Shodh Darpan
An International Research Journal

A Quarterly International Research Journal

Peer Reviewed Journal
Indexed with Google Scholar, SJIF, JIF

SPECIAL ISSUE PART-I

Proceedings of
International Seminar on
Emerging skill development trends in the field of
Sciences, Social Sciences & Education

15 TO 17 JANUARY 2016

KNOWLEDGE PARTNERS   SPONSORED BY

BASTAR UNIVERSITY   JILA PRASHASAN   CHHATTISGARH COUNCIL
OF SCIENCE & TECHNOLOGY

International Seminar on Emerging skill development trends in the field of Sciences, Social Sciences & Education

15 TO 17 JANUARY 2016

Peer Reviewed Journal

Patron

Rev. Dr. Paul T. J.
Principal

Convener

Dr. Anita Nair
Research & Publication Cell

Editor-in-Chief

Dr. Ashim Ranjan Sarkar
HOD, Dept. of CS & IT
Christ College, Jagdalpur, Dt. Bastar (C.G.)

Co Editor-in-Chief

Mrs. Siji Jestus John
Asst. Prof, Dept. of CS & IT,
Christ College, Jagdalpur, Dt. Bastar (C.G.)

MESSAGE

It is heartening to know that Christ College, Jagdalpur is going to organize an International Seminar on January 15-17th 2016. The theme of the Seminar is '*Emerging Skill Development Trends in the field of Science, Social Sciences and Education*'.

I believe that the deliberations of the Seminar would go a long way in determining the role of advancement and innovation in this field. I wish the event and the souvenir a grand success.

(Dr. Raman Singh)

केदार कश्यप

मंत्री
छत्तीसगढ़ शासन
आदिम जाति तथा अनुसूचित जाति, पिछड़ा वर्ग
अल्पसंख्यक कल्याण एवं स्कूल शिक्षा विभाग

अर्द्ध शासकीय पत्र क्र. ....

निवास   : सी-3, फॉरेस्ट कॉलोनी, राजातालाब
             रायपुर (छ.ग.)
दूरभाष : (निवास) 0771-2331032, 2331033 (F)
             (कार्यालय) 0771-2510906, 2221106

रायपुर, दिनांक ....

शुभकामनाएं...

महाविद्यालय के सद्प्रयासों से प्रथम 'अंतर्राष्ट्रीय संगोष्ठी' आयोजन की सूचना से हर्षित हुआ।

प्रसन्नता है, कि संगोष्ठी का विषय **"Emerging Skill Development Trends in the Field of Sciences, Social Sciencs and Education"** सामयिक एवं राज्य की हमारी प्राथमिकताओं एवं आवश्यकताओं के अनुरूप है। मैं आशान्वित हूँ, कि संगोष्ठी के निष्कर्ष, शोधपत्रों की प्रस्तुतियां, राज्य के हमारे कौशल उन्नयन कार्यक्रम को गुणवत्तायुक्त एवं परिणाम मूलक बनाने में हमें समर्थन एवं सहायता प्रदान करेंगे।

संगोष्ठी में सहभागिता कर रहे समस्त प्रतिभागियों का छत्तीसगढ़ एवं बस्तर क्षेत्रवासियों की ओर से हार्दिक अभिनंदन है।

मेरी कामना है, कि संगोष्ठी में विचार-विमर्श, चिंतन एवं शोध प्रस्तुतियों की दिशा लोकहितकारी हों। मेरी अपेक्षा है, कि संगोष्ठी के महत्वपूर्ण विषय एवं श्रेष्ठ परिणाम अर्जित करने के यत्नों के, व्यापक प्रचार-प्रसार की समुचित व्यवस्था अवश्य की जाय।

पुनः क्राईस्ट महाविद्यालय के सद्प्रयासों हेतु बधाई एवं साधुवाद! कार्यक्रम की सफलता एवं **'शोध दर्पण'** के सफल प्रकाशन हेतु मंगलकामनाएं.....

(केदार कश्यप)

प्रति,
प्राचार्य
क्राईस्ट महाविद्यालय
जगदलपुर, जिला बस्तर (छ.ग.)

संतोष बाफना

विधायक, जगदलपुर वि.क्षे. 86
सचेतक, भाजपा विधायक दल, छ.ग.

निवास : सदर स्कूल के सामने,
सुभाष वार्ड, जगदलपुर (छ.ग.)
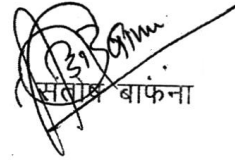दूरभाष : (07782) 222111

क्रमांक/ Q /विधायक/2016   जगदलपुर, दिनांक : 11./01./2016

संदेश

मै यह जानकार अभिभूत हूँ कि नगर के अग्रणी काईस्ट महाविद्यालय के द्वारा "Emerging Skill Development Trends in the Field of Science, Social Science and Education" विषय पर दिनांक 15 जनवरी से 17 जनवरी 2016 तक अंतर्राष्ट्रीय संगोष्ठी का आयोजन किया जा रहा है। इस अंतर्राष्ट्रीय संगोष्ठी से बस्तर के विद्यार्थियों को विशेष लाभ प्राप्त होगा ऐसा मेरा विश्वास है।

यह प्रसन्नता का विषय है कि इस अवसर पर महाविद्यालय द्वारा शोधार्थियों के शोध कार्यों को शोध पत्रिका एवं पुस्तक के रूप मे प्रकाशित किया जा रहा है। शोध पत्रिका के प्रकाशन से राष्ट्रीय एवं अंतर्राष्ट्रीय स्तर पर बस्तर की प्रतिभाओं को पहचान मिल सकेगी।

संगोष्ठी एवं शोध पत्रिका के प्रकाशन की सफलता के लिए मेरी हार्दिक शुभकामनाएं.......

संतोष बाफना

डॉ. शिवकुमार पाण्डेय
कुलपति

Dr. S.K.Pandey
Vice-chancellor

Raipur, Dated: December 14, 2015

MESSAGE

I am happy to learn that Christ College, Jagdalpur is conducting an International Seminar on "**Emerging Skill Development Trends in the Field of Sciences, Social Sciences and Education**" from January 15-17, 2016.

I wish all the success to the participants and the stakeholders of the above. May Bastar which is known as "A Sleeping Giant", wake up and spread its rays all over the World.

(Dr. S.K. Pandey)

Fr. Dr. Paul Joseph
Principal
Christ College, Jagdalpur
Dist. Bastar (Chhattisgarh)

MESSAGE

It is a matter of immense pleasure to know that Christ College Jagdalpur is going to conduct one day International Conference on *"Emerging Skill Development Trends in the Field of Sciences, Social Sciences and Education,"* on January 15-17th, 2016 sponsored by CHHATTISGARH COUNCIL OF SCIENCE & TECHNOLOGY , RAIPUR.

Skill is valuable for our livelihood, survival and existence. It works better when it is coupled with experience, knowledge or wisdom. It is the test of man, moment and environment. It ensures the participation of a large number of eminent thinkers, teachers, researchers, educationists and students on this joyful occasion. It will have a meaningful impact on the partakers and would also be an important contribution in the direction of development of Emerging Skill Development Trends in the Field of Sciences, Social Sciences and Education. I am quite confident that the scholars will come out with valuable suggestions and recommendations which will be good for the nation and the people.

I wish that the discussion, deliberation and discourse on the given topic of the Conference would cover a wide range of sub-topics and themes that are relevant to teaching, research extension & Evaluation. It will also come out with concrete recommendations to improve and enhance the quality of Higher Education. I wish all the best to all the participants and guests, dignitaries and delegates in their personal and professional endeavours. I do hope grand success for the International Conference and I also visualize great future for the college.

(Professor N.D.R. Chandra)
Vice-Chancellor
Bastar University, Jagdalpur
(Chhattisgarh)

दिलीप वासनीकर
आई.ए.एस.
कमिश्नर

कार्यालय कमिश्नर बस्तर संभाग,
जगदलपुर
दिनांक   13.1.2016

<u>शुभकामना संदेश</u>

मुझे यह जानकार अत्यंत हर्ष है कि प्रदेश तथा बस्तर संभाग के उच्च शिक्षा के क्षेत्र में अग्रणी काईस्ट महाविद्यालय, जगदलपुर के द्वारा दिनांक 15 से 17 जनवरी 2016 तक **An Emerging Skill Development Trends in the Field of Sciences, Social Science and Education** विषय पर अंतर्राष्ट्रीय संगोष्ठी का आयोजन किया जा रहा है।

मुझे आशा है कि महाविद्यालय द्वारा अंतर्राष्ट्रीय शोध पत्रिका ''शोध दर्पण'' के विशेष अंक में संगोष्ठी में शामिल हो रहे शोधार्थियों के शोध कार्यों का संकलन तथा लेख को पुस्तक के रूप में भी प्रकाशित किया जावेगा, जिसका लाभ महाविद्यालय में अध्ययनरत छात्र-छात्राओं को मिलेगा।

संगोष्ठी के सफल आयोजन हेतु मेरी तथा प्रशासन की ओर से हार्दिक सुभकामनाऍं।

भवदीय
13.1.2016
(दिलीप वासनीकर)

प्रति,

प्राचार्य,
काईस्ट महाविद्यालय,
जगदलपुर, जिला-बस्तर,(छ0ग0)

राजेन्द्र झा
जिला शिक्षा अधिकारी,
जगदलपुर, जिला—बस्तर(छ.ग.), भारत

संदेश

यह जानकार मुझे अत्यंत प्रसन्नता हुई कि हमारे छत्तीसगढ़ के बस्तर संभाग में क्राईस्ट महाविद्यालय, जगदलपुर के प्रयास से An Emerging Skill Development Trends in the Field of Sciences, Social Sciencs and Education विषय पर पहली बार अंतर्राष्ट्रीय संगोष्ठी का आयोजन तक किया जा रहा है ।

इसके साथ ही यह भी गौरव का विषय है कि इस संगोष्ठी के शोध पत्रों के संकलन को अंतर्राष्ट्रीय शोध पत्रिका ''शोध दर्पण'' के विशेष अंक में प्रकाशन किया जा रहा है । इसके अलावा इस संगोष्ठी में आए विद्वानों के लेख को पुस्तक के रूप में भी प्रकाशित किया जा रहा है ।

आशा है कि इस तरह के प्रयासों का समाज एवं छात्र—छात्राओं के बौद्धिक अभिरूचि को बढ़ाने में बहुमूल्य योगदान होगा ।

संगोष्ठी के सफल आयोजन तथा शोध—पत्र एवं पुस्तक के प्रकाशन पर महाविद्यालय परिवार को मेरी हार्दिक शुभकामनाऍ ।

राजेन्द्र झा
Distt. Edu. Officer
Jagdalpur (C.G.)

प्रति
    प्राचार्य
    क्राईस्ट महाविद्यालय,
    जगदलपुर,
    जिला—बस्तर (छ.ग.)

Editors

- Dr. Mrs. Hansa Shukla, Principal, Sw. Shri Swaroopanand Saraswati Mahavidyalaya, Bhilai, C.G.
- Dr. Aruna Pillay, Asst. Prof, Christ College, Jagdalpur, C.G.
- Mr. Sushil Kumar Sahu, Asst. Prof, Christ College, Jagdalpur, C.G.
- Mr. Abhishek Shukla, Researcher, IBM, New Orchard Rd Armonk, NY
- Mrs. Anushka Banerjee, Sr. Manager, IBM, New Orchard Rd Armonk, NY
- Dr. Swapan Kumar Koley, Associate Professor, Bastar University, Jagdalpur, C.G.
- Dr. Arvind Agrawal, Academic Staff College, Pt. Ravishankar Shukla University, Raipur, C.G.
- Mr. Abdul Samad, Researcher, Allahabad, U.P.
- Mr. T. Gu, RMIT University, Melbourne, Victoria, Australia
- Dr. P.K.Dewangan, HOD, Physics, Govt. NPG College, Raipur. C.G.
- Dr. Sharad Nema, SOS, HOD, Forestry, Bastar University, Jagdalpur
- Mr. M.K.Biswas, Retired Chief Manager(NFL), Palta, New Barrackpore, West Bengal
- Dr. Vinod Kumar Pathak, Associate Prof, Govt. P.G.College, Dhamtari, C.G.
- Dr. Anita Nair, Asst. Prof, Christ College, Jagdalpur, C.G.
- Dr. Kaushilya Sahu, Asst. Prof , M.V.P.G.College, Mahasamund, C.G.
- Mr. Nurul Haque, Astt. Prof, Christ College, Jagdalpur, C.G.
- Dr. Anand Murti Mishra, SOS, Asst. Prof., Anthropology, Bastar University, Jagdalpur, C.G.
- Dr. Vinod Kumar Soni, SOS, Asst. Prof, Forestry, Bastar University, Jagdalpur, C.G.
- Dr. Rosamma Jacob,Asst. Prof, Christ College, Jagdalpur,C.G.
- Mr. Sohan Kumar Mishra, Asst. Prof, Christ College, Jagdalpur, C.G.
- Dr. Vijay Lakshmi Bajpai, Asst. Prof, Christ College, Jagdalpur, C.G.
- Dr. Jessie Jose, Asst. Prof, Dept of Education, Christ College, Jagdalpur , C.G.
- Mr. B.N.Sinha, Asst. Prof, Govt. K.P.G.College, Jagdalpur
- Ms. Nadia Ahad, Rani Durgawati University, Jabalpur. M.P.
- Dr. Arvind Agrawal, HRDC, Pt. Ravishankar Shukla University, Raipur
- Mr. Tuneer Khelkar, Asst. Prof, Govt. K.P.G.College, Jagdalpur

Index

Index

Index

SDIS-001

Big Data for Economic Development: From Information – Economic - Knowledge

B. Ravi Kiran Patnaik[1], Dr. Ashok Bhansali[2], K. Sujatha[3] & Mr. Vijay Sarati[1]

[1]ICFAI University, Raipur, *b.ravikiran@hotmail.com*
[2]OPJIT, Raigarh, *bhansali00@gmail.com*
[3]*Sujatha_1566@gmail.com*

Abstract

This research article uses a conceptual framework to systematically review literature and empirical evidence related to the prerequisites, opportunities, and threats of Big Data Analysis for development. On the one hand, the advent of Big Data delivers the cost-effective prospect to improve decision-making in critical development areas such as health care, employment, economic productivity, crime and security, and natural disaster and resource management. This provides a wealth of opportunities for developing countries. On the other hand, all the well-known caveats of the Big Data debate, such as privacy concerns, interoperability challenges, and the almighty power of imperfect algorithms, are aggravated in developing countries by long-standing development challenges like lacking technological infrastructure and economic and human resource scarcity. This has the potential to result in a new kind of digital divide: a divide in data-based knowledge to inform intelligent decision-making. This shows that the exploration of data-based knowledge to improve development is not automatic and requires tailor-made policy choices that help to foster this emerging paradigm.

The ability to "cope with the uncertainty caused by the fast paced of change in the economic, institutional, and technological environment" has turned out to be the "fundamental goal of organizational changes" in the information age (Castells, p. 165). As such, also the design and the execution of any development strategy consist of a myriad of smaller and larger decisions that are plagued with uncertainty. From a purely theoretical standpoint, every decision is an uncertain probabilistic[1] gamble based on some kind of prior information[2] (e.g. Tversky and Kahneman, 1981). If we improve the basis of prior information on which to base our probabilistic estimates, our uncertainty will be reduced on average. This is not merely a narrative analogy, but a well-

established proven mathematical theorem of information theory that provides the foundation for all kinds of statistical and probabilistic analysis (Cover and Thomas, 2006; p. 29; also Rissanen, 2010).[3]

The Big Data[4] paradigm (Nature Editorial, 2008) provides loads of additional data to fine-tune the models and estimates that inform all sorts of decisions. This amount of additional information stems from unprecedented increases in (a) information flow, (b) information processing and (c) information storage.

(a) During the two decades of digitization, the world's effective capacity to exchange information through two-way telecommunication networks grew from 0.3 exa bytes in 1986 (20 % digitized) to 65 exa bytes two decades later in 2007 (99.9 % digitized) (Hilbert and López, 2011). In contrary to analog information, digital information inherently leaves a trace that can be analyzed (in real-time or later on). In an average minute of 2013, Google receives around 3,000,000 search queries, Facebook users share almost 1,000,000 pieces of content, and Twitter users send roughly 100,000 micro blogs. Additional to these mainly human generated telecommunication flows, surveillance cameras, health sensors, and the "Internet of things" (including household appliances and cars) are adding a large chunk to ever increasing data streams (Manyika, et al., 2011).

(b) At the same time, our technological memory roughly doubled every 40 months (about every three years), growing from 2.5 optimally compressed exa bytes in 1986 (1% digitized), to around 300 optimally compressed exa bytes in 2007 (94% digitized) (Hilbert and López, 2011; 2012). In 2010, it costs merely US$ 600 to buy a hard disk that can store all the world's music (Kelly, 2011). This increased memory has to capacity to ever store a larger part of an incessantly growing information flow. In 1986, using all of our technological storage devices (including research article, vinyl, tape, and others), we could (hypothetically) have stored less than 1% of all the information that was communicated worldwide (including broadcasting and telecommunication). By 2007 this share increased to 16% (Hilbert and López, 2012).

(c) We are still only able to analyze a small percentage of the data that we capture and store (resulting in the often-lamented "information overload"). Currently,

financial, credit card and health care providers discard around 85-95 % of the data they generate (Zikopoulos, et al., 2012; Manyika, et al., 2011). The Big Data paradigm promises to turn an ever larger part of this "imperfect, complex, often unstructured data into actionable information" (Letouzé, 2012; p. 6).[5] What fuels this expectation is the fact that our capacity to compute information in order to make sense of data has grown two to three times as fast as our capacity to store and communicate information over recent decades: while our storage and telecommunication capacity has grown at some 25-30% per year over recent decades, our capacity to compute information has grown at some 60-80% annually (Hilbert and López, 2011, 2012). Our computational capacity has grown from 730 tera-IPS (instructions per seconds) in 1986, to 196 exa-IPS in 2007 (or roughly $2*10^{20}$ instructions per second; which is roughly 500 times larger since the number of seconds since the big bang) (Hilbert and López, 2012).

As such, the crux of the "Big Data" paradigm is actually not the increasingly large amount of data itself, but its analysis for intelligent decision-making (in this sense, the term "Big Data Analytics" would actually be more fitting than the term "Big Data" by itself). Independent from the specific peta-, exa-, or zetta bytes scale, the key feature of the paradigmatic change is that analytic treatment of data is systematically placed at the forefront of intelligent decision making. The process can be seen as the natural next step in the evolution from the "Information Age" and "Information Societies" (in the sense of Bell, 1973; Masuda, 1980; Beniger, 1986; Castells, 2009; Peres and Hilbert, 2010; ITU, 2011) to "Knowledge Societies":building on the digital infrastructure that led to vast increases in information, the current challenge consists in converting this digital information into knowledge that informs intelligent decisions.

The extraction of knowledge from databases is not new by itself. Driscoll (2012) distinguishes between three historical periods: early mass-scale computing (e.g. the 1890 punched card based U.S. Census that processed some 15 million individual records), the massification of small personal databases on microcomputers (replacing standard office filing cabinets in small business during the 1980s), and, more recently, the emergence of both highly centralized systems (such as Google, Facebook and Amazon) and the interconnection of uncountable small databases. The combination of sufficient bandwidth

to interconnect decentralized data producing entities (be they sensors or people) and the computational capacity to process the resulting storage provides huge potentials for improving the countless smaller and larger decisions involved in any development dynamic. In this research article we systematically review existing literature and related empirical evidence to obtain a better understanding of the opportunities and challenges involved in making the Big Data Analysis paradigm work for development.

Conceptual Framework

In order to organize the available literature and empirical evidence, we use an established three-dimensional conceptual framework that models the process of digitization as an interplay between technology, social change, and guiding policy strategies. The framework comes from the ICT4D literature (Information and Communication Technology for Development) (Hilbert, 2012) and is based on a Schumpeterian notion of social evolution through technological innovation (Schumpeter, 1939; Freeman and Louca, 2002; Perez, 2004). Figure 1 adopts this framework to Big Data Analysis.
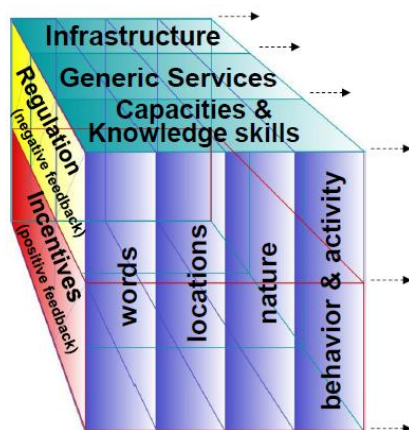
Figure 1: The three-dimensional "ICT-for development-cube" framework applied to Big Data.

The first requisites of making Big Data work for development are a solid technological (hardware) Infrastructure, generic (software) services, and human capacities and skills. These horizontal layers are used to analyze different aspects and kinds of data, such as words, locations, nature's elements, and human behavior, among others. While this set-up is necessary for Big Data Analysis, it is not sufficient for development. In the context of this research article, (under)development is broadly understood as (the deprivation of) capabilities (Sen, 2000). Rejecting pure technological determinism, all technologies (including ICT) are normatively neutral and can also be used to deprive capabilities (Kranzberg, 1986). Making Big Data work for development requires the social construction of its usage through carefully designed policy strategies. How can we assure that cheap large-scale data analysis help us create better public and private goods

and services, rather than leading to increased State and corporate control that poses a threat to societies (especially those with fragile and incipient institutions)? Not needs to be considered to avoid that Big Data will not add to the long list of failed technology transfer to developing countries? From a systems theoretic perspective, public and private policy choices can broadly be categorized in two groups: positive feedback (such as incentives that foster specific dynamics: putting oil into the fire), and negative feedback (such as regulations, that curb particular dynamics: putting water into the fire). The result is a three dimensional framework, whereas different circumstances (e.g. infrastructure deployment) and strategies (e.g. regulations) intersect and affect different aspects of Big Data Analysis.

In this research article we will work through the different aspects of this framework. We will start with some examples of Big Data for development through the tracking of words, locations, nature's elements, and human behavior and last but not the least **economic activity**. After this introduction to the ends of Big Data, we will look at the means, specifically the current distribution of the current hardware infrastructure and software services among developed and developing countries. We will also spend a considerable amount of time of the distribution of human capital and will go deeper into the specific skill requirements for Big Data. Last but not least, we will review aspects and examples of regulatory and incentive systems for the Big Data paradigm.

Applications of Big Data for Development

From a macro-perspective, it is expected that Big Data informed decision-making will have a similar positive effect on efficiency and productivity as ICT have had during the recent decade (see Brynjolfsson and Hitt, 1995; Jorgenson, 2002; Melville, Kraemer, and Gurbaxani, 2004; Castells, 2009; Peres and Hilbert, 2010). However, it is expected to add to the existing effects of digitization. Brynjolfsson, Hitt, and Kim (2011) surveyed 111 large firms in the U.S. in 2008 about the existence and usage of data for business decision making and for the creation of a new products or services. They found that firms that adopted Big Data Analysis have output and productivity that is 5 - 6 % higher than what would be expected given their other investments and information technology usage. Measuring the storage capacity of organizational units of different sectors in the global

economy, one of the consultant company McKinsey (Manyika, et al., 2011) shows that this potential goes beyond data intensive banking, securities, investment and manufacturing sectors. Several sectors with particular importance for development are quite data intensive: education, health, government, and communication host one third of the data in the country. The following reviews some illustrative case studies in development relevant fields like employment, crime, water supply, and health and disease prevention.

Tracking words

One of the most readily available and most structured kinds of data relates to words. The idea is to analyze words in order to predict actions or activity. This logic is based on the old wisdom ascribed to the mystic philosopher Lao Tse: "Watch your thoughts, they become words. Watch your words, they become actions…". Or to say it in more modern terms: "You Are What You Tweet" (Paul and Dredze, 2011). Analyzing comments, searches or online posts can produce nearly the same results for statistical inference as household surveys and polls.

Tracking locations

Location-based data are usually obtained from four primary sources: in-person credit or debit card payment data; in-door tracking devices, such as RFID tags on shopping carts; GPS chips in mobile devices; or cell-tower triangulation data on mobile devices. The last two provide the largest potential, especially for developing countries, which already own three times more mobile phones than their developed counterparts (reaching a penetration of 85 % in 2011 in developing countries) (ITU, 2011). By 2020, more than 70 percent of mobile phones are expected to have GPS capability, up from 20 percent in 2010 (Manyika, et al., 2011), which means that developing countries will produce the vast majority of location-based data. Location-based services have obvious applications in private sector marketing, but can also be put to public service. In Stockholm, for example, a fleet of 2,000 GPS-equipped vehicles, consisting of taxis and trucks, provide data in 30 - 60 seconds intervals in order to obtain a realtime picture of the current traffic situation (Biem, et al., 2010). The system can successfully predict future traffic conditions, based

on matching current to historical data, combining it with weather forecasts, and information from past traffic patterns, etc. Such traffic analysis does not only save time and gasoline for citizens and businesses, but is also useful for public transportation, police and fire departments, and, of course, road administrators and urban planners.

Chicago Crime and Crime spotting in Oakland present robust interactive mapping environments that allow users to track instances of crime and police beats in their neighborhood, while examining larger trends with time-elapsed visualizations. Crime spotting pulls daily crime reports from the city's Crime watch service and tracks larger trends and provide user customized services such as neighborhood-specific alerts. The system has been exported and successfully implemented in other cities.

Tracking Nature

One of the biggest sources of uncertainty is nature. Reducing this uncertainty through data analysis can quickly lead to tangible impacts. A recent project by the United Nations University uses climate and weather data to analyze "where the rain falls" in order to improve food security in developing countries (UNU, 2012). A global beverage company was able cut its beverage inventory levels by about 5 % by analyzing rainfall levels, temperatures, and the number of hours of sunshine (Brown, Chui, and Manyika, 2011, p. 9). Combing Big Data of nature and social practices, relatively cheap standard statistical software was used by several bakeries to discover that the demand for cake grows with rain and the demand for salty goods with temperature. Cost savings of up to 20 % have been reported as a result of fine-tuning supply and demand (Christensen, 2012). Real cost reduction means increasing productivity and therefore economic growth.

The same tools can be used to prevent downsides and mitigate risks that stem from the environment, such as natural disasters and resource bottlenecks. Public authorities worldwide have started to analyze smoke patterns via real time live videos and pictorial feeds from satellite, unmanned surveillance vehicles, and specialized tasks sensors during wildfires (IBM News, Nov. 2009). This allows local fire and safety officials to make more informed decisions on public evacuations and health warnings and provides them with real-time forecasts. Similarly, the Open Data for Resilience Initiative fosters the provision and analysis of data from climate scientists, local governments and

communities to reduce the impact of natural disasters by empowering decisions-makers in 25 (mainly developing) countries with better information on where and how to build safer schools, how to insure farmers against drought, and how to protect coastal cities against future climate impacts, among other intelligence (GFDRR, 2012). Sensors, robotics and computational technology have also been used to track river and estuary ecosystems, which help officials to monitor water quality and supply through the movement of chemical constituents and large volumes of underwater acoustic data that tracks the behavior of fish and marine mammal species (IBM News, May 2009). For example, the River and Estuary Observatory Network (REON) allows for minute-to-minute monitoring of the 315-mile New York's Hudson River, monitoring this important natural infrastructure for 12 million people who depend on it (IBM News, 2007). In preparation for the 2014 World Cup and the 2016 Olympics, the city of Rio de Janeiro created high-resolution weather forecasting and hydrological modeling system which gives city

official the ability to predict floods and mud slides. It is reported to have improved emergency response time by 30 % (IBM Social Media, 2012). The optimization of a systems performance and the mitigation of risks are often closely related. The economic viability of alternative and sustainable energy production often hinges on timely information about wind and sunshine patterns, since it is extremely costly to create energy

Figure 2 *Public data on natural resource extraction: Natural resource rent vs. government data disclosure (year=2010; n=40).*
Source: own elaboration, based on Revenue Watch Institute and Transparency International, 2010; World Bank, 2010. Note: The Revenue Watch Index is based on a questionnaire that evaluates whether a document, regular publication or online database provides the information demanded by the standards of the Extractive Industry Transparency Initiative (EITI), the global Publish What You Pay (PWYP) civil society movement, and the IMF's Guide on Revenue Transparency (www.revenuewatch.org/rwindex2010/methodology.htm)

buffers that step in when conditions are not continuously favorable (which they never are). Large datasets on weather information, satellite images, and moon and tidal phases have been used to place and optimize the operation of wind turbines, estimating wind

flow pattern on a grid of about 10x10 meters (32x32 feet) (IBM, 2011). In 2014, Hud Hud Cyclone created a massive disaster in Visakhapatnam, Andhrapradesh, India, but the damages of human life and property was very less due to weather prediction and alerts to the common man. It was possible only because of tracking of data and analyzing it with Big Data analytics tools.

Tracking Behavior

Half a century of game theory has shown that social defectors are among the most disastrous drivers of social inefficiency. The default of trust and the systematic abuse of social conventions are two main behavioral challenges for society. A considerable overhead is traditionally added to social transactions in order to mitigate the risk of defectors. This can be costly and inefficient. Game theory also teaches us that social systems with memory of past and predictive power of future behavior can circumvent such inefficiency (Axelrod, 1984). Big Data can provide such memory and are already used to provide short-term payday loans that are up to 50 % cheaper than the industry's average, judging risk via criteria like cell phone bills and the way how applicants read the loan application Website (Hardy, 2012a).

Behavior abnormalities are usually spotted by analyzing variations in the behavior of individuals in light of the collective behavior of the crowd. As an example from the health sector,

With Big Data, a simple analysis of variations allows to detect "unwarranted variations" which originate with the underuse, overuse, or misuse of medical care (Wennberg, 2011). These affect the means of health care, but not its ultimate end.

Behavioral data can also be produced by digital applications. Examples of behavioral data generating solutions are online games like World of Warcraft (11 million players in 2011) and FarmVille (65 million users in 2011). Students of multi-player online games can readily predict who is likely to leave the game, explain why that person left, and make suggestions how to provide incentives to keep them playing (Borbora, Srivastava, Hsu and Williams, 2012). By now, multiplayer online games are also used to track and influence behavior at the same time. Health insurance companies are currently developing multi-layer online games that aim at increasing the fitness levels of their clients. Such games are fed with data from insurance claims and medical records, and combine data

from the virtual world and the real world. Points can be earned by checking into the gym or ordering a healthy lunch. The goal is to reduce health care cost, and to increase labor productivity and quality of life (Petrovay, 2012). In order to make this idea work, Big Data solutions recognize that people are guided by dissimilar incentives, such as competing, helping out or leading in a social or professional circle of peers. The collected data allows the incentive structure of the game to adapt to these psychological profiles and individually change peer pressure structures. In order to identify those incentive structures it is essential to collect different kinds of data on personal attributes and behavior, as well as on the network relations among individuals. The tracking of who relates to whom quickly produces vast amounts of data on social network structures, but defines the dynamics of opinion leadership and peer pressure, which are extremely important inputs for behavioral change (e.g. Valente and Saba, 1998).

Tracking Economic Activity

A contentious area of Big Data for development is the reporting of economic activity that could potentially harm economic competitiveness. An illustrative case is natural resource extraction, which is a vast source of income for many developing countries (reaching from mining in South America to drilling in North Africa and the Middle East), yet have been a mixed blessing for many developing countries (often being accompanied by autocracy, corruption, property expropriation, labor rights abuses, and environmental pollution). The datasets processed by resource extraction entities are enormously rich. A series of recent

Source: own elaboration, for details see author, elsewhere.

Figure 3: Gini measure of the world's number of storage and computational devices, and their technological capacity (in optimally compressed MB, and MIPS), 1986 and 2007 (Gini = 1 means total concentration with all capacity at one single device; Gini = 0 means total uniformity, with equally powerful devices).

case studies from Brazil, China, India, Mexico, Russia, the Philippines and South Africa have argued that the publication of data that relate to the economic activity of these sectors could help to remind the current shortcomings, without endangering the

economic competitiveness of those sectors in developing countries (Aguilar Sánchez, 2012; Tan-Mullins, 2012; Dutta, Sreedhar and Ghosh, 2012; Moreno, 2012; Gorre, Magulgad and Ramos, 2012; Belyi and Greene, 2012; Hughes, 2012). As for now, Figure 4 shows that the national rent that is generated from the extraction of the natural resource (revenue less cost, as percentage of GDP) negatively relates to the level of government disclosure of data on the economic activity in oil, gas and mineral industries: the higher the economic share of resource extraction, the lower the availability of respective data.

Tracking other data

As indicated in the conceptual framework of Figure 1, these are merely illustrative examples of Big Data Analysis. Information is a "difference which makes a difference" (Bateson, 2000; p. 272), and a countless number of variations in data patterns can lead to informative insights. Some additional sources might include the tracking of differences in the supply and use of financial or natural resources, food and aliments, education attendance and grades, waste and exhaust, public and private expenditures and investments, among many others. Current ambitions for what and how much to measure diverge. Hardy (2012b) reports of a data professional who assures that "for sure, we want the correct name and location of every gas station on the globe … not the price changes at every station"; while his colleague interjects: "Wait a minute, I'd like to know every gallon of gasoline that flows around the world … That might take us 20 years, but it would be interesting" (p. 4).

What they all have in common is that the longstanding laws of statistics still apply. For example, while large amount of data make the sampling error irrelevant, this does not automatically make the sample representative. For example, boyd and Crawford (2012) underline that "Twitter does not represent 'all people', and it is an error to assume 'people' and 'Twitter users' are synonymous: they are a very particular sub-set" (p. 669). We also have to consider that digital conduct is often different from real world conduct. In a pure Goffmanian sense (Goffman, 1959), "most of us tend to do less self-censorship and editing on Facebook than in the profiles on dating sites, or in a job interview. Others carefully curate their profile pictures to construct an image they want to project" (Manovich, 2012). Therefore, studying digital traces might not automatically

give us insights into offline dynamics. Besides these biases in the source, the data-cleaning process of unstructured Big Data frequently introduces additional subjectivity.

Infrastructure

Having reviewed some illustrative social ends of Big Data, let us assess the technological means (the "horizontal layers" in Figure 1). The well-known digital divide (Hilbert, 2011) also perpetuates the era of Big Data. From a Big Data perspective, it is important to recognize that digitization increasingly concentrated informational storage and computational resources in the so-called "cloud". While in 1986, the top performing 20 % of the world's storage technologies were able to hold 75% of society's technologically stored information, this share grew to 93 % by 2007. The domination of the top-20 % of the world's general-purpose computers grew from 65 % in 1986, to 94 % two decades later (see also author, elsewhere). Figure 5 shows the Gini (1921) measure of this increasing concentration of technological capacity among an ever smaller number of ever more powerful devices.

The fundamental condition to convert this increasingly concentrated information capacity among storage and computational devices ("the cloud") into an equalitarian information capacity among and within societies lies in the social ownership of telecommunication access. Telecommunication networks provide a potential uniform gateway to the Big Data cloud. Figure 6 shows that this basic condition is ever less fulfilled. Over the past two decades, telecom access has ever become more diversified. Not only are telecom subscriptions heterogeneously distributed among societies, but the varied communicational performance of those channels has led to an unprecedented diversity in telecom access. In the analog age of 1986, the vast majority of telecom subscriptions were fixed-line phones, and all of them had the same performance. This resulted in a quite linear relation between the number of subscriptions and the average traffic capacity (see Figure 4). Twenty years later, there's a myriad of different telecom subscriptions with the most diverse range of performances. This results in a two dimensional diversity among societies with more or less subscriptions, and with more or less telecommunication capacity.
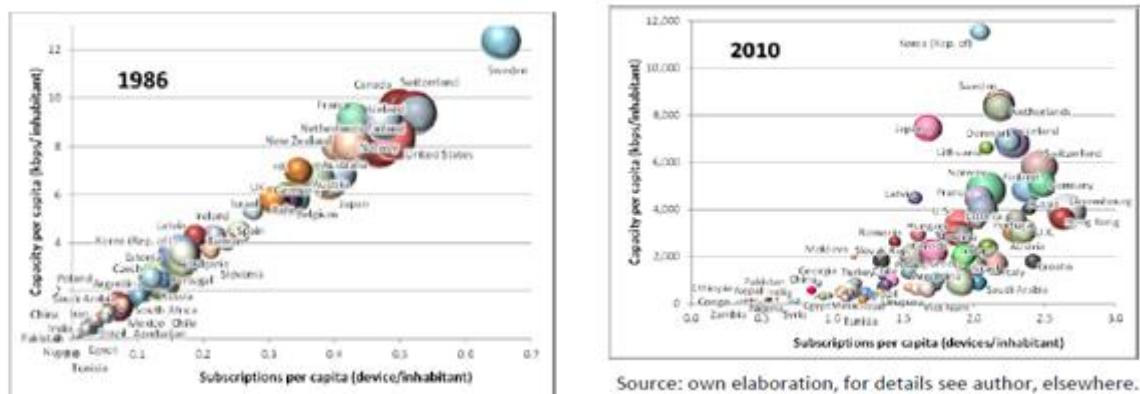
Source: own elaboration, for details see author, elsewhere.

Figure 4: Subscriptions per capita vs. Capacity per capita (in optimally compressed kbps of installed capacity) for 1986 and 2010. Size of the bubbles represents Gross National Income (GNI) per capita (N = 100).

Summing up, incentives inherent to the information economy, such as economies of scale and short product lifecycles (Shapiro and Varian, 1998) increasingly concentrate information storage and computational infrastructure in a "Big Data cloud". Naturally, the vast majority of this Big Data hardware capacity resides in highly developed countries. The access to these concentrated information and computation resources is skewed by a highly unequal distribution of telecommunication capacities to access those resources. Far from being closed, the digital divide incessantly evolves through an ever changing heterogeneous collection of telecom bandwidth capacities (author, elsewhere). It is important to notice that Figure 6 merely measures the installed telecommunication bandwidth and not actual traffic flows. Considering economic limitations of developing countries, it can be expected that the actual traffic flow is actually more skewed than the installed telecommunication bandwidth.

One way to confront this dilemma consists in creating local Big Data hardware capacity in developing countries. Modular and decentralized approaches seem to be a cost effective alternative. Hadoop, for example, is prominent open-source top-level Apache data-mining warehouse, with a thriving community (the Big Data industry leaders, such as IBM and Oracle embrace Hadoop as an integral part of their products and services). It is built on top of a distributed clustered file system that can take the data from thousands of distributed (also cheap low-end) PC and server hard disks and analyze them in 64 MB blocks. Built in redundancy provide stability even if several of the source drives fail (Zikopoulos, et al., 2012). With respect to computational power, clusters of videogame

consoles are frequently used as a substitute for supercomputers for Big Data Analysis (e.g. Gardiner, 2007; Dillow, 2010). Our numbers suggest that 500 PlayStation 3 consoles amount to the average performance of a supercomputer in 2007, which makes this alternative quite price competitive (author, elsewhere SUPP).

Generic Services

Additional to the tangible hardware infrastructure, Big Data relies heavily on software services to analyze the data. Basic capabilities in the production, adoption and adaptation of software products and services are a key ingredient for a thriving Big Data environment. This includes both financial and human resources. Figure 5 shows the shares of software and computer service spending of total ICT spending (horizontal x-axis) and of software and computer
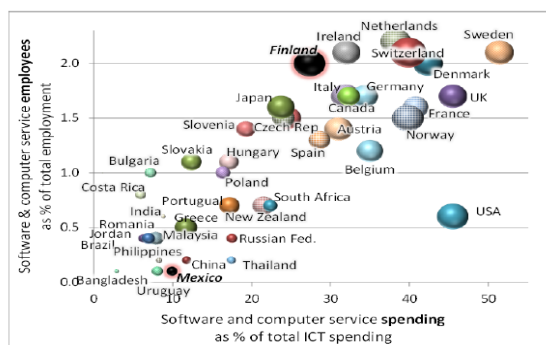
Source: own elaboration, based on UNCTAD, 2012.

Figure 5: Spending (horizontal x-axis) and employees (vertical y-axis)of software and computer services (as % of respective total). Size of bubbles represents total ICT spending per capita (n=42 countries).

service employees of total employees (vertical y-axis) for 42 countries. The Size of the bubbles indicates total ICT spending per capita (a rather basic indicator for ICT advancement). Larger bubbles are related to both, more software specialists and more software spending. In other words, those countries that are already behind in terms of ICT spending in absolute terms (including hardware infrastructure), have even less capabilities for software and computer services in relative terms. This adds a new dimension to the digital divide: a divide among the haves and have-nots in terms of digital service capabilities, which are crucial for Big Data capacities. It makes a critical difference if 1 in 50 or 1 in 500 of the national workforce is specialized in software and computer services (e.g. see Finland vs. Mexico in Figure 5).

Data as a commodity: in-house vs. outsourcing

There are two basic options on how to obtain such Big Data services: in-house or through outsourcing. On the firm-level, Brynjolfsson, Hitt, and Kim (2011) find that data driven decision making is slightly stronger correlated with the presence of an in-house team and

employees than with general ICT budgets, which would enable to obtain outsourced services. This suggests that in-house capability is the stronger driver of organizational change toward Big Data adoption. The pioneering examples of large in-house Big Data solutions include loyalty programs of retailers (e.g. Tesco), tailored marketing (e.g. Amazon), or vendor-managed inventories (e.g. Wal-Mart). However, those in-house solutions are also notoriously costly.

Outsourcing solutions benefit from the particular cost structure of digital data, which have extremely high fix-costs and minimal variable costs (Shapiro and Varian, 1998): it might cost millions of dollars to create a database, but running different kinds of analysis is comparatively cheap, resulting in large economies of scale for each additional analysis. This economic incentive leads to an increasing agglomeration of digital data capacities in the hands of specialized data service provider which provide analytic services to ad hoc users. For example, specialized Big Data provider companies provide news reporters with the chance to consult the historic voting behavior of senators, restaurants with the intelligence to evaluate customer comments on the social ratings site Yelp, and expanding franchise chains with information on the vicinity of gas stations, traffic points or potential competition in order to optimize the placement of an additional franchise location (Hardy, 2012a). Others specialize on on-demand global trade and logistics data, which include on the contracting, packing and scanning of freight, documentation and customs, and global supply chain finance (Hardy, 2012b) and again others offer insights from Twitter and other social networking sites. Being aware of the competitive advantage of having in-house knowledge of Big Data Analysis, but also about the sporadic need to obtain data that is much more cost-effectively harnessed by some third party provider, many organizations opt for a hybrid solution and use on-demand cloud resources to supplement in-house deployments (Dumbill, 2012).

In this sense, data itself becomes a commodity and therefore subject to existing economic divides. With an overall revenue of an estimated US$ 5 billion in 2012 and US$ 10 billion in 2013 globally (Feinleib, 2012), the Big Data market is quickly getting bigger than the size of half of the world's national economies. Creating an in-house capacity or buying the privilege of access for a fee "produces considerable unevenness in the system: those with money - or those inside the company - can produce a different type of research

than those outside. Those without access can neither reproduce nor evaluate the methodological claims of those who have privileged access" (boyd and Crawford, 2012; p. 673-674). The existing unevenness in terms of economic resources leads to an uneven playing field in this new analytic divide.

Capacities & Skills

Additional to supporting hardware and service capabilities, the exploitation of Big Data also requires data-savvy managers and analysts and deep analytical talent (Letouzé, 2011; p. 26 ff), as well as capabilities in machine learning and computer science. Hal Varian, chief economist at Google and Professor emeritus at the University of California at Berkeley, notoriously predicts that "the sexy job in the next 10 years will be statisticians… And I'm not kidding" (Lohr, 2009; p.1). Statisticians and
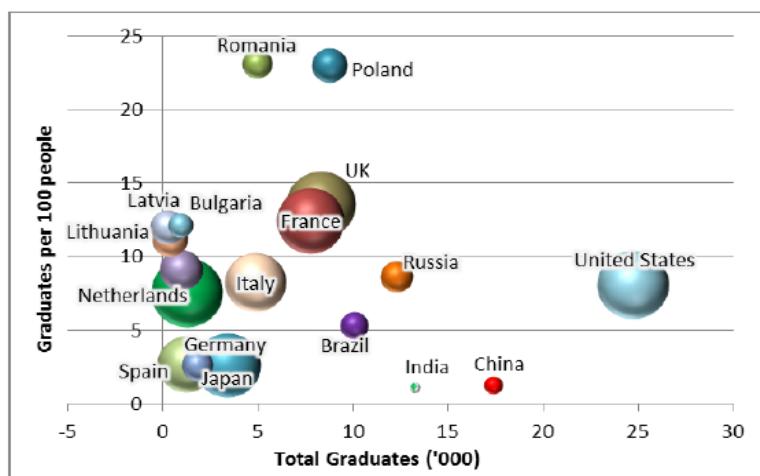
Figure 6: Graduates with deep analytical training: total (horizontal x-axis), per 100 people (vertical y-axis), Gross National Income (GNI) (size of bubbles). Source: own elaboration, based on Manyika, et al., 2011 and World Bank, 2010. Note: Counts people taking graduate or final-year undergraduate courses in statistics or machine learning (a subspecialty of computer science).

awareness about the importance of statistical capabilities are rare in developing countries. In a characteristics example, Ghana's statistical authorities took 17 years to adopt the UN system of national accounts from 1993. After up-dating their method in 2010 the surprised statisticians found that Ghana's GDP was 62 % higher than previously thought (Devarajan, 2011). Manyika, et al. (2011) predict that by 2018, even the job magnet United States will face a shortage of some 160,000 professionals with deep analytical skills (of a total of 450,000 in demand), as well as a shortage of 1.5 million data managers that are able to make informed decisions based on analytic findings (of a total of 4 million in demand). First case studies on the use of Big Data applications in development project show that adequate training for data specialists and managers is one of the main reasons

for failure (Noormohammad, et al., 2010).

Figure 6 shows that the perspectives in this regard are actually mixed for different parts of the developing world. Some developing countries with relatively low income levels achieve extremely high graduation rates for professionals with deep analytical skills (see e.g. Romania and Poland, which are high up on the vertical y-axis in Figure 6). In general, countries from the former Soviet bloc (also Latvia, Lithuania, Bulgaria, and Russia) produce a high level of analysts. Other countries, such as China, India, Brazil and Russia produce a large number of analysts (far to the right on the x-axis in Figure 6, which mainly relates to their population size in absolute terms). In 2008, these so-called BRIC countries (Brazil, Russia, India and China) produced almost 40 % of the global professionals with deep analytical skills, twice and many as the United States. Traditional power-houses of the global economy, such as Germany and Japan, are comparatively ill-prepared for the human skills required in a Big Data age. This leads to the long-standing and persistent discussion about brain drain, and of the eventual possibility that professionals from developing countries will build bridges of capabilities between developed and developing countries (Saxenian, 2007).

Figure 7: Word cloud of this research article: one simple and quick way to visualize Big Data.
Source: The full text of this research article; world cloud created using www.Wordle.net ; i.ehttp://www.wordle.net/show, /wrdl/6170795/BigDataResearch article

One way of dealing with the shortage and fostering the creation of skilled professionals are collective data analysis schemes, either through collaboration or competition. This does not only apply to developing countries. A survey of leading scientists from the Journal Science suggests that only one quarter of scientists have the necessary skills to analyze available data, while one third said they could obtain the skills through collaboration (Science Staff, 2011). Wikis to collectively decode genes or analyze molecular structures have sprung up over recent years (Waldrop, 2008), and

specialized platforms of distributed human computing aid in the classification of galaxies GalaxyZoo (galaxyzoo.org) and complex protein-folding problems (folding.stanford.edu). The alternative to collaboration is competition. During 2010-2011 the platform Kaggle attracted over 23,000 data scientists worldwide in a dozen of data analysis competitions with cash prizes between US$ 150 and US$ 3,000,000 (Carpenter, 2011). In one competition, a Ph.D. student in glacier mapping outperformed NASA's longstanding algorithms to measure the shape of galaxies (Hardy, 2012b). In another example, 57 teams (including from Chile, Antigua and Barbuda, and Serbia) helped an Australian statistician to predict the amount of money spend by tourists (a value insight for a mere US$ 500 cash price) (Hyndman, 2010).

Incentives: positive feedback

The third side of the conceptual framework from Figure 1 represents the social construction of technological change through policy strategies that aim at chosen normative aspects of development. One way of doing this is to positively encourage and foster desired outcomes.

Financial incentives and subsidies

As so often, money is not the sole solution, but it makes things easier. One concrete example of government subsidies is the Office of Cyber infrastructure (OCI) of the U.S. National Science Foundation (NSF), which counts with a budget US$ 700 and US$ 800 million to invest, among other objectives, into "large-scale data repositories and digitized scientific data management systems" (NSF, 2012). Part of the ambition to bring Big Data to the general public includes fostering data visualization (Frankel and Reid, 2008) (see Figure 7 for a simple example). NSF and the academic Journal Science have hosted a data visualization competition for nine consecutive years (Norman, 2012).

A much more resource intensive effort, also from the U.S., refers to the approximately US$ 19 billion of the American Recovery and Reinvestment Act that is earmarked to encourage physicians to adopt electronic medical recordkeeping systems (Bollier, 2010). Digitizing recordkeeping makes health care more versatile and contributes to important savings. It is estimated that a correction of the abnormalities in Figure 3b (deviate patterns of Medicare spending) would save up to 33 % of total health care spending in the U.S. (Darthmouth, 2012), which represents 16 % of U.S.'s GDP. In

developing countries, health care expenditure ranges between 4 - 8 % of GDP.

Exploiting public data

Another incentive for Big Data consists in the exploitation of the natural quasi-monopoly held by the public sector for many areas of social data (Kum, Ahalt and Carsey, 2011; WEF and Vital Wave, 2012). Each organization of the U.S. government is estimated to host some 1.3 Peta bytes of data, compared with a national organizational mean of 0.7 PB, while the government itself hosts around 12 % of the nationally stored data, and the public sector related sectors of education, health care and transportation another 13 % (Manyika, et al., 2011). In other words, if data from the public sector would be "public", around one quarter of the available data resources could be liberated for Big Data Analysis.

The ongoing discussion about the openness of digital government data moves along two main axes (Figure 10a). One is rather technical and refers to the accessibility of the data format. Information listed in PDF files, for example, are less accessible and actionable than data published in structured Excel spreadsheets, while those proprietary spreadsheets are again less accessible than open source databases like CSV. The emerging gold standard are so-called "linked data" (Berners-Lee, 2006), which refers to datasets that are described by an open standard metadata layers (such as uniform resource identifier (URI) and resource description framework (RDF)) that makes the data readily readable and sortable for humans and machines. The other axis refers to the kind of data source. The most straightforward kind of source is traditional public statistics, such as produced by household surveys and censuses. Geospatial data[6] is also among the most widely published public data and is useful for a large amount of applications, as previously discussed. Public procurement and expenditure data is often less transparent, even so some developing and developed governments have made important advances (e.g. Suárez and Laguado, 2007; or usaspending.gov). The borderline between usefulness and legality is often in question in the case of publishing vast amounts of (sometimes classified) documents through portals like Wikileaks (e.g. Sifry, 2011). Here the topic of Big Data for intelligent decision-making intersects with the more contentious topic of public transparency and State secrecy, which often runs under the heading

of "open governments" (Lathrop and Ruma, 2010; Concha and Naser, 2012). The numbers 1-4 in Figure 10a loosely classify the perceived level of challenges encountered when publishing open government data.[7]

While government administrators often do not feel pressure to exploit the data they have available (Brown, Chui, and Manyika, 2011), several initiatives have pushed governments around the world to "commit to pro-actively provide high-value information, including raw data, in a timely manner, in formats that the public can easily locate, understand and use, and in formats that facilitate reuse" (Open Government Partnership, 2011)[8]. Several dozen developing countries have set up portals like datos.gob.cl in Chile, bahrain.bh/wps/portal/data in Bahrain, or www.opendata.go.ke in Kenya to provide hundreds of datasets on demographics, public expenditures, and natural resources for public access. Also international organization, like the World Bank (data.worldbank.org), regional governments, like Pernambuco in Brazil (dadosabertos.pe.gov.br) or local governments, like Buenos Aires in Argentina (data.buenosaires.gob.ar) provide databases about local housing, the condition of highways, and the location of public bicycle stands. Data.gc.ca from Canada and Data.gov from the U.S. stand out with over 260,000 and 370,000 raw and geospatial datasets from a couple of hundred agencies respectively.6 On the one hand, the open access model allows everybody to access this wealth of data collected and published by the most advanced countries. This provides important opportunities for developing countries, such as shown by the case of the usefulness of weather and climate data (GFDRR, 2012). On the other hand, data about housing, geography, traffic, and health is certainly most useful to the host country. In the case of France, 76 % of the data is national, 12 % regional, 10 % local and departmental, and only 2 % international (Vincey, 2012). Therefore, local data production capacity still provides an international development advantage.

