha are Rajasthan, Madhya Pradesh, Maharashtra, Bihar, mungbean production comes from 10 states of India. These tones and yield 472 kg/hectare. More than 80 per cent of 4.26 million hectare with an annual production of 2.04 million producer and consumer of mungbean, which is grown in the and semi-and regions of India. India is the largest ni nworg dron seluq thent there are a needenum

nitrogen fixation and increase soil fertility (Sharar et al. 2001) raintall, rapid growth, early maturation, restore soil fertility by to drought tolerance, grow in harsh climate and minimum Mungbean grow easily in Rajasthan because it has ability

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JODHPUR, RAJASTHAN, INDIA POPULATION STATUS OF DEMOISFLLE CRANES IN SATLANA WETLAND

Meenakshi Meena*, Kuldeep Garg and Ashok Kumar Jaipal

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area for winter month and showed local diurnal migration which requires conservation attention. because of the ideal habitat condition of the study area for avilauna. In conclusion these migratory birds inhibited the wetland in February to March. The result of the current study showed that sadiana harbored high diversity and species composition India. The present study recorded these birds reach at satiana wetland in September to October in flocks of 1200-1600 and leave During migration, it travels more than 2000 km. in 5 to 7 days and reaches the wellands, agriculture fields, stubble fields in crane in varied habitats. Direct observation of demoiselle crane and discussion with local people in the study area were made. cranes were observed from September 2019 to December 2020. The random transect method was used to study for Demoiselle main objective of this study was to assess the population status of the demoiselle crane at Satlana village, Jodhpur. Demoiselle ABSTRACT : Wedands support a huge kind of faunal diversity by providing them suitable habitat, alongside food and water. The

Key words : Demoiselle crane, bird, diversity, richness, wetlands, Jodhpur.

also de la factoria de la companya d 03895.2021.24.000 in Salana Weiland Jodhpur, Rajasthan, India, J. Exp. Zool. India 24, 000-000. DocID: https://connectjournals.com/ How to cite : Meenakshi Meena, Kuldeep Garg and Ashok Kumar Jaipal (2021) Population status of demoiselle cranes

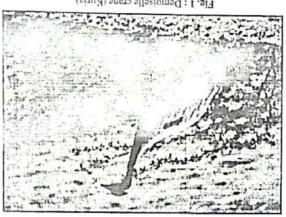


Fig. 1 : Demoiselle crane (Kurja)

(Gehlot et al, 2020). the religion, faith, culture, and attitude of local people

historical places means safety to them, after harvesting Favorable temperature, climate and area surrounded by the Marwar region. the availability of food grains. The affinity of Jodhpur pulls these migratory birds to

the fields the entire chain of tood pulls them up here

INTRODUCTION

Jungles, seas, caves etc. all places of the highest altitudes, high peaks, deserts, recological significance for avifauna. They occupy almost Wetland habitats in the India and whole world have great (Mitsch and Gosselink, 1986; Guadagnin et al, 2005). their species diversity and regulating the ecological web Wetlands are an important area for birds and in supporting includes all major groups of animals including birds. smains or the ped to flourish a variety of living organisms Gosselink, 1986). The habitat features of the wetland or seasonally covered with shallow water (Mitsch and aquatic and terrestrial systems, which are permanently Wellands are ecosystems intermediate between

to That Desert is due to their conservation is etched in (Koskimies, 1989). The eternal attachment of Demoiselle to major factors and can be observed relatively easily environments such as rural ponds because they respond of the most significant indicators of the health of diversity, particularly the migratory birds. Birds are one The Thar Desert of Rajasthan is the heaven for avian