The good news is that an open data policy does not seem to be strongly correlated with the level of development of the country. Figure 10b shows that the number of databases provided on these central government portals correlate only weakly with the economic wellbeing of the country (horizontal x-axis) and the perceived path trajectory of transparency in the national public sector (the size of the bubbles presents the most

widely used index of perceived transparency and corruption worldwide; Transparency International, 2011). On average, those governments of our sample with more than 500 publicly available databases on their open data online portals have 2.5 times the per capita income, and 1.5 times more perceived transparency than their counterparts with less than 500 public databases. Notwithstanding, Figure 10 also shows that
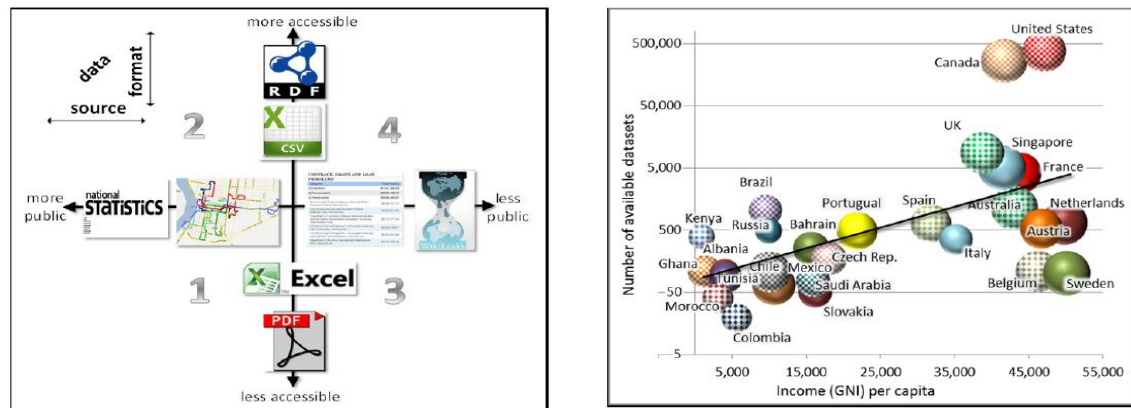
Figure 8: Open Government datas: (a) schematic conceptual framework; (b) Number of datasets provided on central government portal (vertical y-axis, logarithmic scale), Gross National Income per capita (horizontal x-axis), Corruption Perception Index (size of bubbles: larger bubbles, more transparent) (year=2011; n=27).
Source: own elaboration, (b) based on the 27 official open data portals; World Bank, 2010; and Revenue Watch Institute and Transparency International, 2011. Note: First launched in 1995, the Corruption Perception Index combines the subjective estimates collected by a variety of independent institutions about the perceived level of transparency and corruption in a country (since corruption is an illegal and often hidden   activity,   subjective   perceptions   turn   out   to   be   the   most   reliable   method: www.transparency.org/research/cpi)

several governments from developing countries are more active than their developed counterparts in making databases publicly available (see e.g. Kenya, Russia and Brazil).

Regulation: negative feedback

The other kind of tools to guide the Big Data paradigm into the desired development direction consists in the creation of regulations and legislative frameworks. This touches on many of the longstanding issues that have been discussed for years in the ICT-community (e.g. Lessig, 2000). It involves security (e.g. how frequent is data theft and espionage?), intellectual property (e.g. who owns which data, who owns which data analysis results, and is a detected data pattern patentable?), liability (who is responsible for inaccurate data that leads to negative consequences?), and interoperability (who defines the standards to enable data exchange, and are they open or proprietary?).

Control and privacy

Concerns about privacy and State and corporate control are as old as electronic database management. Fingerprinting for the incarcerated, psychological screening for draft inductees and income tax control for working people were among the first databases to be implemented in the U.S. before the 1920 (Beniger, 1986). As early as 1948, some 25-30 years before scholars like Bell (1973) and Masuda (1980) started to talk about the "Information Age", George Orwell described a rather terrifying vision of the Information Society: "By comparison with that existing today, all the tyrannies of the past were half-hearted and inefficient" (Orwell, 1948; 2, 9). Fact of the matter is that "any data on human subjects inevitably raise privacy issues" (Nature Editorial, 2007; p. 637).   Digital information always leaves a potential trace that can be tracked and analyzed (Andrews, 2012). One distinction that is often made in the Big Data discussion is whether or not the tracked data is generated actively or passively, and voluntarily or involuntarily (King, 2011). For example, the collection of Big Data on social activity often blurs the difference between being in public (i.e. sitting in a park) and being public (i.e. actively courting attention) (boyd & Marwick 2011). Traditional research surveys are an example of active and voluntary data provision. In the United States, the Food and Drug Administration (FDA) and Department of Health and Human Services have passed regulations that have empowered so-called Institutional Review Boards (IRBs) to approve, require modifications in planned research prior to approval, or disapprove research involving humans. Such IRBs approval processes have become a standard part of a graduate education at American research universities and "scientists must meet strict rules on any research on human subjects. In contrast, private firms are largely free from such constraints, and already have wide latitude to snoop on, and data mine, their employees' work habits". (Buttler, 2007; p. 645). These issues are much less regulated in developing countries, be it in the private sector or academia. A less regulated example of active and voluntary data provision refers to online user ratings of products or services, such as customer reviews or scaled ratings. These sources are frequently used for large-scale data analysis. An example of voluntary passive data provision is when users knowingly allow online retailers and search engines to personalize shopping recommendations and search results based on passed interactions with the system. An even more contentious example

of involuntary passive data provision is the tracking of Twitter comments or mobile phone locations (Andrews, 2012).

While the fine-tuning of intelligent search mechanisms and the personalization of shopping experiences are seen desirable by many users, the issue of privacy becomes especially delicate when personalized data is used for control. Orwell (1948; 1,3) warned especially about the manipulation of democratic processes through personalized control and brainwashing. In present times, the analysis of various kinds of Big Data (including credit card repositories) have resulted in well-known concepts as "Soccer Moms", "America's Home-Schooled" or "Late Breaking Gays" (Penn and Zalesne, 2007), which have become decisive swing groups in American party pooling for votes in democratic elections. In the best case scenario, the identification of these groups enables a political candidate for democratic office to spin a message to please an identified group of interest. The result is populism and not the democratic representation of the people through a free mandate, such as foreseen in most democratic constitutions (Hilbert, 2007; Ch. 2.3). In the worst case, the political candidate uses this information to spin a message to manipulate the identified group. The pinpointed manipulation of citizens evidently already moves into the direction of Orwellian brainwashing. The democratic flipside to the transparent citizen is the transparent State, which returns to the discussion of "open government data", this time not from the perspective of voluntary projects, but from the perspective of mandatory regulation. Freedom of Information legislation aims at the principle that all documents and archives of public bodies are freely accessible by each citizen, and that denial of access has to be justified by the public body and classified as an exception, not the rule. As of 2012, roughly 70 countries passed such legislation (FOI, 2012).

Interoperability of isolated data silos

One of the main challenges of harnessing Big Data consists in bringing data from different sources together. Large parts of valuable data lurk in "data silos" of different departments, regional offices, and specialized agencies. Fragmentation impedes the massive and timely exploitation of data. Manyika, et al. (2011) show that the data landscape in sectors like education and health tends to be more fragmented than the rather

concerted data landscape of banking or insurance services, whose databases speak the same informatics language. Data interoperability standards are becoming a pressing issue for the Big Data paradigm in both developed (NSF, 2007), as well as in developing countries: several years ago, Latin American governments have started to work on a White Book on e-Government interoperability in Latin America (UN-ECLAC, 2007), but over recent years, the topic as a whole has lost momentum in the region (de la Fuente, 2012).

Critical reflection: all power to the algorithms?

We end this research article with a critical reflection on the broader implications of the Big Data paradigm for development. Placing computer-mediated analytic treatment of data at the forefront of decision-making also implies the encouragement of machinated decision-making over human evaluation. In the past, the vast majority of information processing was executed by managers, analysts, and human data crunchers (Nelson, 2008)[9]. Human evaluators have been overtaken by machines in many fields. By now, Big Data based artificial intelligence diagnosis tools that detect aneurysms have a success rate of 95% versus 70 % for human radiologists (Raihan, 2010). When fostering this kind of approach, we inevitably give a lot of power to algorithms (Baker, 2008). Per definition, algorithms can only execute processes that are programmed into them. These processes might be directly dictated by a human being or by another algorithm (such as an evolutionary algorithm), which again was dictated by a software specialist. Unfortunately, the programmer rarely is able to consider all the intricate complexities of a constantly evolving environment, which consists of a large number of interdependent parts, which pursue different goals. While some of the results are rather amusing (such as a book on flies that was offered for US$ 23 million on Amazon by competing algorithms that calculated supply and demand patterns, Slavin, 2011), while others can have disastrous consequences that affect the stability of entire economies, such as shown by the example of "black-box" trading (or algorithmic trading). From a starting point near zero in the mid-1990s, algorithmic trading is responsible for as much as 70-75 % of trading volume in the U.S. in 2009 (Hendershott, Jones and Menkveld, 2011) and has triggered several unreasonable sell-offs at stock markets (triggering a so-called "flash-crash") (Kirilenko, et al., 2011). The common reason for the imperfect nature of

algorithms is that fact that most current algorithms are mainly informed by the world as it was or, at best, as it is. Fed by a large number of past experiences, common algorithms can predict future development if the future is similar to the past. In order to do so, it is not even necessary to be able to explain the ongoing dynamics of the past. For example, a social networking site like Facebook or Twitter might not be able to answer the more fundamental questions like "why are people saying what they are saying?" and "why are people behaving like they are behaving?" but they can tell us that they presently do, and, if nothing changes, that they will continue to do in the future. "Google conquered the advertising world with nothing more than applied mathematics. It didn't pretend to know anything about the culture and conventions of advertising — it just assumed that better data, with better analytical tools, would win the day" (Anderson, 2008, p.1). In other words, Google can predict without explaining, nor understanding, but simply by looking for patterns from the past.[10]   Since explaining and predicting are notoriously different (Simon, 2002; Shmueli, 2010), blind prediction algorithms can disgracefully fail if the environment evolves, since the insights are based on the past, not on a general understanding of the overall dynamics. Considering the exponential complexity arising from mutual endogenous and exogenous influences among stock market traders, trading algorithms, and the general economic environment, it is not surprising that specialized trading algorithms are not able to handle all cases of a quickly changing trading landscape.

Another consequence is that algorithms based on data from the past will naturally reinforce past behavior. Garland (2012) reports that many corporate and government leaders got used to hearing reports that confirm data patterns that they are used to seeing, and react with "confusion, anger, and psychological transference" when confronted with future scenarios that are discontinuous of existing patterns. He concludes that data pattern based decision-making makes it actually "harder for us all to adapt to a changing world" (p. 1). The repeated confrontation with personal past behavior not only leads to cognitive dissonance, but potentially also to social conflict. For example, personalized online search machines use algorithms to selectively guess what information a user would like to see based on past information about the user (such as location, past clicking behavior and search history), which is useful if the user would like to fine-tune research

results or shopping suggestions. However, as a result, the algorithms tend to show only information which agrees with the user's past viewpoint. For example, Pariser (2011, p. 9) reports two different people performing an online search for "BP". While one got investment news about British Petroleum, another got information about the Deepwater Horizon oil spill. The constant reconfirmation of personal viewpoints can easily lead to polarization and extremism. Polarization is one of the innate enemies of the democratic process of creating one common will of the people through critical reflection of alternative viewpoints (Habermas, 2000; Hilbert, 2007, Ch. 2.1). It is important to underline that algorithms do not necessarily have to be based purely on Big Data sets that explain past behavior. Agent-based model, for example, are increasingly getting better in predicting the outcome of social complexities of even unknown future scenarios through computer simulations that are based on a collection of mutually inter depend algorithms. Some hope that the combination of data from the past and computational modeling of future scenarios will help us to get a better understanding of ongoing social complexities (e.g. Farmer and Foley, 2009).

Conclusion

Recently, much has been written and discussed about the Big Data paradigm. A systematic review of over 100 pieces of mainly recent literature and several pieces of hard fact empirical evidence show that the Big Data paradigm holds both promises and perils for development dynamics. On the one hand, an unprecedented amount of cost-effective data can be exploited to inform decision-making in areas that are crucial to many aspects of development, such as health care, security, economic productivity, and disaster- and resource management, among others. The extraction of actionable knowledge from the vast amounts of available digital information seems to be the natural next step in the ongoing evolution from the "Information Age" to the "Knowledge Age". On the other hand, the Big Data paradigm is a technological innovation and the diffusion of technological innovations is never immediate and uniform, but inescapably creates divides during the diffusion process through social networks (Rogers, 2003). As with all previous examples of technology-based innovation for development, also the Big Data paradigm runs through a slow and unequal diffusion process that is compromised by the lacks of infrastructure, human capital, economic resource availability, and

institutional frameworks in developing countries. This inevitably creates a new dimension of the digital divide: a divide in the capacity to place the analytic treatment of data at the forefront of informed decision-making. This divide does not only refer to the availability of information, but to intelligent decision-making and therefore to a divide in (data-based) knowledge. These development challenges add to perils inherent to the Big Data paradigm, such as concerns about State and corporate control and manipulation, and the blind trust in imperfect algorithms. This shows that the advent of the Big Data paradigm is certainly not a panacea. However, in a world where we desperately need further insights into development dynamics, Big Data Analysis can be an important tool to contribute to our understanding of and improve our contributions to manifold development challenges.

References

1. *Aguilar Sánchez, C. (2012). Brazil: No Easy Miracle. Increasing Transparency and Accountability in the Extractive Industries (Working Research article Series 2012). Revenue Watch Institute and Trans parency and Accountability Initiative. Retrieved from http://www.revenuewatch.org/sites/default/files/Brazil_TAI.pdf*

2. *Anderson, C. (2008, June 23). The End of Theory: The Data Deluge Makes the Scientific Method Obsolete. Wired Magazine, (Science: Discoveries). Retrieved from http://www.wired.com/science/discoveries/magazine/16-07/pb_theory*

3. *Andrews, L. (2012). I Know Who You Are and I Saw What You Did: Social Networks and the Death of Privacy. Simon and Schuster.*

4. *Bateson, G. (2000). Steps to an Ecology of Mind: Collected Essays in Anthropology, Psychiatry, Evolution,and Epistemology. University of Chicago Press.*

5. *Bell, D. (1973). The Coming of Post-Industrial Society: A Venture in Social Forecasting. New York, NY: Basic Books.*

6. *Belyi, A., & Greene, S. (2012). Russia: A Complex Transition. Increasing Transparency and Accountability in the Extractive Industries (Working Research article Series 2012). Revenue Watch Institute and Trans parency and Accountability Initiative. Retrieved from*

http://www.revenuewatch.org/sites/default/files/Russia_TAI_eng.pdf

7. *Beniger, J. (1986). The Control Revolution: Technological and Economic Origins of the Information Society. Harvard University Press.*

8. *Berners-Lee, T. (2006, July 27). Linked Data. W3 Design Issues. Retrieved from http://www.w3.org/DesignIssues/LinkedData.htm*

9. *Brynjolfsson, E., & Hitt, L. M. (1995). Beyond Computation: Information Technology, Organizational Transformation and Business Performance. Journal of Economic Perspectives, 14, 23-48.*

10. *Butler, D. (2007). Data sharing threatens privacy. Nature News, 449(7163), 644-645.*
doi:10.1038/449644a

11. *Carpenter, J. (2011). May the Best Analyst Win. Science, 331(6018), 698-699.*
doi:10.1126/science.331.6018.698

12. *Castells, M. (2009). The Rise of the Network Society: The Information Age: Economy, Society, and Culture Volume I (2nd ed.). Wiley-Blackwell.*

13. *Darthmouth. (2012). Unwarranted Variations and Their Remedies: Findings from the Dartmouth Atlas of Health Care. Lectures. Retrieved from http://www.dartmouthatlas.org/pages/multimedia*

14. *De la Fuente, C. (2012). Gobierno como plataforma: retos y oportunidades. In El Desafío Hacia El*

15. *Gobierno Abierto En La Hora De La Igualdad. Santiago: United Nations ECLAC. Retrieved from http://www.eclac.org/ddpe/publicaciones/xml/9/46119/W465.pdf*

16. *Devarajan, S. (2011). Africa's statistical tragedy. Africa Can...end Poverty. Retrieved from http://blogs.worldbank.org/africacan/africa-s-statistical-tragedy*

17. *Dutta, R., Sreedhar, R., & Ghosh, S. (2012). India: Development at a Price. Increasing Transparency and Accountability in the Extractive Industries (Working Research article Series 2012). Revenue Watch Institute and Trans parency and Accountability Initiative. Retrieved from*

18. *Farmer, J. D., & Foley, D. (2009). The economy needs agent-based modelling. Nature, 460(7256), 685-686. doi:10.1038/460685a*

19. *Gell-Mann, M., & Lloyd, S. (1996). Information measures, effective complexity, and total information Complexity, 2(1), 44-52.*

20. Gini, C. (1921). Measurement of Inequality of Incomes. The Economic Journal, 31(121), 124-126.

21. Goffman, E. (1959). The Presentation of Self in Everyday Life (1st ed.). Anchor.

22. Gorre, I., Magulgad, E., & Ramos, C. A. (2012). Phillippines: Seizing Opportunities. Increasing Transparency and Accountability in the Extractive Industries (Working Research article Series 2012). Revenue Watch Institute and Trans parency and Accountability Initiative. Retrieved from http://www.revenuewatch.org/sites/default/files/Philippines_TAI.pdf

23. Hendershott, T., Jones, C. M., & Menkveld, A. J. (2011). Does Algorithmic Trading Improve Liquidity? The Journal of Finance, 66(1), 1-33. doi:10.1111/j.1540-6261.2010.01624.x

24. Hilbert, M., & López, P. (2011). The World's Technological Capacity to Store, Communicate, and Compute Information. Science, 332(6025), 60 -65. doi:10.1126/science.1200970

25. Hilbert, M., & López, P. (2012). How to Measure the World's Technological Capacity to Communicate, Store and Compute Information? Part I: results and scope. International Journal of Communication, 6, 956979.

26. IBM News. (2007, August 16). Beacon Institute and IBM Team to Pioneer River Observatory Network. News release. Retrieved March 7, 2012, from http://www-03.ibm.com/press/us/en/pressrelease/22162.wss

27. IBM News. (2009a, May 13). IBM Ushers In Era Of Stream Computing. News release. Retrieved March 7, 2012, from http://www-03.ibm.com/press/us/en/pressrelease/27508.wss

28. IBM News. (2009b, November 19). UMBC Researchers Use IBM Technology to Fight Rising Threats of Forest Fires. News release. Retrieved March 7, 2012, from http://www03.ibm.com/press/us/en/pressrelease/28863.wss#release

29. Kelly, K. (2011, March 28). Keynote Web 2.0 Expo SF 2011. San Francisco. Retrieved from http://www.web2expo.com/webexsf2011/public/schedule/detail/19292

30. López, P., & Hilbert, M. (2012). Methodological and Statistical Background on The World's Technological Capacity to Store, Communicate, and Compute Information (online document). Retrieved from http://www.martinhilbert.net/WorldInfoCapacity.html

31. Manovich, L. (2012). Trending: The Promises and the Challenges of Big Social

Data. In M. Gold (Ed.), Debates in the Digital Humanities (pp. 460-476). Minneapolis: The University of Minnesota Press. Retrieved from http://www.manovich.net/DOCS/Manovich_trending_research article.pdf

32. *Masuda, Y. (1980). The Information Society as Post-Industrial Society. Tokyo: World Future Society.*

33. *Melville, N., Kraemer, K., & Gurbaxani, V. (2004). Review: Information Technology and Organizational Performance: An Integrative Model of IT Business Value. MIS Quarterly, 28(2), 283-322.*

34. *Moreno, R. (2012). Mexico: A Moment of Opportunity. Increasing Transparency and Accountability inthe Extractive Industries (Working Research article Series 2012). Revenue Watch Institute and Trans parency and Accountability Initiative. Retrieved   from http://www.revenuewatch.org/sites/default/files/Mexico_TAI_eng.pdf*

35. *Nature Editorial. (2007). A matter of trust. Nature, 449(7163), 637-638. doi:10.1038/449637b Nature*

36. *Editorial. (2008). Community cleverness required. Nature, 455(7209), 1. doi:10.1038/455001a Nelson, S. (2008). Big data:*
    The Harvard computers. Nature, 455(7209), 36. doi:10.1038/455036a

37. *Raihan, I. (2010). Managing Big data. Retrieved from*
    http://www03.ibm.com/systems/resources/systems_Managing_Big_Data_Podcast _Transcription.pdf

38. *Revenue Watch Institute, & Transparency International. (2010). Revenue Watch Index 2010.*

39. *Transparency: Governments and the oil, gas and mining industries. Transparency International.*

40. *Retrieved from*
    http://www.revenuewatch.org/rwindex2010/pdf/RevenueWatchIndex_2010.pdf

41. *Shmueli, G. (2010). To Explain or to Predict? Statistical Science, 25(3), 289-310. doi:10.1214/10-STS330*

42. *Sifry, M. L. (2011). WikiLeaks and the Age of Transparency. OR Books.*

43. *Simon, H. A. (2002). Science seeks parsimony, not simplicity: searching for pattern in phenomena. In A. Zellner, H. A. Keuzenkamp, & M. McAleer (Eds.), Simplicity, Inference and Modelling: Keeping It Sophisticatedly Simple (pp. 32-72).   Cambridge   University   Press.   Retrieved   from*

http://dx.doi.org/10.1017/CBO9780511493164

44. *Slavin, K. (2011). How algorithms shape our world (Vol. Talks). Retrieved from http://www.ted.com/talks/kevin_slavin_how_algorithms_shape_our_world.html*

45. *Suárez Beltrán, G., & Laguado Giraldo, R. (2007). Manual de contratación pública electrónica para América Latina. Bases conceptuales, modelo legal, indicadores, parámetros de interoperabilidad*

46. *(No. 20). Santiago Chile: United Nations ECLAC.*

47. *Sunstein, C. (2003). The Law of Group Polarization. In J. Fishkin & P. Laslett (Eds.), Debating Deliberative Democracy (1st ed., pp. 80-102). Wiley-Blackwell.*

48. *Tan-Mullins, M. (2012). China: Gradual Change. Increasing Transparency and Accountability in the Extractive Industries (Working Research article Series 2012). Revenue Watch Institute and Trans parency and Accountability Initiative. Retrieved from http://www.revenuewatch.org/sites/default/files/China_TAI_eng.pdf*

49. *Transparency International. (2011). Corruption Percpetion Index 2011. Retrieved from http://www.transparency.org/cpi2011*

SDIS-003

Effectiveness of emotional intelligence training programme on emotional intelligence and problem solving ability of juvenile delinquents

Shabana & Manimekhala Shukla

Kalyan P.G. College, Sector-7, Bhilainagar, DURG (C.G.), Mobile No: 9406248063

Abstract

Present study focuses on determining the effectiveness of Emotional Intelligence training program on emotional Intelligence and problem solving ability of the juvenile delinquents. Sample comprises of forty juvenile delinquents of Durg district of Chhattisgarh.The study was Experimental pre-post design involving control and experimental group. Standardized tool adopted for the present study includes Emotional Intelligence Questionaire and Emotional intelligence training programme constructed and standardized by Ajwani (2008) and problem solving scale developed and standardized by Dubey (2004) were used for data collection. Data was analyzed by using t-test. Findings indicate significant effect of Emotional intelligence training programme on emotional intelligence and problem solving ability of experimental group of juvenile delinquents.

Introduction

Juvenile delinquency is a major problem in many societies as it causes major distress and damage to victims, perpetrators and society at large. **(Nas et al, 2005).**Delinquent children belong to that category of exceptional children who exhibit considerable deviation in items of their social adjustment and are consequently also labeled as socially deviant or socially handicapped. They are found to possess criminal tendencies and usually indulge in antisocial behavior **(Vijayanath et. al. 2010)**. Delinquency is produced by inadequate socialization, social disorganization, strain, peer group influence, etc. **(Altschules and Armstrong, 1994).** Family variables like family stability, family cohesiveness and family adaptability impact strongly on juvenile delinquency. **(Kudirat et. al, 2010)**. Distress in family structure and affiliation with delinquent peers has a significant role in delinquency phenomenon **(Sajad Alboukords et. al., 2012)**. Parenting style is linked to delinquency. Neglectful and authoritarian parenting was positively related to delinquency **(Moitra and Mukherjee, 2010).**

Delinquency encompasses a range of norm breaking behaviours for which adolescents are criminally responsible, drug use, violent offences against other persons and carrying weapons are just some instances of delinquency (**Mart, 2008**). Delinquency put a youth at risk for drug use and dependency, school dropout, incarceration, injury, early pregnancy and adult criminality. Saving youth from delinquency saves them from wasted lives (**David et. al., 2007**). Life skills for adolescents include decision making, problem solving, creative thinking, critical thinking, effective communication, interpersonal relationship, self awareness, empathy, coping with emotions and stress (**Tilak, 2009**). School based prevention approach found to prevent tobacco, alcohol and illicit drug use can prevent violence and delinquency (**Botvin et. al., 2006**). **Epstein et. al., 1983**, describes an after school program which provides academic remediation, socialization, recreation, group therapy, meal preparation and fieldtrips for children with behavior problems, its effectiveness is characterized by high attendance and testimonials from parents and teachers.**Lynch et. al., (2004)** found the intervention group improved significantly on measures of social -emotional competence, prosocial skills and some measures of coping. A life skills approach develops skill in adolescents, both to build the needed competencies for human development and to adopt positive behaviours that enable them to deal effectively with the challenges of everyday life. **Botvin et. al. (1995)** found that life skill training had numerous significant positive effect on the treatment group that received complete intervention programme.

Some of the identified risk of factors for delinquency are genetic or biological and cannot easily be changed. Others are dynamic involving the quality of parenting, school involvement peer group associations or skill deficits and are more readily altered ongoing analysis that carefully monitor the social development of cohorts of at risk youth beginning in infancy and early childhood continue to retime how their risk factors develop and interact overtime (**Mark, 1988).**

Objectives

1. To find out whether there is significant difference between pre test scores of control and experimental group for emotional intelligence among juvenile delinquents.

2. To find out whether there is significant difference between post test scores of control and experimental group for emotional intelligence among juvenile delinquents.

3. To find out whether there is significant difference between pre test scores of control and experimental group for problem solving among juvenile delinquents.

4. To find out whether there is significant difference between post test scores of control and experimental group for problem solving among juvenile delinquents.

Hypothesis

1. There will be no significant difference between pre test scores of control and experimental group for emotional intelligence among juvenile delinquents.

2. There will be significant difference between post test scores of control and experimental group for emotional intelligence among juvenile delinquents.

3. There will be no significant difference between pre test scores of control and experimental group for problem solving among juvenile delinquents.

4. There will be significant difference between post test scores of control and experimental group for problem solving ability among juvenile delinquents.

Methodology

Equivalent Pre post test design was utilized for the study.

Variables Involved

For the present study independent variable is Emotional Intelligence training program and dependent variables includes Emotional Intelligence and problem solving ability.

Sample

For the present study forty juvenile delinquents from Durg juvenile delinquent center were selected by adopting purposive sampling technique.

TABLE NO. 1
POPULATION DETAIL OF JUVENILE CENTRES IN C.G.

S.No.	District	JD Centers	Total JD
1.	Durg	1	40
2.	Rajnandgaon	1	50
3.	Bilaspur	1	50
4.	Raipur	1	50
5.	Ambikapur	1	50
6.	Bastar	1	50

Measures

Standardized tool adopted for the present study includes Emotional Intelligence Questionaire and Emotional intelligence training programme constructed and standardized by Ajwani (2008) and

problem solving scale developed and standardized by Dubey (2004) were used for data collection. For statistical analysis of data dependent t-test was computed.

Procedure

Pre post design test was utilized for the study**.**The experimental group was exposed to twenty days sessions of Emotional Intelligence and problem solving training programme while the control group was not given any training only given pre-post questionnaire for Emotional intelligence and Problem solving ability.

TABLE NO. 2

S. No.	Variable	Test	Category	M	SD	t	Level of Signif.
1.	Emotional Intelligence	Pre	Control Experimental	96.15 108.65	19.24	2.149	NS
		Post	Control Experimental	90.85 121.75	20.21	5.246	S**
		Pre Post	Control	96.15 90.85	18.34	0.203	NS
		Pre Post	Experimental	108.65 121.75	23.44	1.88	S*

S* Significant at 0.05   S** Significant at 0.01

Results and Discussion

The package seems to have made tangible impact on Emotional Intelligence and problem solving ability of juvenile delinquents Table No. 1 indicates that unlike pre test, the difference in mean values of post test of control and experimental group was found to be significant at 0.05 level.   It indicates significant difference in Emotional intelligence of control and experimental group of juvenile delinquents which further indicates the effectiveness of emotional intelligence training programme on emotional intelligence of experimental group of juvenile delinquents.More over significant difference exist in the pre test score of experimental group for emotional intelligence and no significant difference exist in the pre post test score of control group for emotional intelligence.

Findings are corroborated by the findings of Lynch et. al. (2004) that intervention programmes improves social-Emotional competence, pro social skills and coping stress.

Table No. 2 reveals that the t-value for post test of experimental and control Group for problem solving is 3.97 which is found to be significant at 0.01,which indicate significant effect of problem solving training on problem solving ability of experimental group of juvenile delinquents. More over significant difference exist in the pre post test score of experimental group of experimental group for problem solving ability and no significant difference exist in the pre post test scores of control group for problem solving ability of juvenile delinquents. Intervention programmes on life skills should be made part of training given in juvenile delinquent centres further such centres should collaborate with institutions providing intervention programmes and frequent such programmes should be organized.

TABLE NO. 3

S. No.	Variable	Test	Category	M	SD	t value	Level of Sig.
1.	Problem Solving	Pre	Control Experimental	5.15 5.95	2.02	1.01	NS
		Post	Control Experimental	3.45 5.7	1.01	2.2	S*
		Pre Post	Control	5.15 3.45	1.5	202	NS
		Pre Post	Experimental	5.95 5.7	2.17	3.97	S**

S* Significant at 0.05   S** Significant at 0.01

REFERENCE

1.Ajwani(2008)Emotional intelligence scale, F.S.Management private limited ,Raipur.

2.Botvin, G.J., Griffin, K.W; Nicholas, T.R (2006) preventing youth violence and delinquency through a universal school based prevention approach, prevention science, 7, 403-408.

3.Botvin, Gilbert, J., ali Baker, Linda Dusenbury, Elizabeth, M, Botvin and Tracy Diaz Nicholas (1995) Drug abuse prevention trial' Journal of the American Medical Association, 273 (14) : 1106-12.

4. David, P. Farrington and Brandon, C. Welsh (2007) saving children from a life crime early risk factors and effective interventions, Oxford University.

5.Dubey,L.N.(2004) Problem solving ability scale,National psychological corporation of India,Agra.

6.Epstein; Norman; Maragos; Nikos (1983) "Treating delinquent-prone Addescents and pre addescents" social work, vol. 28, P. 66-68.

7.Kudirat, B.S; Nsisong, A.U; Abayomi, A.O; Felicia, N.M and Lconard, N.E (2010).Family types and juvenile delinquency: Journal of social sciences, 23(1), P-21-28.

8. Lynch, Kathleen Bodisch, Susan RcGeller and Melinda, G. Schmiat (2004).Multi-yea evaluation of the effectiveness of a Resilience based prevention program for young children." Journal of primary prevention 24(3) 335-53.

9.Mark W. Lipscy and James H. Derzon (1998) "Predictors of violent and serious delinquency in addescence and early adulthood." In serious and violent juvenile offenders, edited by Rolf Loeber and David P. Farmington.

10.Moitra Tanusree and Mukherjee Indrani (2010) :A comparative study I delinquency and non delinquents." International journal of criminal justice sciences, vol. 5, Issue-2, P-274-285.

11. Sajad Alboukordi, Ali Mohammad Nazari, Robaben Nours and Javad Khodadadi Sangden (2012) Predictive factors for juvenile delinquency. The role of family structure, parental monitoring and delinquent press: International journal of criminology & social theory, vol. 5, No. 1, P. 770-777.

12.Tilak (2009) "Life skills for addescents" Indian academy of pediatrics cited in www.slideshare. Net/drrajtilak/life-skills-to-addescents presentation.

13.Vijayanath, V; Anitha, M.R; Raju, G.M; Prakash, B. (2010) Juvenile delinquency" Biomedical research, Vol. 21, No. 3.

SDIS-006

Assessment of Noise Pollution in Different Areas of Raipur City

Meeteshwari Shakar[1], Khageshwar Singh Patel[1], Satendra Kumar Induria[2*]

[1]*SoS in Environmental Science, Pt.Ravishankar Shukla University Raipur-492001, CG*
[2]*SoS in Life Sciences, Pt.Ravishankar Shukla University Raipur-492001, CG, INDIA*
Corresponding author Email-induriasaten@gmail.com

Abstract

Raipur, capital of Chhattisgarh state in India is located in latitude 21 º30' N and longitude 82° 01'E. A densely populated city in central India has noticed tremendous pace of development in field of infrastructure, industry, transportation etc which has triggered a vicious cycle resulting intolerable sound pollution in the city. We in our study examined ten locations in city using Sound Level Meter. Our study reveals astonishing result with eight out of ten locations studied have recorded more than 90 dB SPL. Thus an immediate need arises to strictly control the rising sound pollution level.

Key words: Raipur, intolerable, Sound Level Meter, infrastructure.

Introduction

Noise, defined as 'unwanted sound', is precisely quoted as environmental stressor. Transport noise is an increasingly prominent feature of the urban environment, making noise pollution an important environmental public health issue.(Garg et al., 2007) Major cities like Mumbai, Delhi, Kolkata and Chennai are listed among the noisiest cities in India (Shastri et al., 1996) According to Robert Koch a Nobel Prize Winner German bacteriologist "A day will come man will have to fight merciless noise as the worst enemy of health" (Chauhan *et al.,* 2010). Noise has a significant impact on the quality of life (WHO, 1980) Chief sources of traffic noise are the motors and exhaust systems of automobiles. In addition, noise from the roadway is generated by commercial activity, construction, religious activities, ceremonials, festivals etc. Noise levels and its effects depend such as infrastructure, number of vehicles, road quality, weather and climate. (Kisku, et al.,2003). Noise is produced by various parts of the vehicles such as engine inlet exhaust, propulsion and transmission including gears, breaks, horns etc. As the vehicle grow older and their mechanical conditions deteriorate the noise generated in

more. Large diesel engine vehicle, commercial trucks, tractor-trolley, transport vehicles are main source of traffic noise. The effects of noise on human health and comfort are divided into four categories depending on its duration and volume. They are –(**Fig.1**) (i) physical effects such as hearing defects; (ii) physiological effects, such as increased blood pressure, irregularity of heart rhythms and ulcers; (iii) psychological effects, such as disorders, sleeplessness and going to sleep late, irritability and stress; and (iv) effects on work performance, such as reduction of productivity (Evans and Hygge, 2000). Long exposure to very frequency noise may cause nausea, vomiting, pain, hypertension, high blood pressure, cardiovascular problems, sleep disturbance, restlessness, depression, fatigue, allergy, mental stress and annoyance (Rehm, 1983).
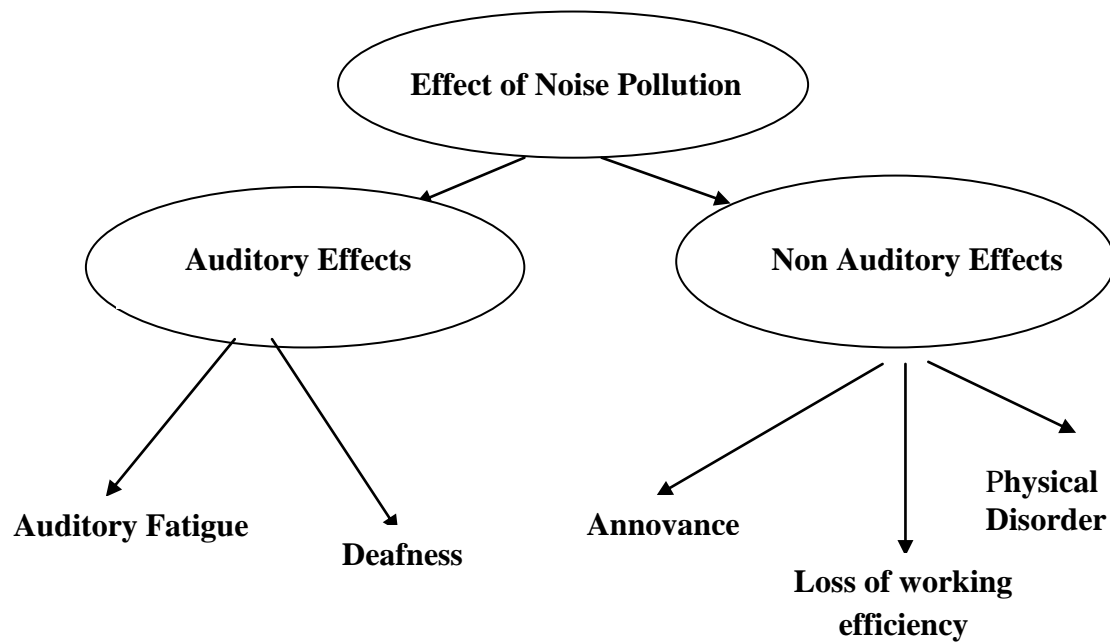
Fig: 1 Effect of Noise Pollution on human being

Fast growing vehicle population in Raipur city in the recent years has resulted in considerable increase in traffic on roads causing alarming noise pollution. Noise level increases with traffic volume in an exponential manner taking a step in this direction a case study was undertaken in Raipur city. Noise pollution level was measured in Raipur city and various parameters were determined.

Materials and Method

Study Sites

Raipur, the capital of Chhattisgarh state of India.. It is rapidly emerging as industrialized and urbanized city. Raipur is located in latitude 21 º30' N and longitude 82º 01'E. The total area of the city is 226 km^2 and the population is 1,010,087 (Municipal Corporation). The study locations were laid at ten different sites covering all the direction (**Fig.2**). The study area has lot of commercial complexes, educational institutes, petrol pumps, and many shops of different products.
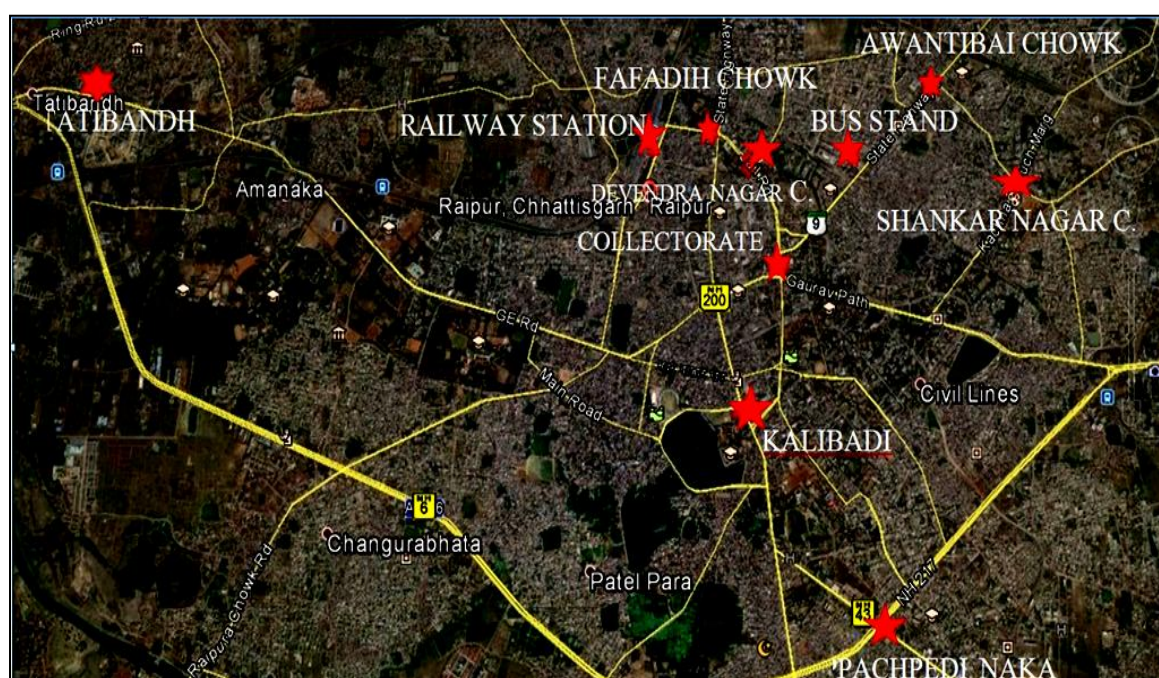
Fig: 2 Different study sites of Raipur city shown as stars with respective locations.

Procedure utilized for monitoring of sound levels:

Noise levels or intensities were measured using by Sound Level Meter model no. SL-4030. Sound Level Meter is level distribution analysis, sometimes called statistical distribution analysis (Berry and Zwicker, 1986).The work was conducted in April 2015, in ten different areas of Raipur city [which was randomly selected] on working days during working hours, from 9:00am to 9:00pm, at every 10 minutes intervals. Measurement was made following the ISO 1996 guidelines.

Result and Discussion

The noise levels recorded from different areas of Raipur city were astonishingly higher than expected .Eight out of ten locations studied have recorded more than 90dB namely Railway Station (109.8dB), Pandri Bus Stand (104.7dB), PachpediNaka (103dB), Tatibandh (101.2dB), Fafadih (99.8dB), Collectorate (97.5dB), Kalibadi (94.8dB), Awanti Bai Chowk (92.3dB) as presented in (**Fig.4**). Number of vehicle passing at the given time in different location closely relates to the SPL recorded (**Fig.3**) The minimum and maximum SPL (sound pressure level) ranged between 84.6 to 109.8 dB respectively. Relative index of study locations and number of vehicle passing in the stipulated time was correlated (**Fig.5**). Presumably the relation shows increased traffic load due to frequent jam causes increase in SPL.
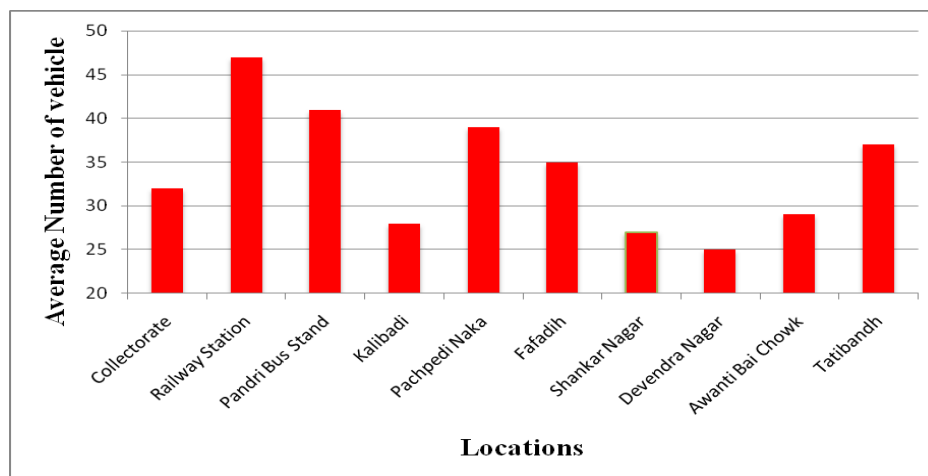
Fig: 3 Variation of traffic flow at different locations in Raipur.
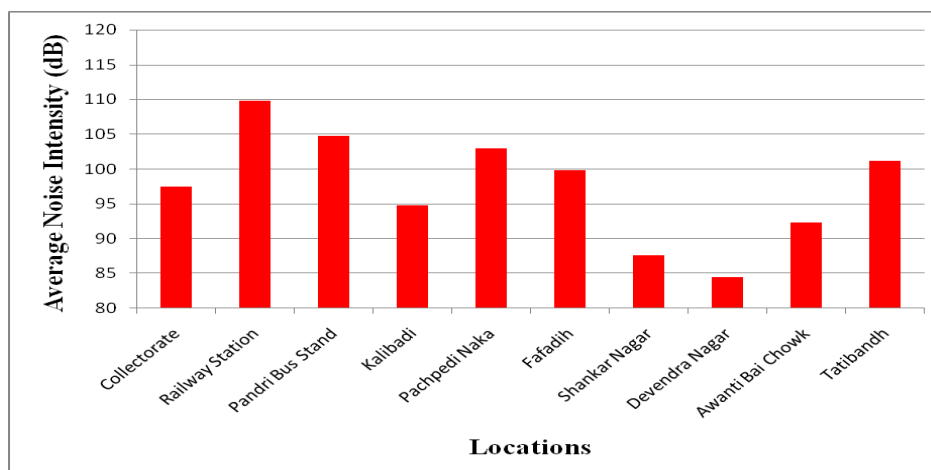
Fig: 4 Measured SPL of different location of Raipur.
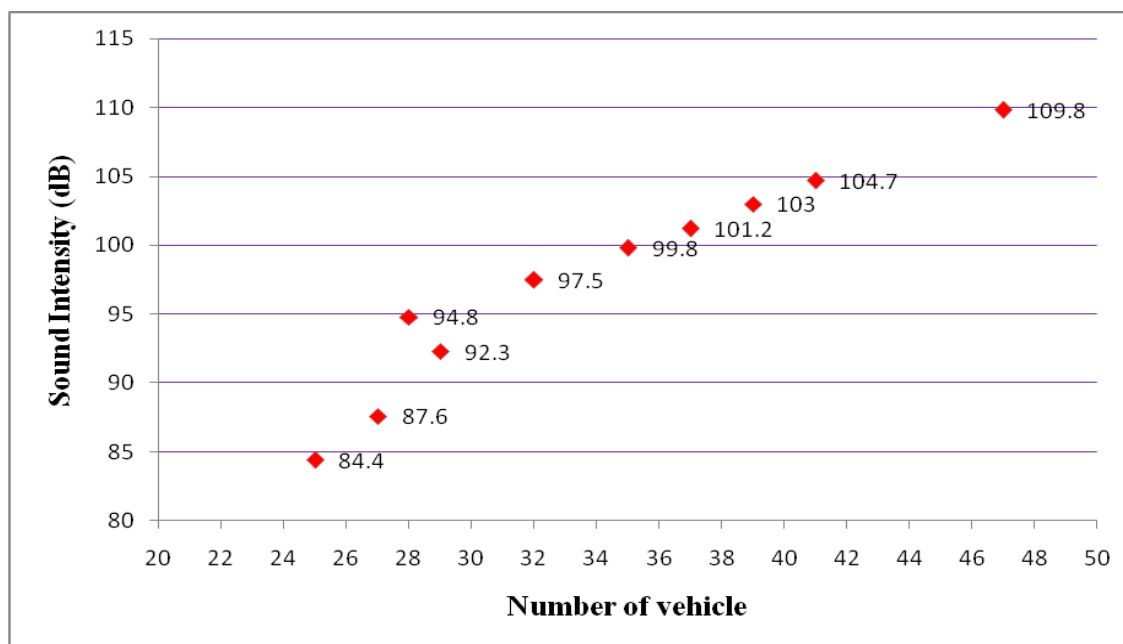
Fig: 5 Relative indices between sound intensity and vehicle number

The result of noise pollution levels indicate that the pollution levels were highly variable at different areas depending on the density of vehicles plying on the roads. The noise levels in few areas exceeded the standards.

Noise pollution level values in the study area varied between a maximum of 109.8 dB and a minimum of 69.2 dB. It was also observed that even in some sensitive areas the noise levels exceeded the prescribed standard of Central Pollution Control Board.

Conclusion and Recommendations

The present study shows that all the selected sites in Raipur suffering from higher level of noise level, for the minimization of higher level of noise level in Raipur city followings recommendation are suggested to combat this problem.

1. Widening of the roads should be done to minimize the traffic congestion.
2. The traffic volume should be reduced by diversion of traffic. The heavy vehicles mainly trucks and busses should be strictly banned at pick hours in the city.

3. Avenue plantation should be encouraged as it has been proved that trees with dense foliage were found to be highly effective in absorbing the acoustic noise and act as very good screens in bringing down the noise levels.

4. Use of horns and music system in vehicles should be minimized.

5. Automatic traffic signals should be installed at all junctions and both vehicles drivers as well as pedestrians are must obey traffic rules strictly.

6. The awareness program should be initiated to aware people about adverse effects of noise pollution on health.

Acknowlegement

Reference

1. *Berry, B. and Zwicker, E.,Comparison of subjective evaluation of impulsive noise with objective measurements of the loudness-time function given by loudness meter, In R. Lotz (Ed), Inter Noise Control Foundation, Vol. II: 849-854 (1986).*

2. *Chauhan et al., 2010). Chauhan, A. and Pande, K.K. (2010). Study of noise level in different zones of Dehradun City, Uttarakhand. Report and Opinion, 2(7):65-68.*

3. *Evans, G.W. & Hygge. S. (2000). Noise and performance in children and adults. In Prasher D, (Eds.), Handbook of Noise and Health.*

4. *Garg N.K., Gupta V. K. and Vyas R.K., Noise pollution and its impact on urban life. J. Environ. Res. And Develop., 2(1), (2007).*

5. *Kisku, G.C., P. R. Salve, M. M. Kidwai, S. C. Barman, A.H. Khan,*

6. *R. Singh, D.Mishra, S. Sharma and S. K. Bhargava : A random survey of ambient airquality in Lucknow city and its possible impact on environmental health,Indian J. Air Pollut. Cont., 3(1), 45-58 (2003*

7. *Rehm, S., Research on extra aural effects of noise since 1978 In : Rossi, G., ed., Proceedings of the Fourth International Congress on noise as a Public Health Problem,Vol 1, Milan, Centro Ricerche e studi Amplifon (1983).*

8. *Shastri, S.C., Bakre, P.P., Khan, T.I. (1996). Industry, environment and the law. Jaipur, I-Publication, RBSA Publishers.*

9. *WHO, 1980) WHO, 1980. Environmental health criteria on Noise.12. World Health Organisation.*

SDIS-012

Case Study for Bank ATM Queuing Model

Preeti Nand

Department of Science, Christ College, Jagdalpur, Email: preeshiv7587@gmail.com

Abstract:

To avoid the huge manpower used to serve the customers inbanking like withdrawing cash from Bank etc. and long queues in counters bank introduced automated electronic machine named ATM(Automated Teller Machines). Initially banks provided one ATM on every branch. Later as per the requirement banks increased the number of ATM at different location. Even this number of ATM would not sufficient to servecustomers on some occasions like any festival time etc. though it is appropriate on usual time. Hence to satisfy customer requirements on all the months of a year, the ATM service need to be modified and synchronized with the frequency of customer's arrival to ATM. Queuing model could be used effectively to achieve this requirement, For which we need the data of bank through which we can derive arrival time, servicetime, waitingtime, utilization time in the queue and the average number of customers in the queue. So that this datacan be used in Little's theorem and M/M/1 queuing model.

Keywords: Bank ATM, Little'stheorem, M/M/1 queuing model, waiting lines.

Introduction

On 2nd September 1969, America's first automatic teller machine (ATM) makes its public debut, dispensing cash to customers at Chemical Bank in Rockville Center, New York. ATMs went on to revolutionize the banking industry, eliminating the need to visit a bank to conduct basic financial transactions. By the 1980s, these money machines had become widely popular and handled many of the functions previously performed by human tellers, such as check deposits and money transfers between accounts.

In 1908 Copenhagen telephone company requested A.K. Erlang to work on the holding times in a telephone switch. In which he identified number of telephone Conversations and telephone holding time.In which he found exponential distribution, which was the beginning of queuing theory.So queuing theory was initially proposed by A.K. Erlang in

1903.Queuing theory means number of persons waiting in a line or queue. Queue is a flow of customers towards the service facility. Queues are formed in the absence of perfect balance between service facilities and the customers. By the term customers we mean arriving time that require some service to be performed.

Here we see the useof queuing theory to study the waiting lines in Bank ATM.In ATM bank customers arrive randomly and the service time i.e. the time the customers take is also random. Little's theorem and M/M/1 model are used to find the arrival time,service time, utilizationtime, waiting time in the queue and the average number of customers in the queue.In Jagdalpur there are 17 banks and the number of ATM for every bank are as follows:

1. State Bank of Indiahaving number of ATM is 16
2. Punjab National Bank having number of ATM is 4
3. Axis Bank having number of ATM is 1
4. Canara Bank having number of ATM is 2
5.Bank Of Baroda having number of ATM is 2
6.ICICI Bank having number of ATM is 1

On average 700 customers are served on week days (Monday to Friday) and are served 350 customers on weekends(Saturday & Sunday).Generally it is found that ATM are much more busy on festivals like Dushehra, Diwali etc., most of the ATMs found out of service on such occasion during the peak transaction time. Apart from that ATMs are found busy on Sundays.

Queuing System

The mechanism of queue process is very simple. Customers arrive at a service counter and are attend to by one or more of the services. As soon as a customer is served, it departs from the system. Thus a queuing system can be described as consisting of customers arriving for service, waiting for service if it is not immediate, and leaving the system after being served.The general framework of a queuing system is in Figure-01:
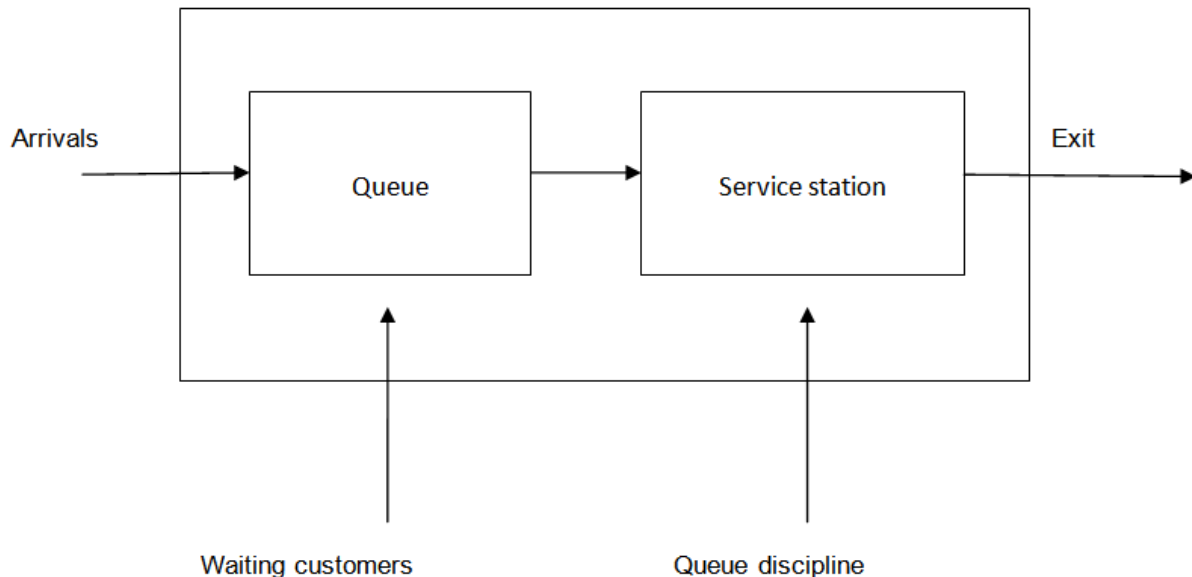
Fig.01

Elements of Queuing System: The basic elements of a queuing system are as follows:

1. Input or Arrivals Process (Ʌ): This element of queuing system is concerned with the pattern in which the customers arrive for service. Input source can be described by following three factors:

(a) Size of the queue: If the total number of potential customers requiring service are only few, then size of the input source is said to be finite. On the other hand if the potential customers requiring service are sufficiently large in number then the input source is considered infinite.

(b) Pattern of the arrivals: Customers may arrive in the system at known times or they may arrive in a random way.In case the arrivals are known with certainty, the queuing problems are categorized as deterministic model.If the time between the successive arrivals are uncertain, then the arrival pattern is measured by mean arrival rate .These are the probability distribution under random process.

(c) Customers behavior: It is also necessary to know the reaction of a customer upon entering the system. A customer may decide to wait no matter how long the queuebecome(PATIENT CUSTOMER), or if the queue is too long to suit him, may

decide not to enterit (IMPATIENT CUSTOMER). Customers deciding not to join the queue if it is too long (BALKING). Customers switch between queues if they think they will get served faster by so doing (JOCKEYING). Customers leave the queue if they have waited too long for service (RENEGING) .The final factor to be considered regarding the input process is the manner in which the arrival pattern changes with time. If it is time dependent the process is termed as transient.

2. Queue Discipline (Q): It is a rule according to which customers are selected for service when a queue has been formed. The most common queue discipline is the first come first served (FCFS) or first in first out (FIFO) rule under which the customers are serviced in the strict order of their arrivals .Other queue discipline include : last in first out (LIFO) rule according to which last arrival in the system is serviced first. Beside these disciplines other disciplines are: selection in random order (SIRO) rule under which the arrivals are served randomly. There is also a variety of priority schemes according to which a customer service is done in preference over some other customers.

Under priority discipline the service is of two types: (i) Pre-emptive priority, under this rule the customers of high priority are given service over the low priority customer that is lower priority customers interrupted to start service for a high priority customer.The interrupted service is resumed again as soon as the highest priority customer has been served.(ii) Non pre-emptive priority: In this case the highest priority customers goes ahead in the queue,but his service is started only after the completion of the service of the currently being served customer.

3.Service Station (S): The service mechanism is concerned with service time and service facilities. Service time is the time interval from the commencement of the service to the completion of service. If there is infinite number of servers then all the customers are served instantaneously on arrival and there will be no queue.If the number of servers is finite then they bare served according to a specific order. Further the customers may be served in batches of fixed size or of variable size rather than individually by same server.

Service facilities are of following types:

(a) Single queue one server

(b) Single queue several servers

(c) Several queues one server

(d) Several servers

4.Capacity of The System (W): The source from which customers are generated may be finite or infinite. A finite source limits the customers arriving for service i.e. there is a finite limit to the maximum queue size. The queue can also be viewed as one with forced balking where a customer is forced to balk if he arrives at a time when queue size is at its limit. Alternatively, afinite source is forever abundant as in the case of telephone calls arriving at a telephone exchange.The schematic representation of queuing model in Figure-02.
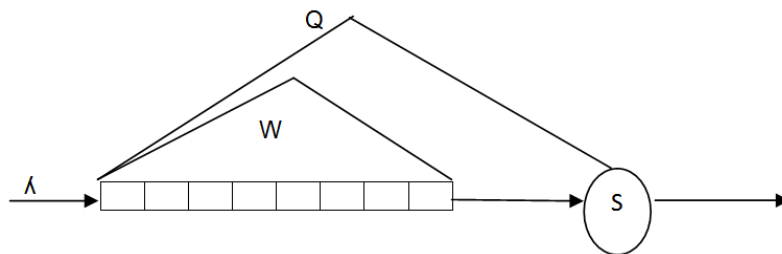
Fig.02

Methodology:

TheLittle's theorem and M/M/1 models can be used in queuing system areas follows:

1. Little's Theorem: Little's theorem describes the relationship between throughput rate (i.e. arrival & service rate),cycle time and work in process i.e. number of customers/Jobs in the system. The theorem states that expected number of customers (N) for a system in steady rate can be determined using the following equation:

$$L = ʎT \qquad\qquad (1)$$

Here $ʎ$ is the average customer arrival rate and T is the average service time for acustomer.Three fundamental relationship can derived from Little's theorem

i. L increases if Λ or T increases

ii. Λ increases if L increases or T decreases

iii. T increases if L increases or Λ decreases

2. ATM MODEL (M/M/1 queuing model): M/M/1 queuing model means that the arrival and service time are exponentially distributed i.e. Poisson Process.For the ATM M/M/1 queuing models variables are:

(a) Λ: The mean customer's arrival rate

(b) μ: The mean service rate

(c)$\rho = \frac{\Lambda}{\mu}$:Utilization factor

(d) P_0 : Probability of zero customers in the ATM, $P_0 = 1 - \rho$ $\qquad$ (2)

(e) P_n : Probability of having n customers in the ATM,$P_n = P_0\rho^n$ $\qquad$ (3)

(f) L: The average number of customers in the ATM, $L = \frac{\rho}{1-\rho} = \frac{\Lambda}{\mu-\Lambda}$ $\qquad$ (4)

(g) L_q: The average numbers of customers in the queue:$L_q = L \times \rho = \rho^2/(1-\rho) = \frac{\rho\Lambda}{\mu-\Lambda}$(5)

(h) W_q: The average waiting time in the queue,$W_q = \frac{L_q}{\Lambda} = \frac{\rho}{\mu-\Lambda}$ $\qquad$ (6)

(i) W: The average waiting time spent in the ATM, $W = \frac{L}{\Lambda} = \frac{1}{\mu-\Lambda}$ $\qquad$ (7)

The conceptual model of the case ATM queuing system in Figure-03.
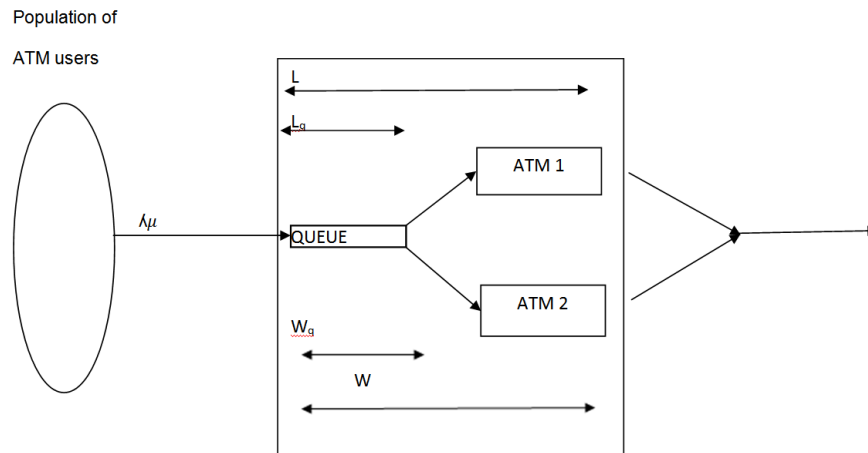
Fig. 03

Observation and discussion:

For four weeks (in November 2015) number of transactions happened in ATM of State Bank of India, collectorate branch are collected from the bank and shown in table-01:

DAY	WEEK DAYS					WEEKEND		WEEKDAYS TOTAL	WEEKEND TOTAL	FESTIVAL DAY
WEEK	MON	TUE	WED	THU	FRI	SAT	SUN			
1st	135	103	142	112	150	152	197	642	349	627
2nd	102	113	149	108	195	163	175	667	338	
3rd	78	107	189	123	158	187	190	655	377	
4th	107	188	132	145	133	159	193	705	352	

Table-01
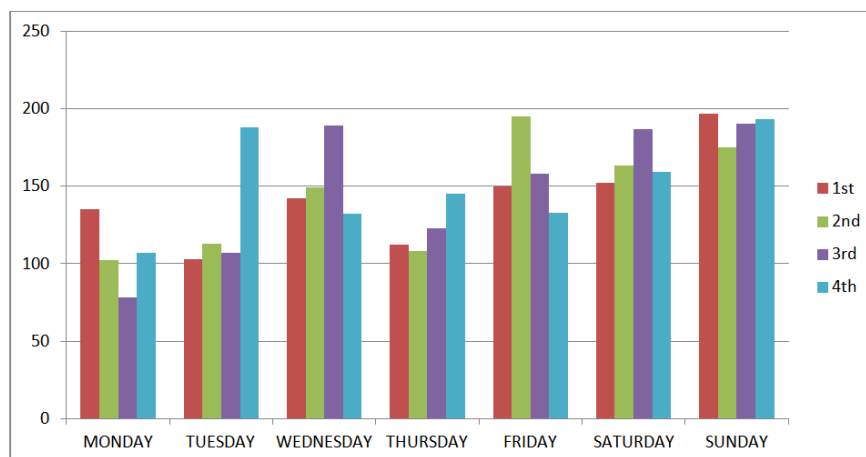
Fig. 04
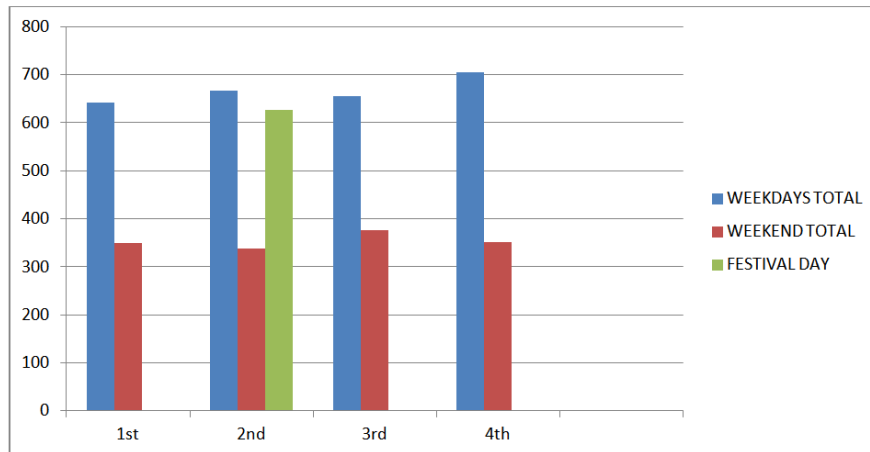
Fig. 05

From figure-04 it can be observed that in weekends the ATM had more number of transactions. In that weekends particularly in Sunday number of transaction are more. And figure-05 shows that in festival day ATM had number of transactions almost equal to the total amount of transactions used to happen in a week.

Calculation

It was observed that, during first two days of a week, there are on average 60 people coming to the ATM in an hour time period of banking time. From thisthe arrival rate can be derived as:

$$\Lambda = \frac{60}{60} = 1 \text{ (cpm)}$$

It was also found out from observation that each customer spends 2 minutes on average in the ATM(W), the queue length is around3 people (L_q) on average waiting time is around 2.5 minute i.e 150 seconds.

Theoretically, the average waiting time is $W_q = \frac{L_q}{\Lambda} = \frac{3\ customers}{1\ cpm} = 3$ minutes $= 180$ seconds

From above it can be concluded that the observed actual waiting time dose not differ by much when it is compared with the theoretical waiting time.

Next, let calculate the average number of people in the ATM using (1),

$$L = 1 \text{ cpm} \times 2 \ minutes = 2 \ customers$$

Having calculated the average number of customers in the ATM, the service rate and the utilization rate can also be derived using (5) & (2)

$$\mu = \frac{\lambda(1+L)}{L} = \frac{1(1+2)}{2} = 1.5 \text{ cpm}$$

Hence , $\rho = \frac{\lambda}{\mu} = \frac{1 \ cpm}{1.5 \ cpm} = 0.70$

with the very high utilization rate of 0.70 during banking time, the probability of zero customers in the ATM is very small as can be derived using (3),

$$P_0 = 1 - \rho = 1 - 0.70 = 0.30$$

This provides the formula to calculate the probability of having n customers in the ATM as follows:

$$P_n = (1 - \rho)\rho^n = (1 - 0.70)(0.70)^n = (0.30)(0.70)^n$$

It is assumed that impatient customers will start to balk when they see more than 3 people are already queuing for the ATM. And also assume the maximum queue length that a patient customer can tolerate is 10 people. As the capacity of the ATM is 1 people, the probability of 4 people in the system (i.e. in the ATM) can also be calculated.

Therefore the probability of customers going away = P (more than 3 people in the queue) = P(more than 4 people in the ATM) is

$$P_{5-11} = \sum_{n=5}^{11} P_n = 0.15423 = 15.423 \ \%$$

Hence, probability of customers going away is around 15.423 %.

Flow chart for determining optimal number of ATMs based on wait time
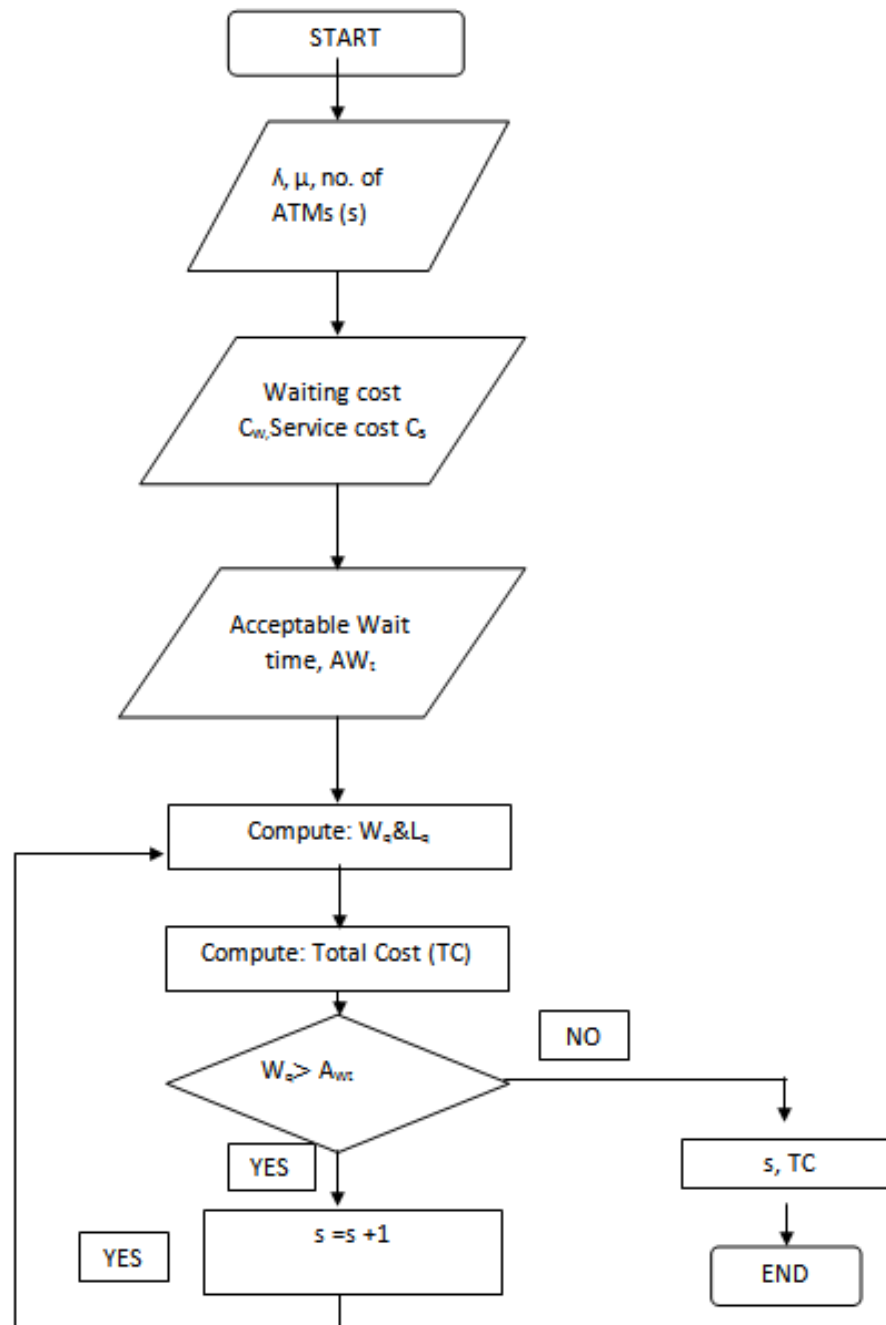
Total cost for operating the ATM queuing system with s ATMs:

$$TC = TC_S + TC_w$$

Where;

TC_S= total operating cost of s ATMs at the bank.

TC_w= total cost of customer wait in queue.

The total operating cost of the s ATMs (TC_S) is equal to the cost of running an ATM (C_S) per unit time multiplied by the number of ATMs (s). Therefore be expressed as;

$$TCs = s \text{ x } C_S$$

Cost of operating an ATM (C_S) may include cost of labour to fix mechanical faults, cost of labour to periodically stock the machines with cash and the cost of installation of additional ATMs. In the same way, total cost of customer wait in queue at the case ATMs (TC_w) is equal to the wait cost (C_w) of customers in queue per unit time multiplied by the average number of customers that are present in queue (Lq) per unit time. Wait cost may refer to the cost of losing customers (not keeping them in queue) who are unhappy and are less likely to return due to long wait in queue. The average daily cash withdrawal at the ATM if known could be used as the waiting cost value. The total cost of customer wait in queue at the case ATMs can therefore be expressed as;

$$TC_w = L_q \text{ x } C_W$$

Result

After calculating the probability of customers going away and total cost for operating the ATM queuing system with s ATMs (for this case only one ATM is considered at present). It is found that, it will be beneficial for the bank to have one more ATM at the same location. As it will attract impatient customer also at the time of long queue and can be used as stand-by in idle days or can be used when the existing ATM in maintenance. And during festival time both ATM can serve the customer. By this way bank can serve its customer in more efficient and effective manner.

Conclusion

It can be concluded that queuing theory could be used for the optimal operation of bank ATMs on all the transaction periods by synchronizing the customer's arrival to ATM. It will help to manage huge number of customers and can reduce more manpower involvement into it.

What could be much better?

If all transaction could be made online or by cards i.e. (CASHLESS TRANSACTION). It will make the banking very easy task and safe. Crimes like ATM robberies etc. could be stopped. As well as it is easy to trace all the transaction of individual's accounts. Only thing is it is necessary to make online transactions very safe to avoid cyber-crimes. The Sweden government is first to encouraged the electronic transaction and running it successfully in their country.

References

1. *OperationResearch* "Kantiswarup,P.K.Gupta&Manmohan" Sultan Chand& sons.

2.Bhavin Patel and PravinBhathawala,*"Case Study for Bank ATM Queuing Model"*.

3.M. S. R Murthy, M. Pushpa Latha &K.GR.Deepthi, Vishnu *"Minimizing The Waiting Time at Bank ATM For Service with Queuing Model"*.

4.S. K. Dhar, *"Case Study for Bank ATM Queuing Model"*.

SDIS-013

Performance Measures for a Three-Unit Compact Circuit

Dr. V.K. Pathak & Dr. Seema Sahu

B.C.S. Govt. P.G. College, Dhamtari PIN 493773, (Chhattisgarh), India

Abstract

This paper analyses a three component system with single repair facility. Denoting the failure times of the components as T_1 and T_2 and the repair time as R, the joint survival function of (T_1, T_2, R) is assumed to be that of trivariate distribution of Marshall and Olkin. Here, R is an exponential variable with parameter α and T_1 and T_2 are independent of each other. In this paper use of Laplace-Transform is taken for finding Mean Time Between Failure, Availability and Mean Down Time and table for Reliability measure is shown in the end.

Key Words: MTBF, Availability, MDT, Reliability.

[1] Introduction

Reliability measures for a two-component standby system with repair facility were obtained by several authors under different assumptions in the past. Lie et al. (1977) and Yearout et al. (1986) have done extensive reviews for the failure times and repair times assuming that these are statistically independent. Joshi and Dharmadhikari (1989) considered the bivariate exponential distribution to derive the performance measures associated with a two-component standby system. Goel and Srivastava (1991) considered a correlated structure for the failure and repair times and obtained various reliability measures.

In many situations, a unit or system can be repaired immediately after breakdown. In such cases, the mean time between failures refers to the average time of breakdown until the device is beyond repair. When a system is often unavailable due to breakdowns and is put back into operation after each breakdown with proper repairs, the mean time between breakdowns is often defines as the mean time between failures. If we consider only active repair time i.e. the time spent for actual repair, then the mean time to repair (MTTR) is

the statistical mean time for active repair. It is the total active repair time during a given period divided by the number of during the same interval. Frequently, a system may be unavailable on account of periodic inspections and not because of breakdowns. By the systematic inspection or preventive maintenance for the detection of defects and prevention of failures, the system is kept in a satisfactory operational condition. The time spent for this is termed as the preventive maintenance downtime. There is difference between mean time between maintenance (MTBM) and mean time between failures (MTBF). When preventive maintenance downtime is zero or is not considered, MTBM is same as MTBF.

Here in this paper, we perform the analysis of a three-component standby system with single repair facility. Here T_1 is the exponential variable with parameter k_1 and T_2 is another random variable with parameter k_2. R is an exponential variable with parameter α . T_1 and T_2 are independent of each other. It is further assumed that these components are identical in nature and each unit works as new after the repair and switching devices are perfect and instantaneous.

The following are the assumptions for the model:

(i) The system is composed of three components linked in parallel-series configuration (Fig. 1).

(ii) The components are non-identical in nature.

(iii) At time t=0, all the components are in operable mode.

(iv) After repair each unit works as new.

(v) Switching devices are perfect and instantaneous.

Define $p_i(t) = \Pr\{X(t) = i : X(0) = 0\}, i = 0, 1, 2$

Here in this model, we consider the following trivariate exponential distribution for (T_1, T_2, R) with survival function of (Marshall and Olkin, 1967) of the form :

$$\overline{F}(t_1, t_2, t_3) = \exp[-k_1(t_1 + t_2) - k_2 t_3 - k_3\{\max(t_1, t_2) + \max(t_2 + t_3)\}]$$

$$t_1, t_2, t_3 \geq 0; k_1, k_2 > 0; k_3 \geq 0 \qquad \text{[1.1]}$$

It may be observed that

i) T_1 and T_2 are independent and identically distributed exponential random variables with the parameter (k_1+k_2),

ii)   R is exponential with the parameter (k_2+2k_3), not necessarily independent of (T_1,T_2) and

iii) (T_1,R) and (T_2,R) are identically distributed as bivariate exponential with the parameter (k_1, k_2+k_3, k_3).

By considering (1) as the survival function of (T_1,T_2,R) , we obtain expressions for reliability, MTBF and the gain due to repair facility. The state transition diagram for the system, in the interval $(t, t + \Delta t)$ is given below:
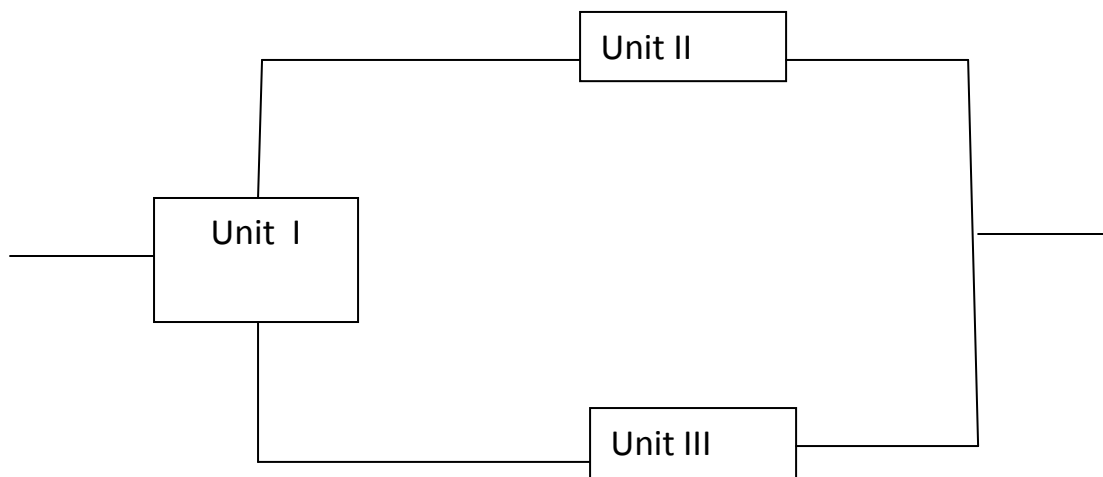
Figure 1 State Transition Diagram of three-unit standby System

[2] MTBF Calculation

Since reliability of the system is given by R(t)= $P_0(t)$ + $P_1(t)$ + $P_2(t)$, we want to find the

expressions for $P_0(t)$, $P_1(t)$ and $P_2(t)$. We know that $\mathrm{MTBF} = \int\limits_0^\infty R(t)\, dt$

We have, $p_i(t) = p_r\{X(t) = i : X(0) = 0\}$, $i = 0,1,2$

So, $p_i(t + \Delta t) = p_r\{X(t + \Delta t) = i : X(0) = 0\}$

$$= \sum_{j=0}^{2} p_r \{ X(t + \Delta t) = 0 , X(t) = j : X(0) = 0 \}$$

Using $P(AB) = P(A/B)P(B)$, we have

$$= \sum_{j=0}^{2} p_r \{ X(t + \Delta t) = 0 , X(t) = j \} \{ X(t) = j : X(0) = 0 \}$$

$$= \sum_{j=0}^{2} p_r \{ X(t + \Delta t) = 0 , X(t) = j \} p_j(t)$$

$$= p_r \{ X(t + \Delta t) = 0 : X(t) = 0 \} p_0(t) + p_r \{ X(t + \Delta t) = 0 : X(t) = 1 \} p_1(t)$$
$$+ p_r \{ X(t + \Delta t) = 0 : X(t) = 2 \} p_2(t)$$

$$p_0(t + \Delta t) = (1 - \alpha \Delta t) p_0(t) + \gamma \Delta t \, p_1(t) + 0(\Delta t)$$

$$p_0(t + \Delta t) - p_0(t) = -\alpha \Delta t \, p_0(t) + \gamma \Delta t \, p_1(t) + 0(\Delta t)$$

Dividing by Δt and taking limit $\Delta t \to 0$ we have

$$\underset{\Delta t \to 0}{Lim} \frac{p_0(t + \Delta t) - p_0(t)}{\Delta t} = -\alpha \, p_0(t) + \gamma \, p_1(t) + \underset{\Delta t \to 0}{Lim} \frac{0(\Delta t)}{\Delta t}$$

$$p_0'(t) = -\alpha \, p_0(t) + \gamma \, p_1(t) \qquad\qquad [2.1]$$

Similarly, we can write $p_1(t + \Delta t) = pr(X(t + \Delta t) = 1 : X(0) = 0 \}$

$$p_1(t + \Delta t) = \sum_{j=0}^{2} pr(X(t + \Delta t) = 1 , X(t) = j : X(0) = 0 \}$$

$$= \sum_{j=0}^{2} pr(X(t + \Delta t) = 1 , X(t) = j \} p_j(t)$$

$$= pr\{ X(t + \Delta t) = 1 : X(t) = 0 \} p_0(t) + pr\{ X(t + \Delta t) = 1 : X(t) = 1 \} p_1(t)$$
$$+ pr\{ X(t + \Delta t) = 1 : X(t) = 2 \} p_2(t)$$

so, we have $p_1(t + \Delta t) = \alpha \Delta t \, p_0(t) + \{1 - (\beta + \gamma) \Delta t\} p_1(t)$ which on simplification gives

$$p_1^/(t) = \alpha \, p_0(t) - (\beta + \gamma) p_1(t)$$

Assuming, $\alpha = k_1 + k_3$, $\beta = k_1$ and $\gamma = k_2 + k_3$, we get the equations [6.2.3] and [6.2.4] in the following reduced form:

$$p_0^/(t) = -(k_1 + k_3) \, p_0(t) + (k_2 + k_3) \, p_1(t)$$

$$p_1^/(t) = (k_1 + k_3) \, p_0(t) - (k_1 + k_2 + k_3) \, p_1(t)$$

$$p_2^/(t) = k_2 \, p_0(t) - (k_1 + k_2 + k_3) \, p_1(t) + k_2 p_2(t) \qquad\qquad [2.2\text{-}2.4]$$

Taking Laplace transform on both the sides of [6.1.5] and [6.1.6] and noting that $L\{p_i(t)\} = L_i(s)$

We get $(k_1 + k_3 + s) \, L_0(s) - (k_2 + k_3) \, L_1(s) + (k_3 + s) \, L_2(s) = 1$

$$(k_1 + k_3) \, L_0(s) - (k_1 + k_2 + k_3 + s) \, L_1(s) + k_2 L_2(s) = 0$$

$and \quad (k_2 + s) \, L_0(s) - (k_1 + s) \, L_1(s) + (k_1 + k_3 + s) L_2(s) = 0$

solving using Cramer rule, we get

$$L_0(s) = \frac{(k_1 + k_2 + k_3 + s)}{\{s^2 + (2k_1 + k_2 + 2k_3)s + k_1(k_1 + k_3)\}}$$

$$L_1(s) = \frac{(k_1 + k_3)}{\{s^2 + (2k_1 + k_2 + 2k_3)s + k_1(k_1 + k_3)\}} \quad \text{and}$$

$$L_2(s) = \frac{(k_2 + k_3 + s)}{\{s^2 + (2k_1 + k_2 + 2k_3)s + k_1(k_1 + k_3)\}}$$

Let s_1 and s_2 be the roots of the equation $s^2 + (2k_1 + k_2 + 2k_3)s + k_1(k_1 + k_3) = 0$

$$let \quad s_1 = \frac{-(2k_1 + k_2 + 2k_3) + \sqrt{k_2^2 + 4(k_1 + k_3)(k_2 + k_3)}}{2}$$

$$and \quad s_2 = \frac{-(2k_1 + k_2 + 2k_3) - \sqrt{k_2^2 + 4(k_1 + k_3)(k_2 + k_3)}}{2}$$

[2.5-2.6]

Since s_1 , $s_2 < 0$. Thus we have,

$$L_0(s) = \frac{(k_1 + k_2 + k_3 + s)}{\{(s - s_1)(s - s_2)\}} \quad ; \quad L_1(s) = \frac{(k_1 + k_3)}{\{(s - s_1)(s - s_2)\}} \quad ; \quad L_2(s) = \frac{(k_2 + k_3 + s)}{\{(s - s_1)(s - s_2)\}}$$

Resolving into partial fractions, we have

$$L_0(s) = \frac{(k_1 + k_2 + k_3 + s_1)}{(s - s_1)(s_1 - s_2)} - \frac{(k_1 + k_2 + k_3 + s_2)}{(s - s_2)(s_1 - s_2)}$$

$$L_1(s) = \frac{(k_1 + k_3)}{\{(s - s_1)(s - s_2)\}}$$

$$L_2(s) = \frac{(k_2 + k_3)}{\{(s - s_1)(s - s_2)\}}$$

[2.7-2.9]

Taking inverse Laplace transforms of the above equations , we get

$$p_0(t) = \frac{(k_1 + k_2 + k_3 + s_1)e^{s_1 t} - (k_1 + k_2 + k_3 + s_2)e^{s_2 t}}{s_1 - s_2} \quad and$$

$$p_1(t) = \frac{(k_1 + k_3 + s_1)(e^{s_1 t} - e^{s_2 t})}{s_1 - s_2}$$

$$p_2(t) = \frac{(k_2 + k_3)(e^{s_1 t} - e^{s_2 t})}{s_1 - s_2}$$

[2.10-2.12]

Hence the reliability of the system is given by $R(t) = p_0(t) + p_1(t) + p_2(t) = \frac{s_2 e^{s_1 t} - s_1 e^{s_2 t}}{s_1 - s_2}$

$$\text{MTBF} = \int_0^\infty R(t)\,dt = -\frac{(s_1 + s_2)}{s_1 s_2} \quad \text{where } s_1 \text{ and } s_2 \text{ are given by equation above.}$$

$$\text{So, MTBF} = \frac{(k_1 + k_2 + 2k_3)}{k_1(k_1 + k_3)} \qquad [2.11]$$

it may be noted that MTBF when there is no repair facility is given by

$$\text{MTBF (no repair facility)} = \text{E }(T_1 + T_2) = \text{E }(T_1) + \text{E }(T_2) = \frac{1}{k_1 + k_3} + \frac{1}{k_1 + k_3} = \frac{2}{k_1 + k_3}$$

$$[2.12]$$

[3] Availability analysis of the system

In this section, we consider the transient solution of the system and the availability measures such as the point wise availability and the steady-state availability by considering the above model. By considering the equation [1.1] as the survival function of (T_1, T_2, R), we obtain the expressions for point wise availability and the steady-state availability. Using similar arguments as in the case of MTBF, we obtain the following differential equations:

$$p_0^{/}(t) = -(k_1 + k_3)p_0(t) + (k_2 + k_3)p_1(t)$$

$$p_1^{/}(t) = (k_1 + k_3)p_0(t) - (k_1 + k_2 + k_3)p_1(t) + (k_2 + 2k_3)p_2(t)$$

$$p_2^{/}(t) = k_1 p_1(t) - (k_2 + 2k_3)p_2(t)$$

$$[3.1\text{-}3.3]$$

Taking Laplace transforms of above three equations and applying the Cramer's rule, we get

$$L_0(s) = \frac{s^2 + (k_1 + 2k_2 + 2k_3)s + (k_2 + k_3)(k_2 + 2k_3)}{s^3 + 2(k_1 + k_2 + 2k_3)s^2 + \{(k_1 + k_2 + 2k_3)^2 - k_1(k_2 + k_3)\}s}$$

$$L_1(s) = \frac{(k_1 + k_3)(k_2 + 2k_3 + s)}{s^3 + 2(k_1 + k_2 + 2k_3)s^2 + \{(k_1 + k_2 + 2k_3)^2 - k_1(k_2 + k_3)\}s} \quad \text{and}$$

$$L_2(s) = \frac{k_1(k_1 + k_2)}{s^3 + 2(k_1 + k_2 + 2k_3)s^2 + \{(k_1 + k_2 + 2k_3)^2 - k_1(k_2 + k_3)\}s}$$

[3.4-3.6]

Let s_1 and s_2 be the roots of the equation

$$s^2 + 2(k_1 + k_2 + 2k_3)s + (k_1 + k_2 + 2k_3)^2 - k_1(k_2 + k_3) = 0$$

Resolving into partial fractions, we have

$$L_0(s) = \frac{s_2\{s_1^2 + (k_1 + 2k_2 + 2k_3)s_1 + (k_2 + k_3)(k_2 + 2k_3)\}}{(s_1 - s_2)(s - s_1)s_1s_2} + \frac{s_1\{s_2^2 + (k_1 + 2k_2 + 2k_3)s_2 + (k_2 + k_3)(k_2 + 2k_3)\}}{(s_2 - s_1)(s - s_2)s_1s_2}$$
$$+ \frac{(k_2 + k_3)(k_2 + 2k_3)}{s\, s_1 s_2}$$

Similarly, we can write

$$L_1(s) = \frac{(k_1 + k_3)[s_2(k_2 + 2k_3 + s_1)]}{(s_1 - s_2)(s - s_1)s_1s_2} + \frac{s_1(k_2 + 2k_3 + s_2)}{(s_2 - s_1)(s - s_2)s_1s_2} + \frac{(k_2 + 2k_3)}{s\, s_1 s_2}$$

$$L_2(s) = \frac{s_2 k_1(k_1 + k_3)}{(s_1 - s_2)(s - s_1)s_1s_2} + \frac{s_1}{(s_2 - s_1)(s - s_2)s_1s_2} + \frac{1}{s\, s_1 s_2}$$

[3.7- 3.8]

Taking Inverse Laplace transform on both the sides of equations [6.2.7-6.2.8], we get

$$p_0(t) = \frac{s_2 e^{s_1 t}\{s_1(s_1 + k_1 + 2k_2 + 3k_3) + (k_2 + k_3)(k_2 + 2k_3)\}}{s_1 s_2(s_1 - s_2)}$$
$$+ \frac{s_1 e^{s_2 t}\{s_2(s_2 + k_1 + 2k_2 + 3k_3)(k_2 + k_3)(k_2 + 2k_3)\}}{s_1 s_2(s_2 - s_1)} + \frac{(k_2 + k_3)(k_2 + 2k_3)}{s_1 s_2}$$

$$p_1(t) = \frac{s_2 e^{s_1 t}(s_1 + k_2 + 2k_3)(k_1 + k_3)}{s_1 s_2(s_1 - s_2)} + \frac{s_1 e^{s_2 t}(s_2 + k_2 + 2k_3)(k_1 + k_3)}{s_1 s_2(s_2 - s_1)} + \frac{(k_2 + 2k_3)}{s_1 s_2}$$

$$p_2(t) = \frac{s_2 e^{s_1 t} k_1(k_1 + k_3)}{s_1 s_2(s_1 - s_2)} + \frac{s_1 e^{s_2 t} k_1(k_1 + k_3)}{s_1 s_2(s_2 - s_1)} + \frac{k_1(k_1 + k_3)}{s_1 s_2}$$

[3.9-3.11]

The point availability of the system is given as   A (t) =p_0(t)+p_1(t)= 1-p_2(t) i.e.

$$A(t) = 1 - \frac{s_2 e^{s_1 t} k_1 (k_1 + k_3)}{s_1 s_2 (s_1 - s_2)} + \frac{s_1 e^{s_2 t} k_1 (k_1 + k_3)}{s_1 s_2 (s_2 - s_1)} + \frac{k_1 (k_1 + k_3)}{s_1 s_2} \qquad [3.12]$$

Thus the steady state availability of the system is given as

$$A_\infty = \underset{t \to \infty}{Lim} A(t) = 1 - \frac{k_1 (k_1 + k_3)}{s_1 s_2} = \frac{(k_2 + 2k_3)(k_1 + k_2 + 2k_3)}{(k_2 + 2k_3)^2 + k_1 (k_1 + k_2 + 3k_3)} \qquad [3.13]$$

[4] Mean Down Time Calculation: The system mean down time is an important aspect of Availability analysis and is evaluated by the formula $MDT = MTBF(\frac{1 - A_\infty}{A})$. So, using the results from [3.10] and [3.13], we get

$$MDT = \frac{2k_1 + k_2 + 2k_3}{(k_1 + 2k_3)(2k_1 + k_2 + 2k_3)} \qquad [4.1]$$

[5] References:

1. *Nakagawa, T. and Osaki, S.[1976]. "Markov renewal process with some non-regenerative points and their applications to reliability". Microelectronics Reliability, 15(6), 633-636.*

2. *C.H. Lie, C.L. Hwang and F.A. Tillman [1977],"Availability of Maintained systems: A state of the art survey", A.I.I.E. Trans.,9, 247-259.*

3. *Okumoto, K. [1985]. "Availability of 2-component dependent system". IEEE Trans. On Reliability, R-30(2) 205-210.*

4. *Yearout , R.D, Reddy P, Grosh DL [1986]. "Standby redundancy in reliability- a review". IEEE Trans on Reliability.*

5. *Joshi, B.H. and Dharmadhikari, A.D. [1989]. "Maximization of availability of 1-out-of-2 : G repairable dependent system". Adv. Appl. Prob. 21, 717-720.*

6. *Goel, L.R. and Srivastava, P. [1991]. "Profit analysis of a two-unit redundant system with provision for rest and correlated failure and repair". M. & R. 31, 827-833.*

7. *Papageorgiou, Effii and Kokolakis, George[2004]. "A Two unit parallel system supported by (n-20 standbys with general and non-identical life times". International Journal of System Science,35(1) (2004), 1-12.*

8. *Singh,S.N. & Singh,S.K.[2007]. "A study on a two unit parallel system with Erlangian repair time", Statistica (Bologona),67 (1) (2007), 69-77.*

9. *Wu,Qingtai, Zhang,Jin and Tang,Jiashan.[2015]. "Reliability evaluation for a class of multi unit cold standby systems under Poisson shocks". Comm.Statist.Theory Methods , 44(15) , 3278-3288.*

[6] Observation

We provide the data in the following table. The table gives the values for MDT for various values for k_1, k_2 and k_3.

Table 6.1

k_1	k_2	k_3	S_1	S_2	R(t)
.01	0.1	.01	-5.984	-6.293	$12.992e^{-2t}-10.526e^{-2.5t}-.02e^{-7.876t}$
			-3.123	-5.603	$10.965e^{-4t}-0.785e^{-6.5t}-.802e^{-4.976t}$
			-2.136	-1.610	$9.095e^{-6t}-0.584e^{-7.5t}-.04e^{-9.872t}$
.02	0.2	.02	-7.000	-6.177	$3.09e^{-2.07t}-5.506e^{-2.5t}-.076e^{-6.874t}$
			-6.667	-5.986	$2.654e^{-4.24t}-1.085e^{-6.86t}-2.202e^{-0.906t}$
			-3.125	-2.955	$4.889e^{-6.76t}-0.004e^{-2.56t}-3.045e^{-6.952t}$
.03	0.3	.03	-6.875	-6.172	$4.225e^{-2.0t}-3.793e^{-7.5t}-.068e^{-6.07t}$
			-4.414	-4.133	$6.259e^{-7.25t}-3.005e^{-2.85t}-2.762e^{-0.006t}$
			-3.250	-3.074	$7.809e^{-3.75t}-0.974e^{-2.06t}-0.049e^{-0.952t}$
.04	0.4	.04	-7.224	-6.179	$10.09e^{-5.07t}-5.506e^{-2.5t}-.084e^{-0.874t}$
			-4.454	-3.264	$12.690e^{-9.24t}-7.025e^{-9.82t}-9.002e^{-0.006t}$
			-1.667	-1.633	$14.249e^{-0.76t}-0.904e^{-8.56t}-3.045e^{-6.952t}$

[7] Declaration: It is hereby declared that there is no conflict of interest among authors of this paper.

SDIS-014

Network Pattern Matching In High Speed

Abhishek Shukla & Gregor M. Maier
Senior Researchers, IBM, Newzealand

Abstract

Pattern Matching is an important task in various applications, including network traffic analysis and intrusion detection. In modern high speed gigabit networks it becomes unfeasible to search for patterns using pure software implementations, due to the amount of data that must be searched. Furthermore applications employing pattern matching often need to search for several patterns at the same time. In this thesis we explore the possibilities of using FPGAs for hardware pattern matching. We analyze the applicability of various pattern matching algorithms for hardware implementation and implement a Rabin-Karp and an approximate pattern matching algorithm in Endace's network measurement cards using VHDL. The implementations are evaluated and compared to pure software matching solutions. To demonstrate the power of hardware pattern matching, an example application for traffic accounting using hardware pattern matching is presented as a proof-of-concept. Since some systems like network intrusion detection systems analyze reassembled TCP streams, possibilities for hardware TCP reassembly combined with hardware pattern matching are discussed as well.

1. Introduction

The overall goal of this thesis is to explore the possibilities of pattern matching by means of programmable hardware with respect to high speed network environments. A strong emphasis is given to security applications, like network intrusion detection systems (NIDS). This thesis is written in cooperation with Endace [End07] Technology Ltd. in Hamilton, New Zealand. Endace is a global leader in hardware acceleration and network interface technology.

1.1 Related Work

Using FPGAs for hardware pattern matching has been extensively analyzed by several researchers. But these works ([SP01], [CS03], [SP03]) all focus on incorporating the

pattern to match into the FPGA fabric itself, rather than implementing a generic match engine in hardware.

Dreger et al. [DFM+06] presented and evaluated a software approach to use pattern matching for application layer protocol detection for the Bro network intrusion detection system. Dharmapurikar and Paxson [DP05] have analyzed hardware TCP stream reassembly for security applications in the presence of adversarial behavior.

Exact pattern matching algorithm is a settled field and most text books on algorithms, like [CSRL01], cover pattern matching in some detail. Approximate pattern matching research is a bit more active. Navarro [Nav01] summarizes current research and the state of the art in approximate pattern matching algorithms.

1.2 About Endace DAG Network Monitoring Cards

This thesis is written with the support of Endace Technology Ltd. Endace is a global leader in hardware acceleration and network interface technology, recognized by an elite, worldwide client base of major corporations, government agencies and ISPs. Endace customers operate the world's largest, fastest and most critical networks. Endace solutions enable global customers to observe and analyze 100% of the traffic carried on their networks, guaranteeing security, integrity and performance for their users and applications, regardless of transmission speed, loading or interface type. Endace DAG network monitoring interface cards provide 100% packet or cell capture, regardless of interface type, packet size, or network loading. On top of this zero-loss performance, Endace DAG cards offload the data load workload from the CPU, allowing software applications to inspect and process traffic at much higher speed.

More recent DAG cards also provide hardware-based traffic filtering, data stream replication, and CPU load balancing functions. These effectively accelerate application performance, enabling Network Managers to be confident that every packet has been inspected and reported on, and that nothing has been missed.

2. Design and Implementation of the Rabin-Karp Algorithm

The hardware based Rabin-Karp pattern matcher enables a software application to match a larger number of patterns at line rate. For example the Snort [Roe99] intrusion detection

system uses several hundred patterns to search network traffic for attack patterns. The Rabin-Karp matcher is able to speed up such applications by offloading the pattern matching onto hardware. The application software, e.g., Snort, loads the patterns into the DAG cards. It is possible to modify the set of patterns in the card while capturing is in progress, although packets are not matched while the pattern set is being changed.

The pattern matcher can mark packets containing matches by overwriting parts of the ERF [End04] header. It can also discard packets. The application software can configure whether packets should be marked and/or discarded and if discarding is enabled, the software can configure if matched or unmatched packets shall be discarded. The mark contains the information which pattern lengths had a match, not the actual pattern that had a match. When the software receives a network packet that is marked, it can run a software based pattern matcher on the packet to decide if the mark is a false positive and also to decide which pattern matched. Snort for example does not match all patterns in all packets. The patterns that are matched against a packet depend on the IP addresses and port numbers and on the position of the packet in the connection. E.g., some patterns must occur at the beginning of a connection in order to match. Using this premises, the verification time can be reduced, since the application software only has to verify a match if it occurred in an appropriate packet.

2.1 Design Overview

The general principle is that for every byte of network data (respectively in every clock cycle), the new hash value is calculated and this hash value is then looked up in a table containing the hash values of all patterns. If the hash is found in the table, the pattern is a possible match. If marking packets is enabled, the appropriate mark information is written into the ERF header. False positives can occur due to hash collisions.

Since the hash function and the hash value depend on the length of the pattern, a separate hash calculator and a separate lookup table per pattern length is required.

2.2 Selecting a Hash Function

The hash function must be easy and fast to calculate. Furthermore an ideal hash function should be a rolling hash, i.e., a new hash value can be computed by using the old hash

value, the current byte of packet data, and the byte of packet data seen "pattern length" byte before. The xor operation ($\oplus$) is a suitable function for this purpose. The hash value can then be calculated as

$$\text{hash} \leftarrow \text{hash} \oplus \text{packet[curidx]} \oplus \text{packet[curidx} - \text{patternlen]}$$

where packet is the packet data, curidx is the current position within the packet, and pattern len is the length of the current pattern.

Using the packet byte directly however, will lead to a lot of collisions and false positives. To increase the entropy the current byte is used as an index into a table containing 256 randomly generated and uniformly distributed 32 bit values. The xor is then calculated using these derived 32 bit values. The lookup table can be implemented using dual port Block RAM, in a 32bit×512 entries configuration. The lookup In the following the lookup operation is denoted as ht[x].

Just xoring the 32 bit values still leads to a large number of false positives. The problem is that $x \oplus x$ is always 0. This is a problem for odd and even pattern lengths. For an even pattern length, the total hash of a pattern may become 0. For an odd pattern length it may become 0_ht[x], i.e., the hash may be reduced to the value of just one byte.

One solution is to rotate some of the 32 bit input "bytes" before xoring them. The disadvantage that arises now is, that the hash function is no longer a completely rolling hash, since some of the 32 bit values are rotated. Tests showed that rotating only the first seven input "bytes" gives us a good trade-off between performance of the hash function and number of false positives. The formula to calculate the new hash value thus becomes:

$$\text{hash} \leftarrow \text{ror(ht[packet[curidx]], sh1)}$$
$$\oplus \text{ror(ht[packet[curidx} - 1]], sh2)}$$
$$\oplus \ldots \oplus \text{ror(ht[packet[curidx} - 7]], sh7)}$$
$$\oplus \text{ht[packet[curidx} - 8]]}$$
$$\oplus \ldots \oplus \text{ht[packet[curidx} - \text{patternlen]}$$

where ror is bit rotate right and sh1 . . . sh7 are the numbers of bits the values are rotated. The numbers of bits to rotate are chosen randomly. The values should not be multiples of

each other. For example, shift values of 4, 8, 12, 16, etc. are a bad choice. To calculate the value of ht[packet[curidx − 8]] ⊕ . . . ⊕ ht[packet[curidx −patternlen]] the rolling hash approach can be used.

2.3 Using Wide Datapaths

DAG network monitoring cards do not process network packets byte-wise. They use a wide datapath of several bytes to increase throughput. Therefore the hardware pattern matcher must be able to process several bytes in every clock cycle. This implies, that there are several bytes in every cycle where a match for a pattern can start and the pattern matcher must therefore be able to calculate several hashes per pattern length and cycle, each one starting at a different byte of the current input word.

2.4 Hash Lookups

The lookup table can be implemented using a CAM. On a 32 bit datapath 4 lookups per cycle and pattern length are required, therefore 4 CAMs are be required per pattern length. This CAM must be implemented completely inside the FPGA, since no external CAM resources are available. The Xilinx CoreGen tool can generate 32 bit wide CAMs with 32 entries, but such a CAM requires 4 BlockRAMs. Furthermore these CAMs only provide one search port. Therefore 16 BlockRAMs per pattern length are required. This is way too much, since the FPGAs used only feature a total of 100 to 200 BlockRAMs and a significant number of these are already used for other components of the DAG card.

To overcome this constraint a fuzzy CAM has been developed. The fuzzy CAM exploits the fact that false positives are acceptable and that all CAMs needed for one pattern length contain the same data. Furthermore a real CAM returns the location of the entry, a fuzzy CAM on the other hand will only indicate if the search term was found in the CAM or not, but not where it was found. This means that the pattern matcher will not be able to determine which pattern matched, it will only be able to determine that a pattern matched. Since the application software has to verify matches anyway and since this restriction yields a CAM that uses much less BlockRAMs, the restriction is an acceptable trade-off.

A design in which the hardware matcher can inform the software application exactly which pattern had a potential match would be possible however. If a fuzzy CAM detects a

match, the 32 bit hash value that resulted in the match could be included in the ERF header, so that the application software can analyze it. However this requires additional bandwidth, since the pattern matcher must insert the hash values into the data stream. Furthermore many hash values are looked up every cycle (datapath width in bytes $\times$ number of pattern lengths) and each of those can result in a match. If more than one such match occurs in one clock cycle, an arbiter and queues are be required to be able to include all matches in the ERF header. Implementing an arbiter in hardware is complex and requires a significant amount of logic resources. Since the downsides of such a design outweigh potential gain, the hash values are not included in the ERF header.

As mentioned in Section 2.3, the match verification is not done in hardware. If match verification would be employed, the implementation could not guarantee line rate matching anymore. Furthermore match verification can be done easily in software, as long as the hashing does only yield a small number of false positives.

2.5 Hardware Implementation

Two DAG network monitoring cards were chosen as target system for the Rabin-Karp implementation:

• DAG 4.5, gigabit ethernet card, with a Xilinx VirtexII Pro 30 FPGA. This FPGA contains approximately 13700 slices and 136 BlockRAMs, so a total of 27400 LUTs and 27400 Flip Flops are available. A description of the internal architecture of FPGAs is available at [Wik07b] and a short introduction is presented in Appendix B.

• DAG 8.2X, 10 gigabit ethernet card, with a Virtex4 SX35. This FPGA contains approximately 15400 slices and 192 BlockRAMs.

The number of different pattern length that the pattern matcher can handle is only limited by the available resources in the FPGA, especially the number of available BlockRAMs is the major bottleneck. For both cards a number of 6 different pattern lengths was found to be feasible. Which length are used is arbitrary. For the current implementation pattern length of 4, 5, 6, 7, 8, and 9 bytes were chosen, since most patterns used by systems like Snort are rather short and longer patterns can be truncated. There is no technical limit to the maximum pattern length.

The implementation of the Rabin-Karp pattern matcher has been tested and used on datapaths up to 64 bit wide with a maximum maximum clock frequency of 200 MHz. Since the pattern matcher can process one input word every clock cycle, a maximum bandwidth of 12.8 Gbit/s can be achieved.

3 Design and Implementation of an Approximate Pattern Matcher

This chapter covers the design and implementation of an approximate pattern matcher.

After an introduction, the comparison of pattern and packet data is described, then the approach to calculate the edit distance matrix and the encoding used to represent the values in the matrix are discussed. Finally the actual hardware implementation is presented.

The hardware based approximate pattern matcher enables a software application to match up to 24 different limited expression (see Section 2.2.3) at line rate. Furthermore it can match patterns that contain a defined number of deviations. For example the Bro [Pax99] IDS uses regular expression patterns for its analysis. Although limited expressions are only a subset of regular expressions, the approximate pattern matcher can be configured with patterns that match a superset of the regular expressions used by Bro. If a match is report by the hardware matcher, the Bro system can then run a software based regular expression matcher to verify if the match reported by hardware is indeed a match for the regular expression. Thus the approximate hardware pattern matcher can greatly enhance the system's performance by reducing the number of packets Bro has to analyze.

The application software loads the patterns to match into the card and specifies the maximum number of deviations allowed for each pattern. The patterns loaded can be modified during a capture session, although the pattern that is modified will be disabled while the reprogramming is in progress. I.e., this pattern will not match any packet during this time. However the other patterns are not affected by the reconfigure operation.

Similar to the Rabin-Karp matcher, packets containing matches can be marked by overwriting parts of the ERF [End04] header. The mark contains the information which pattern matched.

3.1 Comparing the Pattern and Packet Bytes

In order to utilize limited expression matching, packet bytes are presented to a lookup table instead of comparing them directly to the pattern. As pointed out in Section 2.2.3,

one lookup table is required for every byte of the pattern. Every lookup table yields a boolean result and all lookups for the current packet byte must be processed in one clock cycle. I.e., xi must be compared to all pattern bytes j, j 2 1 . . .m during one clock cycle. Where xi is the current byte of packet data and m is the length of the pattern. These m lookups can be combined, since the index used for all these lookups is the byte xi. The lookup yields a m bit value, where bit j corresponds to the comparison of xi to pj . These tables are implemented using Xilinx BlockRAMs.

Evaluating the Hardware Pattern Matcher In this chapter the Rabin-Karp and approximate pattern matching hardware implementations are evaluated. Since the Rabin-Karp matcher only compares the hash values but does not verify the results, it is important to know how this match verification will affect an application software utilizing the Rabin-Karp matcher. Furthermore it is interesting to know how a pure software implementation compares to out hardware implementation. Another question is which throughput is achievable by pure software solutions? To quantify these figures, software only implementations for the Rabin-Karp and the approximate pattern matcher are used and their runtime is analyzed.

3.1 Rabin-Karp

To evaluate the performance of the Rabin-Karp pattern matcher, test patterns are extracted from the Snort [Roe99] intrusion detection system. This extraction yields about 1800 patterns. The Rabin-Karp has support for 6 different pattern lengths, 4, 5, 6, 7, 8, and 9 bytes. Snort patterns that are longer than the maximum pattern length of 9 bytes are truncated to one of the supported lengths.

All tests are done in software, since evaluation of the match and false positive rates require software verification anyway. Furthermore simulating hardware behavior in software allows us to verify the actual hardware implementation. The speed comparison has to be done in software anyway. The tests are done with 50 patterns per length and with 250 patterns per length, i.e., the total number of patterns for the tests are 300, resp. 1500 patterns. These numbers where chosen to determine the influence of the number of patterns on the false positive rate. Furthermore 1500 is used as upper limit to reduce the runtime of the tests. These 300, resp. 1500 patterns are selected randomly from the

extracted patterns. Furthermore several sets of patterns are used for the tests with 300 patterns, each set selected from the Snort patterns.

The data on which the pattern matching is applied is a full network trace, including all packet payloads. The trace was collected in 2001 at Auckland University. It contains approximately 23GB of data in 50.8 million packets. About 19GB of the trace file is application layer payload data.

All tests were repeated multiple times to rule out deviations and measurement errors.

set	num	base	match	real match	FP to total	FP to real
	1500	Pkts	22.5%	21.8%	0.71%	3.24%
A	300	Pkts	3.9%	3.9%	0.01%	0.31%
B	300	Pkts	5.6%	5.5%	0.12%	2.18%
C	300	Pkts	11.0%	11.0%	0.01%	0.13%
D	300	Pkts	6.5%	6.4%	0.01%	0.20%
	1500	Bytes	40.0%	38.2%	1.81%	4.75%
A	300	Bytes	8.8%	8.8%	0.03%	0.35%
B	300	Bytes	13.2%	13.0%	0.15%	1.18%
C	300	Bytes	20.0%	19.9%	0.04%	0.18%
D	300	Bytes	13.4%	13.4%	0.03%	0.20%

Figure 3.1: Match and false positive (FP) rates for Rabin-Karp

Match and False Positive Rate

The Rabin-Karp implementation will generate false positive matches. Therefore software applications utilizing the hardware matching must verify every reported match. It is import to know how many packets match, i.e., how many packets must be verified in software. Furthermore the number of false positives is also important to determine the overhead incurred due to false positives.

Figure 5.1 shows the match and false positive rates. Match and false positive rate are noted in percent of total number of packets and in percent of the number of bytes. The number of bytes used is based on IP volume, as specified by the IP total length header field of IP packets. Link layer headers have been omitted from these numbers.

The set column denotes the pattern set used, num the number of patterns, and base specifies whether the figures are based on packets or bytes. match is the rate of packets, resp. bytes matched by the hardware matcher in percent and real match is the match rate

after software verification, i.e., the true number of matches. The false positive rates are calculated against the total number of packets resp. bytes processed (column FP to total) and against the number of packets resp. bytes of real matches (column FP to real).

The rate of false positives is low. Less than 2% of the total traffic (5% of matched traffic) were falsely matched. When searching for only 300 patterns these rates drop to 1% or less.

It can be seen that even when searching for 1500 patterns, about 60% of the traffic volume does not result in a match, i.e., a software application like Snort has to verify only the remaining 40% of traffic. These numbers drop significantly to just 13% to 20% when looking for only 300 patterns. It can also be seen, that these match rates depend heavily on the selected patterns. Pattern set C has a match rate twice as high as the other sets and set B has a much higher false positive rate. As expected, the match rates on a byte basis are much higher, since larger packets are more likely to result in a match.

3.1.2 Speed Comparison

In order to quantify the performance gained by using a hardware matcher, the time required to do the matching in software is analyzed. The software matcher is run with and without verification to quantify the time needed for match verification. It must be noted however, that the software matcher uses a different hash function than the hardware matcher. Therefore the number of false positives may differ and the time needed for verification may differ between hardware and software implementations. No free Rabin-Karp library could be found, therefore the tests were done using a self written Rabin-Karp pattern matcher. While the implementation is correct, it can be assumed that it is possible to further optimize the Rabin-Karp software implementation.

The computer used to calculate these results is an Intel Pentium 4 Xeon with 2.8 GHz and 1GB of RAM. There are no significant deviations when using different pattern sets, therefore average values are shown.

Figure 3.2 depicts the results of the measurements. The table shows the CPU time spend in userspace, as reported by the time program. Furthermore the resulting data throughput is calculated and displayed. The rate all column denotes size of the total trace divided by the time needed, and the rate PL column denotes the size of application layer payload

divided by time needed. The verify column indicates whether match verification was turned on or off, the rows labeled diff show the time difference between the runs with and without verification. The num column indicates the number of patterns.

Running a Rabin-Karp pattern matcher completely in software is slow. It is unlikely that better optimization would be able to increase the throughput into the gigabit range. The time needed for match verification however is reasonably low. If an application software only verifies matches reported by a hardware matcher, throughput of 1 to 2Gbps are achievable while searching for 300, resp. 1500 patterns in parallel.

These figures illustrate that the approach presented in this thesis, a Rabin-Karp hardware pattern matcher with match verification in software, is a feasible solution in gigabit network environments.

verify	num	time	rate all	rate PL
no	300	3624s	45.9 Mbps	41.5 Mbps
yes	300	3688s	45.1 Mbps	40.7 Mbps
diff	300	64s	2596 Mbps	2348 Mbps
no	1500	3756s	44.2 Mbps	40.0 Mbps
yes	1500	3902s	42.6 Mbps	38.5 Mbps
diff	1500	246s	1138 Mbps	1029 Mbps

Figure 3.2: CPU time required for Rabin-Karp pattern matching in software

3.2 Approximate Pattern Matching

Analyzing the match rate of the approximate pattern matcher is not required, since unlike the Rabin-Karp matcher, the approximate matcher does not yield any false positives.

The interesting figure is the amount of CPU time it takes a pure software implementation to do the approximate matching. The TRE library [TRE] and the PCRE library [PCR] where considered for this task. The TRE library does approximate regular expression matching. The PCRE library does Perl compatible regular expression matching but does not allow for approximate matching. While there are many other libraries for regular expression matching, no other library for approximate limited respectively regular expression could be found.

In their default configuration both TRE and PCRE are approximately equally fast.

However the PCRE library supports a pcre study() function call to optimize an expression. Using this function increases PCRE's speed almost eightfold. When using approximate matching with TRE its performance decreases several orders of magnitude.

Since PCRE is that much faster than TRE, PCRE is used for comparison. To be able to get measurements with approximate matching turned on, a very simple, self written approximate pattern matcher with limited expressions is used for this purpose. This matcher is faster than TRE, although it only uses the basic algorithm without any of the performance improvements.

Another question is, how multiple patterns can be matched in software. One approach is to match every packet against every pattern and the second approach is to combine all patterns into one large pattern by using the branch operator |. The patterns used for the evaluation are the ones that are used in Section 6 for application protocol detection. Since PCRE cannot do approximate matching, only exact matches were searched for when using PCRE. To also see the scalability of

these software implementations, the measurements where done with 9 and with 24 patterns. All measurements have been repeated several times. There was no significant deviation.

Pattern Matcher	branch	num	time	rate all	rate PL
PCRE	yes	9	533s	311 Mbps	281 Mbps
PCRE	no	9	722s	230 Mbps	208 Mbps
apm	n/a	9	8046s	21 Mbps	18.7 Mbps
PCRE	yes	24	2052s	81 Mbps	73 Mbps
PCRE	no	24	1888s	88 Mbps	80 Mbps
apm	n/a	24	21765s	8 Mbps	7 Mbps

Figure 3.3: CPU time required for approximate limited expression matching in software

The computer used to calculate these results is an Intel Pentium 4 Xeon with 2.8 GHz and 1GB of RAM. The network trace used is the same as for the Rabin-Karp algorithm, i.e., a 23GB full trace with approximately 50.8 million packets. The matcher has only been applied to the packet payload, thus reducing the size to match to approximately 19 GB.

Figure 3.3 depicts the results of the measurements. The table shows the CPU time spend in userspace, as report by the time program. Furthermore the resulting data throughput is calculated and displayed. The rate all column denotes size of the total trace divided by the

time needed, and the rate PL column denotes the size of application layer payload divided by time needed. The num column indicates the number of patterns, and the branch column denotes whether the branch operator or separate patterns are used.

The maximum throughput that could be achieved was only 311 Mbps and that was by using only 9 different patterns. For regular expression matching, the length of a pattern influences the runtime quadratically. This is the reason why using the branch operator for PCRE is faster than separate patterns with 9 patterns, but slower with 24 patterns. The approximate software matcher is quite slow compared to PCRE. Using the speed improvements available for approximate pattern matchers might yield a speed-up for the approximate matcher.

4. Application Detection Using Hardware Pattern Matching

In this section an example application using approximate hardware pattern matching to analyze and detect the traffic mix on network links is presented as a proof-ofconcept. We limit the application detector to a proof-of-concept implementation, because a final implementation would require a significant amount of profiling work to review the used pattern set and the application layer protocol catalogue we try to detect. Such profiling is a full project of its own, which goes beyond the scope of this thesis.

Applications like network intrusion detection systems or traffic accounting applications need to know which application layer protocol is spoken within a connection.

Most systems use a set of well-known ports, such as those assigned by IANA [IANA], or those widely used by convention. If a connection does not use one of the recognized ports, this application detection approach breaks down. Examples include running a Web server on a non standard port or using port 80 for non Web application.

Some recently developed application layer protocols are in fact designed not to use fixed ports for their operations. Important examples include the voice-over-ip software Skype [BS06] or file sharing protocols.

In [DFM+06] Dreger et al. presented and evaluated an approach using pattern matching for protocol detection. Their application detector is implemented in the Bro NIDS. The hardware pattern matching implementations presented in this thesis are not yet appropriate for use in intrusion detection. The Bro NIDS for example matches patterns on

reassembled data streams. If matching is done on a per packet basis only, attackers would be able evade detection by splitting the compromising patterns across packet boundaries. For security applications, like NIDS, this must be accounted for. The packet based hardware pattern matching implementation can

be used to speed up matching however. Since the packets themselves are matched by the hardware matcher, the NIDS only has to do additional matching on packet boundaries.

However a packet based pattern matching approach is sufficient for analyzing the traffic mix of a network, since most traffic is not malicious and most people do not try to evade. The goal of such an application is to determine what application layer protocols contribute to the total traffic observed on a network link. Recall the traditional approach using port number to distinguish protocols is not sufficient any more.

4.1 Environment

The network environment selected for application detection is the MWN, the Munich Scientific Research Network (M˙unchner Wissenschaftsnetz). It connects two major universities and affiliated research institutions to the Internet. The MWN heavily limits the amount of Peer-to-Peer file sharing traffic using the ipp2p [ipp] module for Linux netfilter [net]. Thus trying to detect these applications in the MWN is not much avail. Furthermore we also limit our analysis to TCP protocols. The applications our detector is looking for are:

• HTTP, the HyperText Transfer Protocol

• iTunes, http connections used for downloading multimedia files from Apple's iTunes Music Store

• RSYNC, the RSYNC protocol for synchronizing data archives, like ftp download servers

• RTSP, the RealTime Streaming Protocol

• SMTP, the Simple Mail Transfer Protocol

• NNTP, Network News Transfer Protocol

• IMAP, the Interactive Mail Access Protocol

• IMAP with starttls. Encrypted IMAP connections using the starttls command to initiate encryption.

• POP3, the Post Office Protocol, version 3

• SSH, the Secure Shell Protocol. SCP, the secure copy protocol is also detected by the patterns for ssh.

• FTP, the File Transport Protocol. Including passive mode data connections.

• HTTPS, SSL encrypted http connections. These connections are not identified via pattern matching, rather connections using well-known port 443 are accounted as HTTPS.

• abnormal termination, connections that are terminated abnormally by a TCP RST.

4.2 Design and Implementation

We need to select the patterns we want to use for protocol detection. The Application Layer Packet Classifier for Linux project [L7f] has an extensive collection of patterns for application layer protocols detection that are freely to available. The RFCs specifying protocols are another source of patterns for application detection. The patterns used for this thesis are based on the patterns from the Application Layer Packet Classifier for Linux project and patterns derived from RFCs. In order to determine the application layer protocol spoken within a connection, the connection state must be held. The application detector uses a hash based connection table to track connections and keep their state. For every incoming packet the appropriate connection record is located and the match information of the packet is read. If a pattern matches, a counter in the connection record is incremented. When the connection is finally terminated and the connection record is evicted from the connection table, the match counters are analyzed to determine which application layer protocol the connection used. For HTTP and FTP the application detector also determines if the connection used a well known port or not. Furthermore the well known ports for these protocols are checked to find connections that use these well known ports but that do not speak the application layer protocol normally associated with that port. Eviction of connections from the connection table is solely based on an idle timeout. TCP control flags are not used.

HTTPS connections and connections that terminated abnormally are not identified by using pattern matching. Since HTTPS connections are encrypted by nature, using pattern matching is not feasible, but nevertheless HTTPS connections using the well known port

of 443 account for a significant amount of total traffic. Therefore these connections are identified by their port.

FTP data connections are handled differently. If a FTP control connection is detected, the connection is parsed to determine the IP and port addresses of the oncoming data connection. This information is then stored and when a new connection arrives, it is checked against the stored information of pending FTP data connections. If the IP and ports are found, the connection is flagged as FTP data connection.

4.3 Limitations

Although the MWN is connected to the Internet using a 10 Gbps line, the available monitoring port is only 1Gbps. At peak times, bandwidth utilization exceeds this 1Gbps limit. Even if the bandwidth is slightly lower than 1Gbps the switch's monitoring port might not be able to handle all packets. Therefore it is possible that some connections cannot be classified because some packets of it are missing. Indeed, we experienced HTTP connections, that were not classified as HTTP. For example in one case, the first server reply packet was missing on the monitor port, but deducting from TCP sequence and acknowledgement numbers, the packet was seen by the HTTP client.

Protocol	num conns	num pkts	volume [GB]	volume [%]
HTTP	65836978	6635431736	4983	54.0%
RSYNC	3353	8677947	8	0.1%
RTSP	17076	237144513	195	2.1%
HTTPS	7030145	363987663	133	1.4%
RST	16803477	1562752776	944	10.2%
NNTP	2381	19622304	13	0.1%
SMTP	7370504	230923776	88	1.0%
SSH	4090088	1494978597	1105	12.0%
POP3	169121	143408999	83	0.9%
IMAP	87449	68735463	36	0.4%
IMPS	46718	20257981	15	0.2%
FTP	411512	283577276	193	2.1%
other	80680446	2693226526	1427	15.5%

Figure 4.1: TCP Traffic mix on the MWN using pattern matching for protocol detection

For our final measurement the application detector was started on a Sunday afternoon and run for two days. Since the application detector was only run for a short period the results are not necessarily representative. The time period is sufficient however to prove the

feasibility of our approach. The results returned from the application detector have not been analyzed deeply. Such analysis would enable us to refine the patterns to reduce false classifications. However a full analysis of error rates and of pattern quality would require several iterations of refining patterns and measuring the new pattern for several days, which goes beyond the scope of this thesis.

4.4 Results

During first test runs of the application detector, a lot of connections could not be identified. After analyzing the connections that could not be identified, we refined the patterns used for protocol detection and we also added more protocols which lead to the protocol catalogue of Section 4.1.

Figure 4.1 shows the results of the application detector run. The largest amount of traffic is HTTP, which accounts for more than 50% of the total traffic volume. Of the 4983GB of HTTP traffic, 42GB were caused by downloads from Apple's iTunes Music store and 163GB of the HTTP traffic was using a port other than the well known port 80. Furthermore the application detector also recorded 58GB of traffic on port 80 that was not classified as HTTP.

SSH connections also amount for a significant amount of network traffic, as could be expected from a network connecting scientific institutions to the Internet. FTP is also responsible for a significant amount of traffic, namely 193GB. 22GB of those were FTP connections using a port other than the well known port 21. It must be noted however, that we also detected approximately 280,000 connections on port 21, that were not detected as FTP. It must be assumed that at least some of these connections are indeed valid FTP sessions, that were not detected by the patterns used. A deeper analysis of this issue should be conducted in the future. Since FTP is used for bulk data transfers, better FTP detection will also lead to a less unclassified traffic volume.

The large traffic volume caused by connections terminated with a TCP RST flag is noticeable. Please also note, that these are only connections that could not be classified before the RST was seen. If a connection can be classified it is accounted towards the appropriate application layer protocol whether it is terminated normally or by a RST. We have not analyzed the reason for this high number of connections terminated abnormally,

since this would go beyond the scope of this thesis. An analysis of these connections is an interesting field for further research however.

5. Primitive TCP Stream Reassembly

In order to facilitate hardware pattern matching for security applications like NIDS a more sophisticated approach must be taken. NIDS must be able to match patterns across packet boundaries, i.e., they must be able to do pattern matching on reassembled TCP streams. Dharmapurikar and Paxson have presented a design for a robust, hardware based TCP reassembler in [DP05]. For the task at hand however, the design presented by them is not feasible. Their reassembler is designed to be able to reassemble all TCP streams with up to one gap (due to reordering or packet loss), but to do so requires extensive bookkeeping of TCP states, implementing TCP state machines and using reassemble buffers in DRAM. All together this is too costly in terms of complexity and resource requirements.

The goal for TCP reassembly with regard to hardware pattern matching is to be able to match across packet boundaries. Furthermore the hardware reassembly does not necessarily have to reassemble all TCP streams. It can be argued, that reassembling the bulk of TCP connections and running pattern matching on these connections is sufficient, since the software application utilizing the pattern matching can be used to reassemble and match connections that could not be handled by the hardware.

If handling all non reassembled connections is too expensive, an application could randomly select some of the non reassembled connections for analysis and thus making it impossible for an attacker to predict if his connection will be matched or not. The hardware still does pattern matching on single packets for non reassembled connections, so the software application only has to search for pattern matches on packet boundaries of these connections.

The TCP reassembler presented here, is able to reassemble TCP connections that are received in order without any gaps and that are carried in unfragmented IP packets.

All other situations have to be handled by the application software. According to Dharmapurikar and Paxson [DP05] reordering occurs only in $2 - 3\%$ of all TCP traffic,

while Jaiswal et al. [JID+03] found that reordering occurs in 3 − 5% of all TCP traffic. Therefore handling connections with reordering in software is feasible.

IP fragmentation is not an issue, since all major TCP stacks set the Don't Fragment flag for IP packets, so the number of fragmented IP packets carrying TCP data is low.

Reassembling only in-order TCP connections enables a hardware reassembler design which only needs small reassembly buffers and which does not have to keep extensive state for TCP connections, like sequence numbers. Having only small reassembly buffers makes it feasible to use SRAM memory for the buffers.

The TCP reassembler requires external components. A TCAM is used to hash TCP/IP connection tuples and a SRAM is used for reassembly buffers. DAG Co- Processor cards feature an 4.5 Mbit CAM and a 18Mbit SRAM (approximately 2MB). When using the TCAM in a 144bit×32k entries configuration, the reassemble will be able to keep state for 32,000 parallel TCP connections. Both directions of a connection are mapped to the same CAM entry to maximize TCAM utilization. Of course, the directions have to be distinguished for the actual reassembly operation.

The design is not verified in hardware. The TCAM interface and the logic to timeout old connections is not implemented yet. The other parts of the TCP reassemble are implemented in VHDL and simulate successfully. For the simulation a software CAM is used to simulate the complete TCP reassembler. Applying the approximate pattern matcher to reassembled TCP streams is working in simulation too. The VHDL code was implemented for synthesis and should therefore be synthesizeable.

Summary

In this thesis we have analyzed possibilities for hardware based pattern matching in FPGAs to speed up applications in the field of network traffic analysis. Various algorithms for pattern matching have been analyzed and their suitability for hardware implementation has been assessed. Two approaches were chosen for implementation— a Rabin-Karp based exact pattern matcher and an approximate pattern matcher with limited expressions. The implementation was done on Endace DAG network monitoring cards, which features FPGAs from the Xilinx VirtexII and Virtex4 families.

The implemented pattern matchers were analyzed and evaluated and we showed, that using hardware for pattern matching is feasible and can lead to significant speed improvements over pure software solution. To further demonstrate the applicability of hardware pattern matching, an example application for protocol analysis and accounting was developed and used to analyze the traffic mix on the Internet connection of the MWN, the Munich Scientific Research Network (M¨unchner Wissenschaftsnetz).

Furthermore the importance of TCP stream reassembly in conjunction with pattern matching was discussed. We analyzed the complexity of TCP reassembly in hardware and found that it is feasible to use a system, that only reassembles in-order TCP streams in hardware and handles the remaining TCP streams in software.

Bibliography

For an easy lookup of citations an Internet link to the location were the document or the application was found is supplied. Please be aware of the fact the the cited Internet contents may change. Therefore, the date in parentheses tells the point in time on which the URL was last accessed.

[BM77] Robert S. Boyer and J. Strother Moore. A lemma driven automatic theorem prover for recursive function theory. In IJCAI, pages 511–519, 1977.

[BS06] S.A. Baset and H. Schulzrinne. An analysis of the skype peer-to-peer internet telephony protocol. In Proceedings of IEEE Infocom, 2006.

[CS03] Christopher R. Clark and David E. Schimmel. A pattern-matching co-processor for network intrusion detection systems. In IEEE International Conference on Field-Programmable Technology (FPT), pages 68–74, Tokyo, Japan, 2003.

[CSRL01] Thomas H. Cormen, Clifford Stein, Ronald L. Rivest, and Charles E. Leiserson. Introduction to Algorithms. McGraw-Hill Higher Education, 2nd edition, 2001.

[DFM+06] Holger Dreger, Anja Feldmann, Michael Mai, Vern Paxson, and Robin Sommer. Dynamic application-layer protocol analysis for network intrusion detection. In Proceedings of the 15th Usenix Security Symposium, pages 257–272, 2006. http://www.net.informatik.tu-muenchen.de/~hdreger/papers/ USENIX_SEC06-DynAppAnalysis.pdf (on 27 Feb 2007).

[DP05] S. Dharmapurika and V. Paxon. Robust TCP stream reassembly in the presenece of adversaries. In Proceedings of the 14th Usenix Security Symposium, 2005. http://www.icir.org/vern/papers/TcpReassembly/TcpReassembly. pdf (on 27 Feb 2007).

[End04] Endace Meassurment Systems, Auckland, New Zealand. ERF – Endace Extensible Record Format, June 2004. http://www.endace.com/support/ EndaceRecordFormat.pdf (on 22 Feb 2007).

[End07] Endace Ltd. Homepage, 2007. http://www.endace.com (on 02 May 2007).

[IANA] Internet Assigned Numbers Authority. http://www.iana.org/ (on 25 Feb 2007).

[ipp] ipp2p project homepage. http://www.ipp2p.org/ (on 02 May 2007).

[JID+03] Sharad Jaiswal, Gianluca Iannaccone, Christophe Diot, Jim Kurose, and Don Towsley. Measurement and classification of out-of-sequence packets in a tier-1 ip backbone. In Proceedings of the IEEE Infocom, San Francisco, March 2003.

[KMP77] Donald E. Knuth, James H. Morris, and Vaughan R. Pratt. Fast pattern matching in strings. SIAM J. Comput., 6(2):323–350, 1977.

[KR87] Richard M. Karp and Michael O. Rabin. Efficient randomized pattern-matching algorithms. IBM Journal of Research and Development, 31(2):249–260, 1987. http://www.research.ibm.com/journal/rd/312/ibmrd3102P.pdf (on 21 Feb 2007).

[L7f] Application layer packet classifier for linux. http://l7-filter.sourceforge. net/ (on 25 Feb 2007).

[Lev66] V. I. Levenshtein. Binary codes capable of correcting deletions, insertions, and reversals. Cybernetics and Control Theory, 10(8):707–710, 1966. Original in Doklady Akademii Nauk SSSR 163(4): 845–848 (1965).

[Nav01] Gonzalo Navarro. A guided tour to approximate string matching. ACM Comput. Surv., 33(1):31–88, 2001. http://www.egeen.ee/u/vilo/edu/2002-03/Tekstialgoritmid_I/Articles/Approximate/Navarro_Review_on_ Approximate_Matching_p31-navarro.pdf (on 26 Jan 2007).[net] Linux netfilter project homepage. http://www.netfilter.org/ (on 02 May 2007).

[Pax99] Vern Paxson. Bro: A system for detecting network intruders in real-time. Computer Networks, 31(23–24), December 1999. ftp://ftp.ee.lbl.gov/papers/ bro-CN99.ps.gz.

[PCR] PCRE library project homepage. http://www.pcre.org/ (on 02 May 2007).

[Roe99] Martin Roesch. Snort – Lightweight Intrusion Detection for Networks. In Proc. 13th Systems Administration Conference - LISA '99, pages 229–238, 1999.

[Sel80] Peter H. Sellers. The theory and computation of evolutionary distances: Pattern recognition. J. Algorithms, 1(4):359–373, 1980.

[SP01] R. Sidhu and V. Prasanna. Fast regular expression matching using FPGAs. In Proceedings of the IEEE Symposium on Field-Programmable Custom Computing Machines (FCCM01), April 2001.

[SP03] Ioannis Sourdis and Dionisios Pnevmatikatos. Fast, large-scale string match for a 10Gbps FPGA-based network intrusion. In Proceedings of the International Conference on Field Programmable Logic and Applications (FPL), 2003.

[TRE] TRE library project homepage. http://laurikari.net/tre/ (on 02 May 2007).

[Ukk85] Esko Ukkonen. Algorithms for approximate string matching. Information and Control, 64(1-3):100–118, 1985.

[Wik07a] Wikipedia. Boyer-Moore algorithm. http://en.wikipedia.org/w/index.php? title=Boyer%E2%80%93Moore_string_search_algorithm&oldid=119109024

(on 19 Apr 2007), 2007.

[Wik07b] Wikipedia. Field Progammable Gate Array (FPGA). http://en. wikipedia.org/w/index.php?title=Field-programmable_gate_array

&oldid=109298228 (on 23 Feb 2007), 2007.

[Wik07c] Wikipedia. Knuth-Morris-Pratt algorithm. http://en.wikipedia. org/w/index.php?title=Knuth%E2%80%93Morris%E2%80%93Pratt_algorithm&oldid=119 212834 (on 19 Apr 2007), 2007.

SDIS-018

Data Models and Transaction Properties of NoSQL Databases

Sanat Kumar Sahu

Department of Computer Science, Govt. Kaktiya P. G. College Jagdalpur (C.G.), sanat.kosa1@gmail.com

Abstract

This research paper is working in the field on NoSQL concepts essential to make and organize a extremely scalable and performance oriented database. In this delve NoSQL, its background, ground rules like ACID, BASE and CAP theorem are discussed. In addition to it, foundation of CAP theorem the different types of NoSQL data stores with their examples, description, and merits and demerits of NoSQL are given.

The concepts of NoSQL, the reason for increase in use nowadays , motivations and demand behind it, and reviewing the types of NoSQL databases models and the issues regarding to these databases primarily areas of application and the data transaction properties issues compared with traditional relational database are discussed.

Keyword: NoSQL, CAP, BASE, ACID, Big Data, RDBMS, SQL

1 Introduction

In the current time, series of various systems and applications called NoSQL databases are achieving popularity due to quick response and guarantee to solve database problems and offering some very attractive extra functionality.

At the same time as SQL databases are able to store and handle data reliably, the biggest intention for NoSQL comes in the appearance of what I call Big Data – huge quantities of semi-structured data entities generated by information and communication technology or our society every day. The NoSQL, schema-less approach to data organizing and the endless, horizontal scaling is potentially the only technique to understand how to capture, curate, search, analyze and visualize big data[10].

NoSQL is a cross-platform, document oriented database that provides, high performance, high availability and simple scalability. NoSQL mechanism is based on theory of collection and document. NoSQL (Not only SQL) is a database used to accumulate huge

amounts of data. NoSQL databases are distributed, non-relational, open source and are horizontally scalable (in linear way). NoSQL does not hold the property of ACID unlike SQL.

NoSQL does not pursue to the usual relational database management system (RDBMS) structure. It is pronounced as noseequel. It is one of the additional category of data storage other than databases (that were used earlier) with the intention of using database to store huge amount of data storage similar to data in facebook, Hike (which keeps on increasing day by day). NoSQL is a non-relational database management system (sometimes called as derived from relational database). It is fast information retrieval database and is manageable. NoSQL primarily derives as of Relational database system. This database primarily interacts with the UNIX operating system. NoSQL databases are those databases by way of the idea that they are non-relational, open source, dispersed in nature as well as it is having high performance in a linear system with the plan of flat scalability. Non- relational database does not put in order its data in associated tables (i.e., data is stored in a non-normalized way). NoSQL databases are open sources; therefore, one can get the code access it and use its code freely, modernize it according to his requirements and assemble it. Distributed incoming data is spread to dissimilar machines and is managed by dissimilar machines so at this point it uses the idea of data replication. NoSQL may be symbolically represented as in Figure 1.

Figure 1: Symbolic representation of NoSQL [2]

The symbol representing NoSQL shows database usage without using SQL (Structured Query Language). So, to use these databases effectively we can make use of a number of earlier formats like XML to store and retrieve information from the database.

 With the coming of social networking sites like facebook and Hike, the necessity of novel technology that will be able to handle large amounts of data has shown the way of

different novel technologies and one of the high-flying is NoSQL which is fairly accommodating in data warehousing. NoSQL (non-relational) is fairly more fast than relational databases.. Formerly, in SQL, we were using Query language to go and get as well as to store data; for NoSQL we store large data entities using documents in XML (eXtensible Mark up Language) formats. XML language is principally used to store structured data in a human readable type[2].

2 Related Work

A lot of early researchers worked to find the relationship between Relational and NoSQL databases overview of NoSQL databases, its types and characteristics. They were so eagerness on the subject of NoSQL and how it declined the domination of SQL. However in their discussion about the structured and non-structured databases, the paper also explained how the make use of NoSQL databases which enhanced the performance of the system; in addition it can scale the network without changing any hardware or exchanging bigger server. The effect is improving the network scalability with low-cost service hardware [1].

3 Why Nosql?

NoSQL database system does not follow (or need) with structured relational model. There are a lot of implementations by way of each functioning extremely in a different way and serving a specific need. These schema-less solutions also agree to limitless forming of entries, or a fairly differing, very straightforward other than enormously well-organized as of use *key based value stores*.

Unlike conventional relational databases, it is promising to group collections of data mutually with some NoSQL databases, such as the MongoDB. These *document stores* keep each data, together, as a single collection (i.e. document) in the database. These documents can correspond to as singular data objects, similar to *JSON* and still requires depending on attributes.

NoSQL databases do not have a familiar way to query the data (i.e. similar to SQL of relational databases) and each explanation makes available its own query system.

Structure and type of data being kept:

SQL/Relational databases have need of a structure with clear attributes to hold the data, contrasting NoSQL databases which typically tolerate free-flow operations [5].

Querying:

Regardless of their licences, relational databases all put into operation the SQL model to a definite degree and thus, they be able to exist queried with the Structured Query Language (SQL). NoSQL databases, on the other hand, apply a inimitable method to work with the data they handle.

Scaling:

Both solutions are straightforward to scale vertically (i.e. by growing system resources). on the other hand, being further up to date (and simpler) applications, NoSQL solutions typically offer a good deal easier way to scale horizontally (i.e. by producing a cluster of several machines).

Reliability:

When it comes to data reliability and protected assurance of performed transactions, SQL databases are still the enhanced back.

Support:

Relational database management systems have decade's long history. They are very accepted and it is especially simple to find both free and paid support. If an question arises, it is therefore a good deal easier to explain than recently-popular NoSQL databases -- above all if said explanation is complex in environment.

Scalability and Performance:

- Horizontal scalability improved than Vertical
- Hardware accomplishment cheaper and processing power increasing
- A smaller amount working complexity as beside RDBMS solutions.
- In whole of the solutions you get hold of usual shredding etc as default.

Cost :

- Scale(as with NoSQL) with large Cost
- Product hardware, software versions, upgrades, maintenance.
- This brought organizations come across elsewhere for alternatives and the want for a cost useful scale out option.

4 ROLE OF DATA ARCHITECTURE IN NOSQL

Table: Shows the difference data modelling of SQL and NoSQL [4]

Data Modelling SQL	Data Modelling NoSQL
- Concurrency, Consistency, Integrity - For Summations, Aggregations, Grouping's - Schema Says: What all Do I answer??	- A simple key-value store is especially powerful and the maximum use cases for a NoSQL explanation. - Hierarchical or graph-like data modelling and processing - Values like maps of maps of maps. - Document Databases which even store arbitrary complex objects. - Document based indexing data store's are a huge success. At times SW apps are not limited to these constraints.

This lead to data models like

Key/Value Store :

STUDENT DATABASE

KEY	VALUE
1	SID:1 DOB: 15-Jul-1990 CLASS: BScI
2	SID:2 DOB: 15-Dec-1990 CLASS: BCA
3	SID:3 DOB: 10-Oct-1989 CLASS: BScI

Figure 2: Key Value (KV) Database

Data is stored in an associative array of key-value pairs. The key is an attribute name, which is correlated to a value.

Well-known key value stores include Redis, Voldemort (developed by LinkedIn) and Dynamo (developed by Amazon) etc.

Wide Column Store / Column Families :

As an alternative of 'tables', in columnar

databases you have column families, which are containers for rows. Unlike RDBMS, you don't need to know all of the columns names also each row doesn't have to have the same number of columns. Columnar databases are best suited to analysing huge datasets- big names include Cassandra and HBase.

Row no:	Column Name:	Column Description:	Time Stamp:	Data Value:

ATTRIBUTE	MEANING
Row no:	It is the key its character is unique and it might be number, string, or alphanumeric
Column Name:	Data stored in the basis of column type
Column Description:	It Explain the stored data
Time Stamp:	It tells a particular complete time stamp
Data Value:	Values or attributes that related to key

Figure 3: Strucutre and meaning of wide column Database

For Examples: Cassandra/Hadoop(Hbase)/Hypertable/Cloudera etc.

Document Based Store's :

This figure   from Document Database solution of NoSQL sums up the distinction between RDBMS and Document Databases beautifully: In its place of storing data in rows and columns in a table, data is hold in documents, and these documents are grouped jointly into collections. Each document can contain a wholly dissimilar structure.
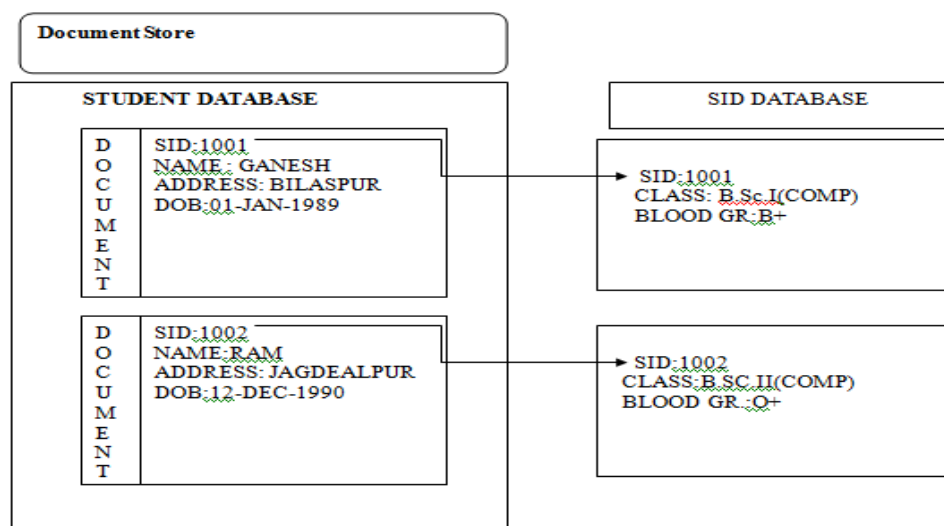
Figure 4 : Document Data Store Techniques

Databases which contains the document stores are CouchDB and MongoD, Solr, Lucene,TerraStore etc.

Graph Data Store :

Used for data whose relations are corresponding to fit in a graph. Data is stored in graph structures with nodes (entities), properties (information about the entities) and lines (connections between the entities). Examples of these types of databases include Neo4J and InfiniteGraph, GraphBase, FlockDb etc.
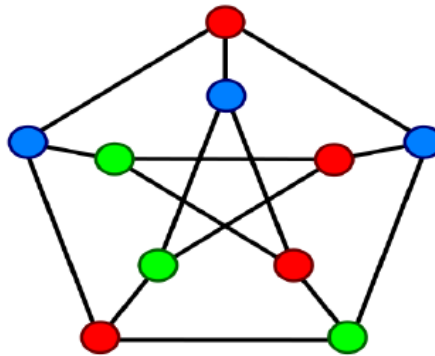
Figure 5: Graph Database[9]

Table1. Examples of major companies using NoSQL databases[3]

Company Name	NoSQL Name	NoSQL Storage Type
Twitter	Cassandra	Column
Facebook	Cassandra|Neo4j	Column|Graph
Hike	MongoDB	Documents
Adobe	HBase	Column
Amazon	Dynamo	SimpleDB	Key--Value	Document
Ebay	Cassandra|MongoDB	Column|Documents
Google	BigTable	Column
Linkedin	Voldemort	Key-value
LotsofWord	CouchDB	Document
MongoHq	MongoDB	Document
Mozilla	HBase|Riak	Column|key-Value
NetFlix	SimpleDB|HBase| Cassandra	Document|Column|Column

5 Transaction Properties of NOSQL Databases

 ACID free:

ACID property

Again I am discussing about brief in ACID (Atomicity, Consistency, Isolation and Durability) property in conventional RDBMS area earlier than touching to the next theme. ACID transactions make available four properties which should be guaranteed[6]:

Atomicity: Each and every one of the operations in the transaction will complete, or not any operations in the transaction will complete. If any one piece of the transaction fails, the whole transaction fails.

Consistency: The database will be in a consistent situation when the transaction start and ends. This asset ensures that any transaction will bring the database from one suitable state to a new state. In high accessibility surroundings these regulations have got to be fulfilled for all nodes in a cluster.

Isolation: The transaction will behave as if it is the only operation being performed upon the database. Every process has to execute in entire isolation from the rest.

Durability: Upon completion of the transaction, the operation will not be reversed.

ACID idea mostly comes from the SQL environment. But in NoSQL we will not apply the ACID idea for the reason that of Consistency feature of SQL . Here to summarize ACID idea, creates problems to NoSQL.
While inside the distributed environment, data is spread to dissimilar machines, every machine stores its data and maintenance of consistency is needed. For case in point, if readily available is modify in one tupple of the table then modify are required in each and every machine on which that particular data resides. If information regarding an updation spreads without delay, then consistency is agreed; if not, then inconsistency is carried out.

BASE

Eventual consistency (usually asynchronous transactions) is a form of a weaker consistency which allows getting better rapidity and accessibility, for the reason that ACID gives powerful consistency (synchronous transactions) for partitioned databases and as a result gets in the technique of availability. A transaction that involves N nodes in a cluster that uses 2-phase commit also reduces the availability. The term eventual

consistency or as it is called **BASE** (**B**asically **A**vailable, **S**oft state, **E**ventual consistency) is the contradictory of **ACID** (**A**tomicity, **C**onsistency, **I**solation and **D**urability). Where **ACID** is negative and requires consistency at the end of every operation, **BASE** is positive and accepts that the database consistency will be in a state of flux. The final consistency is only an acknowledgement that there is limitless delay in propagating a modify complete on one machine to all the other.

Copies which capacity guide to old data. For instance, a distributed system maintains copies of shared data on numerous machines in a cluster to make sure high availability.

When data get updated in a cluster there might be some interval of time during which some of the copies will be updated, but others are not. finally the changes will be propagated to all left over machines. That's why it is named eventual consistency.

 BASE trades consistency designed for ease of use and doesn't give any ordering guarantees at all. Eventual consistency has not anything to do with single node systems from the time when there is no want for propagation. If the database system merely supports eventual consistency, then the application will want to hold the possibility of reading old (inconsistent) data [6].

 CAP

CAP Theorem was formulated by Professor Brewer from University of California. CAP stands for Consistency, Availability and Partition tolerance. In distributed system, Partition tolerance also known as fault tolerance is considered as a most important property. Partition tolerance is a property in which response of the subsystem should be correct unless the whole system fails. If any component of the system is not functional or have some kind of software or hardware issues then operation should be carried out successfully. Consistency means in distributed system operation carried out at one node should have consistent state throughout all the nodes in the system unless explicitly changed. The operation should be carried out as a whole or should not carry out at all. Availability means system should respond to all client requests. There should not be any case where system fails to respond client request. The CAP theorem states, that though

its desirable to have Consistency, High-Availability and Partition-tolerance in every system, unfortunately no system can achieve all the three at the same time [6][11].

6. Conclusion and Future

In this paper the theory of the relational databases and NoSQL database was reviewed, the inspiration behind NoSQL databases and why various big companies are using NoSQL in place of relational databases and how it has declined the power of SQL, with its background and uniqueness. NoSQL databases are special in many features from traditional databases like structured schema, transaction properties, complication, crash recovery and dealing with storing huge amount of data in database. It's as well as describes its ground rules so as to outline the foundation of the NoSQL databases similar to ACID, BASE and CAP theorem. The architectures of the relational database versus the NoSQL database was discussed. The outcome is the NoSQL database which has more flexible architectures as compare to relational database.

The work will be in continued and carried out in reviewing different NoSQL databases and their performances.

7. References

1. Mohamed A. Mohamed, Obay G. Altrafi, Mohammed O. Ismail," Relational vs. NoSQL Databases: A Survey" published in the International Journal of Computer and Information Technology (ISSN: 2279 – 0764) Volume 03 – Issue 03, May 2014 pp 598-601

2. Sharma Vatika, Dave Meenu," SQL and NoSQL Databases" published in the International Journal of Advanced Research inComputer Science and Software Engineering Volume 2, Issue 8, August 2012 ISSN: 2277 128X pp20-27

3. "Current Data Security Issues of NoSQL Databases", WWW.FIDELISSECURITY.COM January 2014 © 2015, Fidelis Cybersecurity pp1-16

4. "SQL VS. NOSQL- WHAT YOU NEED TO KNOW",www.dataconomy.com

5. "Understanding SQL And NoSQL Databases And Different Database Models", Feb 2014 www.digitalocean.com

6. Voroshilin ivon "Brewer's CAP Theorem Explained: BASE Versus ACID", article in the ivoroshilin.com DEC 13TH, 2012 5:21 PM

7. Adeyi ThankGod S., Abdullahi Saleh E., Junaidu Sahalu.B," DualFetchQL System: A Platform for Integrating Relational and NoSQL Databases" published in the International Journal of

Engineering Research & Technology (IJERT) Vol. 2 Issue 12, December – 2013 ISSN: 2278-0181 pp- 1973- 1981

8. *Shubham Kumar " NoSQL: Need and Evolution" JUDCON JBoss Users and Developers Conference 2013:India*

9. *Rafique Ansar, "Evaluating NOSQL Technologies for Historical Financial Data" published in the Examensarbete 30 hp Januari 2013 Chapter 3 pp-20*

10. *Basu Sam ,"Red Pill or Blue Pill? Choosing Between SQL & NoSQL ", November 5, 2014 telerik.com.*

11. *Muhammad Yousaf "Evaluation and implementation of Distributed NoSQL Database for MMO Gaming Environment", Examensarbete 30 hp Oktober 2011 Institutionen för informationsteknologi Department of Information Technology*

SDIS-019

Effect of canopy architecture management in fruit production

Abhay Bisen[1*]and Shwati Pardhi[2]
[1]Assistant Professor (Horticulture), College of Agriculture, Rajnandgaon, IGKV (C.G.)
[2] Ex-Ph.D Scholar, Dr. B.S.K.K.V, Dapoli (M.S.)
*Corresponding author's Email: abhay_horti@yahoo.co.in

Abstract

Sustainable production in evergreen fruit crops is a biggest challenge in India. The erratic behaviour of fruit tree flushing and flowering pose a serious threat to the fruit industry for sustained supply and price trend. Hence, the is need was felt to developed " state of art "technologies for harnessing the naturally available recourses in a sustainable manner to meet the growing demands of the society with respect to nutritive and quality fruits. Canopy architecture and its managements is one of the important operations in fruit crops for harnessing the natural resources through utilization of proper space, nutrients, moisture, solar energy and aeration in the new as well as existing productive and old senile fruit orchards. The tree architectural management, for strong frame and size control, has become a priority for reducing production cost and increasing input use efficiency, yield and quality in various perennial for reducing production cost and increasing input use efficiency, yield and quality in various perennial tree fruit species. Canopy design and shape influence light interception with assured higher monetary returns to fruit growers. This management process is an essential tree management operation that starts from the first year of plant establishment which of course varies with species and environments but enable the plant to produce high quality and quantity by providing proper frame work more fruiting area and utilization of available natural recourses. Therefore, early higher control, open centre Canopy, strong limps with wide crouch angle and more fruiting area and sustained progressive tree canopy architecture management are the important techniques, which should be practiced in fruit crops for higher returns to growers.

Key words: Fruit crops,Canopy, Architecture,Management

Nature does not care how many good sized, high quality fruits are to be born by a trees. For economical fruit growing, the natural form and shape of fruit trees have to be

modified through the practices of pruning to achieve the target of more yield with better quality fruits. The fruit growers desire to regulate the growth and development of their trees in a specific manner for production of maximum fruit, because it is not always wise to allow a plant to develop naturally, since unwanted portions may develop at the expense of those, which are essential from the cultivator's point of view to increase production. Canopy architecture management is thus one of the most important production factors confronting to the rapidly increasing fruit industry in India Singh *et al* (2011). Indeed, canopy architecture is the deigning of the tree through manipulation of its frame and canopy to optimize its production potential with excellent quality fruits. In many fruit crops, 15-520% increase in production with enhanced fruit quality has been witnessed by managing appropriate and efficient canopies particularly in short statured trees. Small trees capture and convert sunlight into fruit production in a better way than larger ones hence it has direct impact on orchard efficiency Kumar (2011).

Fruit production involves the capturing and conversion of sunlight into production of fruit biomass (dry-matter content). The main controlling factors in this context are the amount of incoming radiation and percentage of total radiation received by photo-synthetically active leaves (PAL) for conversion of solar energy into fruits yield Nath *et al.* (2012). In general, the question always arises as to why the plants may not be left as such to be governed by the nature itself. The answer is that the nature's purposes are not always the same as the mankind. Nature intends that a plant should live merely in order that it may reproduce itself in as great quantities as possible. The removal of unwanted plant parts and having a balance between vegetative and reproductive growth essential part of architecture management. The practice of pruning, as and when performed in an appropriate manner, keeps the plant in such a shape and condition so that it yields the fruits of desired quality.

The fruit crops grown in different climatic zones (tropical, subtropical and temperate zones) are required to be trained and pruned differently depending upon the type of plant and specific objectives of the fruit growers. Canopy architecture depends on the choice of trees size, their population per unit area and pruning needs to get optimum pruning should be done when trees are young to develop their basic shapes and frame and continued as tree matures to provide sufficient fruiting area Singh (2011). In commercial orchards,

pruning operations are normal and routine activity to be done once/twice in a year as the case may be but in the orchards where trees have outgrown their allotted space, pruning operation only bring them within their allotted limit and increase their bearing surface through rebuilding the effective canopy area Threes that grow too close together shade out the lower canopy portions and in return decrease their fruit getting ability. Here also pruning plays a crucial role to bring them back in fruiting condition through midterm architecture corrections like centre opening side branch chopping. The basic principles in canopy management are:

• Maximum utilization of light.

• Avoidance of built-up microclimate congenial for diseases and pest infestation.

• Convenience in carrying out the cultural practices.

• Maximizing productivity with quality fruit production.

• Economy in obtaining the required canopy architecture.

The canopy development in perennial fruit crops has a seasonal and lifetime developmental pattern. The sum of development over individual season results in the final canopy dimension and form. In general, most of the fruit orchards are not managed by initial training and pruning that is why with ageing, the trees attain taller size and huge structure, thereby leading to higher cost towards orchard management. The basic problems with overcrowded orchards are non availability of sufficient light, more incidences of pests, etc. Generally, farmers are not aware of the importance of tree architecture and canopy management, as well as their related techniques. As a result, a majority of trees attain tall or curved growth structure and canopy marked with criss-cross branches, leading to a dense vegetative growth with very poor infiltration rate of active radiation. Such conditions not only affect the photosynthetic rate but also facilitate proliferation of pests. Consequently, for want of due care of tree canopy architecture and pressures of pest abundance and poor photosynthetic efficiency over the years, the trees turn senile.

The development of unproductive orchards in vast stretch in fruit belts has become a common sight. In fact, fruiting potential of the trees is largely governed by their architecture, canopy density and photosynthetic efficiency Nath (2013).

Procedures of canopy architecture management

Canopy management practices are discussed below:

1. Training of Fruit Trees:

After planting the fruit plants in the orchard, the training starts from day one. Initially few branches arising from rootstock portion and 10-15 cms above the union are removed at the time of planting. When vines are staked or tied over a trelly or pergola in a certain fashion or some of the parts are removed with a view to give it a desired shape, the operation is called training.

The training is done with the following objectives

1. To admit light upto centre of the tree and provide sufficient movement of air across the plant.

2. To increase photosynthetic activity by exposing leaves to the sun.

3. To provide strong scaffold system this could bear the heavy load of fruits, without limb breakage.

4. To make hoeing, spraying, irrigation and other cultural practices at a nominal cost.

5. To get balanced distribution of fruit over the tree.

Training Systems:

The following training systems are normally followed for tree crops.

(i) Central Leader System

The central leader is allowed to grow uninterrupted. The secondaries grow on the central axis on all directions. The fruit tree grows in a natural way. The tree trunks become very strong due to the spread of many scaffolds and secondaries. The trees become tall and spread mostly unmanageable at maturity. This system is most suited to litchi and mango.

(ii) Modified Leader System

The central leader is allowed to grow to produce 3-4 side branches, then it is headed back at 75 cm height for low headed and at 90 cm for high headed plants. In the next year, the top bud sprouts to take the shape of the central leader, which is again headed back after getting 2-3 scaffolds at the last scaffold giving it an open centre. This can be done after 2-

3 years of removal of the central leader that is why the system of training is called modified leader system of training. In all, there can be 5-7 scaffolds on which secondaries are made to develop by removing apical dominance of each scaffold periodically. Thus a tree takes the shape of an umbrella in spread and a cone in height. Modified leader system trees possess a strong durable framework like central leader system and openness of the open-centre system. Tress do not grow as tall as in central leader system, thus remain manageable for a long time. Orchard efficiency is never adversely affected due to overgrowth. There is no breakage of limbs due to the load of the fruits. This system is suited to pears, peaches, guava, mango, litchi and many more which can grow to form big trees.

(iii) Open-centre System

The plants are planted in the orchard and simultaneously headed back to 75 cm height. The well placed 4-5 side branches are allowed to develop on the main axis. The top growing axis is again cut and is not allowed to resprout and give side branches. The selected scaffolds are made to produce secondaries and tertiaries just like in modified leader system.

Thus the tree gives the appearance of the umbrella. The limbs can cause breakage on the small main axis due to over weight of fruit on few scaffolds in comparison to modified leader system. This system is preferred for those fruit trees which have 10-15 years of life span example peaches and plums. This system is very suitable for exotic peaches in North Indian plains.

Pruning

Normally pruning is an invigorating process. Many a times it is carried out to encourage new growth and fruiting. Pruning is defined as the removal of unwanted parts, viz. shoots, branches roots to allow the fast growth in the remaining parts.

Objectives

(i) To remove the apical dominance for encouraging branching.
(ii) To remove unproductive over crowded branches.

(iii) To remove diseased and dead wood branches.

(iv) To encourage vegetative growth.

(v) To control the overall size of the fruit tree.

(vi) To regulate fruiting for regular cropping.

(vii) To give particular training.

Method of Pruning

Annual pruning can be done in two ways

(i) Heading Back

This type of pruning can be done in both evergreen and deciduous fruit trees to remove apical dominance and encourage side branching. For peaches which bear on new growth, this type of pruning is an annual feature for getting regular fruiting. Normally 1/3 of the top shoot is removed every year during pruning. However, in some fruits like phalsa the whole bush is headed back to the ground level to develop sufficient number of branches for bearing regularly.

ii) Thinning Out

When there is a bushy growth of side shoots on the secondaries or tertiaries, some of the branches are removed entirely from point of emergence without leaving any stub. It results in providing light and aeration in the tree. Thinning out encourages fast growth of the remaining terminals. This gives the tree a large growth. To get best results from pruning a mix of heading back and thinning out will be best for long-term production of quality fruits from peaches.

(iii) Rejuvenation

Old, tall overgrowing fruit trees of mango litchi, pear, etc. can be rejuvenated to get the fruit from the same trees for a number of years again. In literature it has been mentioned that the trees may be rejuvenated in parts, i.e. head back few scaffolds in one year and few is second and rest in the third. This way a tree shall continue to provide fruit for these years and rejuvenated simultaneously.It has been found practically wrong. To rejuvenate the tree whole of the tree should be headed back at one time. Keep only 4-5 well placed scaffolds to a length of 15-20 cm. Many sprouts appear on these stubs. Make

selection in the same season and keep 7-10 scaffolds on all the stubs not more than two on each stub in any case.

Such trees come into bearing again in 3-4 years after rejuvenation. The rejuvenation has been practiced in the field for pear, mango and guava orchards successfully. The time of rejuvenation for pear is December-January, for mango-January-February and for guava March-April and August-September.

Time of Pruning

Time of pruning in different fruit plants differ from fruit to fruit. Normally deciduous fruits trees are pruned when complete dormant after shedding of leaves. Pruning of pear, peach and plum should be done in December-January, whereas phalsa and grapes needs to be pruned end January-February first week. Ber which is summer deciduous should be pruned in May-June.

2. Bending of Scaffolds

To manage the canopy and get early fruiting from trees with long juvenile period, the bending of branches have been successfully practiced in pear. The bending of flexible scaffolds downward can be carried out by tieing the scaffolds to the trunk of the same tree or on to pegs in the basin of the tree.

Bending of scaffolds provides the advantage of geotropism. The spur formation is enhanced by two years. Normally it becomes difficult in getting secondaries on the main scaffolds in pear training. Bending also helps in the sprouting of buds to produce good number of secondaries on a scaffold. Thus training on modified leader system is enhanced by one to two years. The bending of scaffolds can be carried out in Guava, Mango and litchi in addition to pear.

3. Provision of Supports

The selection and breeding programme have developed precocious and heavy bearing cultivars in different fruits. Well managed orchards bear very heavily in their early years of bearing. The tender scaffold system is unable to bear this heavy weight and limbs tend to break from the centre.Some limbs break out rightly from the point of union

on the trunk. This is particularly so in pathanakh pear. Peach cultivars and kinnow. The patharnakh orchards get devastated due to limb breakage these orchards never come to that position in the coming years.Only the few cms long broken limbs continue to bear fruit. Peach tree break from the centre, the broken trees usually die. To save the hard developed canopy of tree, the bamboo supports should be provided to the major heavily bearing limbs/shoots. This is required to 3-4 years of early bearing. Later on tree establish itself with required yield/fruit weight.

References

Kumar, R. (2011). Orchard canopy management for enhanced productivity of fruit crops. Souvenir National seminar on Development of Horticulture in Bihar: Issues and Strategies organized by Bihar Horticulture Society, RAU, Pusa on 28-29th January, 2011 at Patna, Bihar.

Nath,V. (2013). Canopy architecture and management in litchi under high density. National Seminar on Plant canopy Management in fruit trees under high density plantation. 21-24 September, 2013. CISH, Rehmankheda, Lucknow.

Nath, V., Thakre, M., Pandey, S.D., Kumar, Amrendra and Kumar, R. (2012) 4th International Symposium on Liichi, Longan and other Sapindaceae Fruits, December 2-6, 2012, white River, South Agrica.

Singh G. (2011), Innovative production technology: Canopy architecture. Horticulture to Horticulture Bussiness (Eds. K.L. Chadha, A.K. Singh and V.B. Patel) Westville publisher, New Delhi.

Singh G., Kumar R. and Nath V. (2011), Rajuvenation in Litchi. FAO bulleting NRC on Litchi, Mazaffarpur, Bihar. India pp-1-14

SDIS-020

Training Program Plays a Vital Role in Skill Development

Divya Dandwani

Department of Management Studies, Christ College, Jagdalpur, divyadandwani1@gmail.com,
Mobile No: 9300263400

Abstract

Human Resource Management or Personnel Administration or Personnel Management is defined as the people who staff and manage organization. It comprises of the functions and principles that are applied to retaining, training, developing, and compensating the employees in organization. Out of all these divisions, one such important division is training and development.

In my research paper "Training Program Plays a Vital Role in Skill Development" I have tried to touch upon the various methods of training i.e., both on-the-job and off-the-job training methods that are used to enhance knowledge and skill of the employees and how they are beneficial for employees to achieve organizational objectives. As a researcher in my research paper I have given my best to make it meaningful, and a systematic research paper. I have used primary and secondary sources of data collection for my study. For my research, the sampling method adopted is purposive sampling. This research paper aims to find out the impact of training in increasing the productivity of employees, enhancing skills and knowledge, the satisfaction level of employees, role of training in achieving organizational objectives, change in attitude of employees after the training program they have gone through, to improve labor-management relations. Thus the main focus of my research was how training improves the performance of employees on present jobs and prepares them for taking up new assignments in future.
Keywords- Training, Skill development, Methods of training, Process of training.

Introduction-
Definition of skill development

Skill Development means developing yourself and your skill sets to add value for the organization and for your own career development. Fostering an attitude of appreciation for lifelong learning is the key to workplace success.

Definition of Training:

Dale S. Beach defines training as 'the organized procedure by which people learn knowledge and/or skill for a definite purpose'. Training refers to the teaching and learning activities carried on for the primary purpose of helping members of an organization acquire and apply the knowledge, skills, abilities, and attitudes needed by a particular job and organization.

According to Edwin Flippo, 'training is the act of increasing the skills of an employee for doing a particular job'.

According to Dale Yoder, "Training is the process by which manpower is filled for the particular jobs it is to perform."

Jack Halloran: Training is the process of transmitting and receiving information related to problem solving.

Mathis and Jackson: Training is a learning process whereby people learn skills, concept, attitudes and knowledge to aid in the achievement of goals.

Gary Dessler: Training is the process of teaching new employees the basic skills they need to perform their jobs.

Decenzo & Robbins: programs that are more present day oriented, focuses on individual's current jobs, enhancing specific skills and abilities to immediately perform their job called training.

Ricky W. Griffin: Training usually refers to the teaching operational or technical employees how to do the job for which they were hired.

Methods of Training

There are two types of training methods **(Fig.1)**

On-the-job training (OJT) methods- On-the-job training (OJT) is a form of training taking place in a normal working situation. On-the-job training, sometimes called direct instruction, is one of the earliest forms of training (observational learning is probably the earliest). It is a one-on-one training located at the job site, where someone who knows how to do a task shows another how to perform it. It often utilizes job rotation, coaching, job instruction, internship training, etc.
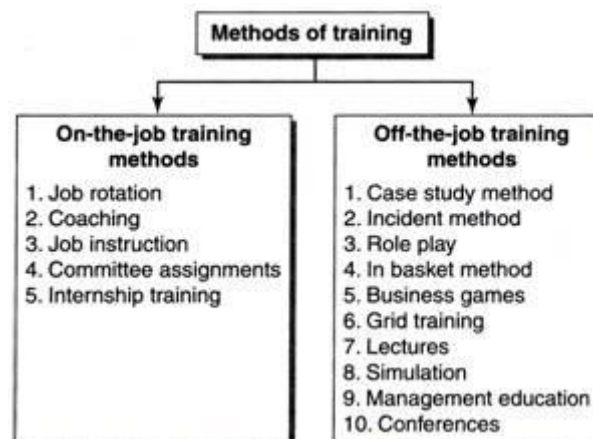
(Fig.1) Methods of Training

Off-the-job training methods- Employee training at a site away from the actual work environment. It often utilizes lectures, case studies, role playing, simulation, etc.

Process of Training Program

Training is not a one sort affair; rather it is a step-by-step process that will complete only after successful completion of given sequential activities. **(Fig.2)**

1. Identifying Training Needs

Training need is a difference between standard performance and actual performance. Hence, it tries to bridge the gap between standard performance and actual performance. The gap clearly underlines the need for training of employees. Hence, under this phase, the gap is identified in order to assess the training needs.

2. Establish Specific Objectives

After the identification of training needs, the most crucial task is to determine the objectives of training. Hence, the primary purpose of training should focus to bridge the gap between standard performance and actual performance. This can be done through setting training objectives. Thus, basic objective of training is to bring proper match between man and the job.

3. Select Appropriate Methods

Training methods are desired means of attaining training objectives. After the determination of training needs and specification of objectives, an appropriate training method is to be identified and selected to achieve the stated objectives. There are number of training methods available but their suitability is judged as per the need of organizational training needs.
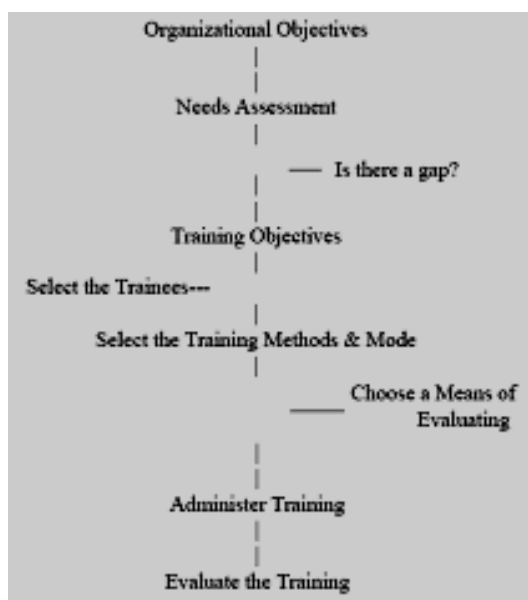
(Fig.2) Process of Training Program

4. Implement Programs

After the selection of an appropriate method, the actual functioning takes place. Under this step, the prepared plans and programs are implemented to get the desired output. Under it, employees are trained to develop for better performance of organizational activities.

5. Evaluate Program

It consists of an evaluation of various aspects of training in order to know whether the training program was effective. In other words, it refers to the training utility in terms of effect of training on employees' performance.

6. Feedback

Finally, a feedback mechanism is created in order to identify the weak areas in the training program and improve the same in future. For this purpose, information relating to class room, food, lodging etc. is obtained from participants. The obtained information, then, tabulated, evaluated, and analyzed in order to mark weak areas of training programs and for future improvements.

Objectives of the Study

1) To understand the importance of training in enhancing the knowledge and skill of an employee.
2) To determine whether training helps to increase the productivity of the employees.
3) To find out whether training helps in increasing employee morale.
4) To know the impact of training in the satisfaction level of employees.
5) To know the various methods that is used in training the employees.
6) To find the treatment of employees during the training program.
7) To know whether training helps the employees to achieve organizational goals.
8) To study the impact of training in improving employer-employee relationship.
9) To know about the employees opinion about the training program provided to them.

Research Methodology

Sources of data collection

Primary source of data collection: - In my research the main sources of primary data includes filling questionnaires, observation, etc.

Secondary source of data collection: - In my research the various sources of secondary data for the study include websites, books, journals etc.

Research Methodology

Sampling Method   -   Purposive Sampling

Sampling unit   -   Employees

Source of data   -   Primary and Secondary data

Data collection tool -   Questionnaires

Analysis and Findings of the Study

  1. **Methods of training-** There are two methods of training: **(Table.1) (Fig.3)**

   (a) **On-the-job training (OJT) methods**

   (b) **Off-the-job training methods**

OPTIONS	RESPONSE	PERCENTAGE
A	On-the-job training (OJT) methods	56%
B	Off-the-job training methods	44%
Total		100%

Table.1- Methods of Training   (Fig.3)
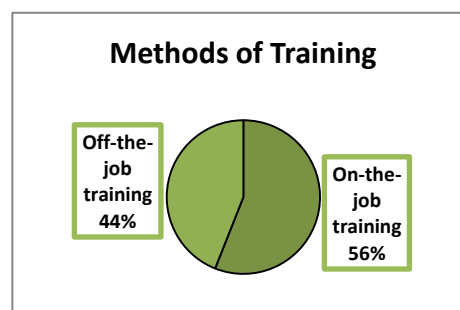
Inference: In my study I found that 56% of the employees say on-the-job training methods are used to train the employees.

  2. **Job satisfaction among the employees with respect to training process-**

Options	Response	Percentage
A	Yes	82%
B	No	18%
Total		100%

Table.2-Job satisfaction among the employees   (Fig.4)
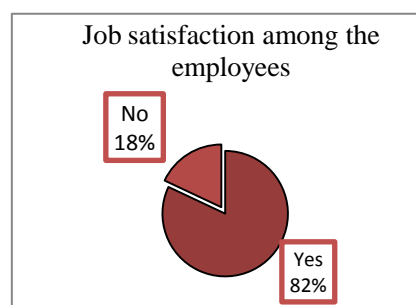
Inference: In my study I found that 82% of the employees are satisfied with the training process provided to them.

3. **Motivation level of the employees with respect to training process-** (Table.3) **(Fig.5)**

Options	Response	Percentage
A	Highly Satisfied	17%
B	Satisfied	70%
C	Dissatisfied	13%
Total		100%
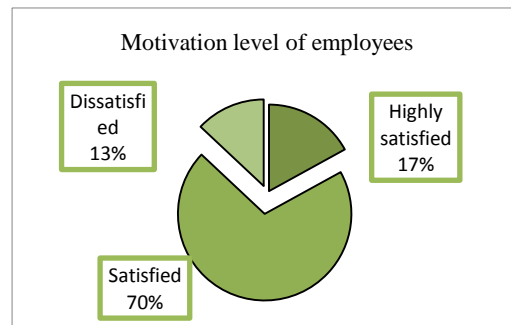
Table.3-Motivation level of employees

(Fig.5)

Inference: In my study I found that 70% of the employees are satisfied with the training process provided to employees.

4. **Helps the employees to achieve short-term & long-term career goals-** (Table.4) **(Fig.6)**

Options	Response	Percentage
A	Yes	81%
B	No	19%
Total		100%
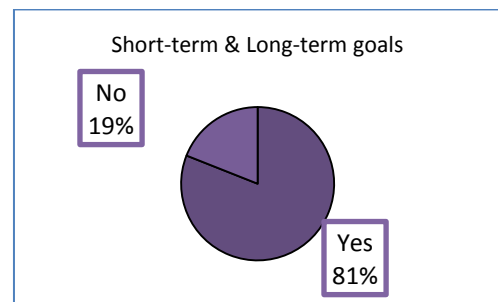
Table.4-Short-term & Long-term goals

(Fig.6)

Inference: In my study I found that 81% of the employees are of the opinion that training program help them achieve short-term & long-term career goals.

5. Helps to achieve new skills & development- (Table.5) (Fig.7)

Options	Response	Percentage
A	Highly Satisfied	84%
B	Less Satisfied	16%

New skills & development

Less satisfied 16%

Highly satisfied 84%
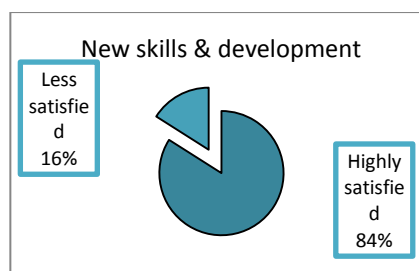
Table.5- New skills & development   (Fig.7)

Inference: In my study I found that 84% of the employees take the benefit of training program which in turn help them in skill development. They are highly satisfied with the training program.

6. Treatment of employees during the training program- (Table.6) (Fig.8)

Options	Response	Percentage
A	Fair Treatment	89%
B	Unfair Treatment	11%
Total		100%

Treatment of employees

Unfair treatment 11%

Fair treatment 89%
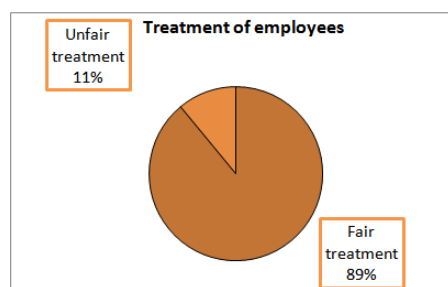
Table.6- Treatment of employees   (Fig.8)

Inference: In my study I found that 89% of the employees are of the view that they are treated fairly during the training program.

7. Helps to improve employer-employee relationship- (Table.7) (Fig.9)

Options	Response	Percentage
A	Yes	84%
B	No	16%
Total		100%

Employer-employee relationship

No 16%

Yes 84%
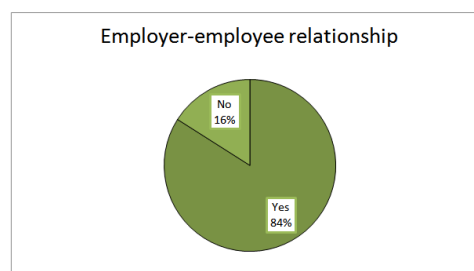
Table.7-Employer-employee relationship   (Fig.9)

Inference: In my study I found that 84% of the employees say the training program provided to them helps the employees improve their employer-employee relationship.

8. **Helps to increase the productivity- (Table.8) (Fig.10)**

OPTIONS	RESPONSE	PERCENTAGE
A	Yes	84%
B	No	16%
Total		100%
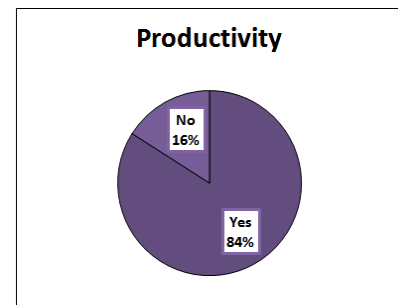
Productivity

Table.8- Productivity   (Fig.10)

Inference: In my study I found that 84% of the employees view the training program is beneficial and it provide them required knowledge & skills. Thus, training program helps in increasing the productivity of the employees.

Conclusion

In my research I found that training and development hold loads of significance like help in train the employees, help in the development of the employees within the organization, enhance the skills of the employees and managers, increase organizations productivity and etc. Be it a general employees of the company or a higher positioned managers, training services are required for both. These help them grow, deliver more and take the organization at the peak level. Training provides employees the detailed information of their jobs and hence makes it easy for them to perform. This increasing productivity of the employees helps the organization further to achieve its long-term goal. Training helps to increase the team spirit, team–work and inter team collaborations. It helps in inculcating the zeal to learn within the employees. This in turn allows employees to deliver best quality work and boost up the success of organization.

The basic purpose of training is to develop skills and efficiency. Every organization has to introduce systematic training programs for the employees. This is because trained

personnel are like valuable assets of the organization. They are responsible for the progress and stability of the organization. Expenditure on training is a profitable investment. Thus, I came to the conclusion that training is important as it constitutes a vital part of managerial control and helps in skill development of employees.

Suggestions/Recommendations

On the basis of my study I give following suggestions:

1. To motivate employees to do their work smartly and skillfully, training programs should be relevant to the organizational and the employees' needs. The training delivered should be effective enough to bring a positive change in the employees' attitude and approach towards their job.

2. Training is not merely sharing information. This information should meet the professional needs of the employees, such as enhancing the skill-set required to excel in the job they are currently doing. Training should provide information for the employee about why the new skills, skill enhancement or information is necessary. Make certain the employee understands the link between the training and his job.

3. Identify the skills that employees need to do their jobs, identify gaps between where they are and what they need, and focus training on resolving the gaps.

4. Newly trained employees usually get back to their work stations with enhanced confidence, renewed enthusiasm and higher levels of competency. However, not all of them retain the same levels of zeal and commitment to apply the skills acquired through training to their job. It is only a handful of employees who do that. Recognize their exceptional performance by rewarding them smartly or by felicitating them with the 'Performer of the Month' award. This will instill in the employee's the spirit to perform and achieve the target.

5. To make training programs cost-effective and save valuable productive time of employees, organizations can move towards online training for their employees.

References

Books

1) *A.K Singh, B R Duggal, Puneet Mohan, Human Resources Management*

2) *Bohlander Snell, Human Resources Management*

3) *C.R. Kothari, Research Methodology Methods and Techniques*

4) *David A. De Cenzo, Human Resources Management*

5) *Gary Dessler, Human Resources Management*

6) *K.Aswathappa, Human Resources Management*

7) *L M Prasad, Principles and Practice of Management*

8) *L.M.Prasad, Human Resources Management, Sultan Chand & Sons*

9) *N. K Singh, Human Resources Management, Himalaya Publishing House*

10) *Nicholas J Bentell, Human Resources Management*

11) *P. Jyothi, P., Venkatesh, D.N., Human Resource Management*

12) *P.Subba Rao, Personnel and Human Resources Management, Text and Cases, Himalaya Publishing House*

13) *R.S. Gupta, B.D.Sharma, N.S.Bhalla, Principles and Practice of Management, Kalyani Publishers*

14) *Randall S Schuler, Human Resources Management*

15) *Shashi K Gupta, Rosy Joshi, Human Resources Management*

16) *Susan E Jacks On, Human Resources Management*

17) *T.N. Chhabra, Human Resources Management, Concepts and Issues, Dhanpat Rai & Co.*

Journals

1) *Debra L. Truitt, The Effect of Training and Development on Employee Attitude as it   Relates to Training and Work Proficiency, Sage Journals.*

2) *Ms. Pallavi P. Kulkarni, A Literature Review on Training & Development and Quality of Work Life.*

3) *Nigel Meager, The Role of Training and Skills Development in Active Labour Market   Policies.*

4) *Shakila P, A Literature Review and Reports on Training and Development, The International Journal of Management.*

5) *Sonali Kanchan, Sakshi Varshney, Skill Development Initiatives and Strategies, Asian   Journal of Management Research.*

6) *Uma S.N, Assistant Professor cum Head Placement and Training, Surana College,   Bangalore, India, International Journal of Science and Research.*

Web Sites:

1) *www.google.com*
2) *www.knowledge.com*
3) *www.scribd.com*
4) *www.vikipedia.com*
5) *www.yahoo.com*

SDIS-022

Skill Development Programmes: The Key to Economic Prosperity and Empowerment" Myth or Reality?

Ms. Nadia Ahad

PhD Research Scholar, UGC- JRF (Maulana Azad National Fellowship), Depatment of Sociology & Social Work, Rani Durgawati University, Jabalpur

Abstract

Training and Development function plays a significant role in energizing and empowering human resources by increasing their skills through innovative and productive programmes. Women self help groups are at present playing a vital role in the personality and skill development of women in India. But Indian women are generally far behind men in aspects such as entrepreneurship skills, managerial skills, marketing skills etc. A self-help group is a voluntary association of poor women which empowers them in almost all spheres of life. Women are an integral part of every economy. All round development and harmonious growth of a nation would be possible only when women are considered as equal partners in progress with men. Empowerment of women is essential to harness the women labour in the main stream of economic development. Hence, the present study is based on the secondary data which examine the impact of Self-Help Group in socio-economic development of rural community in general and women in particular and also suggests suitable measures for the effective improvement of functioning of SHGs in improving the socio-economic conditions of the rural people.

Introduction: Self-help group

A Self-Help Group is defined as a voluntary group valuing personal interaction and mutual aid as means of altering or ameliorating problems perceived as alterable, pressing and personal by most of its participants. Women empowerment is an active, multi-dimensional process, which enables women to realise their full potential and powers in all spheres of life. SHGs are concerned with development of women in all respects along with a sound knowledge about their rights and duties. Voluntary membership, participatory planning, education and training, resource mobilisation, self-management,

anti bureaucracy, empowerment building, linkage building, process extension and movement building, monitoring and self evaluation, sustainability are some of the characteristic features of Self-Help Groups.

Self Help Group is about people coming together with others who are affected by a particular issue (experience, disadvantage, discrimination, etc) to support each other and to work together to change the disadvantage affecting them. Activities that groups do include are community education, information, mutual support etc. Self Help group (SHG) is a self-governed, peer-controlled small and informal association of the poor, usually from socio-economically homogeneous families who are organized around savings and credit activities. Funds for credit activities are coming through regular savings deposited by all of its members on a weekly or fortnightly basis. In the meetings they discuss common village problems and plan solution, share information; make efforts to improve their health and literacy skills. Self Help Groups are not charity or simply community based groups. They are made of and controlled by the people affected. Group members are not volunteers. Although the work is usually unpaid, members work to change their own situation and the support is mutual. The knowledge base of self-help mutual support groups is experiential, indigenous, and rooted in the wisdom that comes from struggling with problems in concrete, shared ways. Self-help groups build on the strengths of their members. SHGs have another very important role to play particularly in the transfer of technology to user group population. It has been found by the members of SHGs that they offer them organizational base, large resources, and access to modern technology leading to employment and income generation. Thus, SHG movement among the rural poor in different parts of the country is emerging as a very reliable and efficient mode for technology transfer. However, it is strongly felt that the pace of transfer and popularization of technologies must be accelerated so that even the small farmer can benefit from new technologies.

Self Help Groups: Path Ways Out of Poverty In India

Self-help groups (SHGs) play today a major role in poverty alleviation in rural India. A growing number of poor people (mostly women) in various parts of India are members of SHGs and actively engage in savings (in actual term Thrift) and credit (S/C), as well as in

other activities(income generation, natural resources management, literacy, child care and nutrition, etc.).The S/C focus in the SHG is the most prominent element and offers a chance to create some control over capital. The SHG system has proven to be very relevant and effective in offering women the possibility to break gradually away from exploitation and isolation. Almost all major donor agencies support SHGs in India in one way or another and many success stories are available, describing how membership in a SHG changed the life of a particular individual or group for the better. Many NGOs are promoting the SHG mechanism and linking it to various other development interventions. Whereas there is ample evidence that the SHG approach is a very effective, efficient and relevant tool for organizing and empowering the poor, do arise with design, development and introduction of programmes to promote income generating activities (IGAs) that will generate sufficient, sustainable and regular income.

The approach towards poverty alleviation is based on the formation of self-help groups at the grass root level. This brings about the necessity for organizing them in a group by which they set the benefit of collective perception, collective decision-making and collective implementation of programme for common benefits. This organization holds the power and provides strength and acts as an anti dote to the helplessness of the poor. The group saving of self helps groups serve a wide range of objectives other than immediate investment. The approach has evolved over the years in India.

Objectives of the Study

The objectives of the present paper is aimed to study

(a) To examine the impact of Self-Help Group in socio-economic development of rural community in general and women in particular.

(b) To evaluate the importance of Microfinance for development of capacity building, entrepreneurial skills and sustainability among rural women and

(c) To suggest suitable measures for the effective improvement of functioning of SHGs in improving the socio economic conditions.

Conceptual evolution of Micro Finance in India

The irrepressible desire and inherent capacity of poor to improve their living for themselves is considered as the foundation for concept of Micro Credit. Propelled by the demonstrative success of Bangladesh Grameen Experiment Micro Credit is acknowledged as an effective channel to take the poor into a new domain of economic empowerment.

Micro – credit is a novel approach of banking with poor with the distinct advantages of high repayments of loans and low transaction cost. Various micro – finance initiatives have gathered pace in the recent years. In Micro – Credit NABARD's role has been twofold, viz., promotional and financial. Promotional efforts assume the form of the SHG – Bank Linkage programme and facilitating training. Financial involvement is in terms of providing refinance, revolving fund assistance and grants.

Over the last decade micro finance has become an accepted institutional framework for taking financial services to the poor. Micro finance has now evolved into a type of independent financial system of its own and there are a number of variants in micro finance institutions and systems. But broadly they can be classified into two—the individual approach and the group approach. An example of the group approach, where the group itself, not the individual member, is the client, is the self-help group program in India.

In India a number of micro-credit schemes have been introduced, first in form of cooperatives
and later in form of loan melas for rural financing. Targeting women – specific programmes however started much later mainly by NGOs such as SEWA, PRADAN, MYRADA etc. The
Government later entered this arena through Rashtriya Mahila Kosh, Indira Mahila Yojana, STEP and through NABARD. Of late the Rural Women's Development and Empowerment Project known as `Swashakti' has reached a take off stage in nine States

by involving NGOs fully for its delivery of various components of the Project leading to holistic empowerment of

women, by making them stakeholders along with the State Government Departments, Banks and beneficiaries.

Economic Impact of Self-Help Groups and Micro Finance

Women have tremendous energies to start their own enterprises given the right opportunities. They have developed abundant self-confidence and self-esteem through self-help group movement not only to overcome economic poverty but also social and gender issues which can be tackled effectively through this process.

The micro-financing of women through self-help groups has helped the groups to achieve a measure of economic and social empowerment. It has developed a sense of leadership, organizational skill, management of various activities of a business, right from acquiring finance, identifying raw material, market and sustainable diversification and modernization.

The Government promoted SHGs through the following programmes in various parts of India to strengthen SHG movement:

DWCRA Groups:

Groups with a maximum membership of 15 women are formed by the Department of Rural

Development under the Development of Women and Children in Rural Areas (DWCRA) scheme. Thrift is used an important point for entry and micro financing among members. The scheme focuses on organization of women into groups to foster a collective approach to their problems and to enhance their bargaining power. These organised women pull many of the Government programmes into their respective villages for their benefit.

SGSY Scheme:

Swaranjayanthi Gram Swarozgar Yojana (SGSY) is a modified version of IRDP with a focus on group approach. Grading of groups is done once in six months to ascertain their

status of performance and corrective capacity building is undertaken. Assistance for economic activities is given through bank loan-cum scheme subsidy to individuals in groups as well as to groups.

Anganwadi groups

These groups are formed by the Department of Women and Welfare at the habitation level for implementing health, nutrition, and literacy programmes for women. Micro finance is extended to the members for taking up income generating activities as individual or as group

enterprises.

Joint forest management groups

Village communities in notified forest areas are formed into Vana Samrakshana Samithis (VSS) to conserve forest wealth. Social mobilisation through the SHG route is being achieved under this programme. Village communities are exhorted to take up alternative income generating activities.

Watershed management groups

Farmers in the watershed areas are formed into groups for implementing improved techniques

of watershed development with the intervention of a facilitating agency, normally an NGO. While on-farm development activities are funded through grant support, these groups are also

encouraged to take up microfinance, with thrift as an entry point activity.

Rashtriya Mahila Kosh groups (RMK groups)

These are groups formed by NGOs and funded by RMK, a fund set up by the

Government of

India for associating women to undertake income-generating activities. Credit is extended to

individual women in the group mode.

Micro finance programmes of CAPART

The Council for Advancement of People's Action and Rural Technology (CAPART) is set up by the Ministry of Rural Development, Government of India, to fund voluntary organizations and community based organizations engaged in serving rural areas. CAPART occupies a significant space in shaping the development innovations of NGOs and catalyzing development initiatives to reach the poor.

The broad components of the scheme are as follows:

1. Institutional capacity building for women's development.

- Promotion of women SHGs, cluster associations, and capacity building.

2. Supporting mechanism for income generating activities.

- Mobilization of investment funds, provision of business management, and technical support services.
- Mechanism to access social programmes and leverage funds for community asset creation.
- To assist in improving women's access to social services such as health and child care.
- To create and improve community assets such as drinking water, sanitation, and day care centres.

3. Provide effective project management systems

- To strengthen the capacity of central and state level agencies to manage.

Future Concerns of SHG movement in India

There are many studies suggesting the successes of SHGs in empowering women. At the core SHG philosophy is the concern to gain control over capital by rural, poor women by virtue of spendthrift, gaining access to a financial pool of their own in time of need or to start income generation activity. A positive derived from Group psychology has been applied to SHG movement in developing countries. While there are many successful stories about the benefits of SHGs, there are many concerns about the future of SHG movement in India. The concern stems from their initial success and their geometric

progression. Are they heading towards right direction of women empowerment? Are our formal lending institutions capable of handling so many illiterate women? Do we have the financial resources to lend loans to the vast number of SHGs? Are the loans given to SHGs sufficient to start an income generating activity on their own? Are Demand- Supply linkage been studied while deciding income generating activity for all SHGs in massive scale? What are the likely marketing problems or competitions, which are likely to arise when SHGs start micro-enterprises? Some of these issues are addressed in the present study

Suggestion for better Implementation of machinery

Implementation mechanism may follow the design of the program. It may be kept in mind that a proper role transformation strategy and implementation of the same in letter and spirit is essential for the development of people's institutions. Loan facility must available for all the members without any restriction. SHGs are not treated as financial system but they are formed with a view to social and economic change of the rural people especially for the rural women.

Proper emphasis should be given to group lending and SHGs formulation to alleviate poverty. In avoiding of any misuse of money, there should be a need of proper regulating authority at each level such as saving, depositing, and money lending. Periodical training programme at regular intervals to group members may be organised by the NGOs and other Government officials to aware about bank loan, proper accounts keeping, self management, decision making etc. Attendance at meeting and workshops should be made mandatory so that the members can enhance their group cohesiveness.

Women should be properly educated so that they will enhance the capability to manage communities and community projects. The NGOs and the State government must also monitor at a regular interval the overall performance of SHGs and the members included in it. There is a need for establishing a computerized MIS for SHGs and SHG federations to monitor their performance on a regular basis.

Conclusion

Self-help group and microfinance has the potential to have a powerful impact on women's empowerment. Although it is not always empowering for all women, most women do experience some degree of empowerment as a result. Empowerment is a complex process of change that is experienced by all individuals somewhat differently. Women need, want, and profit from credit and other financial services. Strengthening women's financial base and economic contribution to their families and communities plays a role in empowering them.

The self-help group is a small body formed by the people for meeting their specific objectives, particularly credit. However Local literature shows that self-help groups have been developed for a wide range of populations, including the mentally ill and their families, persons with disabilities and their care-givers etc. SHGs are initially formed on the foundation of the accumulated endowment of bonding social capital already existing in the community. The social capital produced by the SHG as it matures through creation of new ties and linkages, strengthens the community's cooperative capacity to the achievement of group government. When the SHGs grow they begin to articulate the community demands as they become aware of their rights and therefore attitude of the government bureaucratic officials changes and they become more responsive to the needs of the community i.e., with the maturity of SHG the state-society relationship begin to change at the local level towards the better.

As Wariara Mbugua of UNFPA says, "No longer can this strategy be reduced to simple income-generating activities through revolving funds, but rather it entails and other elements of empowerment such as leadership, self-management, networking and entrepreneurship". By adopting a holistic approach that takes into account cultural, economic, and political factors affecting women's empowerment, MFIs can ensure that women are more deeply and consistently empowered through their programs.

REFERENCES

1. Bali Swain, R. Can (2007) Microfinance Empower Women? Self-Help Groups in India, Dialogue, No. 37, ADA, Luxembourg.

2. Karmakar, K.G (1999) Rural Credit and Self-Help Groups: Micro-finance needs and concepts in India', Sage Publications, Vol. No.7

3. Kropp, Dr. Erhard W. & Suran Dr. B.S. (2002) Linking Banks and (Financial) Self Help   Groups in India – An Assessment, November, 2002

4. Nair, A (2005) Sustainability of Microfinance Self Help Groups in India: Would Federate   Help? World BankPolicy Research Working Paper 3516, February, 2005.

5. Singh, Kavaljit, Banking Sector Liberalization in India: Some Distributing Trends, ASED,August 29, 2005.

SDIS-023

Performance Appraisals of Employees in Organization

Narendra Dev Mirjha & Ludiya Chauhan
Research Scholar, Pt. Ravishankar Shukla University.Raipur

Abstract

This article discusses performance appraisal as an important part of many organizational objectives. Performance appraisal is a very important human resource management function. Its objective is to improve overall productivity and effectiveness by maximizing individual performance and potential. It involves appraisal of employees and appraisal of job. The appraisal system evaluates an individual's performance against previously agreed work objectives in specified period of time. The appraisal methods used are check list, graphic rating scale, forced choice method, management by objectives, 360-degree method etc. The issue in appraisal design arises are what to evaluate, when to evaluate, who are raters etc. There are many advantage to the management by adapting proper appraisal system. The merits are performance feedback, promotion, transfer, compensation decision and for human resource planning. So the performance appraisal helps not only the employee whose work is being appraised, but also helps the manager doing the appraising to gain insight into the organization.

Key word used – need and uses, appraisal process, appraisal form, design, method, advantages.

"Performance Appraisal of an employee in any organization is same as the assessment of student in school examination."

Meaning- performance means to do something and appraisal means to decide the work or obligation done. Thus performance appraisal means deciding the value of the work done by an individual. Performance appraisals is the assessment of individual's performance in a systematic way. The performance is measured against such factors as job knowledge, supervision, dependability, quality and quantity of output, initiative leadership ability, cooperation, judgment and health. Performance management is a very important human

resource management function. Its objective is to improve overall productivity and effectiveness by maximizing individual performance and potential. Appraisal is concerned with improving individual and collective performance, improving communication between managers, supervisors and staff. This approaches involves periodic review and appraisal of how well employees perform their assigned duties.

Need and uses of performance appraisals- The performance appraisal system fulfill many needs and is very useful for management. The appraisal system is useful for promotion of employees, training and development, for compensation analysis for the evaluation of human resource program. The appraisal techniques are useful for communication improvement between managers and employees.

Performance appraisal process- The performance appraisal process consist of five steps which are given below:

1. **Setup performance standard-** appraisal systems require performance standards, which serve as benchmarks against, which performance measured

2. **Communicate performance standard to employee-** once the standard set, it is responsibility of the management to communicate the standard to all the employees of the organization. The employee should be informed and the standard should be clearly explained to them.

3. **Measure actual performance with setup standard-** The actual performance is compared with desired or the standard. Actual performance may be up to the standard or it may go off the track. Comparison tells the deviations in the performance of the employees from the standard set. It includes recalling, evaluating and analysis of data related to employees and job performance.

4. **Discuss the appraisal with the concerned employee-** The result of the appraisal assessment is communicated and discuss with the concerned employee. The focus of the discussion is on communication and listening. The results, problem and solution are discussed with the aim of problem solving and reaching consensus.

5. **Take suitable action if necessary-** The last step of process is to take decisions, which may be to improve the performance of the employee,

providing healthy work environment, taking the required corrective action or human resource decision like incentives, promotion, transfer, demotion etc.
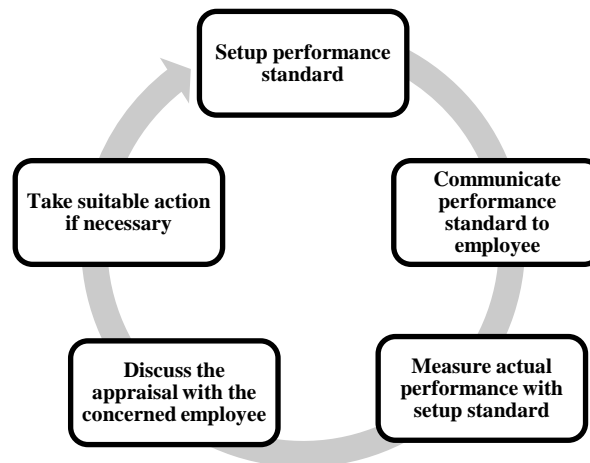
Fig. Performance appraisal process

Issue in appraisal design – The design of appropriate performance appraisal in organization is very lengthy task for the management. The issue arises before the management and there solution are describe here:

What to Evaluate- The basic problem arise before managers in developing appraisal design is what to evaluate. The appraisal design may be employee oriented or job oriented. It may contain honesty, quality and quantity of work, job knowledge, cooperativeness, dependability etc.

1. **When to Evaluate-** The evaluation of performance can be conducted quarterly, half- yearly or annual basis. Generally it is recommended to conduct the appraisal program on annual basis.

2. **What Method Used**- The method adapted for performance appraisals are varied and according to nature of job. The methods are check list, critical incident method, forced choice method, behaviorally anchored rating scale, management by objective, 360-degree appraisal etc.

3. **Who are the Raters-** The choice of raters are in the management hands. The rater may be managers, supervisor or collogues of the same work group. It may be outsiders in context of 360- degree method of appraisal.

4. **What Problems Arise-** The appraisal design is time consuming and stressful job. The content of appraisal form, period of evaluation and getting result ,bias free rating, monitoring the employees when they work for the purpose of evaluation are the major problem arise at performance appraisal design.

5. **How to Solve-** This problem can be solved with mutual understanding and co-operation between supervisor, employees and management. An open exchange between employee and manager can show the manager where improvements in equipment, procedures, or other factors might improve employee performance and help manager in proper evaluating.

Methods /Technique of performance appraisal-

Broadly all method can be divided into two categories Traditional Method and Future Oriented Method .The first seven point given below are traditional method and last three technique are future oriented method of performance appraisal:

1. **Check list-** In this system, a large number of statement that describe specific job are given. Each statement has weight according to its value. While rating to an employee the supervisor check all those statement that most closely describe the behavior of the individual under assessment. The rating sheet is then scored by averaging the weight of all the statement checked by the rater.

2. **Graphic rating scale-** It measure the degree of characteristics required for adequate performance of the job. It consist of a number of quality and characteristics which are judged on a point scale (4, 5, 6, 7, 8, or more). The characteristics could be honesty, quality and quantity of work, job knowledge, cooperativeness, dependability etc. the extreme point on the scale refer to the anchor point of judgment. The rating may be higher to low, excellent to poor etc.

3. **forced choice method-** The method consist of providing a list of behavior related method related statement like- he expect too much, applies safety rule, standard time of working, promotes high working morale and so on. The supervisor is asked to indicate the least and most descriptive statement for a particular subordinate. In development of this method, a variety of statistical

tools are used before the list and weightages are finalized then converted into numerical score providing the relative merit of the employee.

4. **Forced distribution method-** Under this method, employee is appraised according to a predetermined distribution scale. The rater are required to allocate a certain scale or percentage to certain categories (e.g. superior, good, average) or percentile (e.g. 40% outstanding, 20% good, 20% fair and 10% poor). Both the number of category and percentage of employees to be allotted to each category are a function of performance appraisal design and format.

5. **Critical incidence method-** In this method first of all good and bad, effective and ineffective job behavior of an employee is prepared for each job. These critical incidents or events represent the outstanding or poor behavior of employees or the job. At the end of the rating period these recorded critical incidents are used in evaluation of the worker's performance.

6. **Behaviorally anchored rating scale-** This method is a combination of rating scale and critical incident technique of employee performance evaluation. The critical incident serve as anchor statements on a scale and the rating form usually contain six to eight specifically defined performance dimensions.

7. **Confidential report-** The supervisor makes an evaluation of such characteristics of his subordinate as intelligence, loyalty, attendance conduct, character etc. this is the most traditional method used in number of Indian organization, particular in public sector.

8. **Psychological appraisals-** This method is more direct to assess employee's potential for future performance rather than the past one. It is conducted in the form of in-depth interviews, psychological test, and discussion with supervisor and review of the evaluations. It is more focused on employees emotional, intellectual, and motivational and other personal characteristics affecting his performance. The quality of this appraisal largely depend upon the skill of psychologist who perform the evaluation.

9. **Management by objective-** In this method subordinate in consultation with the supervisor sets out short term objectives followed by specific action that he has to carry out. The goal are jointly set and are action oriented. At the end of

the specified period the activities are jointly reviewed by both the subordinate and superior and depending on the performance of the goals are modified or redesigned for the next period of time.

10. **360-degree method-** A popular appraisal technique is the 360-degree feedback. In this method, employees are evaluated by colleagues, customers, subordinate, managers, other interested parties and supervisor. The major advantage of this techniques is that it offers the employee a glimpse of how others view his performance in various relationship critical to his job. It also allow a different perspective in the evaluation process.

Issue in appraisal design – The design of appropriate performance appraisal in organization is very lengthy task for the management. The issue arises before the management and there solution are describe here:

1. **What to Evaluate-** The basic problem arise before managers in developing appraisal design is what to evaluate. The appraisal design may be employee oriented or job oriented. It may contain honesty, quality and quantity of work, job knowledge, cooperativeness, dependability etc.

2. **When to Evaluate-** The evaluation of performance can be conducted quarterly, half- yearly or annual basis. Generally it is recommended to conduct the appraisal program on annual basis.

3. **What Method Used**- The method adapted for performance appraisals are varied and according to nature of job. The methods are check list, critical incident method, forced choice method, behaviorally anchored rating scale, management by objective, 360-degree appraisal etc.

4. **Who are the Raters-** The choice of raters are in the management hands. The rater may be managers, supervisor or collogues of the same work group. It may be outsiders in context of 360- degree method of appraisal.

5. **What Problems Arise-** The appraisal design is time consuming and stressful job. The content of appraisal form, period of evaluation and getting result ,bias free rating, monitoring the employees when they work for the purpose of evaluation are the major problem arise at performance appraisal design.

6. **How to Solve-** This problem can be solved with mutual understanding and co-operation between supervisor, employees and management. An open exchange between employee and manager can show the manager where improvements in equipment, procedures, or other factors might improve employee performance and help manager in proper evaluating.

A typical appraisal form-

To get the best results it's a good idea to use a form for appraisal. A typical appraisal form includes such job performance factors like result achieves, volume of work, effectiveness in working with others in firm, quality of work performance, initiative, job knowledge and dependability etc. The form will serve as a record of the person appraised and will provide a basis for later review and comparison. It is factual, fair and lends itself to self-appraisal. The below figure of Graphic Rating Scale explain the rating of employees behavior on the job.

EMPLOYEES PERFORMANCE APPRAISAL FORM

Name.. Job Title

.... Department ....

    Period Covered ....

Purpose -The primary purpose of this appraisal form is to measure the degree of characteristics of employees for evaluating the performance of the job. It consist of a number of quality and characteristics which are judged on a point scale 1, 2, 3 and 4. The characteristics could be honesty, quality and quantity of work, job knowledge, cooperativeness, dependability. The extreme point on the scale refer to the anchor point of judgment. The rating goes from low to higher.

(1)	(2)	(3)	(4)
Unsatisfactory	Need Improvement	Meet Expectation	Outstanding

Task accomplishment –

1. Rate the quality of this person in degree of honesty-

    (1) O   (2) O   (3) O   (4) O

2. Rate the quality of this person's work-

    (1) O   (2) O   (3) O   (4) O

3. Rate the thoroughness of this person's completed work -

    (1) O   (2) O   (3) O   (4) O

4. Rate this person's overall job knowledge -

    (1) O   (2) O   (3) O   (4) O

5. Rate this person's cooperativeness –

    (1) O   (2) O   (3) O   (4) O

6. Rate this person's dependability on other collogues -

    (1) O   (2) O   (3) O   (4) O

Remark -..

....

    Employees sign.   Supervisor sign.

Advantage of performance appraisal

1. **Performance Feedback-** most employees are very interested in knowing how well they are doing at present and how they can do better in a future. They want this information to improve their performance in order to get promotions and merit pay. It gives clear growth path to talented individuals. Proper performance feedback can improve the employee's future work. It also gives him satisfaction and motivation to work hard.

2. **Promotion-** performance appraisal is a way of finding out which employee should be given a promotion. Past appraisals assessment, managers opinion with other background data , will enable management to select proper person for reward and promotion

3. **Transfers-** performance appraisal is also useful for taking decision regarding transfer. Transfers often involve change in job responsibilities, change in work condition and work environment so it is important to find out the employees who can take these responsibility.   Identification of such employee who can be transferred is possible by performance appraisal.

4. **Employees training and development-** appraisal assessment is used to find out whether an employee requires additional training and development. Deficiencies in performance may be due to inadequate knowledge and skills. So selecting the candidate for proper training and skill development is possible through performance appraisal.

5. **Validation of selection process-** performance appraisal is a means of validating both internal i.e. promotion and transfer and external like hiring new employees from outside sources. Organization spend a lot of time and money for recruiting and selecting employee. The various tools are used for selection process. The performance appraisal find out the validity of various selection tool and processes for selecting employees in future.

6. **Compensation decision-** it include salary, bonus, fringe benefit and other allowances paid to the employee. Performance appraisal can be used to compensate the employee by

7. **Human resource panning –** the appraisal process help in human resource planning (HRP). Accurate and current appraisal data regarding certain employees help the management in taking decision for future employment. Without knowledge of who is capable of being promoted, transfer, demoted, lay off or terminated, management cannot make employment plans for the future.

Shortcoming of performance appraisal-

The introduction and operation of a good performance appraisal system is very difficult task. The appraisal system suffer from many drawbacks. The demerits of performance appraisal system are given below:

1. **Very time consuming-** Many appraisal tools that offer the most objective view of an employee's performance are also the most time consuming. One of the most popular peer-review models, the 360-degree feedback appraisal model, require training of evaluators and careful crafting of customized survey question. The evaluation process itself can take up to two or more weeks at a time, depending on the size of the company.

2. **If not done appropriately can be a negative experience-** As we know that appraisal techniques are time consuming if we cannot design the method and appraisal form appropriately according to nature of job. The appraisal system can be a negative experience for manager as well as workers. It may cause to loss of belief of employees on appraisal system.

3. **Can be stressful for all involved-** punitive intention and poor goal alignment are risks with most appraisal technique. If the supervisor have quarrel to any of employee working under him then they can use appraisal technique as a punishment tool against him. The ambiguity of goal set are also create stress to the workers on performance.

4. **Inconsistent with team work-** The performance appraisal technique given above, all are based on evaluation of performance or work of employees on individual

basis .This technique is inconsistent with team work and group effort are not taken into consideration.

5. **Subject to rater error and biases-** Managers bring their own biases and subjective notion to the appraisal process. Bias can also skew the results of more subjective peer review based appraisal schemes, causing employees to belief in the system and not to see them as credible measures of performance.

Conclusions

Performance management is a very important human resource management function. Its objective is to improve overall productivity and effectiveness by maximizing individual potential and performance. Many factors will impact the effectiveness of an organization's performance appraisal system, but these three are most important. First, the system needs to be aligned with and support the organization's goals and direction for success factors. Second, well-developed, efficiently administered tools and processes are needed to make the system employees friendly and well received by organizational members. Third, and most important, is that both managers and employees must use the system in a manner that brings visible, value-added benefits in the areas of performance development, performance planning, feedback and achieving results. . Managers need guidance, training and encouragement in how to conduct appraisals properly. Performance appraisals of all types are effective if they are conducted properly, and better if the appraisal process is clearly explained and agreed by the people involved.

Bibliography-

1. *Grote, Richard Charles* *The Performance Appraisal Question and Answer Book: Survival Guide for Managers 2002.*
2. *Cardy, R. L.* *Performance management: Concepts, skills, and exercises, 2003.*
3. *Ghorpade, J.* *Managing the five paradoxes of 360-degree feedback. Academy of Management Executive, 2000.*
4. *Sahu, R. K.* *Performance Appraisal System*
5. *Goel, Dewakar* *Performance Appraisal And Compensation Management*

6. *Rao, T.V.*   *Performance Management and Appraisal System: HR Tools For Global Competitiveness*

7. *Deb, Tapomoy*   *Performance Appraisal And Management*

SDIS-025

Knowledge, attitude, acceptance and stigma of Leprosy in tribal concentrated Bastar district of Chhattisgarh, India

Swapan Kumar Kolay Ph.D.[1*], Veena Mishra M.Sc.[2], Samiran Bisai Ph.D.[3], Ranabir Pal MD.[4], Pradip Kumar Mohanta MD.[5], Debabrata Sarbapalli MD.[6]

1. School of Anthropology & Tribal Studies, Bastar University, Dharampura, Jagdalpur, Bastar 494001, (CG), India, Mobile: +91- 9826497122, Email: kolay.swapan@gmail.com
2. School of Anthropology & Tribal Studies, Bastar University, Dharampura, Jagdalpur, District: Bastar 494001, (CG), India.
3. Society for Applied Studies, Salt Lake - 700064, Sector-I, CF-198, Kolkata, West Bengal, India.
4. Department of Community Medicine and Family Medicine, All India Institute of Medical Sciences (AIIMS), Jodhpur-342 005, Rajasthan, India.
5. Department of Surgery, College of Medicine & JNM Hospital, Kalyani, Nadia, West Bengal, India.
6. West Bengal University of Health Sciences, DD-36, Sector-1, Salt Lake City, Kolkata-700064, West Bengal, India.

Abstract

This study was conducted to ascertain socio-economic conditions, social stigma levels, life style, social intervention translational efforts and recommendations for policy makers.

The study was conducted during April, 2012 to June, 2013 on 101 leprosy patients selected by non-probability convenient sampling regardless of age and gender. The study instrument engrossed leprosy related socio-demographic variables, knowledge with different kinds of problems and issues experienced by them for which they were evinced.

Overall majority were males (74.3%), married (80.2%), literate (55.5 %) in productive age (16-60years) group (85.2%); annual family income of less than one lakh (53.5%). Few (20.8%) got job as leprosy welfare worker while 15 percent became jobless after having leprosy. Positive knowledge gained as Leprosy patients were communicability (84%), numbness of hands as early symptom (75%), cure (88%), deformities in untreated cases (91%), no vertical transmission (91.1%). Experiences shared were disturbed marital (90.1%) and social life (94.1%), losing jobs (54.5%), isolation with hesitation to talk to people (29.7%), and attending social gatherings (87.1%), family members not sharing food (94.1%); forced to leave the family (54.5%); yet, health education interventions improved their knowledge (91.1%). Multi-Bacillary leprosy was higher in

newly registered cases with higher disability in hands and feet (60.4%), eye (30%), more WHO grade-2 disabilities (9.9%) due to delayed diagnosis after one year.

The study on the functioning of people affected by leprosy revealed the physical problems they encounter and the way this affects their social participation need to be addressed.

***Key words:** Leprosy, Social stigma, Disability grading, India.*

Introduction:

Leprosy, responsible for serious deformities and disabilities leading to stigmatization and psychosocial suffering, has remained endemic in many countries, especially affecting the poorest sector of people. By affecting peripheral nerves and skin lead to deformities from loss of eye brows to paralysis of muscle or resulting from injury or infection to hands or feet affecting activities of daily living (1,2,3).

Many interventions contributed to eradicate Leprosy from this world as it is curable by World Health Organization (WHO) multidrug therapy (MDT) in a closely monitored system introduced since early 1980's. Since then the prevalence of Leprosy has dropped down significantly, apart from certain endemic areas in India and South America (1). Social stigma and prejudices associated with leprosy still remain major obstacles for its eradication (4,5).

Further, Leprosy affected weaker and marginalized sections of society had been facing lot of stigma as global phenomenon. The stigmas are prevalent basically at the family level and its promoting them to beg and run from the homes for mental peace and are compelled to hide this curable disease to self-reporting, avoiding diagnosis and early treatment, allowing a completely curable disease to worsen to the point of disfigurement with other risk correlates (6).

World leprosy day is celebrated to promote awareness with the advocacy of curability, if untreated, leads to progressive and permanent damage to the skin, nerves, limbs and eyes; not highly infectious - transmission during close and frequent contacts with untreated cases (7).

In the above scenario this study was conducted with the objectives to ascertain the socio-demographic and socio-economic conditions, the social stigma attached to the disease,

translational efforts of all levels of stakeholders to intervene in the normal social course for optimum recommendations for policy makers.

Methods

The leprosy affected participants of the study were receiving medical services from the Maharani Hospital, Jagdalpur, catering health care needs to the people of Bastar district. According to the latest census the total population in the district was 1413199. Among them 931780 were documented as tribal population, which constitutes 66% of the total population of the district (8).

The investigators collected data from on the following inclusion criteria:

1. The leprosy patients had been registered in the hospital.

2. The patients who were under medication for the last one year

3. Those who were continuing treatment without break.

The investigator did retrospective data mining all the registered patients in the hospital for the treatment of leprosy wherein the respondents were identified and selected following abovementioned inclusion criteria, were pursued to participate in our study.

Non-consenting, non-co-operative and severely ill patients were excluded for ethical reasons. Altogether 101 registered leprosy patients receiving the treatment were included as the study.

Study instrument

Pre-tested close-ended questionnaires contained questions linking to correlates of stigma, impact and effects of the stipulated leprosy morbidity in relation with the socio-demographic situation. By initial translation, back-translation, re-translation followed by pilot study, the questionnaire was custom made for the study. The pilot study was carried out on the general patients of other diseases from the same area following which some of the questions from the interview schedule were modified. This data collection tool used for the study was an interview schedule that was based on at the institute with the assistance from the faculty members and other experts developed on information provided by the global experts prior to the study for ensuring feasibility, acceptability, time management, validity and reliability. The personal details were collected in first

section; family details were in second part; details of treatment were collected in next sections with the social stigma and kinds of food which is taken by the patients.

Data collection procedure

Institutional ethical committee approved the study. All the patients or their caregivers were explained the purpose of the study and were ensured strict confidentiality. Written informed consents were taken from each participants prior to study with the option not to participate. The principal investigator then collected the data. The collection of the data was from April, 2012 to June, 2013. On an average, five to six interviews were conducted in a day. Details of the questionnaire can be provided, if required. Information on leprosy was disseminated to the patients their and caregivers in health education sessions to complement the findings of study.

The investigator conducted focused group discussions on the life style of the patients, stigma and their daily transactions of the family, friends and other relatives who actively elucidated their views and problems faced by them. The investigator had conducted personal interviews with the doctors to ascertain the right information and treatment who clarified their ideas about the leprosy and the problems they are facing in their profession while they are treating the patients.

Data analysis

After collection of data through the primary source the data were thoroughly cleaned, were coded and a code book was prepared. The data were entered into a master chart very meticulously. Thereafter, it was processed into the computer through MS Excel package. Later, the computerized data was taken in print form and the same was cross checked with the master chart to find out error(s), if any. The procedures involved for qualitative data were transcription, preliminary data inspection, content analysis and interpretation.

Results

A total of 101 (male =75, female =26) leprosy patients as well as their household have been surveyed. These consist of a total population of leprosy patient in Maharani Hospital in April 2012 to June 2013 in Jagdalpur. Out of 101 Leprosy patient of which are males 75 (74.3%) and 26 (25.7%) are females. Among total patients, majority of them

are 81 (80.2%) married followed by 9% are unmarried. The rate of widow and widower are about 3 and 8 percent respectively. Age group distribution of Leprosy patient was analyzed, the rate of studied patients for 21-30 years was 14.9, 31-40 years for 25.7 and 29.7 and 17.8 percent respectively under the age group of 41-50 years and 51-60 years; rate (6%) of young (≤20 years) and older (61+ years) were identical. It was observed that out of the total patients, majority 55.5 percent are literate, whereas illiterates are 44.5 percent. Out of the total literates, 32.1 percent are completed primary education followed by 26.8 percent can only read & write. The corresponding rates for middle school are identical (26.8%). However, 8.9 and 5.4 percent patients completed 10th and 12th years of school. As regards the different occupations adopted by the leprosy patients, 40.6 percent started working inside the leprosy center as fruit sellers, vegetable sellers or as cobblers while 20.8% started working as welfare worker inside the leprosy center. It is found that about 15 percent patients became jobless when they contracted leprosy (Table 1).

Majority of the families (28.7%) annual income Rs. <100000 followed by 24.8 percent patients income range between Rs. 50001 - 100000. Whereas only 17.8 percent of families annual income less than Rs. 12000. Near about 30% of leprosy patient annual family income range between Rs. 12,001 - 50,000 (Table 2).

On the variables regarding the knowledge of the patients about leprosy, 61 percent stated that leprosy is transmitted by touching, divine in origin thought 7.9 percent, while 8.9 percent considered leprosy as a hereditary disease; 23 percent knew it as a communicable disease. About 75 percent of the patients noticed numbness of hands as an early symptom of leprosy, while 11.9 percent noticed a discolored skin patch. Leprosy is curable stated by 88 percent of the patients. Majority 91 percent said that leprosy causes deformity and there is no vertical transmission as answered by 91.1 percent; 85 percent of the respondents did not have proper knowledge about leprosy before they contracted leprosy (Table 3).

Social life of 94.1 percent of the patients was affected after the development of leprosy; 54.5 percent of the patients lost their jobs; hesitation to talk to people was reported by 29.7 percent. Other social problems were isolation in the form of hesitation to go the people and attending social gatherings was reported by 87.1 percent; marital life of 90.1 percent was affected; family members do not eat with the patients was reported by

94.1 percent. About 54.5 percent were forced to leave the family. Health education had improved knowledge of 91.1 percent (Table 4).

Leprosy cases were clinically classified into Pauci bacillary and Multi bacillary leprosy according to WHO study group on chemotherapy of leprosy. In our study population Multi bacillary (MB) leprosy was higher in newly registered patients. Overall 85.2 percent were between the age group 16-60 years, which was economically productive age group; remaining 15 (14.9%) cases were found below 16 years and above 60 years, respectively; almost equally distributed in both the genders. However, the overall proportion of PB and MF were more than 2times and three times higher among male patients than female patients (Table 5).

The researchers noted that the disability rate was 60.4 percent for hands and feet; ophthalmic disability 30 (29.7%). The WHO grade-2 disabilities among leprosy patients were 9.9 percent. Disability rate was more in Multi-Bacillary leprosy patients than in Pauci Bacillary (Table 6).

Majority 27 (67.5%) patients did delay in diagnosis of leprosy cases was up to 12 months. Subjects with delayed diagnosis beyond 12 months had 40 percent grade-2 disabilities than diagnosed within 12 months (Table 7).

Discussion

Three million people worldwide are estimated to be disabled by the consequences of this chronic, debilitating disease, with many co-morbidities and personal implications (9). In India, the year 2011-12 started with 0.83 lakh leprosy cases on record as on 1st April 2011, with prevalence rate 0.69 per 10,000 populations. The distribution of Leprosy cases are not evenly distributed between states of India. The highest rates were reported from Chhattisgarh state (except Union Territory) with prevalence rate of 1.69 per 10,000 populations (10). However, the Indian government has been taken many steps to elimination of Leprosy through improve coverage as well as quality of services in the inaccessible areas (11).

The stigma, exclusion and restricted participation is an everyday reality of many ex-leprosy patients noted in our study. Moreover, as substantial diagnostic delay occurred, people affected feel a need for support groups and better access to relevant information about leprosy is needed. WHO recommended that MDT treatment

completion rates should be maintained at around 90-95 percentm with a patient friendly system for delivery of MDT that is flexible with regular contact between patient and health workers (12). In a retrograde cohort study done in Kamrup district of Assam, India different socio-demographic variables affected the treatment seeking behavior of registered cases ranging from loss of occupational hours to fear of social stigma (13).

Literacy

Majority (55.5%) was literate in our study, of them 32.1 percent completed primary education and middle school (26.8%). In a comparable study in Nepal, among majority of leprosy cases were reported to be illiterate (14).

Occupation

In our study 40.6 percent started working inside the leprosy center as fruit sellers, vegetable sellers or as cobblers; 20.8 percent were working as welfare worker inside the leprosy center; 15 percent patients became jobless when they contracted leprosy. In a non-intervention study carried-out in Nepal, majority of leprosy patients were laborers by occupation (14).

Annual income

Majority of the families annual income was less that Rs. one lakh. In the abovementioned study in Nepal, majority of non-compliant leprosy cases were from poor economic class (14).

Knowledge and experience of patients and community

In our study, a great majority knew leprosy as a communicable disease, curable and can cause deformity if untreated with no vertical transmission. Social life of 94.1 percent was affected after the development of leprosy; 54.5 percent lost their jobs; hesitation to talk to people was reported by 29.7 percent; isolation in the form of hesitation to go the people and attending social gatherings in 87.1 percent; marital life of 90.1 percent was affected; family members do not eat with the patients was reported by 94.1 percent. 54.5 percent were forced to leave the family. Health education had

improved knowledge of 91.1 percent. Rather than experiencing stigmatization from their surroundings, most ex-leprosy patients reported suffering mainly from internalized forms of stigma related to the concealment of their affliction, the social isolation. Professionals that deal with (ex) leprosy patients need to enquire actively for signs of these hidden forms of self-stigma. Self-stigma is also common in other stigmatizing conditions in developed countries, such as HIV, epilepsy and mental illnesses.

The International Classification of Functioning, Disability and Health definition not only consider disability in medical terms but also recognizes the social context of disability as a negative image wherein leprosy patients with grade 2 disability fear about stigmatization and discrimination, and experience serious psychosocial and economic problems (15,16). Researcher from Nepal suggested that there is an urgent need of rehabilitation for the patients who have already developed disabilities which are irreversible which emphasize on legal, social, religious, medical and occupational aspects (17). WHO Strategy for leprosy elimination encourages self-reporting and early treatment by promoting community awareness and changing the image of leprosy; increased empowerment of people affected by the disease, together with their greater involvement in services and community, will bring us closer to a world without leprosy (7).

Distribution of leprosy cases according to age, sex and type

Overall 85.2 percent were between the age group 16-60 years, which was economically productive age group in our study equally distributed in genders. In our study population Multi bacillary (MB) leprosy was higher in newly registered patients. In the Assam study significant statistical association was found between gender, literacy status, per capita income per month and socioeconomic status with treatment outcome (13).

Distribution of disability

The disability rate was 60.4 percent for hands and feet; ophthalmic disability half (29.7%); WHO grade-2 disabilities 9.9 percent and more in Multi-Bacillary leprosy patients. Leprosy is a leading cause of permanent disability among communicable diseases. An estimated three million people live with disability due to leprosy and it is

expected that up to one million people will continue to suffer from disability in the next decades (18, 19).

Leprosy cases according to delay in diagnosis and disability

Majority (67.5%) patients did delay in diagnosis of leprosy cases was up to 12 months. Subjects with delayed diagnosis beyond 12 months had more grade-2 disabilities than presented within 12 months. Many studies had evaluated the reasons of adherence to WHO MDT and its successful completion. Further, socio-cultural studies involving leprosy patients were conducted to find the extent of defaulting, its correlates and reasons. In a retrograde cohort study was done in 2007 in Kamrup district of Assam, India from the cases registered for WHO-MDT treatment during 2002 to 2005 where defaulter rate was noted to be quite high even among urban population. The researchers concluded that principal causes of defaulting were related to gender, educational status, income as well as social class, or some combination of these. Recommendations, on strategic interventions to obviate the cause for noncompliance, were presented (13).

Type of WHO classifications

Overall 85.2 percent were between the age group 16-60 years, which was economically productive age group; Multi bacillary leprosy was higher in newly registered patients and had higher numbers of grade 2 disabilities. An analytic cross-sectional study was carried out in Dhanusha district in Nepal also noted similar observations with male (68.3% on MB-MDT) and 90 female (61.1% MB-MDT) leprosy patients (20).

Prejudice and treatment completion

Researchers reported about non-compliance of treatment that was related with this social disease directly and indirectly. This is serious concern for all who are dedicated to eradicate leprosy. The Nepal study noted significant associations between treatment completion status and gender with 79.2 percent of male leprosy patients completed treatment in relation to 65.6 percent female. [21] A community-based study from 12 leprosy endemic areas in Philippines reported noncompliance rate with the WHO-MDT regimen as 30 percent with reasons blended differently to patients, drugs, health care provider (21). Mozambique study found 59.2 percent MB patients completed treatment; of the defaulters, 57.7 percent defaulted within six months, as the patients established

early into a treatment routine, likely to complete treatment (22). The Mumbai study showed the 'drop-out' pattern significantly reduced by introduction of the special measures over years (23).

Very little is known about the social impact of this disease in a non-endemic area. The statistical outcomes of the Participation Scale confirm the participation restrictions reported by people affected in the qualitative interviews. The fact that visible disability did not have an independent effect as predictor for participation restriction may be explained by the fact that people more easily mask their disability or lie about the cause than that they conceal seeing a doctor for their condition. Medical consultations also remind people of their disease and of being 'different' that way. The social participation restrictions experienced by people were illustrated by examples of non-affected people in the Jagdalpur that stigmatize and by the patients' own memory of leprosy being a shameful disease. The effect of culture on stigmatization has been acknowledged by many research groups. The causes and manifestations of stigma may differ among different cultures but effects of stigma on individuals and families are remarkably similar across cultures. The same is true for stigma reduction interventions, although these may need to be culturally adapted to local context before implementation (24).

The findings of this study ask for action to reduce self-stigma and diagnostic delay. Future research should investigate the importance and impact of self-stigma for people affected by leprosy elsewhere. It would be interesting to find out in what way leprosy is stigmatized in other non-endemic areas and whether internalized stigma is more common in developed countries than public stigma. Self-stigma can be challenged by interventions that encourage the development of personal identity through interaction with peers, proper information distribution, psycho-social support as well as general empowerment. Increased and continuing awareness among doctors is necessary to minimise continuing damage and disability. Leprosy should be brought more often to the attention of medical specialists most likely to be consulted by leprosy patients, such as dermatologists and neurologists. The diagnosis of leprosy should be considered in cases of chronic dermatitis with peripheral nerve involvement in foreign-born individuals, as well as in those who have undertaken protracted travel abroad. Leprosy can be a

complicated and challenging disease to manage. If suspected, referral to a tropical disease expert or a dermatologist with expertise in leprosy is warranted.

Some health reports show very high morbidity and mortality of most public health problems which mostly has corresponding relationship with the environment. The Govt. of the day, through the National Leprosy programme & Parasite control program, had restraligized, formulated new policies on prevention and treatment of Leprosy to ensure the burden of Leprosy is reduce to the barest minimum. The following suggestions mentioned below;

Strengths of the study

The social stigmas were the driving forces to study the present status among the tribal community as we wanted to provide proper knowledge about leprosy before they contracted leprosy as building a positive attitude could be an important milestone to eradication of leprosy. Our study has been able to through light on this social issue that stigma adds to the burden of leprosy causing considerable emotional suffering, even long after being cured. These emotional sufferings are caused by the generalized ignorance about Leprosy, feeling of being different or ashamed and sometimes by actually being treated differently by the healthy fellow citizens those are major hindrance to eradication of curable illness. Unfortunately in absence of the basic awareness on the pathogenesis and treatment success stories, the associated stigma has been causing the patients to hide this 'Social disease' incurable and remains a major obstacle in National Leprosy Eradication Programme.

Limitations of the study

We had several limitations. First, there was a concern on the hospital based study. The majority of people invited by letter did not respond. Due to patient confidentiality regulations, we do not have information of those who did not respond. Therefore, we were not able to compare profiles of people who did not respond to those who did participate. Contact tracing of the leprosy patients could have provided us with higher number of study participants to enrich our study. Moreover, the groups of potentially affected people not under medical care, like illegal immigrants, were not included in our survey. These may have resulted in selection bias as the defaulter could have been

affected by stigma and social pressure for which they had to discontinue becoming reservoir of infection and hindering all efforts to break the chain of transmission. Our recall method study may fail to accumulate accurate information added with the responder's hesitancy to talk straight to make us assume that our findings are an under-representation of the actual problems faced by ex-leprosy patients in the Jagdalpur. The participation scores indicated some moderately severe restrictions, which may warrant psycho-social interventions. Our findings should therefore be interpreted with caution. Even though the Participation Scale is a validated tool to measure the effects of stigma, self-stigma can be measured more specifically using an instrument like the ISMI scale. Other studies on leprosy in Jagdalpur reported on the diagnostic delay people face. Important causes of delay are misdiagnoses because dermatological and neurological conditions such as leprosy can be difficult to recognize and diagnose.

Future directions of the study

A multipronged strategy should be initiated with Behavior Change Communication (BCC) as mainstay to remove this curable disease from the globe. Future phase of our research should involve a larger community based study that will hopefully incorporate self-stigma as a matter of priority and use a comprehensive assessment of self-stigma. Literature supports on gender differences related to leprosy revealed that many leprosy and epidemiological factors play a role in the comparative leprosy treatment completion status of males and females. Additional research is needed to determine the relative impotence of health service-related factors in treatment completion. Moreover, other research will focus on assessing community behavior and attitude towards leprosy patients under treatment. It is recommended that closer attention to gender differences be given to improve MDT coverage, capacity building, increase community awareness. Further, the causes of noncompliance have to be explored with research on amalgamation of shorter course of treatment with regular supply of drugs with empathetic health care provider approach. The success stories of the current WHO leprosy elimination schedule rest on the conformity of health care stakeholders. Research on post intervention knowledge and practice among patients and caregivers has to be repeatedly explored.

To sum up, we concluded that male patient share twice more likely to be treatment completers than female counterparts, after adjustment for leprosy type, disability grade, skin lesion site, age, educational status, caste level, religion, occupation, family type, family income per year and family land. Similarly, after adjustment with the above-mentioned variables researcher also conclude that literate patients and patients with no disability and disability grade I are more than twice as likely to be treatment completers than illiterate patients and patient shaving disability grade II. WHO-MDT has proven tool of leprosy intervention, particularly when patients report early and start treatment without delay and its successful completion is vital. Regrettably, combination of individual, psychosocial, financial, therapeutic and health service factors affects the goal of eradication of leprosy for which motivation, reassurance and regular contact help.

Recommendations

In our socio-economic-culturally uneven country no short term solution can help us leprosy eradication. To deal with this colossal task, we need holistic approach involving professional, social service activist, government and teaching institution with health professionals.

Health education: Health education system needs to improve knowledge about leprosy among the people with lesser educational level by audio-visual aids. From school curriculum with leprosy, the system should create wider awareness for eradication of leprosy (c. f. Polio).

Myths and reality: A multimedia approach with peer learning by cured cases help motivate the general public to help fight the myths and misconceptions about leprosy.

Capacity building: We have to train and retrain health care providers of all levels with periodic random evaluation by health service research with the political will.

Improved services: Patient-friendly health services, spreading awareness about the advantages of eradicate leprosy not only for the patient but also for the citizen, could be motivating factors, making people aware of recent findings like association of WHO-MDT with a lower risk of relapse.

References

1. *Chavan LB, Patel P (2011). Epidemiology of disability in incident leprosy patients at supervisory urban leprosy unit of Nagpur city. Natl J Community Med, 2(1): 119-122.*

2. *Handog EB, Gabriel MTG, Co CC (2011). Leprosy in the Philippines: a review. Int J Dermat, 50: 573–581.*

3. *Braga FJHN (2012). Nuclear medicine in tropical diseases. Brazilian Arch Biolo Technol, 45: 1-7.*

4. *Briden A (2003). Maguire E. An assessment of knowledge and attitudes towards amongst leprosy/ Hansen's disease workers in Guyana. Lepr Rev, 74:154-162.*

5. *Kar S, Ahmad S, Pal R (2010). Current knowledge attitudes, and practices of healthcare providers about leprosy in Assam, India. J Global Infect Dis 2010; 2: 212-215.*

6. *Leyden N (1994). Leprosy current concepts and treatment. CRC Press, India.*

7. *WHO Leprosy Fact sheet no. 101. Updated January (2014) http://www.who.int/mediacentre/factsheets/fs101/en/, last accessed on January 26, 2015.*

8. *Bisai S, Saha KB, Sharma RK, Muniyandi M, Singh N (2014). An overview of tribal population in India. Tribal Health Bull, 20: 1-126.*

9. *World Health Organization. Global Strategy for Further Reducing the Leprosy Burden and Sustaining Leprosy Control Activities 2006–2010. Regional Office for South-East Asia, New Delhi. Operational Guidelines. 2006. http://www.ilep.org.uk/fileadmin/uploads/Documents/WHO_Publications/opguid1 30706sm.pdf , [accessed on February 19, 2015].*

10. *Central Leprosy Division, Directorate General of Health Services, Nirman Bhawan, New Delhi – 110011, NLEP – Progress Report for the year 2011-12.*

11. *WHO (2009). Enhanced global strategy for further reducing the disease burden due to Leprosy (2011-2015) - Operational guidelines. WHO, SEARO, New Delhi.*

12. *WHO Expert Committee on leprosy (1998). Technical Report series, 874.*

13. *Kar S, Pal R, Bharati DR (2010). Understanding non-compliance with WHO-multidrug therapy among leprosy patients in Assam, India. J Neurosci Rural Pract, 1:9-13.*

14. *Chalise SC (2005). Leprosy disease in Nepal: Knowledge and non-compliance of patients. J Nepal Med Assoc, 44: 39-43.*

15. *Rafferty J (2005). Curing the stigma of leprosy. Lepr Rev, 76: 119–126.*

16. *Scott J (2000). The psychosocial needs of leprosy patients. Lepr Rev, 71:486–491.*

17. *Sathian B, Kumar A, Sreedharan J, Banerjee I, Roy B, Rajesh E (2014). Time trend and prediction of Grade-2 disability among new cases of leprosy in Nepal: A statistical modeling. Nepal J Epidemiol, 4(3): 378-383.*

18. *Britton WJ, Lockwood DN (2004). Leprosy. Lancet, 363:1209–19.*

19. *Meima A, van Veen NH, Richardus JH (2008). Future prevalence of WHO grade-2 impairment in relation to incidence trends in leprosy: an exploration. Trop Med Int Health, 13:241–246.*

20. *Kumar RB, Singhasivanon P, Sherchand JB, Mahaisavariya P, Kaewkungwal J, Peerapakorn S, et al (2004). Gender differences in epidemiological factors associated with treatment completion status of leprosy patients in the most hyperendemic district of Nepal. Southeast Asian J Trop Med Public Health, 35: 334-339.*

21. *Honrado ER, Tallo V, Balis AC, Chan GP, Cho SN (2008). Noncompliance with the World Health Organization-multidrug therapy among leprosy patients in Cebu, Philippines: Its causes and implications on the leprosy control program. Dermatol Clin, 26: 221-229.*

22. *Griffi ths S, Ready N (2001). Defaulting patterns in a provincial leprosy control programme in Northern Mozambique. Lepr Rev, 72: 199-205.*

23. *Naik SS, More PR (1996). The pattern of 'drop-out' of smear-positive cases at an urban leprosy centre. Indian J Lepr, 68: 161-166.*

24. *Cross H, Choudhary R (2005). STEP: an intervention to address the issue of stigma related to leprosy in Southern Nepal. Lepr Rev, 76: 316–324.*

Table 1: Occupational status of Leprosy respondents

Types of Occupation	Leprosy Respondents	
	n	percent
Agriculture	18	17.8
Labour / Welfare	21	20.8
Service	2	2.0
Business	41	40.6
Jobless	15	14.9
Agriculture + Service	4	4.0
Total	**101**	**100**

Table 2: Annual income range among Leprosy respondents

surveyed household

Annual Income Range (Rs.)	Leprosy Respondents household	
	n	percent
Less than 12,000	18	17.8
12,001-20,000	15	14.9
20,001-50,000	14	13.9
50,001-1,00,00	25	24.8
More than 1,00,000	29	28.7
Total	**101**	**100**

Table 3: Knowledge of respondents regarding Leprosy

Variables	Responses	Total Respondents (n=101)
		percent
Transmission of leprosy	Touching	61.4
	Sneezing	5.9
	Food stuff	12.9
	Hereditary	8.9
	Divine	7.9
	Unknown	2.9
Early symptom	Numbness of hand	75.2
	Discolored skin patch	11.9
	Auto-amputation	5.9
	Deformed nasal bridge	2.9
	Early symptom	1.9
	Thickened ear lobes	1.9
Communicable disease	Yes	23.7
	No	76.2
Is leprosy curable?	Yes	88.1
	No	11.9
Leprosy deformed any body parts	Yes	91.1
	No	8.9
Numb skin patch developed	Yes	20.8
	No	79.2
Vertical transmission	Yes	8.9
	No	91.1
Transmission through breast feeding	Yes	5.0
	No	95.0
Knowledge of leprosy before disease	Yes	14.9
	No	85.1

Table 4: Attitude of respondents and community towards Leprosy

Variables	Response	Total Respondents (n=101)	Percent
Leprosy affected social life	Yes	95	94.1
	No	06	5.9
Fired from the job	Yes	55	54.5
	No	46	45.5
Hesitation to talk with the people	Yes	30	29.7
	No	71	70.3
Not to go near to others	Yes	76	75.2
	No	25	24.8
Hesitation to attend social gathering	Yes	88	87.1
	No	13	12.9
Leprosy affected marital life	Yes	91	90.1
	No	10	9.9
Refusal to eat with the patient	Yes	95	94.1
	No	06	5.9
Forced to leave the family	Yes	55	54.5
	No	46	45.5
Satisfaction of the patient with the treatment	Yes	99	98.0
	No	02	2.0
Health education program has improved the knowledge regarding leprosy	Yes	92	91.1
	No	09	8.9

Table 5: Distribution of Leprosy respondents according to age, sex and type of Leprosy

Age (Year)	PB			MB			Total *(%)*
	Male	*Female*	*Total (%)*	*Male*	*Female*	*Total (%)*	
Less than 15	1	2	3 (6.2)	2	1	3 (5.7)	6 (5.9)
16 – 30	9	1	10 (20.8)	4	1	5 (9.4)	15 (14.9)
31 – 45	2	4	6 (12.5)	17	2	19 (35.9)	25 (24.8)
46 – 60	19	7	26 (54.2)	16	4	20 (37.7)	46 (45.5)
> 60	2	1	3 (6.3)	3	3	6 (11.3)	9 (8.9)
Total	**33**	**15**	**48 (47.5)**	**42**	**11**	**53 (52.5)**	**101 (100)**

Table 6: Distribution of Leprosy respondents according to WHO grades of disability

Grade of Disability	Distribution		
	PB (%)	*MB (%)*	*Total (%)*
Grade – 0	33 (68.8)	28 (52.8)	61 (60.4)
Grade – 1	11(22.9)	19 (35.9)	30 (29.7)
Grade – 2	4 (8.3)	6 (11.3)	10 (9.9)
Total	**48 (47.5)**	**53 (52.5)**	**101 (100)**

Table 7: Leprosy respondents according to delay in diagnosis and disability grading

Delay in Diagnosis	Disability Grading		Total *(%)*
	Grade-1 (%)	*Grade-2 (%)*	
Less than or equal to 12 months	21 (70.0)	6 (60.0)	27 (67.5)
More than 12 months	9 (30.0)	4 (40.0)	13 (32.5)
Total	**30 (75.0)**	**10 (25.0)**	**40 (100)**

SDIS-026

A Comparative Study of Academic Achievement of Senior Secondary School Students on the basis of their Brain Hemisphere Dominance

Dr. Jasbir Kaur

Associate Professor Department Of Education, Rungta College Of Science & Technology, Durg

Abstract

In the present study academic achievement of the students of senior secondary school is compared on the basis of their brain hemisphere dominance. The sample of the study consisted of 800 students (N = 800). The brain hemisphere dominance was found out with the help of SOLAT test, which resulted in classifying the students into right brained, left brained and integrated brained. Academic achievement of right brained, left brained and integrated brained students were compared by applying t- test.

Introduction

Educators have been concerned over the years with identifying those factors which facilitate learning and increased academic achievements. Investigations have yielded no simple solution to this problem. Indeed, enhancing learning and achievement seems complex and multifaceted.

The biological understanding of how two hemisphere of our brain function has now reached general consensus.

The present study deals with the comparison of academic achievement of senior secondary schools students on the basis of brain hemisphere dominance.

Many studies have shown that Brain hemisphere dominance plays an important role in the academic performance of college students. The accommodation of students learning styles in the learning environment have resulted in improved test scores while, a mismatch in learning characteristic and learning environment have resulted in poor students achievement (Andrew, 1990; Drum etal, 1995; klaves, 1994)

Ozzettin kok (2007) determined the effects of the language curriculum designed in compliance with the principle of Neurolinguistic programming, and brain dominance on the students academic achievement.

Szirony, G. M. etal (2009) made a preliminary analysis on brain hemisphere dominance and vocational preference. Finding on this added analysis revealed a high correlation between perception of musical ability and right brain hemisphere.

These finding provide information that could be useful for educators in the future. Administrators, college and school teachers could use knowledge of a student hemisphericity to help guide them into carrier and educational path in which they would excel knowledge of a child's hemisphericity helps teacher to better accommodate student need in the classroom.

Objective of the study

To compare the academic achievements of senior secondary school students on the basis of their brain hemisphere dominance. (Right, Left and Integrated)

Significance of the study

The importance of this study lies in the knowledge regarding the difference in the academic achievement of right left and integrated brain hemisphere dominance of senior secondary school students . the result of this study could be helpful to the parents while guiding their spouse regarding choice of subjects as per their brain hemisphericity .

Conceptual and Operational definitions

In the present study academic achievements is often taken as grade point obtained by a student in a particular class.

Hemisphericity is the cerebral dominance of an individual in retaining and processing modes of information in this own style of learning and thinking.

Saba.G (2010) conducted a study to find out the effect of handedness on intelligence level of student. ANOVA showed non significant difference between the intelligence of student at different education levels.

Erin Michelle Oliver (2012) conducted a study to find out associations between problem solving strategies and brain hemisphericity. The finding shows that there exists significant relationship between problems solving strategies and brain hemisphericity.

*Associate Professor, Rungta College of Science & Technology, Durg

Hypothesis

H − Academic achievement of senior secondary students will differ significantly on the basis of their brain hemisphere dominance.

Tools

Independent variable

For measuring brain hemisphericity dominance of selected subjects SOLAT scale by D. Venket Raman (1994) was used.

The reliability coefficient of correlation for the right, left and integrated hemisphere function were found to be 0.89, 0.65 and 0.71 respectively. The validity for the right, left and integrated hemisphere is 0.842, 0.621 and 0.678 respectively.

Dependent Variable

Academic Achievement Questionnaire was constructed by the researcher and the reliability and validity of the test was found to be 0.70 and 0.65 respectively. The study was conducted on a sample of 800 students of class XI drawn from different schools of Durg District.

The SOLAT test and academic achievement test were administered on 800 students of XI standard. The data collected were tabulated approximately and suitable statistical procedure were used for analysis.

To verify the hypothesis i.e. " Academic achievements of senior secondary students will differ significant on the basis of their hemisphere dominance "t" test was used. The obtained result of such statistical analysis is presented in the table given below.

Table

Comparison of academic achievements of students with right left and integrated brain hemisphere dominance.

Group	Mean	S.D.	M.D.	"t"
Right Brain Hemisphere dominance (N = 232)	55.45	8.70	0.21	0.28
Left Brain Hemisphere Dominant (N = 367)	55.66	9.30		
Right Brain hemisphere Dominant (N= 232)	55.45	8.70	5.51	5.21**
Integrated Brain Hemisphere (N = 201)	60.97	12.63		
Left Brain Hemisphere Dominant (N = 367)	55.66	9.30	5.30	5.23**
Integrated Brain Hemisphere (N = 201)	60.97	12.63		

**Significant at 0.01 level

From the analysis of entries reported in the above table, it is evident that the academic achievements of student exhibits dominant right brain hemisphere (M = 55.45) and dominant left brain hemisphere (M = 55.66) did not differ statistically. The reported t = 0.28, was found to be statistically insignificant.

The academic achievements of student with integrated brain hemisphere (M = 60.97) was found to be significant higher as compared to students with dominant right brain hemisphere (M = 55.45). the reported t = 5.21, confirm this finding that the difference between these two group is statistically significant at .01 level.

The academic achievement of student with integrated brain hemisphere (M = 60.97) was found to be significantly higher as compared to academic achievement of students with dominant left brain hemisphere (M = 55.66). The reported t = 5.23, confirm this finding that the difference between these two groups is significant (statistically) at .01 level.

From the analysis of data, it can be inferred that academic achievement of student with integrated hemisphere is significantly better than the student with dominant left and right brain students with dominant left and right brain hemisphere but no significant difference was observed in academic achievement of students with dominant right and left brain hemisphere. To view of this findings differential hypothesis is partial accepted.

On the basis of the above mentioned findings, it can be concluded that brain hemisphericity plays a big part in academic achievement of students so by identifying the brain hemisphere dominance the academic achievement of individual could be improved while conducting this piece of research, the researcher feels that similar study can be conducted in the light of socio economic status

Educational implication

The results of the present study will be helpful for educators to evaluate academic achievement of secondary school student in the light of their brain hemisphere dominance.

REFERENCES

1. *Andrew R.H.(1990). The development of a learning styles program in low socioeconomic, underachieving north carolina elementary school. Journal of reading, writing and learning disabilities International,, 6, 307-314*
2. *.Dunn, R. Debella, T., etal (1995) learning style researches define difference differently. Educational leadership, 38(5), 372 – 375,*

3. *Erin Michelle Oliver (2012); Relationship between problem solving strategies and brain hemisphericity in high school students. Texas state university ecommon@texas state university, Honors Degree Thesis,*

4. *ozzettin kok (2007). Learning styles and academic performance of criminology students in English. Unpublished Master's Thesis, Baguiocity,*

5. *Saba, G (2010); effect of Handedness on Intelligence level of students. Journal of the Indian Academy of applied Psychology, vol.35, No. 1, 85 – 91,*

6. *szivony, G.M. etal (2009) Brain hemisphere dominance and vocational preference. A preliminary analysis. Work: A journal of Prevention, Assessment and Rehabilitation, volume 29, Number 4/2007.*

SDIS-027

Effect of Social – Economic Status and Domestic Violence on Academic Achievement

Mrs. Rita Gupta

Vice Principal – Rungta College of Science & Technology, Durg

Abstract

In the present study total 100 students including boys and girls studying in class IX of various private schools in Raipur were taken as the sample for the present study and for knowing the relationship between SES and Domestic Violence and Their effect on Academic Achievement. To measure the Domestic Violence Socio-Economic status and Academic achievement Questionnaire with significant reliability and Validity was used.

Introduction

Every individual acquires or gains optimum result of his or her desired things by hard work, attention and capability. But it is affected by many factors in many factors in many times. It is evident in the study of relationship between Socio-Economic status and domestic violence and their effect on academic achievement differ from one another in different field. Nisanth & Dr. kumar (2012) worked together on, "Traces of Domestic Violence: perspectives of School Going children in India" Most the time investigators felt the children's were sealed to reveal their bitter experiences of domestic violence. Tiwari & Prasad studied on the topic, "Children's Vulnerability to Domestic violence". The study concluded that the student belonging to Lower middle class family in a sub urban of Mumbai had studied up to STDIX. Parents were educated upto middle school level. The study indicates that the domestic violence as a hindrance in over all development of the Children Farooq, Choudry, Shafiq & Berhana (2011) conducted a survey on " Factors Affecting Students" Quality of Academic Performance. A case of secondary school level. It wass found that girls perform better than the male students.

Koenig, stephensen, Ahmed, Jejeebhoy, and Coumphell (2005) conducted an individual research work on the topic "Individual and contextual Determinants of Domestic violence

in north India" children with higher socioeconomic status was found to be protective against physical but not sexual violence.

Thus, we can say that socio-economic circumstances may influence student's risk of domestic violence in complex and contradictory ways. And the domestic violence is increasingly being recognized not only as a serious public health concern.

Vice Principal – Rungta College of Science & Technology, Durg

Objective of the study

To study the effect of Socio-Economic and violence on academic achievements.

Objectives

1. To study the relationship between Socio-Economic status and Domestic Violence.
2. To study the effect of different level of socio-economic status of academic achievements.
3. To study the effect of Domestic violence on academic achievement.
4. To study the effect of socio-economic status and Domestic violence on academic achievement.

Hypothesis.

H_1 There exists no significant co-relation between SES and ACA. Achieve in student of different school in Raipur.

H_2 There exists no significant co-relation between Domestic Violence and Academic Achievements in the student of different school in Raipur.

H_3, There exists no significant difference between Academic Achievement of high SES and low SES in the students in the students of different school in Raipur.

H_4, there exists no significant difference in Academic Achievement of High Domestic violence in the students of different school in Raipur.

Hypothesis

In the present study, the statement of the problem is

Academic Achievement mean: The secured Scores by the student is considered as their academic achievement.

Domestic Violence

"Pattern of abusive behavior in many relationship that is used by one partner to gain or maintain power and control over another intimate partner"

- US Officer

Socio-Economic Status

In terms of people's access to material and social resources as well as their ability to participate in society (ABS, 2006).

- Australian Bureau of Statistics

Variables

1. Dependent variable – In the present study, academic achievement is taken as dependent variable.
2. Independent variable – Socio-Economic status and Domestic Violence are taken as independent variable.

Tools

A. **Socio-economic Questionnaire –**
The tools used for the present study are socio-economic status developed by Rajbir Singh, Radhey Shyam and Soutish kumar.
Self-made questionnaire on domestic violence was constructed with high reliability and validity.
Analysis and Interpretation

Table – 1

No significant co-relation between SES & Academic Achievement in student of different schools in Raipur.

Variable	No. of students	Mean	S.D.	r
SES	100	104.78	13.3	0.08 NS
AA	100	62.1	11.3	

Here, df (degree of freedom) = 98, Probability level > 0.05, NS = Not significant

Table 1 shows that the 'r' value came out to be not significant at 0.05 level with df 98, shows that there is no significant correlation between SES and AA. Because the Mean and SD value (104.78 & 13.3) of SES and mean & S.D. value. (62.1) & 11.3

Of AA provides the 'r' value (0.08) with no significant result.

Table – 2

Significant correlation between Domestic violence and Academic Achievement in Students of different schools I Raipur

Variable	No. of students	Mean	S.D.	r
Domestic variable	100	15.63	6.3	0.735 S
Academic Achievements	100	62.1	11.3	

Here, df (degree of freedom) = 98, P (Probability level) < 0.05, S = Significant.

Table no. 2 shows that the 'r' value came out to be significant at 0.05 level with df = 98, show that there is significant correlation between domestic Violence and

Academic reveals the value of 'f' (-0.73) which indicates tha the Domestic Violence of the Student Certainly effects their Academic achievements.

Table – 3

No significant difference between Academic achievement of High SES and Low SES in the students of different schools in Raipur.

Variable	No. of students	Mean	S.D.	t
LOW SES	100	68.1	12.87	0.09 NS
HIGH SES	100	56.1	9.73	

Here, df (degree of freedom) = 98, P (Probability level) > 0.05, NS = Not significant

Table 3 shows that the 't' value came out to be much significant as there lies no difference between Academic Achievement of High SES and Low SES in different schools students. Because the mean and SD value (68.12 & 12.87) of low SES reveals the t value, which indicates the Academic Achievement of High SES and low SES is of no Significant difference

Table – 4

Variable	No. of students	Mean	S.D.	t
High Domestic Violence	100	50.3	7.8	0.17 NS
Low Domestic Violence	100	73.9	14.8	

Here, df (degree of freedom) = 99, P (Probability level) > 0.05, NS = not Significant

Table 4 shows that there is no significant difference in Academic Achievement of High Domestic Violence and low Domestic Violence because the mean & SD value (50.3 & 7.8) of High Domestic Violence and the mean and SD value (73.9 & 14.8) of low Domestic Violence provides the 't' value (0.17) with no effective difference from the above findings we can conclude that domestic violence effects the academic career of a students, so it should be restricted or washed from the society.

Educational Implication

In the present study the discussed issue are Domestic Violence and SES and their impact on the Academic Achievement of students. These are all somehow the issues of society and has an impact on social being, especially on the students regarding their academic development. Therefore the study has a great educational implication.

References

1. *Farooq, Chaudhary, Shafiq & Berhonu. "Factors Affecting student ts quality of Academic performance. A case of Secondary School level" http//:www.sc.hec.gov.pk/aphds/submit.asp?supid=4546(2011)*

2. *Nishant, P.M. kumar, Dr. AG. "Traces of domestic Violence perspective of school Going Children in India" International Journal of Social science and Inter disciplinary research .vol. 1 Issue 10, ISSN – 2277 3630 (October2012)*

3. *Koenig, Stephenson, Ahmed, jebeebhoy & Campell "Individual and Contextual Determinants of Domestic violence in North India". American Journal of Public Health, vol. 96 No. 1 (Jan, 2006) 132-138*

SDIS-028

Whither Modernity? Musings on an Alternative Paradigm for Skill Development

Dr. T. J. Abraham

Dept. of English Studies, Central University of Tamil Nadu, Thiruvarur, 610101,
Phone: 9495694176 email: tjabraham2000@yahoo.com

Abstract

The paper, primarily through a historical retrospection attempts to locate the skill or knowledge development initiative in the contemporary era and proceeds to identify a few of its implications. Such a historical perspective, by and large, focuses on the views of Immanuel Kant and Michel Foucault, both of whom have been essentially concerned about how the nature of skill and learning development impacts human life. The two centuries that separate their essays with almost uniform title, not to speak of a host of essays with the same title during the period, have only added greater urgency to the issue. While Kant exudes confidence and hails the Enlightenment project, Foucault is skeptical or even alerts one to the damaging historical effect of the pursuit of knowledge on human life. Foucault, through his genealogical and archeological analysis, demonstrates how our knowledge production has led to the sacrifice of human subject. Notably, Foucault's sense of disappointment, far from being an isolated sentiment has come to define the mood of the discreet academic community globally. In this context, how far the failure of western modernity could be a lesson to be learned for the rest of the world, including India, needs to be explored. The question whether India has been better or worse off, having remained somewhat insulated from western modernity, gains greater significance in the age of postmodernity. Even as skill development can by no means, be by passed, one needs to seriously address its nature and its cost. Could we think of an India- specific, if hybridized, paradigm of skill development model?

Introduction

No worthy deliberation on Skill development and higher education can be done independent of   the aims one sets for higher education either in the form of an ultimate purpose or an immediate one. The ultimate purpose of all skill development higher education may be viewed under two parameters, namely,

i) Human (and nonhuman) happiness and welfare.

ii) Sustainability.

A viable initiative will necessarily have to address these two issues, even as the perspectives regarding what makes for happiness and what does not, may differ substantially.

Besides, any meaningful programme that is chalked will have to be based on lessons that we have learned from history. Borges, following Cervantes, calls "History, the mother of truth!"(41), and then goes on to define "history not as *delving into* reality but as the very *fount* of reality" (41). Evidently, one has to assign, like Borges does, prime role to history in the production of truth and knowledge. Accordingly, this paper attempts a discussion on skill development in the broad context of history as the fount of reality in which the two essays on the Enlightenment by Immanuel Kant and Michel Foucault may be read for their bearing on the present.

Evidently, the Western world so dominated the world at large on a variety of facets of life during the modern era that there arose a widely shared, if erroneous,view that the West has come up with a viable and enduring model of skill acquisition in higher education. However,even a cursory analysis of history would convince us that this is far from true.

For instance, there is a general agreement that the present Western template of skill development through higher education had its onset with the Renaissance which was followed up by the Age of Enlightenment. One would not be wide of the mark if one says that Renaissance was by and large a passage from a God-centred universe to that of a man-centred one. The Renaissance humanism reverberated and resonated in the Western academies to such an extent that a general sense came to prevail that man is the measure of everything. That is, the worth of everything would hinge on its effects on the human person. This anthropocentric position had far reaching consequences. And it raised many questions.

Close on the heels of Renaissance was the Age of Enlightenment, which in general, came to view human being yet again as the triumphant hero of history. Significantly, the debate

regarding the truth of the Enlightenment has caught the imagination of a host of thinkers in the last three centuries. The debate on the thematic of Enlightenment engages with the fundamental questions of human history, truth and knowledge. Among others, the thought of two thinkers seems to bear rather heavily on the development and knowledge. Famously, Immanuel Kant published an essay entitled "An answer to the Question: What is Enlightenment?" in November 1784 in the Berlin Monthly (*Berliner Monatschrift*), against an open invitation to respond to the question about the definition of Enlightenment. The two centuries that followed witnessed a profusion, and of considerable vigour, of debate on the same theme. The second half of the 20th century saw in particular the fierce polarization of the thinkers on the basis of their take on the Enlightenment project. Theoreticians like Adorno, Horkheimer, Heidegger, Bataille and particularly Derrida and Foucault were inclined to the view that the Enlightenment project has been more or less a failure. On the other hand, Habermas and a host of the votaries of the liberal humanist persuasion, if with certain reservation, seem to have abiding faith in the Enlightenment.

Kant begins the essay with a definition: "Enlightenment is man's emergence from his self-incurred immaturity. Immaturity is the inability to use one's own understanding without the guidance of another. . . .The motto of Enlightenment is therefore: *sapere aude*! Have courage to use your own understanding". The heady cocktail born out of a sense of omnipotence of reason and its alleged ability to establish mastery over nature generated a widespread sense of euphoria. In popular imagination, the new scientific temper seemed to set things right for the world. There really were perceptible changes for good. Science and technology, travel and exploration, astronomy, industrial revolution, plant taxonomy, political organization, new human and social sciences and so on swept man off his feet. To imagine that we have had conquest over nature was really heady stuff. Even there was a confidence that science would see humanity go on improving and would finally establish an earthly paradise for everyone.

However, the sense of euphoria did not last long. The high expectations about a glorious era that propelled human history from the Renaissance through the Age of Enlightenment gave way to pessimism and disillusionment. Obviously, humanity came to witness a host

of phenomena that unsettled all sensitive intellectuals. These discountenanced all the hopes of a heaven on earth for everyone. The rise of Nazism and fascism, the two world wars, the inequality in the distribution of wealth between the developed and underdeveloped nations, the Great Depression, Colonialism and imperialism coupled with nationalist chauvinism, cold war, poverty amidst plenty, ecological degradation and so on are but a few things that signalled that humanity was heading towards something other than paradise on earth. It powerfully drove home the sense that humanity hardly grew from barbarity and that it was inferior to even animals with regard to their deportment to their fellow creatures. The grand illusory world of civilization stood debunked.   So much so that education, progress, refinement, and so on suddenly became mere hollow words.

 It is against this backdrop that one should read Foucault's essay "What is Enlightenment?" (1984) published exactly 200 hundred years after Kant's essay. That Foucault returned to the theme of Enlightenment repeatedly in the last phase of his life, that he repeats Kant's own title and that Kant's view of Enlightenment functions as a leitmotif in Foucault's own essay only underscores the extent to which Kant's essay underpins Foucault's. Foucault begins his essay with the observation that Kant's essay introduces a crucial question of modernity involving the very ontology of ourselves. The issue gathers urgency and significance as the Enlightenment has determined at least in part, what we are, what we think and what we do today.   Above all, "What is Enlightenment" is a question that the modern philosophy is struggling to address: "modern philosophy is the one which attempts to answer the question posed two centuries ago so imprudently . . . . "

Foucault refers to four areas of difficulty with Kant's essay. Kant views the Enlightenment as one that "can be achieved only if the relations between the will, authority and the use of reason are fundamentally modified; it is both a process which is under way and a duty of the individual requiring personal initiative; it is unclear whether the Enlightenment affects the social and political existence of all humanity of the human being; and since it is not only an obligation on the individual, it raises the problem of how the private use of reason can take public and political forms."

Now, the question "What is Enlightenment" being synonymous with 'what is modern philosophy?', Foucault addresses modernity. Modernity, for Kant and Baudelaire, as it is for Foucault, is an attitude: " a mode of relation to contemporary reality; a voluntary choice made by certain people; finally a way of thinking and feeling, also a way of acting and behaving, which at the same time marks a relation of belonging and presents itself as a task."

Foucault's definition of modernity and Enlightenment does not involve a "fidelity to elements of doctrine", but rather "a permanent reactivation of an attitude, that is, of a philosophical ethos which could be characterised as the permanent critique of our historical being". Besides, this work involves a scrupulous analysis of us as historically determined beings, and we should be ever on the lookout for the contingencies presenting themselves as apparent necessities. The work also entails our attempts directed to test and cross boundaries, to explore and extend possibilities of being free and being human.

Rather than seeking to establish the universal basis and conditions of knowledge and ethics, Foucault proposes to analyse the historical constitution of discourses in which we articulate what we think and do. The point of departure from the Kantian essay is that while the Kantian approach tried to identify the limits which knowledge could not cross, Foucault argues that we should constantly devise ways of transgressing the frontiers imposed on us. Besides, one feels that there is a possibility, even a confident hope of 'transcendence' in the Kantian system, which is absent in Foucault. Significantly, Foucault describes his critique as genealogical in its aims and archaeological in its method. This, understood even in its minimal level, is a reminder of one's inevitable historical rootedness as well as the huge implications emanating from it. Foucault's deviation from Kant is implied in his slight misquotation of Kant's motto of Enlightenment *sapere aude*. Foucault reverses the order of this, quoting it as *aude sapere*, perhaps, thereby stressing the daring and transgressing involved in 'Dare to be wise', rather than the wisdom achieved through such daring.

Yet another point of departure in Foucault's essay is to point out that Kant's essay commits the error of mistaking culture-specific elements for a priori valid truth claims or

'contemporary limits of the necessary' for limits intrinsic to our very constitution and thinking and willing subjects. Therefore, obviously for Foucault, our inquiry into the history of thought is not to "be oriented retrospectively toward the 'essential kernel of rationality' that can be found in enlightenment and that would have to be preserved in any event'. On the other hand, such an approach "will be oriented toward 'the contemporary limits of the necessary' that is toward what is not or is no longer indispensible for the constitution of ourselves as autonomous subjects".

Foucault's view sounds remarkably similar to Kant's own as expressed in his famous three-fold question: "What can I know?", "What should I will?", and "What may I reasonably hope for?". The crucial point of departure, as has been pointed out above, is that Foucault treats them in genealogical fashion—as belonging to a certain historically delimited configuration of knowledge, discourse or will-to-truth. That is to say, he rejects any version of the all too familiar universalist premise that would hold such views to be more than contingent and cultural artifice.

Hence, the Enlightenment project is viewed not so much as a "theory, a doctrine or . . . a permanent body of knowledge that is accumulating" but rather "an ethos, a philosophical life in which the critique of what we are is at one and the same time the historical analysis of the limits that are imposed on us and an experiment of the possibility of going beyond them".

In his essay, Foucault proposes to continue the project of Enlightenment. Describing it as an ethos and not a doctrine, helps him locate his work as figuring in the space opened by Kant's essay, albeit with different solutions. Finally, just like Kant, Foucault holds that Enlightenment has not been completed and he doubts whether it would ever be complete. "I don't know if we will ever become mature . . . and that we are not yet mature".

 The essay discussed above hardly takes kindly to the present western skill development or knowledge programme. It detects some fundamental malaise inherent in the centuries-long Enlightenment programme and by extension, all skill development initiatives. However, even as one despairs of any educational initiatives that can escape the critique Foucault is making, it becomes an emphatic, and a representative, confession of its

failure. An alternative historical paradigm is what one may explore. And the bottom line is that any meaningful deliberation on skill development would become more self-conscious, with the acute awareness of its purpose, the cost involved as well as the possible outcome. Certain directions are unequivocally clear, that is, one needs to rethink on excessive and exclusive humanist and rationalist bias. Probably thinking in the lines of an Eastern model pioneered by India is in order.

The main stream Western academies talk of the failure of the Enlightenment Project. This sense of failure was by and large a matter of deflating the hopes based exclusively on human reason. Thus the widely shared sense of disillusionment had to do with the dawning of an awareness of the limitation of human reason. The nonhuman realm gradually came to be looked upon as fit for consumption and exploitation alone. Naturally, the realization, rather belatedly yet appropriately, regarding the need for reining in of the human arrogance began to be felt. That one cannot deny intrinsic worth of everything nonhuman, that one cannot afford to have so much investment on human caprice, and that being tyrannical towards the nonhuman is at one's own peril, have been lessons that humanity has learned the hard way. Accordingly, the Western academies now talk of inclusive growth, cultural pluralism, ecological awareness, sustainable growth and so on.

True, India, by and large, remained insulated from the horrors that the West was exposed to in the first half of the 20th century. Evidently, modernity, if by and large imported from the West, struck roots in India at a slower pace. Scientific exploration was in its incipient stage and was limited to isolated pockets then. Consequently, India did not see the huge momentum in scientific advancement that characterised the West.

One wonders whether the stakeholders would take kindly to the description of the present Indian education scenario as a blind or even poor imitation of the West which is destined to end up by inheriting its perils, shorn of its merits even. One is in need of an educational system that emerges from the soil catering to the local contingencies, redolent of the autochthonous conditions as opposed to an imported one.Hence, broadly, the need of the

hour is to develop an India specific model that is so inclusive that it would make the scientific rationality gel with our own cultural specificity.

One should, instead of being blind imitators, chart a composite and sustainable methodology attuned to India specific needs. And inclusivity is part of Indian inheritance. For instance, the Indian mainstream thought has been one that put unqualified stress on inclusivity with a human –nonhuman identification. The great *Mahavakayas* like *Aham Brahma Asmi*, (I am Brahman), *Tat Tvam Asi* (You are that [Brahman]), regardless of their numerous interpretations, are oriented towards such inclusion, ecological harmony and sustainability. We cannot go back to the past. Indeed, we should not. Instead, in the absence of a panacea for all the ills plaguing the world, we should together explore ways to make education relevant to everyone.Needless to say, that this India specific Higher Education should bear the stamp of global relevance. For, insularity, in the global village that the world is now, is neither desirable nor possible. The twin axes of India specificity and global applicability, therefore, should form the fulcrum for higher education in futuristic India.

While this may be the broad policy orientation for higher education in India, one has to seriously engage with the issues related to the actual execution of the policy.

Evidently, the topic of the Seminar, "Emerging Skill Development Trends in Sciences" assumes utmost significance in the context of the rather abysmally low ranking that has been slapped on Indian educational institutions vis-a-vis their global peers. That even our premier institutes figure nowhere near the frontrunners in the world academic realm is food for our serious thought. The fact that Indian universities are hardly in the reckoning for the ultimate Nobel laureateship unnerves us. The matter, obviously, demands urgent attention and calls for solution to be initiated on a war footing.

All our efforts, consequently, need to be streamlined with a singleness of purpose towards excellence within the broad framework suggested above.

The immediate target of our Higher Education, then, would be the following:

  i. the production of human resource par excellence,

ii. continuous innovation in technological efficiency, and

iii. achievement of optimum organizational economy.

Above all, the focal point of our efforts would be to benchmark research whose quality and rigour would, at the end of the day, distinguish men from boys. A discipline specific apex body to oversee and assess the quality of research output at the universities would go a long way in raising the quality to the desired level. The Indian Higher Education sector seems to be oblivious of the world of difference that separates an amateur from a virtuoso.

 Above all,a world class curriculum underpinned by the state of the art infrastructure too is of fundamental importance to achieve the virtuosity towards which everyone aspires. In this context, the laudable efforts initiated at the national level for multiple accreditations, apart from NAAC may be noteworthy. Indeed, multiple rating agencies with varied domain specific parameters would be of considerable value in identifying the lacunae in the system and to initiate remedial measures. Probably we will do well with more of such agencies. Needless to say, the external agency rating should be adequately supplemented by self evaluation through the use of rigorous performance indicators and benchmarking. Besides, statistical information gathered through surveys of students, employers, and professional bodies would form indices of quality. No one believes quality to be an accident. It can only emerge out of the conjoint effort of all the stakeholders and the resultant synergy in higher education everywhere. For, at the end of the day, as the adage goes, "From the fruits, you shall know them".

Finally, all these initiatives should be simultaneously culture specific and must be oriented to meet the future needs of humanity at large. The historical rootedness of such efforts here, as always, has an element of inevitability about them, and in the final analysis this would define us as individuals. If such a definition of oneself is informed by a sense of transgressing the limits imposed by one's present history, one can, given the unenviable human predicament, hardly ask for more.

References

Borges, Jorge Luis. *Fictions*. Trans. Andrew Hurley. London: Penguin, 2000.

Foucault, Michel. *The Foucault Reader*. Ed.Paul Rabinow. London: Penguin, 1991.

Gay, Peter. *The Enlightenment: A Comprehensive Anthology*. New York: Simon and Schuster, 1973.

.

SDIS-029

Women Empowerment and skill development through developing Entrepreneurial skills

Dr. Aruna Pillay
Christ College , Jagdalpur, District Bastar, C.G., India

Abstract

Women empowerment enables autonomy and control over their lives. The empowered women become agents of their own development, able to exercise choices to set their own agenda and be strong enough to challenge their subordinate position in the society. To be a woman – a wife, a mother, and individual in India means many things. It means that you are the storehouse of tradition and culture and in contrast a volcano of seething energy, of strength and power.

Women Entrepreneurs may be defined as the women or a group of women who initiate, organize

and operate a business enterprise. Government of India has defined women entrepreneurs as an enterprise that can motivate a whole generations to change its values, its aspirations, its very concept of civilized life." In current scenario due to modernization, urbanization, globalization and upliftment of educational facilities, with increasing awareness women are now seeking gainful employment in several fields. Women are entering into Entrepreneurship even while facing socio-cultural, economic, technical, financial and managerial difficulties.

Women entrepreneurship movement can gain momentum by providing encouragement, appropriate, awareness, training, environment and support. This paper elaborates women empowerment, skills enhancement through entrepreneurship opportunities, broadly women entrepreneurship in Indian context.

Key words: Skills enhancement, women empowerment, Entrepreneurship, Empowered, Upliftment, Challenges.

Introduction

Empowerment Women are an integral part of every economy. All round development and harmonious growth of a nation would be possible only when women are considered as equal partners in progress with men. However, in most developing countries, women have a low socio and economic status. In such countries effective empowerment of women is essential to harness the women labour in the main stream of economic development. 3 Empowerment is the process of enabling or authorizing an individual to think, behave, take action and central work in an autonomous way. It is the process by which one can gain control over one's destiny and the circumstances of their lives. Empowerment can be viewed as means of creating a social environment in which one can make decisions and make choices either individually or collectively for social transformation. Women empowerment enables autonomy and control over their lives. The empowered women become agents of their own development, able to exercise choices to set their own agenda and be strong enough to challenge their subordinate position in the society. Although women constitute half of world's population yet they are the largest group which is excluded from the benefits of social and economic development. Women constitute a strong labour force which needs to be mobilized and encouraged to make an effective contribution to the development process. In India, the work participation rate for women is less than half that of men. Despite efforts made towards economic empowerment of women, majority of the active female population continue to be confined to micro, small scale enterprises and the informal sector. n the simplest of words it is basically the creation of an environment where women can make independent decisions on their personal development as well as shine as equals in society.

Women want to be treated as equals so much so that if a woman rises to the top of her field it should be a commonplace occurrence that draws nothing more than a raised eyebrow at the gender. This can only happen if there is a channelized route for the empowerment of women.

Thus it is no real surprise that women empowerment in India is a hotly discussed topic with no real solution looming in the horizon except to doubly redouble our efforts and continue to target the sources of all the violence and ill-will towards women.

Objectives of Study

The objectives of study are as follows.

1) To study the role of skills enhancement for women entrepreneurship and empowerment.

2) To study the present status of women empowerment in India

3) To analyze the new challengesfor women entrepreneurs in India.

4) To find out the factors motivating women for Entrepreneurship.

5) To study the women empowerment in India.

Methodology of Study

The research is major based on secondary data. During Research an extensive

secondary data from various sources as mentioned in references have been taken. The research drafting and analysis is based on the outcome of various researchers whose research has been considered as a spring board for preparing the present research work.

Value of women empowerment in skill development

The aim of skill development, particularly in case of women, is not merely to prepare them for jobs, but also to improve the performance of women workers by enhancing the quality of work in which they are engaged.

Empowering women and girls is not only right thing to do. It is also smart economics and vital to

ending poverty and boosting shared prosperity-the World Banks Groups twin corporate goals. Evidence shows that resources in the hands of women boast household spending in areas that benefit children. The World Banks group has made strong commitments on genders. Gender equality is also a key priority for IDA. According to World Bank gender equality can be achieved by Educating girls increasing literacy rate among women. •Increasing early childhood development interventions.

Increasing women's labour force participation and strengthening labour policies affecting women.

- Improving women's access to credit, land and other resources.
- Promoting women's political right and participation.

- Expanding reproductive health program and family support policies.

- The Government has also been making efforts for creating a congenial work environment for women. For this purpose, a separate 'cell for women labour' has been set up in the Ministry to focus attention on the condition of working women and bring about an improvement therein. The cell has the following function:-

- Formulation and coordination of policies and programmes for the female labour force within the framework of national manpower and economic policies.

- Maintaining liaison with other Government agencies to secure effective implementation of the

- programmes in respect of women workers.

- Monitoring the implementation of the Equal Remuneration Act, 1976.

- Setting up of an Advisory Committee under the Equal Remuneration Act, 1976.

- Giving grant in aid to Non-Governmental Organization/Voluntary Organization to formulate and execute action oriented projects for women workers.

Moreover, a number of protective provisions have been incorporated in the various laws enacte.

Challenges for Women In India

There are several challenges that are currently plaguing the issues of women's rights in India. A few of these challenges are presented below. While a lot of these are redundant and quite basic issues faced across the country, these are contributory causes to the overarching status of women in India. Targeting these issues will directly benefit the empowerment of women in India.

1) **Education**

   While the country has grown from leaps and bounds since its independence where education is concerned, the gap between women and men is severe. While 82.14% of adult men are educated, only 65.46% of adult women are known to be literate in India. Not only is an illiterate women at the mercy of her husband or father, she also does not know that this is not the way of life for women across the world. Additionally, the norms of culture that state that the man of the family is the be-all and end-all of family decisions is slowly spoiling the society of the country.

2) **Poverty in the Country**

About a third of the country's population lives on less than 1.25USD per day. The GINI index keeps rising slowly over the years, indicating that the inequality in the distribution of wealth in the country is increasing, currently hovering a little close to 33.9.

Poverty is considered the greatest threat to peace in the world, and eradication of poverty should be a national goal as important as the eradication of illiteracy. Due to abject poverty, women are exploited as domestic helps and wives whose incomes are usurped by the man of the house. Additionally, sex slaves are a direct outcome of poverty, as unearthed by Davinder Kumar:-

Andhra Pradesh accounts for nearly half of all sex trafficking cases in India, the majority involving adolescent girls. According to police estimates, a shocking 300,000 women and girls have been trafficked for exploitative sex work from Andhra Pradesh; of these just 3,000 have been rescued so far.

The state is relatively prosperous, ranking fourth in terms of per capita GDP in India, but it is also home to some of the poorest people in the country.

If poverty were not a concern, then the girl child will be able to follow her dreams without concerns of sexual exploitation, domestic abuse and no education or work.

3) **Health & Safety**

The health and safety concerns of women are paramount for the wellbeing of a country, and is an important factor in gauging the empowerment of women in a country. However there are alarming concerns where maternal healthcare is concerned.

In its 2009 report, UNICEF came up with shocking figures on the status of new mothers in India. The maternal mortality report of India stands at 301 per 1000, with as many as 78,000 women in India dying of childbirth complications in that year. Today, due to the burgeoning population of the country, that number is sure to have multiplied considerably. The main causes of maternal mortality are:-

- Haemorrhage: 30%

- Anaemia: 19%

- Sepsis: 16%

- Obstructed Labour: 10%

- Abortion: 8%

- Toxaemia: 8%

While there are several programmes that have been set into motion by the Government and several NGOs in the country, there is still a wide gap that exists between those under protection and those not.

Poverty and illiteracy add to these complications with local quacks giving ineffective and downright harmful remedies to problems that women have. The empowerment of women begins with a guarantee of their health and safety.

Women Entrepreneurship in India

The educated women do not want to limit their lives in the four walls of the house. They demand

equal respect from their partners. However, Indian women have to go a long way to achieve equal rights and position because traditions are deep rooted in Indian society. India being a male-dominated society, very few women is in the large entrepreneurial field. They constitute only 10% of the total. To help women entrepreneurs, government has taken many steps and various program of training and incentives have beenstarted to develop entrepreneurial ability. Women in India constitute 48per cent of the total population. But their participation in economic activities is only 38 per cent. The development of women as entrepreneurs will generate multifaceted socio-economic benefit to the country.

In India, women comprise about 30 percent of corporate senior management positions, which is notably higher than the global average (24 percent). But in the overall workforce, India is one of the worst countries in the world — 113th out of 135 — when it comes to the gender gap. And women entrepreneurs constitute only 10 percent of the total number of entrepreneurs in the country. We believe that women entrepreneurs have an

edge over male entrepreneurs. Edges matter to investors. And the numbers back this up outside India. I believe that this is also true in India.

One of the most obvious reasons to invest in women leaders in India is that women control the vast majority of household spending. So unless you are a business that is focussed mostly on men, women are more likely to better understand customer perspective. Another is that women are often better at building long-term relationships than men. Lasting relationships benefit a business tremendously, as only so much can be achieved without trus with employees, customers, suppliers, shareholders, government, etc.

Qualities of women entrepreneurs in India

1. Management and control

A woman or a group of women manages the whole business of enterprise. She prepares various plans and executes them under her own supervision and control. There may be some persons to help her but ultimate control lies with the woman.

2. Employment to Women

A woman entrepreneur must provide at least 51 percent of the employment generated in her enterprise to women.

3. Risk-taking

Risk means uncertainty. It is the condition of not knowing the outcome of an activity. A woman entrepreneur takes calculated risk.

She faces uncertainty confidently and assumes risk. She has to tie up capital and wait for good returns. A woman entrepreneur likes to take realistic risks because she wants to be a successful entrepreneur.

4. Good organizer

The most critical skill required for industrial development is the ability of building a sound organization. A woman entrepreneur assembles, co-ordinates, organizes and

manages the other factors namely land, labor and capital. She obtains factors of production from the society and supplies them finished product.

5. Self confidence

It is essential to be a self confident for a woman entrepreneur. She should have faith in herself and in her abilities. She should have the confidence to implement the change and overcome any resistance to change. A woman entrepreneur should have courage to own the mistakes and correct them.

6. Decision–maker

The main function of a woman entrepreneur is to make decision. She takes various decisions regarding the activities of her enterprise. She decides about the type of business to be done and the way of doing it. A woman entrepreneur must be clear and creative in decision making process.

7. Visionary

A woman entrepreneur is one who incubates new ideas, starts her enterprise with these ideas and provides added value to society based on their independent initiative.

8. Hard worker

A distinguishing feature of a woman entrepreneur is the willingness to work hard. She has to follow the principle, "Hard-work is the key to success".

9. Achievement oriented

A woman entrepreneur is an achievement oriented lady, not money hungry. She works for challenge, accomplishment and service to others. Achievement orientation is a derive to overcome challenges, to advance and to grow.

10. Optimistic

A woman entrepreneur must be optimistic. She should approach her venture with a hope of success and attitude for success rather than with a fear of failure. The positive thinking of woman entrepreneur can turn the situation favorable to her.

11. Technically competent

The success of an enterprise largely depends upon the ability of woman entrepreneur to cope with latest technology. Technical competency refers to the ability to devise and use the better ways of producing and marketing goods and services.

12. Bold and brave

Women entrepreneurs face the adversities boldly and bravery. She has faith in herself and attempts to solve the problems even under great pressure.

13. Mentally sound

A woman entrepreneur is energetic, single-minded, having a mission and a clear vision. She should be a lady of creative thinking and analytical thinking. She must be intelligent, adaptable and problem solver.

14. Leadership

Leadership quality is one of the most important characteristic of a woman entrepreneur. It is the process of influencing and supporting others to work enthusiastically towards achieving objectives.

Problems undertaken by Women Entrepreneurs

Innovation nurtures entrepreneurship its give opportunity to explore new idea for commercialization and growth which brings empowerment through skills development. This paper explores the women empowerment by virtue of skills enhancement through entrepreneurship.

Following are some of the basic problems a highlighted by various research studies undertaken by women entrepreneurs is:

- Lack of information
- Lack of family support
- No motivating factor.
- Lack of traning
- Lack of financial support.
- Lack of innovative ideas

- Gender Inequality
- Lack of Micro Financing Scheme
- Lack of Skill Development
- Lack of Entrepreneurship/Business Skills
- Lack of Marketing Facilities
- Lack of Networking and Trust Building
- Non-Conducive Working Environment

Here research intended to study the role of skills development via entrepreneurship which finally results in empowering women so as to become a successful entrepreneur.

Measures to Motivate women Entrepreneurs in India

- Eradication of traditional beliefs like change in traditional benefits
- Family support
- Improve the conditions for women's entrepreneurship
- Encourage entrepreneurship through the educational system:
- Teach entrepreneurship to women:
- Foster Marketing confidence among women:
- Foster entrepreneurial networks
- Disseminate financial information to women:
- Encourage financial intermediaries to take a leading role:
- Take women's needs into account in program design:
- Improve women's asset position:
- Promote micro- and equity finance:
- Disseminate information on international trade opportunities:
- Fostering public/private partnerships to globalize women-owned enterprises:
- Engender SME statistics:
- Standardize SME research methodologies:

Conclusion

Empowerment of women is necessary for socio –economic development. Literacy place a vital role in women empowerment. Increasing literacy rate among women helps in better development of both women and children. Women should be given the opportunities so that women can excel themselves. Gender equality has to be established in our country for a faster empowerment of women. Corporate and Private sectors should provide a ample opportunities to women and working with women should be a core objective of their business.

Empowerment of women has considerable hurdles; In spite of them women empowerment in

India took a stagnant shape. The women trait plays a major role on overcoming various kinds of obstacles in their empowerment. The encouragement of women entrepreneurship has been carried out on various levels as well as from various from platforms. Moreover the positive change in traditional mentality of so called Indian society has been observed. The little skill enhancement efforts as well as moral boosting attitude of family hikes the performance of women by miles. The skills enhancement through encouraging entrepreneurship results in empowerment of women which is prime need of our Nation.

To sum up women empowerment cannot be possible unless women come with and help to self empower themselves. There is a need to formulate reducing feminized poverty, promoting education of women, and prevention and elimination of violence against women.

References

(1) Dhruba hazarika- International journal of Educational Planning & Administration., Vol 1, Number 3 (2011), pp. 199-202

(2) Prof. Probal Gupta –Tactful Management Research Journal, ISSN: 2319-7943, Impact factor: 2.1632(UIF)

(3) Prof. Neelima Prashant Warke and Dr. Parag A. Narkhede, Tactful Management Research Journal, ISSN: 2319-7943, Impact factor: 2.1632(UIF)

(4) Rajendra N (2003), "Problems and prospects of women entrepreneurs", SEDME, Vol.30, No.4, December, P.40.

(5) Sharma Sheetal (2006), "Educated Women, Empowered Women", Yojana, Vol. 50, No.12, P.52.No.3, September, 2006, P.9.

(6) Dharmeja S.K. (2002), "Women Entrepreneurs: Opportunities, Performance, Problems", Deep Publications (P) Ltd., New Delhi, India

(7) Biswas (1999), "Measuring Women's empowerment some methodological issues", Asia-Pacific Journal of Rural Development Vol. 9, No.2, P.63-71.

(8) The research paper in Indian Management Studies journal on "Recent trends and Implications of Women.

(9) www.womenempowermentinindia.com

(10) www.yourarticlelibrary.com

(11) Dr. R. Vijaya Anuradha and Dr. G. Lokanandha Reddy- conflicts journal of education vol. I, Issue 2.July 2013, ISSN NO. 2320-9305.

SDIS-031

Leadership Skills for Global Understanding

Dr.Rosamma Jacob

Christ College, Jagdalpur, District Bastar, C.G., India

Introduction

Globalleadership effectiveness has been amajor issue in literature of world business, socialissues, human resource management and development, just to name a few (Caligiuri& Tarique, 2012; Rockstuhl, Seiler, Ang, Dyne & Annen, 2011; Harteis, 2012). How to perform global leadership efficiently in the increasingly tough global market is vital to international business and workforce management. Leadership is a key component of all organizations but its function and capacity are getting more complicated with increased involvement in globalization and technology development (Punnett, 2004). Technological advances extend the possibility of global economy which has changed the way people do business and communicate. Cross-cultural managers must look at the world change as a challenge and an opportunity for organizational growth and individual development. In addition,to cope with the changes, international business educators and facilitators need to respond swiftly to the impacts of demographics, technology, and globalization in order to offer specific job skill development on global leadership, work ethic, and continuous learning (Aggarwa, 2011). As the demand of knowledge-based enterprises rises, it is both employees' and managers' responsibilities to enhance the success of workplace learning and workforce development (Harteis, 2012). Global leaders need to build their interpersonal skills to deal with racial conflicts that have occurred and to develop individuals and groups in the workplace (Byrd, 2007).

A successful international leader must know what leadership is expected and execute it accordingly (Ulrich & Smallwood, 2012). Individuals with different cultural backgrounds may vary in their conception and expectations of leadership. Due to the largely Western and individualistic perspective on leadership, the extent to which Western leadership theories apply globally is being questioned. Japanese leadership practice, for example, is different from the West by its cultural traditions and business practices (Takahashi, Ishikawa & Kanai, 2012). To create a leadership that lasts over time, global leaders must show expected competence in cross-cultural awareness and practice. It is important they understand the significance of leadership and leadership expectations, and to develop and

sustain effective leadership strategies for long-term change (Ulrich & Smallwood, 2012). Effective global leadership is a key to unlock the mystery of working with diverse employees and bring the organizational development and change to the next level

Background of the study

As imparting education has become a kind of business the quality and value of education has diminished in the field of education. At present the development in science and technology has knitted the world as a small ball. Apart from that education is still remaining as cramming of some readymade dozes of knowledge instead of drawing out the innate capacities ,talents and inherent powers of a child .Besides that every state and country is emphasizing significance to its own culture by keeping away the culture of other countries. Therefore, today education fails to bring aliround levelopment in a student consequently the child is unable to acquire qualities of a good leader with a global mindset.

Methodology of the study

The researcher has done a deep study on various review related literature of the same topic conducted by different researchers . And also the researcher has prepared a questionnaire and collected data by having an open discussion with various people who are directly associated to educational institutions and some leaders working in different fields.

Objectives of the study

(a) To identify essential leadership skills for success as a global leader in this rapidly changing world.

(b) To find out whether there is any difference among the male and female leaders in acquiring skills of global leadership.

(c) To study whether there is any difference among the male and female leaders in the challenges for global leadership.

Qualities Required for a Global Leadership

1. Inquisitiveness

The best global leaders are open to new experiences. In their everyday life, they are generally curious about anything new. In becoming familiar with culture in other countries, they are able to suspend criticism/opinion.

According to J. Stewart Black, former director of INSEAD in Singapore, "When in a new country, high-potential global leaders seek out new experiences. They want to try the local food, not the internationalized cuisine at some five-star hotel. They pick up the local newspaper; they talk to local residents."

Don't be fooled into thinking that an overseas assignment automatically makes a person "global."

In fact, sometimes they were critical and/or joked about it. They socialized with other Americans and complained about local "inconveniences" like not being able to buy their favorite brand of cereal. People with this mindset may have several overseas assignments, but it is doubtful they ever become global leaders unless they somehow change their mindset.

2. Dealing with multiple perspectives and ambiguity

A global leader has to manage multiple viewpoints and perspectives from various countries. They must be flexible, responsive to true differences in problem-solving among countries, have the ability to learn from mistakes and the ability to balance shorter and longer term objectives.

3. Frame-shifting

This is the ability to shift leadership style depending on the country/culture.

Example: A consultative style that draws upon the input of others may be OK when operating in Italy. But that style would not be appropriate in Korea where employees are used to very hierarchical relationships and expect management to provide all the answers.

4. Adapt and add value

There is a time to teach employees overseas as well as learn from them, a time to make decisions, and a time to listen. Getting the right balance is very important.

Global leaders who adapt too much to the local environment are unlikely to accomplish their goals. But those who are overly quick or eager to teach (to add value) may find others turned off. The leader will likely come across as an "ugly" American that knows everything and thinks the U.S. way is the only way.

5. Multiple business models

Business models are different from country to country —and certainly different from those used in the U.S. A global leader must understand the requirements in each country for customized marketing, branding, products/services and selling techniques.

American companies have had success domestically in focusing on operational efficiency and business processes. This doesn't work in many other countries. In the developing ones, for example, a more entrepreneurial approach is required. The focus is on breaking into a market, learning a new business model and developing a presence/branding. Developing operational efficiency and processes are put on the back burner.

With 50 percent of revenues in U.S. multinationals coming from overseas, it becomes critical to have leaders who understand the strategic markets of the future. Tomorrow's successful companies will be those that are already grooming managers to be global leaders.

Essential Skills for Leadership

The global market has created needs for international corporations. Globalleadership effectiveness has been a major issue in literature of world business, educational field, social issues, human resource management and development, just to name a few (Caligiuri& Tarique, 2012; Rockstuhl, Seiler, Ang, Dyne & Annen, 2011; Harteis, 2012). How to perform global leadership efficiently in the increasingly tough global market is vitalto international business and workforce management.Leadership is a key component of all organizations but its function and capacity are getting more complicated with increased involvement in globalization and technology development (Punnett, 2004). Technological advances extend the possibility of global economy which has changed the

way people do business and communicate. Cross-cultural managers must look at the world change as a challenge and an opportunity for organizational growth and individual development. In addition,

to cope with the changes, international business educators and facilitators need to respond swiftly to the impacts of demographics, technology, and globalization in order to offer specific job skill development on global leadership, work ethic, and continuous learning (Aggarwa, 2011). As the demand of knowledge-based enterprises rises, it is both employees' and managers' responsibilities to enhance the success of workplace learning and workforce development (Harteis, 2012). Global leaders need to build their interpersonal skills to deal with racial conflicts that have occurred and to develop individuals and groups in the workplace (Byrd, 2007).

A successful international leader must know what leadership is expected and execute it accordingly (Ulrich & Smallwood, 2012). Individuals with different cultural backgrounds may vary in their conception and expectations of leadership. Due to the largely Western and individualistic perspective on leadership, the extent to which Western leadership theories apply globally is being questioned. Japanese leadership practice, for example, is different from the West by its cultural traditions and business practices (Takahashi, Ishikawa & Kanai, 2012). To create a leadership that lasts over time, global leaders must show expected competence in cross-cultural awareness and practice. It is important they understand the significance of leadership and leadership expectations, and to develop and sustain effective leadership strategies for long-term change (Ulrich & Smallwood, 2012). Effective global leadership is a key to unlock the mystery of working with diverse employees and bring the organizational development and change to the next level.

Blended Organizational Culture

More managerial and professional positions are occupied by females, and more diverse cultural groups, lifestyles, ages, and abilities are seen in the workplace (Carr-Ruffino, 2005). A wide range of people brings different challenges and advantages in terms of ideas, creativities, styles, and innovations into the workplace. In such blended organizational culture, any racism, sexism, or ageism can easily cause organizational loss

of innovative potential and failure in global market (Parvis, 2003). Organizational culture affects business success (Khana & Afzalb, 2011). To enhance organizational competitiveness and performance, core organizational values (e.g.,performance excellence, innovation, social responsibility, worker involvement, and quality of work life) should be emphasized (Khana & Afzalb, 2011). Effective global leaders must increase their capabilities to manage the complexity of diverse people,

understand and respect differences, make necessary adjustment in the leadership, and be ready for opportunities and challenges that come alone. As the leaders are the most influential key to organizational performance, it is crucial for human resource development professionals to support leaders to resolve racially diverse issues through leadership development (Byrd, 2007).

Gender Differences

Until recently, women were continually underrepresented in higher level positions (Harris & Leberman, 2012). Genders are two different species in terms of genetics, psychology, and work-related management (Morosini, 2005). Females tend to hear what and how it is being said and exhibit greater levels of interest in interpersonal relations; in contrast, males tend to hear only what has been said and display greater levels of aggression (Morosini, 2005). Men are traditionally expected to be an aggressive and tough leader while women are stereotyped as emotional and insecure followers with the need of protection. Women tend to have different qualities in their working styles, and such differences can contribute to preferable behavior, thought and leadership; however, gender bias has interfered in obtaining their leadership positions (Ely, Ibarra & Kolb, 2011; Vinnicombe & Singh, 2003). To solve this problem, developing a women-only leadership program has been proposed and used to assist women leaders toward senior leadership roles. For example, a national New Zealand Women in Leadership Program has operated for five years, and the program has been a success on individual and organizational levels to increase participants' self-confidence, networking skill, and opportunity for job promotion (Harris & Leberman, 2012). As the number of working women continually increases, understanding gender stereotype can assist multicultural

leaders to build positive relationships and avoid biased management decisions (Carr-Ruffino, 2005).

Cultural Diversity

One significant variable that should be considered in leadership is cultural context (Gutierrez, Spencer & Zhu, 2012). Work ethics, behaviors, communication styles, and management-labor relationships are different from country to country. Leadership competence is conceptualized differently in different countries (Kowske & Anthony, 2007). In high context countries (e.g., Japan, China, and South Korea), employees tend to prefer indirect messages and rely heavily on nonverbal codes;however, employees from low context countries (e.g., Germany and Great Britain) tend to communicate directly and construct more information in messages (Hackman & Johnson, 2004). Since cooperative relationships are often observed in Asia countries, most of the Asians tend to feel individual praising will influence group harmony, and the manager should praise the entire group rather than one specific group member (Lussier, 2005). In accordance with different cultural expectations, different cultural groups have different expectations of leadership, and this can affect the behaviors of employees and managers. It is critical that employees are aware of their leaders' appreciation for individual cultural differences without personal bias (Nguyen & Umemoto, 2009). By doing so, the leaders can better fulfill their responsibilities of creating a multi-cultural workplace and a strategic foresight of organizational innovation.

Develop Self-Awareness

Identify self-strengths and -weakness. Global leaders need to conduct a selfawareness test or assessment to identify self-strengths and -weaknesses (Dubrin,2004). It is important for the leaders to understand their individual reactions to situations and approaches to decision-making. Knowing self-limitations (i.e.,

strengths and weaknesses) and behavioral patterns can help the leaders perform more effectively in cross-cultural settings (Frost & Walker, 2007). Being able to overcome stereotypes and capitalize on one's advantages are keys to global leadership practice. To further benefit from identifying self-limitations, leaders may use results to structure a

unique and personalized leadership style. For example, female leaders might use empathy and collaboration as their leadership traits since they tend to work best in a cooperative relationship that brings great voices into the workplace and consequently increases the team work quality and performance outcome.

Appreciate individual differences.

Global leaders face a tremendously complex, multicultural world which requires appreciation of individual uniqueness

(Holt & Seki, 2012). Each individual has particular behaviors that are shaped by cultural background, life experiences, and values. To better understand cross-cultural issues, international leaders should learn each employee's demographics and appreciate the diversely valuable inputs they bring into the workplace (Parvis, 2003).

Understand Cultural Stereotypes

Avoid stereotyping and personal biases.

Global leaders need to understand local culture, stand in the employees' shoes, and be open minded to differences (Frost& Walker, 2007). Understanding cultural stereotyping helps leaders over comepersonal bias and value others in a diverse workplace. Personal biases against foreigners or people who are different from oneself can cause failures in finding qualified employees and building employees' trust, as well as their commitment and productivity (Dubrin, 2004). It is important for leaders to be objective in leadership practice without making assumptions. Leaders also need to lead by example to let employees believe ethical behaviors (e.g. respecting the difference of others and avoiding personal bias) are seriously emphasized in the organization (Roy, 2012). Through cultural awareness and sensitivity, organizations can then have a better chance of success in global competition and adequate return on investments (Okoro,2012). Lead people with respect. A key for employees to achieve their full potential is to treat them with respect (Choan, 2003). Respecting every individual is a key principle of effective leadership that incorporates other aspects of morality. People have different expectations of how they like to be treated based on their cultural backgrounds and values. By respecting individual

character traits and unique attributes, global leaders can avoid cultural stereotypes and unleash the full potential of workers in a diverse workplace.

a) Increase Self-Assurance

Understand competitors. A true leader must cultivate his or her capability and self-assurance to assist employees build confidence and enthusiasm (Weiss, 2004). To increase leaders' self-assurance, one can begin with understanding the competitors. Studying competitors' culture, business strategy, organization performance, etc. can enhance leaders' competitiveness in the global market and increase organizational outcomes. It is also important for leaders to extend the knowledge of international business and strengthen technical skills in management and leadership practice.

b) Stay one step ahead of the game and be enthusiastic to challenges

Effective global leaders need to be results-oriented,achievement driven and forward thinking (Gutierrez, Spencer, & Zhu, 2012). They must have the ability to quickly respond to problems and make proper decisions from divergent aspects (Rausch, Halfhill, Sherman & Washbush, 2001). They also need to be able to identify opportunities swiftly and be capableofturningchallenges into opportunities. Most importantly, global leadership is about initiative,trustworthiness, integrity,andenthusiasmofperformance (Flaum, 2002).

c) Look at Future Challenges

An outstanding cross-cultural leader thinks globally and leads locally (Gutierrez, Spencer & Zhu, 2012). Global leaders should not microprint the world market and satisfy what had already been done. It's necessary for the leaders to step back and look at a bigger picture to find out what is currently going on and anticipate future challenges. They must look at the challenges as a lifelong endeavor and an opportunity for organizational and individual growth. From a global perspective to evaluate and predict future challenges, leaders need to look beyond the current situation and think outside of the box by continuous learning and self-development to overcome traditional thinking, using multiple senses when seeking solutions, and staying alert to opportunities (Dubrin, 2004).

Create a Vision and Be Able to Sell It

A vision must be realistic, match with environmental challenges in the future and value the organization, stakeholder, and customers as a whole. To create a vision and bring the organization to the next level, global leaders must have the abilities to recognize and connect global trends with organizational development plans (Lussier,2005). Leaders must be able to create a vision for how to effect positive changes that fit organizational goals and global trends. Most importantly, leaders need to be able to sell their vision to employees by effectively communicating with employees, getting employees' buy-in, and influencing employees to work toward the vision (Cranford & Glover, 2007).

Develop a Global Mindset

It is critical for global leaders to enrich his or her cultural intelligence (Lovvorn & Chen, 2011). By doing so, their international experience can be transformed into a global mindset (Lovvorn & Chen, 2011). A global mindset is one special trait of international leadership which is associated with trust, manager-employee relationship, and organizational commitment (Story & Barbuto, 2011). The development of a global mindset also involves cultural intelligence and global business orientation (Story & Barbuto, 2011). Effective global leaders tend to have mental models that offer valid ways of viewing and handling the complex issues in leadership practice

(Johnson, 2008). Leaders need to be open-minded, thinkglobally and act swiftly to maintain their competitiveness in multicultural organizations and global markets.

Additionally, leaders could also engage transformative learning in leadership development that focuses on not only critically reflecting on individual behaviors and assumptions but also effectively creating means of understanding and acting upon the environment (Johnson, 2008).

Gain and Offer Supports

Gain ongoing support from all levels of the organization.

It is often an issue of gaining ongoing support from subordinates and superiors when the global leaders are enthusiastic to form or interlock changes for organizational development. Leaders must develop a support system – a network tactic for developing

teamwork and leadership successions (Lussier, 2005). Being more visible and accessible to employees can enhance the manager-employee relationship, create a positive organizational climate, and increase overall productivity.

Provide supports to people and organizations.

Global leaders should also learn to offer their support to employees especially during the period of organizational change. Collaboration and exchange of information and creative ideas are encouraged to promote an innovative, open and supportive working environment that is necessary for leadership effectiveness (Dubrin, 2004; Roy, 2012).

Build Effective Communication Skills

Develop verbal communication skills.

Global leaders also need cross-cultural negotiation skills to maintain international competitiveness (Okoro, 2012). They need to be able to ask questions and exchange messages effectively because diverse personalities and characteristics can easily cause misunderstanding and misinterpretations. Words and tone must be used carefully in order to deliver the message accurately while maintaining a good relationship. Thus, global leaders are recommended to receive training in interpersonal relationship and group communication competence (Okoro, 2012).

Develop non verbal communication skills.

Actions speak louder than words. The global managers must be cognizant of their nonverbal language and be aware of acceptable behaviors, as well as restrict behaviors, in different cultures. For example, when a Japanese businessperson gives a gift, it normally means a gift to welcome or for appreciation rather than a bribe; similarly, returning a gift is considered polite

(Lussier, 2005). In some cultures, such as Brazil, kisses and hugs are the norm of greeting while other countries, such as China, nodding heads and smiling or shaking hands are used for greeting. Because of cultural differences, people have various perceptions of personal space, touching, eye contact, etc. Global leaders need to fully understand what these nonverbal behaviors are and the messages they represent.

View each communication as an opportunity to sell a vision and develop a relationship.

Both verbal and nonverbal communication skills are applied in leadership practices. Note that open and honest communications can build a solid connection between the leader and followers, as well as develop respect and trust in the leadership (Mendez-Russell, 2001). Effective communications can construct the leader's credibility and increase employees' commitment and loyalty to the leader and the organization (Choan, 2003). Therefore, every communication opportunity should be treated as an opportunity to sell the leader's vision and to enhance relationship with employees.

Search For and Utilize Available Resources

The current technologically explosive era creates a global village where people work together without geographic and psychological boundaries. The fast-growing technology development not only helps the organization increase its production and profit but also assists leaders enhance efficiency of team work and activities (Dubrin,2004). Abilities to use innovative technology products (e.g., video conferencing,instant messaging, e-mail, etc.) are important technical skills to promote global leaders' interpersonal skills and international leadership practices (Roy, 2012). Inaddition, extant scholarly research provides useful and effective theories, experimental findings, and frameworks such as leadership theories and strategic approaches that can be adopted and utilized to increase the effectiveness of leadership practices in the field (Swanson & Holton, 2009). Leaders could acquire valuable information from literature and adjust their leadership styles or strategies to better fit for the organizational needs and future challenges.

However, because of advanced technology, people do not have as much as faceto-face interactions as formerly. Limited physical contact challenges global leaders to lead and influence those off-workplace employees. To solve technological disadvantages in leadership practices, leaders may overcome the barriers via different leadership approaches and management policies. Moreover, because of increased numbers of multinational companies and increased interdependences of nations, there is no generally accepted theory of cross-culture leadership (Punnett & Shenkar, 2004). Global leaders

must carefully use the available leadership theories or models because what is applicable and successful in one country may not necessarily deliver the same results in another country. It is important to note that most available theories or models of leadership were developed in the West and that may unwittingly insert Western bias into findings and conclusions (Lussier, 2005). Since different countries have different perceptions about leadership, one key of being successful in global leadership practice is to study and get to know the employees,organizations and global trends.

Create Appropriate Motivational Techniques

Effective global leaders need to be able to establish trust, motivate team members, and foster a team spirit (Roy, 2012). Creating appropriate motivational techniques (e.g., reward and recognition) can stimulate employees' performance and increase their feelings of appreciation and belonging (Swanson & Holton, 2009). To use reward as a motivational technique, the reward must be fair, announced, and changed periodically to ensure employees will not lose interest in striving for a reward (Ventrice, 2003). Moreover, global leaders can also motivate employees by promoting multiple cultural backgrounds and values (Frost & Walker, 2007). In other words, showing empathy for others and giving appreciation of different values, as well as beliefs and experiences, can motivate employees and retain the best employees.

Take Social Responsibility Seriously

Today's leadership is expected to promote corporate social responsibility, an important concept in dealing with stakeholders (Smith, 2011; Strand, 2011). Organizations are expected to provide their social concerns of the community and social responsible to various stakeholder groups by consumers (Smith, 2011). Consequently, global leaders have their social responsibilities to create a pleasant workplace which directly affects human well-being.

TABLE 01

Difference among the male and female leaders in acquiring skills of global leadership.

SKILLS	MALE	FEMALE
Social Responsibility	29	21
Innovative Technology	38	12
Motivational Techniques	24	26
Non-Verbal Communication	27	23
Team Spirit	31	19
Knowledge	33	17
Self Awareness	25	25
Ability to predict Future Challenges	36	14

Challenges for Global Leaders

A more flexible relationship between global leaders and their followers is essential in the workplace. Globalization, technologic innovation, demographic changes bring a tremendous transformation into human life and work. For organizations to remain competitive in the global market, a close emotional interdependent link and an ongoing development of trust and loyalty between leaders and followers must be established. A greater manager-employee relationship can significantly influence members' behaviors and increase the degree of their commitment to the leader and the organization (Lussier, 2005). The relationship can be enhanced by spending time together and considering the members' needs, expectations, and values. Global leaders cannot have an outstanding performance without the ability to guide and influence employees to work toward the organizational goals.

Technology plays a significant role in global policies, economics, and culture and shapes the structure of the global system (Fritsch, 2011). Technological advancement has not only saved time and money for a greater organizational profit and a better quality of life but has also created a global village with shared regulation, language, and values. The business and the nature of work are changed by technology (Aggarwa, 2011). It makes distance learning and telework happen. Online learning is a commonly used training strategy, and both web meeting and e-mail are must-have tools for organizational communication. Virtual workforce, virtual organizations, and e-leadership are also

emerging from technology development. Different leading approaches are thus required in the new virtual working environment (Wang, 2011).

However, it also creates problems of distance and disconnection on human relations. As technology has made its progress and impact on global organizations, traditional leadership can no longer fully assist managers to lead the employees who work at different places or nations. International organizations demand the cross-cultural managers using appropriate leadership skills to inspire and influence diverse employees. There is a strong consensus that acquisition of effective leadership skills will bring the organization through global transformation chaos and contribute to a sustainable advantage (Amagoh, 2009; Caligiuri & Tarique, 2012; Ulrich & Smallwood, 2012).

1. Communication Skills
2. Gender differences
3. Cultural Receiveness
4. Emotional insecurity
5. Trust and loyalty
6. Racism
7. Ageism
8. Quicck response to problem

TABLE 02

Difference among the male and female leaders facing challenges for global leadership.

CHALLENGES	MALE	FEMALE
Communication Skills	28	22
Gender Difference	17	33
Cultural Recieveness	22	28
Emotional insecurity	08	42
Trust and Loyalty	26	24
Racism	24	26
Ageism	12	38
Quick Response to Problem	08	42

Educational Implications

 (1) teaching international content across the curriculum and at all levels of learning to expand students' knowledge of other countries and cultures; (2) expanding the training pipeline at every level of education by providing a congenial atmosphere to promote the learning of various foreign languages and (3) national leaders--political leaders as well as the business and philanthropic communities and the media--should educate the public about the importance of improving education in languages other than English in international studies. (4)Student exchange programmes should be encouraged and strengthened at international level.(5)Study tour and inter- cultural competitions should be organized at international level in the field of education.

Conclusion

Leadership in such global environment conditions involves cultural awareness, global mindset, interpersonal skills, and effective manager-employee relationships. Global leaders need to develop leadership skills demanded in a global context. Eleven essential skills for leadership effectiveness in the diverse workplace development were identified in this study for global leaders who intend to (a) cultivate human potential of employees, (b) enhance the overall organizational performance, (c) take social responsibility, and (d) obtain skills in international leadership and cross-cultural human relations. The basic premise is global leaders need to constantly update their leadership knowledge, skills, and abilities for effective leadership performance in diverse workplace development and cross-cultural management, as well as for the competitiveness in the global market. International business management and human resource development communities would be beneficial by continually exploring and empirically investigating the essential leadership skills for global leaders. Future research that compares global leadership strategies across international organizations from various countries will be of great value to global leadership practice. Another avenue for future research involves the use of qualitative methods to examine dynamic cross cultural competencies on virtual working environments, which may further explore the global dimensions of leadership development practices.

References

1. *Aggarwa R. (2011). Developing a global mindset: Integrating demographics, sustainability, technology, and globalization. Journal of Teaching international Business, 22(1), 51-69. doi: 10.1080/08975930.2011.585920*

2. *Amagoh, F. (2009). Leadership development and leadership effectiveness.*

3. *Byrd, M. (2007). Educating and developing leaders of racially diverse organizations.*

4. *Human Resource Development Quarterly, 18(2), 275-279. doi:10.1002/hrdq.1203*

5. *Caligiuri, P., & Tarique, I. (2012). Dynamic cross-cultural competencies and global leadership effectiveness. Journal of World Business, 47(4), 612-622. doi: 10.1016/j.jwb.2012.01.014Carr-Ruffino, N. (2005).*

6. *Making diversity work. Upper Saddle River, NJ: Pearson*

7. *E ducation.Choan, P. S. (2003). Value leadership: The seven principles that drive corporate value in any economic. San Francisco, CA: Jossey-Bass. Cranford, S., & Glover, S. (2007). Challenge match the stakes grow higher for globalleaders. Leadership in Action, 27(3), 9-14. doi:10.1002/lia.1207 Dubrin, A. (2004). Leadership: Researching findings, practice, and skills (4th ed.).Boston, MA: Houghton Mifflin. Ely, R.J., Ibarra, H., & Kolb, D.M. (2011). Taking gender into account: Theory and design for women's leadership development programs. Academy of Management Learning Education, 10(3), 474-493. doi: 10.5465/amle.2010.0046*

8. *Flaum, S. (2002). Six Ps of great leadership. Executive Excellence, 19(8), 3-4. Fritsch, S. (2011). Technology and global affairs. International Studies Perspectives, Online Journal for Workforce Education and Development Volume 6 Issue 1 – Spring 2013*

9. *2012(1), 27-45. doi: 10.1111/j.1528-3585.2010.00417.x Frost, J., & Walker, M. (2007). Leadership culture - cross cultural leadership. Engineering Management, 17(3), 27-29.*

10. *Gutierrez, B., Spencer, S.M., & Zhu, G. (2012). Thinking globally, leading locally:*

11. *International Journal, 19(1), 67-89. doi:10.1108/13527601211195637*

12. *Hackman, M. Z., & Johnson, C. E. (2004). Leadership: A communication perspective*

13. *(4th ed.). Long Grove, IL: Waveland Press.*

14. *Harris, C. A., & Leberman, S. I. (2012). Leadership development for women in New*

15. *Zealand universities: Learning from the New Zealand women in leadership program. Advances in Developing Human Resources, 14(1), 28-44. doi:0.1177/1523422311428747*

16. *Harteis, C. (2012). When workplace learning fails: Individual and organisational*

17. *limitations ? Exemplarily demonstrated by the issue of responsibility in work life.*

18. *International Journal of Human Resources Development and Management, 12(1), 92-107. doi: 10.1504/IJHRDM.2012.044202. Heller, T. (1982). Women and men as leaders: In business, educational and social service organizations. New York, NY: Praeger.*

19. *Holt, K. & Seki, K. (2012). Global leadership: A developmental shift for everyone.*

20. *Industrial and Organizational Psychology, 5(2), 196-215. doi: 10.1111/j.1754-*

21. *9434.2012.01431.x Johnson, H. H. (2008). Mental models and transformative learning: The key to leadership development. Human Resource Development Quarterly, 19(1), 85-89.*

22. *doi: 10.1002/hrdq.1227 Khana, M. A., & Afzalb, H. (2011). High level of education builds up strong relationship between organizational culture and organization performance in Pakistan.*

23. *Lussier, R. N. (2005). Human relations in organization. New York, NY: McGraw-*

24. *Hill Irwin. Lovvorn, A. S. & Chen, J.-S. (2011). Developing a global mindset:*

25. *Mendez-Russell, A. (2001). Understanding leadership for crosscultural*

26. *knowledge management. Journal of Leadership Studies, 2(4), 23-35. doi:10.1002/jls.20078*

27. *York, NY: M.E. Sharpe. part of women's leadership development. E-Leadership in the new ce Vocational Education and Technology, 2(1), 50-59.oi:10.4018/javet.2011010105*

28. *Weiss, W. H. (2004). Effective leadership: What are the requisites. SuperVision, 65(1),14-17*

SDIS-033

Efficient image zooming using cubic spline interpolation

Bushra Upadhyay
Christ college ,Jagdalpur, Dist : Bastar (Chhattisgarh), Pin code:494001 , India

Abstract

Image Zooming is a most important task used in many applications such as digital photography process, medical process, x-rays etc. It is the process of enlarging the image to any factor of magnification only in appearance. While an image zoomed, there are few artifacts that we have to keep in mind. The zoomed image generates some artifacts like that noise, image blur, blocking effects, edge distortion etc.therefore Zoomed image is not exactly same as source image cause of these artifacts. So in this paper, the main focus is on the reduction of this parameter.

Various interpolation schemes are considered in this paper, particularly focusing on function fitting methods because of their inherent abilities to preserve sharp edges. ThroughCubic spline algorithm digital images are zoomed up. The algorithm is based on analyzing the local structure of the image and applying a near optimal and least time-consuming resampling function will preserve edge location and their contrast and resolution. This process is done by segmenting the image dynamically into homogeneous areas, as it is received zooming algorithm which focuses on preserving edges. The algorithm reduces the jagging, blurring problem.

To compare existing algorithms with Cubic spline interpolation algorithm, we have taken real world images and result are compared and we have come to decision that cubic spline interpolation algorithm is better than other interpolation algorithms. The images are compared by Peak Signal to Noise Ratio (PSNR).

Keywords:-Gray scale image, Zooming, cubic spline interpolation

1 Introduction:

A digital image is buildup of elements called pixels. It can be defined as a two dimensional function $f(x, y)$, where x and y are plane co-ordinates. The value of 'f' at any

pair of co-ordinate (*x*, *y*) is called the gray level of the image at that point**.** The processing of digital images is called digital image processing.
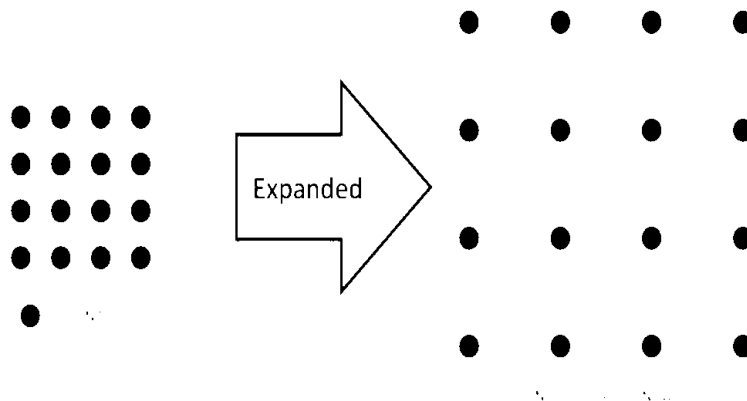
The most common digital image processing tasks include: resizing, zooming and color enhancement. This paper is based on zooming concept of digital images. Image Zooming is changing the number of display pixels per image pixel only in appearance [1]. For zoom level 1, there is one display pixel per image pixel. However for zoom level 2, there are2 display pixels per image pixel in both *x axis* and *y* axis. Through magnification enlargement is usually quantified in terms of number (greater than one).

Interpolation is a method of enlarging the low resolution image to high resolution image. Many image processing application such as facial reconstruction ,multiple description coding and super resolution uses Interpolation .Xin li al proposed a hybrid approach for interpolation using switching between bilinear interpolation local covariance based adaptive interpolation.In this scheme local covariance was first calculated for the low resolution image.These covariance values were then used for interpolating the low resolution images using the property of geometric duality between low resolution covariance and high resolution covariance [2].

The word interpolation originates from the Latin word interpolare ,a contraction of "inter" ,means "between"& polare means "to polish" [3].

2 Backgrounds:-

   The rule in image interpolation is to use a source image as the reference to construct a new interpolated image. Interpolation is a process in which we are creating empty spaces in the source image & filling them with appropriate pixel values[4].

Basic interpolation concept:

Image zooming is a basic function of digital image processing . It is useful in adjusting the size of digital image and also commonly applied to multimedia applications, such as image database, electronic publishing, and medical imaging[5]. The source image to be enlarged is often called the low-resolution image and the enlarged image is called the high-resolution image. We can classify image zooming into two class: fixed image zooming and adaptive image zooming.

some fixed image zooming techniques, nearest neighbor, the bilinear interpolation technique , and the bi-cubic interpolation technique. The pixel copy technique is the simplest technique for image zooming. In the pixel copy technique the unknown pixels in the enlarged image are recovered by its corresponding sampled pixels in the source image. When the scaling factor is high the blocking effect can be easily found in the nearest neighbormethod which is the main drawback of this technique. While using the pixel copy technique the image quality of the enlarged image is poor. Popularly used technique for image zooming is bilinear interpolation technique [6].

This technique is most suitable for smooth areas zooming,the blocking artifact can be found in the edge boundaries of theresultant image when the bilinear interpolation technique is used.

Bicubic interpolation is an extension of spline interpolation for interpolating data points on a two dimensional grid. Bicubicinterpolation works same as bilinear interpolation, except using a cubic function instead of linear function to estimate pixels between known values. This interpolation gives excellentresults, both in processing speed and image quality.

 It is usually the best choice when not too radical downsampling operations are involved in geometrical transformations. Over bilinear interpolation this formof interpolation has advantage and disadvantage. Simple linear fits and also requires a larger neighbor to calculate the curve is cheaper than calculating the cubic polynomial in a specific area of the image is more computationally. The goal of edge preserving zooming techniques is bused for remove/reduce blocking artifacts occurring in image interpolation. In other words, we cannot clear edge boundaries through fixed image zooming techniques but we can preserve more clear edge boundaries through edge preserving zooming technique.

However, the image quality of the enlarged image by using the edge preserving zooming technique is not always better than that of the fixed image zooming technique.

3 Proposed methods:

A Cubic Spline Third Degree Polynomial is given below –

$$(xi) = ai\ (x-xi)\ 3 + (x-xi)\ 2 + ci\ (x-xi) + di (1.1) \quad a_i = \frac{M_{i+1} - M_i}{6h}$$

$$b_i = \frac{M_i}{2}$$

$$c_i = \frac{y_{i+1} - y_i}{h} - \left(\frac{M_{i+1} + 2M_i}{6}\right)h$$

$$d_i = y_i$$

Which lead to the matrix equation?

$$\begin{bmatrix} 1 & 4 & 1 & 0 & \cdots & 0 & 0 & 0 & 0 \\ 0 & 1 & 4 & 1 & \cdots & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 4 & \cdots & 0 & 0 & 0 & 0 \\ & & & \vdots & & & & & \\ 0 & 0 & 0 & 0 & \cdots & 4 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & \cdots & 1 & 4 & 1 & 0 \\ 0 & 0 & 0 & 0 & \cdots & 0 & 1 & 4 & 1 \end{bmatrix} \begin{bmatrix} M_1 \\ M_2 \\ M_3 \\ M_4 \\ \vdots \\ M_{n-3} \\ M_{n-2} \\ M_{n-1} \\ M_n \end{bmatrix} = \frac{6}{h^2} \begin{bmatrix} y_1 - 2y_2 + y_3 \\ y_2 - 2y_3 + y_4 \\ y_3 - 2y_4 + y_5 \\ \vdots \\ y_{n-4} - 2y_{n-3} + y_{n-2} \\ y_{n-3} - 2y_{n-2} + y_{n-1} \\ y_{n-2} - 2y_{n-1} + y_n \end{bmatrix}$$

Where M_1 to be $2M_2$ - M_3 and M_n to be $2M_{n-1} - M_{n-2}$. This causes the curve to degrade to single cubic.

$$\begin{bmatrix} 6 & 0 & 0 & \cdots & 0 & 0 & 0 \\ 1 & 4 & 1 & \cdots & 0 & 0 & 0 \\ 0 & 1 & 4 & \cdots & 0 & 0 & 0 \\ & & & \vdots & & & \\ 0 & 0 & 0 & \cdots & 4 & 1 & 0 \\ 0 & 0 & 0 & \cdots & 1 & 4 & 1 \\ 0 & 0 & 0 & \cdots & 0 & 0 & 6 \end{bmatrix} \begin{bmatrix} M_2 \\ M_3 \\ M_4 \\ \vdots \\ M_{n-3} \\ M_{n-2} \\ M_{n-1} \end{bmatrix} = \frac{6}{h^2} \begin{bmatrix} y_1 - 2y_2 + y_3 \\ y_2 - 2y_3 + y_4 \\ y_3 - 2y_4 + y_5 \\ \vdots \\ y_{n-4} - 2y_{n-3} + y_{n-2} \\ y_{n-3} - 2y_{n-2} + y_{n-1} \\ y_{n-2} - 2y_{n-1} + y_n \end{bmatrix}$$

For cubic spline interpolation method this is final matrix. In this matrix, y_1 to y_n is related to source image coordinates and h is total image matrix size like that if an image has 3*3 sizes then h is 1.

There is another technique calledcubic spline interpolation used for reconstructed image. For curve fitting between the existing points, cubic spline function is used. Cubic spline is widely used to fit a smooth continuous function through discrete data. This function plays important role in image processing and image interpolation. Cubic spline is veryuseful in implementing high quality image zooming. If we joined several point in a common curve then we uses cubic spline because it uses derivatives at each end points.

4 Result

Original image:
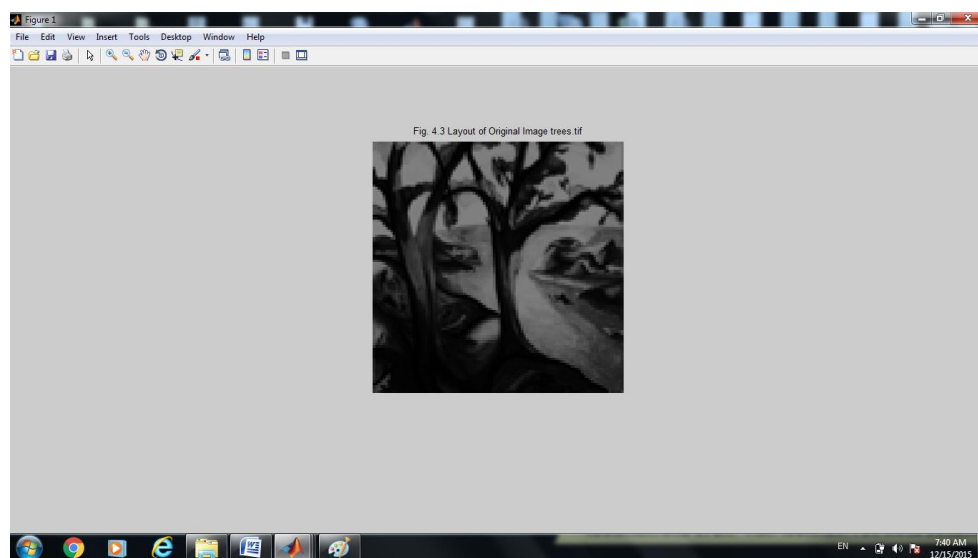
Down sampled Image:
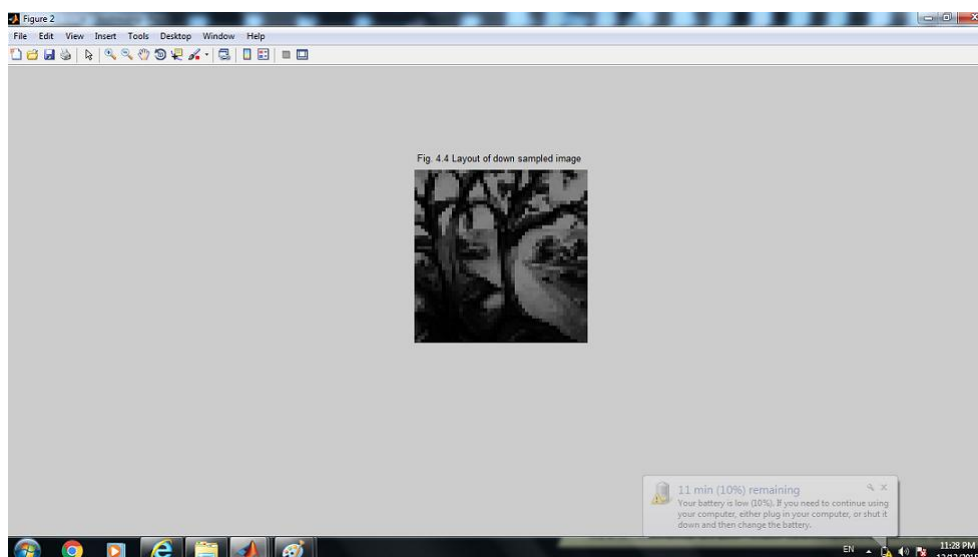
5. ERROR METRICS: -Find Error Metrics(PSNR and MSE) between original and zoomed image.MSE is the expected value of the squared error loss.MSE is the variance of estimator .we can compare the many interpolation algorithm methodThrough MSE and PSNR. Lowervalue of MSE represents higheraccuracy in image [7].

PSNR: - PSNR is the ratio of maximum power of signal and the power of noise signal.PSNR is expressed in terms of decibel(db).

$$PSNR = 20.\log_{10}\left(\frac{MAX_I}{\sqrt{MSE}}\right)$$

The PSNR is calculated by

$$PSNR = 10.log10\ \frac{MAX_I^2}{MSE}(1.2)$$

Where

MSE = mean square error

MAX_I =maximum pixel value= $(2^B$ -1)

B= bits per samples

$$MSE = \frac{1}{mn}\sum_{i=0}^{m-1}\sum_{j=0}^{n-1}[I(i,j) - K(i,j)]^2 \qquad (1.3)$$

K –Zoomed image

I – Original image

m ,n –Coordinate points

The experimental result shown in table 1.

Image	PSNR(DB)
Trees.tif	45.5419

Conclusion

 In this paper, we have improved image zooming algorithm based on Cubic Spline Interpolation technique. The algorithm has been compared with other interpolation technique according to quantitative measurements. to compare existing algorithms with Cubic spline interpolation algorithm, we have taken real world images and result are

compared and we have come to decision that cubic spline interpolation algorithm is better than other interpolation algorithms. We have compared the images by Peak Signal to Noise Ratio (*PSNR).*

REFERENCES:

[1]   R. Jansi, AsnathVictyPhamila, and R. Amutha, "Color Image Interpolation using Optimal Edge Detector", International Journal of Innovation and Applied Studies, ISSN 2028-9324 Vol. 3 No. 3, pp. 813-819, July 2013.

[2]   Xin Li, Michael T. Orchard, "New Edge-Directed Interpolation", IEEE Transactions on Image Processing, VOL. 10, NO. 10, pp. 1521 – 1527, OCTOBER 2001.

[3]   Ahmed N. H. Alnuaimy, Mahamod Ismail, Mohd A. M. Ali and KasmiranJumari, "An Improved Method for Successive Data Schism and Interpolation", WSEAS TRANSACTIONS on MATHEMATICS, ISSN: 1109-2769, Issue 12, Volume 8, December 2009.

[4]   Rukundo Olivier, Cao Hanqiang, "Nearest Neighbor Value Interpolation", IJACSA, Vol. 3, No.4, pp.25-30, 2012.

[5]   Sudhir Sharma, Asst. Prof. Robin Walia, "Zooming Digital Images using Modal Interpolation", International Journal of Application or Innovation in Engineering & Management (IJAIEM), Volume 2, Issue 5, ISSN 2319 – 4847, pp.305-310, May 2013.

[6]   N. Nowrozian , H. Hassanpour , "Image Zooming using Non-linear Partial Differential Equation", IJE TRANSACTIONS, Basics Vol. 27, No. 1,pp.15-28 , January 2014.

[7]   AnkitPrajapati, SapanNaik, Sheetal Mehta, "Evaluation of Different Image Interpolation Algorithms", International Journal of Computer Applications, 0975 – 8887, Volume 58– No.12, November 2012.

SDIS-34

Women empowerment and Skill development Traning
(Empowerment of rural women in the field of entrepreneurship)

Dr. Pallavi Gupta
Christ College, Jagdalpur, District Bastar (C.G.), 494001 India

Abstract

Empowerment of women has emerged as an important issue in recent times. . The major strategies of women empowerment include social empowerment, economic empowerment, political empowerment and gender justice along with demographical justice (rural and urban). Empowering women particularly rural women is a challenge. Women are economically empowered through small scale entrepreneurship programme with the help of Self Help Movement. Economic empowerment of women led to the empowerment of women in several aspects such as socio- economic opportunity, property rights, political representation, social equality, personal rights, family development, and community development and at last the nation development.

The aim of skill development, particularly in case of women, is not merely to prepare them for jobs, but also to improve the performance of women workers by enhancing the quality of work in which they are engaged.

Women are seriously many occupations, thus, policies are needed to fight exclusions in the labour market by reducing the incidence of discriminatory practices. With this background, it is important to ensure women empowerment in the development programmes and thereby strive to have a conducing atmosphere for their effective participation. The strategy for women empowerment programme is addressed through gender sensitization among other sections of the community, capacity building to enhance their efficiency and contribute to economic development and ensure equality and status in the society.

Women are considered an important human resource of the nation and every state should try toutilize them as mediators of economic growth and development. Encouragement for women entrepreneurship is one of the ways for that. Major part of national economic development is contributed by rural economy. Rural women have to be initiated to step

out of home and take responsibilities in the society. Entrepreneurship is considered to be a key for women empowerment especially in rural areas and hence promotion of women entrepreneurs is focused highly by the government. There is a need of continuous attempt to inspire, encourage, motivate and co-operate women entrepreneurs, awareness programs should be conducted on a mass scale with the intention of creating awareness among women about the various areas to conduct business.This paper gives a brief idea about the importance of entrepreneurship for women empowerment and also Steps Taken By Government To Improve Position Of Women Entrepreneurs.Keywords: Economic empowerment, rural women, demographical justice, Women Empowerment, Gender Sensitization, Leadership Skill, Discriminatory Practices.

Introduction

In the simplest of words it is basically the creation of an environment where women can make independent decisions on their personal development as well as shine as equals in society.

Women want to be treated as equals so much so that if a woman rises to the top of her field it should be a commonplace occurrence that draws nothing more than a raised eyebrow at the gender. This can only happen if there is a channelized route for the empowerment of women.

Skill Development: Recognizing The Value of Women Empowerment in Skill Development

Skill and knowledge are the driving forces of economic growth and social development for any
country. Countries with higher and better levels of skills adjust more effectively to the challenges and opportunities of world of work. India has set a target of skilling 500 million people by
2022.The current scenario of women workforce in India; one can observe the huge concentration of female workforce in favour of the informal sector. There are higher number unskilled workers in rural than in urban areas, and more number of women do not have any skills, compared to men with no skills.It has been recognised that the status of

the women and their contribution is not only managing their families, but also Both, women and men, whether urban or rural, are majorly unskilled compared to having some skills. There are higher number of unskilled workers in rural than in urban areas, and more number of women do not have any skills, compared to men with no skills. The table reflects the urgent need that prompted the government to take serious note of this entire situation in training and skill education to the economic and social development of entire society. Women have shown their capacity to play a major role in community development. Hence it is important that women become part of skill development.

The aim of skill development, related to women is not just preparing them for jobs, but also improve the performance of women workers by enhancing the quality of work in which they are engaged.

The empowerment practice has to go beyond its focus on women to gender. The concept of gender will also, encourage an understanding and an analysis of power relation, and enforces the idea of developing capabilities rather than simply skills.

Educating women in India plays a very important role in the overall development of the country. It not only helps in the development of half of the human resources, but in improving the quality of life at home and outside. Educated women not only tend to promote education of their girl children, but also can provide better guidance to all their children.

Skill Development and Women Workers in India:

The 11th five year plan (2007-12) has recognized India´s massive need to skill millions of formal and informal workers in the next ten years. In response, the government developed an ambitious scheme "of increasing the proportion of formal and informal skilled workers in its total workforce from a mere 2% now to 50% by 2022, thus creating a 500 million strong resource pool." Women form a significant proportion of this work force in India, however, they are largely concentrated in the informal sector, engaged in vocations characterized by low earning, low productivity, poor working conditions and lack of social protection. The following table presents the current scenario of women workforce in India, one can clearly observe the huge concentration of female workforce in favor of

the informal sector. Furthermore, Table 2 presents the percentage of skilled women and men in rural and urban areas in terms of marketable skills.

Table 1: Female Workforce in India	Nos. in Millions
Female Workforce in India	148
Female Workforce in Informal Sector	135
Female Workforce in Formal Sector	13

Table 2: Distribution of Persons with Marketable Skills (figures in percentage)				
Skill Status	Rural		Urban	
	Men	Women	Men	Women
No Skill	89.9	93.7	80.4	88.8
Some Skill	10.1	6.3	19.6	11.2
Total	100	100	100	100
SampleSize	183464	172835	109067	99283

Status of Rural Women In India:

Women used to command acute power and importance in our ancient culture. The proof of this fact found in all the scriptures and even our mythological stories. We worship Goddess Durga, Lakshmi, Saraswati and many others. That shows how Indian civilization had revered the female form. Things have not remained the same in last few decades or even centuries. The social fabric has acquired completely new dimensions. The women are considered less powerful and important than men yet situation is not entirely bleak. Thanks to the efforts of government, NGOs, social welfare organizations and many such institutions, there has been a drastic improvement. Many private corporate bodies have also taken a keen interest in improving the economic status of women and the results are extremely encouraging. Pandit Jawaharlal Nehruhad once said, "You can tell the condition of a nation by looking at the status of its women". We completely subscribe to this belief and steps are on its way to further improve the condition of rural women in India.

Steps taken by government to improve position of women entrepreneurs:

Keeping in view the contribution of small business to employment generation ,balanced regional development of the   country, and promotion of exports ,the government of India's policy trust has been on establishing, promoting and developing the small business sector, particularly the rural industries and the cottage and village industries in backward areas. Governments both at the central and state level have been actively participating in promoting self-employment opportunities in rural areas by providing assistance in respect of infrastructure, finance, technology, training, raw materials, and marketing. Following are the support measures and programmes ment for the promotion of small and rural industries:

1.   **NABARD (National bank for agriculture and rural development :**

NABARD was set up in 1982 to promote integrated rural development. Since then , it has been adopting multipurpose strategy for the promotion of rural business enterprises, and rural artisans using credit and non-credit approaches. It offers counseling and consultancy services and organizes training and development programmes for rural entrepreneurs.

2.   **RSBDC (Rural small business development centre):**

It is the first which is set up by the world association for small and medium enterprises and is sponsored by NABARD. It works for the benefit of socially and economically disadvantaged individuals and groups. It aims at providing management and technical support to current and prospective micro and small entrepreneurs in rural areas. Since its inception, RSBDC has organized several programmes, awareness and counseling camps in various villages.

3.   NSIC (National small industries):

This was set up in 1955 with a view to promote, aid and faster the growth of small business units in the country . This focuses on the following fuctions:

•   Supply indigeneous and imported machines on easy hire purchase terms

•   Procure supply and distribute indigeneous and imported raw materials.

•   Export the products of small business units and develop export worthiness.

•   Creating awareness on technological upgradation.

A new scheme of "performance and credit rating " of small businesses is implemented through NSIC with double objectives:

i)   Sensiting the small industries about the need for credit rating

ii)   Encouraging the small business units to maintain good financial track record.

4.   SIDBI (small industries development bank of India):

This has been set up as an apex bank to provide direct /indirect financial assistance under different schemes, to meet credit needs of small business organizations. It coordinates the fuctions of other institutions in similar activities; recommend measures considered nessary for improving the productivity of small enterprises in the informal sector; generate more employment opportunities on a sustainable basis, particularly in the rural areas and enhance the competitiveness of the sector in the emerging global environment.

5.   RWED (Rural and women entrepreneurship development):

The rural and women entrepreneurship development programme aims at promoting a conducive business environment and at building institutional and human capacities that will encourage and support the entrepreneurial initiatives of rural people and women. It also provides the following benefits:

- Creating a business environment that encourages initiatives of rural and women entrepreneurs.

- Providing training manuals for women entrepreneurs and training them.

- Rendering any other advisory services.

6. SFURTI (Scheme of fund for registration of traditional industries):

To make the traditional industries more productive and competitive and to facilitate their sustainable development, the central government set up this fund with Rs. 100 crores allocation to begin within the year 2005. This has to be implemented by the ministry of agro and rural industries in collaboration with state government. The main aim of the scheme are as follows:

- To develop clusters of traditional industries in various parts of the country.

- To build up the innovative and traditional skills, improve technologies and encourage public private partnership,

- To develop market intelligence

- To make the competitive,profitable and sustainable.

- To create employment opportunities in traditional industries.

7. DICs (The district Industries):

The district industries centres programme was launched on may 1st 1978. This is the institution at the district level which provides all the services and support facilities to the entrepreneurs for setting up small and village industries.

Policy Planning For Empowerment of Rural Women

Skills development for rural women and men often requires a combination of training in formal settings (such as schools and training institutions), non-formal settings (such as community groups and NGOs) and informal ones (such as learning from family or peers). It can comprise basic education, vocational training, life sills training, entrepreneurship

training, and agricultural extension services. Policy makers should aim at dsigning and implementing a package of complementary measures to address the specific needs of each category of rural individuals.

1. Develop a gender-responsive strategy for education, training and entrepreneurship development that responds to the needs of rural girls and women.

2. Improved curricula that respond to rural realities, such as combining agricultural training with conventional subjects.

3. Involvement of all parents and communities in planning and managing local education and schooling so they better meet the needs of the boys and girls, their families and their communities.

4. Reduced gender stereotyping in vocational training to improve the classroom environment and particularly to "dismantle" stereotyped profiles of rural women and men that reinforce inequality and inequity in the household and the world of work.

5. Encouragement to girls to study technical subjects, for example, through scholarships.

6. Increase the quality and quantity of gender-responsive vocational education and training institutions in rural areas.

Conclusion

Entrepreneurship among women improves the wealth of the nation in general and of the family in particular. Women today are more willing to take up activities that were once considered the preserve of men, and have proved that they are second to one with respect to contribution to the growth of the economy. Women entrepreneurship must be molded properly with entrepreneurial traits and skills to meet changes in trend, challenges global markets and also be competent enough sustain and strive for excellence in the entrepreneurial arena. What's required is to create devoted team to take up rural entrepreneurship training as per the integrated rural development programme. Rural entrepreneurship is the answer to removal of rural poverty in India.

References

[1]. http://www.preservearticles.com need-for-rural-entrepreneurship.html

[2]. www.enotes.com

[3]. http://www.indianchild.com/women_of_rural_india.htm

[4]. World Bank (2006). "Skill development in India: the vocational education and training system",

SDIS-035

Study of Dye Degradation from Different Basidiomycetes Species

Prof. Chandrahas Sahu & Dr. Shobha Gavri

Seth Phoolchand Agrawal Smriti College, Nawapara (Rajim), Chhattisgarh, India

Introduction

❑ Today the cry of 'pollution' is heard from all the nooks and corners of the globe, and pollution has become a major threat to every existence of mankind on this earth.

❑ Industrial effluents are one of the major causes of pollution especially in causing water pollution.

❑ In a developing country like India, distilleries have become a major source of pollution as 88% of its raw materials are converted into waste and discharged into the water bodies, causing water pollution.

Water Pollution by Dyes -

Dyes are widely used in   –   Textile Industries

Rubber product

Paper & printing Industries

Color photography

Pharmaceuticals

Cosmetics

Food Industries etc.

Mostly Used Dyes in Industries -

Cotton Blue, Methyl Orange, Methyl Violet, Crystal Violet, Amino Black, Reactive Blue 25, Direct Blue 6, Reactive Yellow 81, Red HE4B, Reactive Green 19, Malachite Green.

❑ Out of many contaminants present in wastewater, such as acids, bases, toxic, organic and inorganic dissolves solids and colors, colors are considered the most undesirable and are mainly caused by dyes.

❑ Dyes may significantly affect photosynthetic activity in aquatic life because of reduced light penetration and may also be toxic to some aquatic life due to the presence of aromatics and metals, chlorides etc.

Objectives

❑ Culture collection.

❑ Reviving of pure culture.

❑ Maintenance of culture.

❑ Screening for dye degradation.

❑ Estimation for dye degradation.

Methodology

❑ Culture collection – *Pleurotus florida, Pleurotus sajor-caju, Maitack, Polyporous sp.*1, *Jelly sp., Shizophylum commune, Polyporous sp.*2.

❑ Reviving of pure culture – 1. Potato Dextrose agar,2.Slant preparation

❑ Screening for dye degradation – In Potato Dextrose Agar with dyes:- (Rania M.A. Abedin, 2008)

| 1.PDA Plate with Bromocresol green | 2.PDA Plate with Crystal Violet |

Flow chart of screening technique

⇓

PDA with dyes

⇓

Poured into petri dishes

⇓

Mushroom inoculated in this PDA plates

⇓

Observation taken after few days
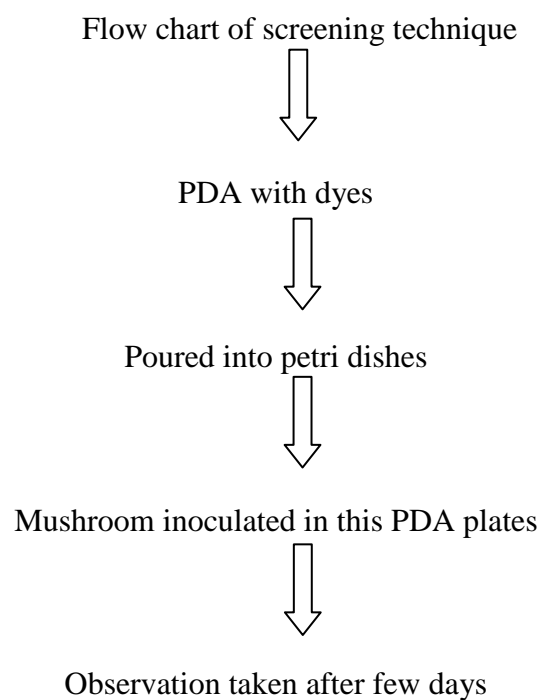
❑ Estimation for dye degradation (Rania M.A. Abedin, 2008) – By Spectrophotometer in Potato Dextrose Broth   with dyes.

| 1. PDB | 2. PDB with   Bromocresol green |

Flow chart of estimation technique

PDB
↓
Divided into different conical flasks

↓   ↓   ↓   ↓   ↓

50 ml   50 ml   50 ml   50 ml   50 ml

(Blank)   (In this added dyes & autoclaved)

↓

One flask used as a control & in all other flasks   mushroom were inoculated.

↓

After 5 & 10 days take reading by using Spectrophotometer.
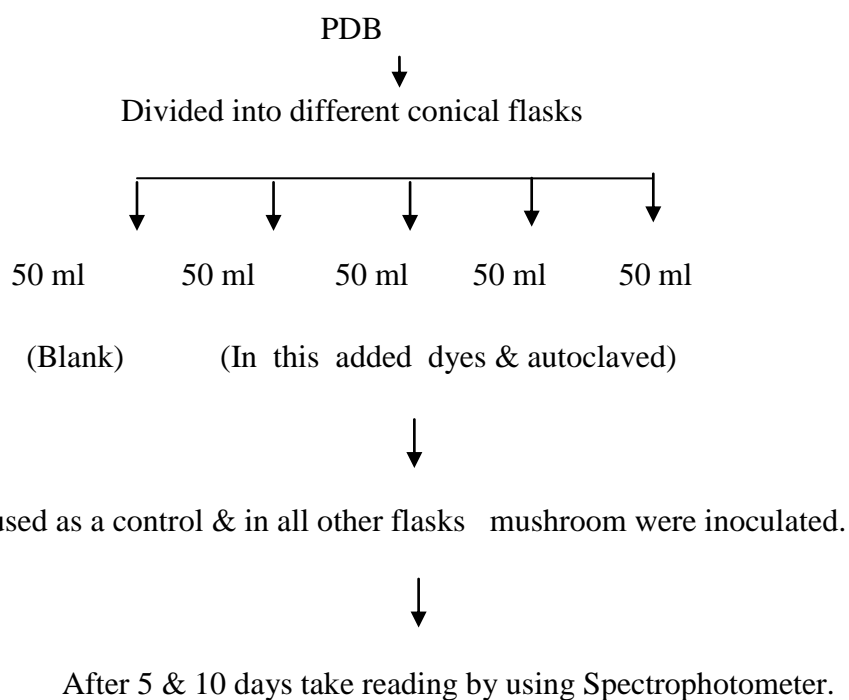
Observations

Screening of Mushroom sp. For Bromocrsol Green dye degradation:

- **After 5 days -**
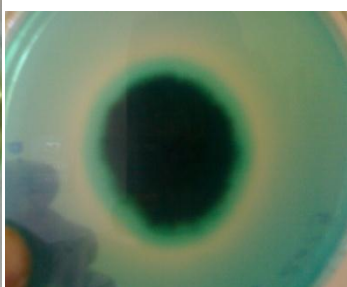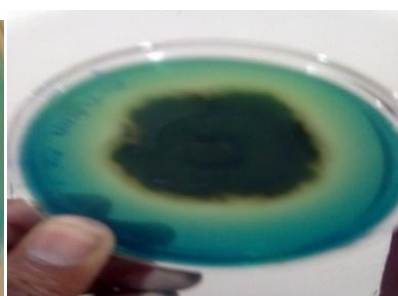
1. *Pleurotus Florida.*   **2.** *Sajor-caju*   **3.** *Polyporous sp.1*

- **After 10 days –**
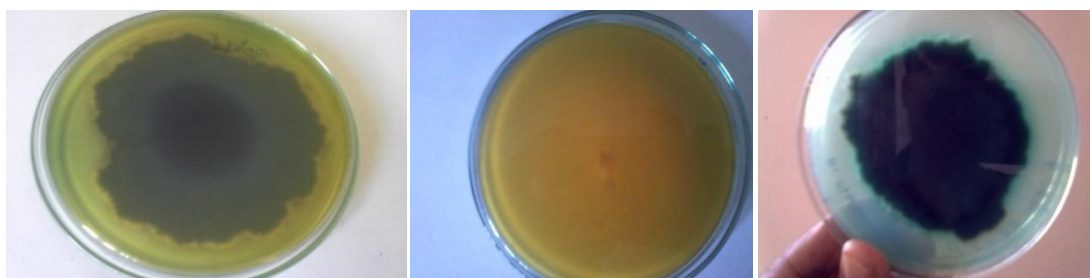
1. *Pleurotus Florida.*   **2.** *Sajor-caju*   **3.** *Polyporous sp.1*

Screening of Mushroom sp. For Crystal violet dye degradation:

- **After 5 days**

1.*Pleurotus sajor-caju*   **2.***Schizophyllum commune*   **3.***Polyporus sp.1*

Result

❑ Percentage degradation of bromocersol Green by Mushroom sp. after 5 days:-

1. *Pleurotus florida*   –   25%

2. *Pleurotus sajor-caju*   –   16%

3. *Polyporous sp.1*   –   15.11%

Pleurotus florida   **_Pleurotus sajor-caju_**   **_Polyporous sp.1_**

After 10 days –

    1. *Pleurotus florida*   –   71.05%

    2. *Pleurotus sajor-caju*   –   *80%*

    3. *Polyporous sp.1*   –   64%

❑ **Percentage degradation of Crystal violet by Mushroom sp.**

After 5 days:

    1. *schizophyllum commune*   –   33.91%

    2. *pleurotus sajor-caju*   –   27.78%

    3. *polyporous sp.1*   –   40%

After 10 days –

    1. *schizophyllum commune*   –   37.36%

    2. *pleurotus sajor-caju*   –   30.79%

    3. *polyporous sp.1*   –   65.58%

Conclusion

Seven species of mushroom isolated were *Pleurotus florida, Pleurotus sajor-caju, Polyporus sp.*1, *Jelly sp., Schizophyllum commune , Polyporus sp.*2, *Mitake*. Seven

species were cultivated in PDA media. In present work we are used two dyes i.e Bromocresol green and crystal violet, all seven species were screen for dye degradation. Degrading ability observed by the plate assay method in Bromocresol green and Crystal violet dye only. Out of seven species only three species *Pleurotus florida, Pleurotus sajor-coju, Polyporus sp.*1 is best for Bromocresol green dye degradation. During incubation period after 5 days percentage of dye degradation recorded by

- each species were *Pleurotus florida*(25%), *Pleurotus sajor-coju*(16%), *Polyporus sp.* 1(15.11%) and after 10 days degradation recorded by each species were 71.04%, 80%, 64% respectively. and for Crystal violet dye only three species *Pleurotus sajor-coju, Schizophyllum commune ,Polyporus sp.*1 is best for Crystal violet dye degradation. after 5 days it give 27.78%,33.91%,40% of degradation and after 10 days same species give 30.79%,37.36%,65.58% of degradation.

Future Aspects

- The elimination of colored effluents in wastewater is based mainly on physical and chemical methods. Although these methods are effective, they suffer from short-comings such as high cost, formation of hazardous by-products and intensive energy requirements.
- But Dye decolorization of industrial effluents has been achieved by degradation using fungi (mushrooms). This is a biological method and biosorption-based process that utilizes the sorption capacity of biological material for the removal of pollutants. Some mushrooms are edible and they do not cause any other pollution. Thats why by using mushroom this biological method is best as compared to physical and chemical method for the elimination of colored effluent in wastewater.

References

1. *B. D. Bhole, Bratati Ganguly, Anusha Madhuram, Deepti Deshpande and Jui Joshi (2004) Biosorption of methyl violet, basic fuchsin and their mixture using dead fungal biomass Current Science, Vol. 86, No. 12.*

2. *Gupta, V.K., Mittal, A., Gajbe, V. (2005a) Adsorption and desorption studies of a water soluble dye, Quilnoline Yellow, using waste materials. J. Colloid Interf. Sci. 284, 89–98.*

3. *Aksu, Z., Tezer, S., 2005. Biosorption of reactive dyes on the green alga Chlorella Vulgaris. Process Biochem. 40, 1347–1361.*

4. *Rania M.A. Abedin, 2008.*

5. *Banat IM, Nigam P, Mc Mullan G, Marchant R, Singh D (1996) Microbial decolorization of textile dye containing effluents.Biores Technol 58: 217-27.*

6. *Verma P, Baldrian P, Nerud F (2003) Decolourization of structurally different synthetic dyes sing cobalt (II)/ascorbic acid/hydrogen peroxide system. Chemosphere 50: 975-979.*

7. *Zhang F, Yediler A, Liang X, Kettrup A (2004) Effects of dye additives on the ozonation process and oxidation by products: a compartive study using hydrolysed CI Reactive red 120. Dyes Pigments 60: I-7.*

SDIS-038

Skill Development through Vocational Education

Dr. Anuradha Shukla
Principal, Shri Ram Shiksha Mahavidyalaya, Thakurtola, Rajnandgaon (C.G.)

Abstract

Education is an act or experience that has a formative effect on the mind, character or physical ability of an individual. The current education system does not focus on training young people in employable skills which will be helpful to them for employment opportunities. Today a large section of India's labor have outdated skills. In all over the world trends in every field are changing so fast that if youth do not adopt latest trends, they will be left far behind from other people. The government is therefore emphasizing on upgrading people's skills by providing vocational education and training to them.Vocational education consists basically of practical courses through which one gains skills and experience directly linked to a carrier in future. Countries with higher and better levels of skills stand more effectively to the challenge and opportunity of globalization. So vocational education has become essential to minimize unemployment.

Key words – Employment opportunities, Vocational education, Practical courses

Introduction

Education is an act or experience that has a formative effect on the mind, character or physical ability of an individual. The world acknowledges the importance and power of education; it has been recognized as an instrument for creating a new social order. The purpose of education is not just making students literate but add knowledge, rational thinking and making them physically skilled to survive. When given the opportunity to learn, students can become empowered to different skills resulting in the development of their lives and the country. So it is the demand of today to incorporate vocational training in our education system.

Vocational education

Vocational education consists basically of practical courses through which one gains skills and experience directly linked to a carrier in future. In all over the world trends in every field are changing so fast that if youth do not adopt latest trends, they will be left far behind from other people. The government is therefore emphasizing on upgrading people's skills by providing vocational education and training to them. It is the education that prepares people for a specific trade. It directly develops expertise in techniques related to technology, skills and scientific technique of all aspects of the trade. It can be at the secondary, higher secondary or higher education level. It is only in the type of trade a person wants to pursue. Actually it is all the training needed for a certain job. It helps student to be skilled and in turn offers better employment opportunities. These training are parallel to the other conventional courses of study (like B.Sc., M.Sc.). Vocational education in a way give students some work related experiences that many employers look for. It can be said that vocational education prepare learners for job that are based on manual or practical activities, traditionally non-academic and totally related to a specific trade or occupation in which the learner participates.

Aims and objectives of vocational education

The objectives of vocational education are as follows-

- To increase the productive potential of the country.
- To raise economic standard of people.
- To reduce the level of unemployment by producing self employment schemes.
- To utilize man power to fullest extent.
- To make use of materials and human resources.

Types of vocational education

Vocational education can be categorized in two categories-

- Formal vocational education- It follows a structured training program that leads to certificates, diploma or degrees recognized by state/ central government, public sector or other reputed concern.

- Non-formal vocational education- It helps in acquiring some marketable expertise which enable a person to carry out her/his ancestral trade or business.

- Different institutions which impart vocational education can be classified in to four categories-(1) Government (2) local body (3) private aided institution (4) private unaided institution. Some vocational education is found in the form of high school CTE (career and technical education) programs that include academic study as well as a variety of courses and work experiences designed to introduce students to many trades such as- construction, business, health services, art, design, computer graphics, cosmetology etc.

Need of vocational education

The current education system does not focus on training young people in employable skills which will be helpful to them for employment opportunities. Today a large section of India's labor have outdated skills. In all over the world trends in every field are changing so fast that if youth do not adopt latest trends, they will be left far behind from other people. The government is therefore emphasizing on upgrading people's skills by providing vocational education and training to them. National skill development system strives to meet present and future labor market. It needs competent and skilled people to improve productivity and to face competitiveness on national and international level. Skill development system includes vocational training, workplace learning, informal learning and training for lifelong learning.

Importance of vocational education

Skills and knowledge are the driving forces of economic growth and social development of any country as it is a key factor in the employability of workers and sustainability of enterprises. The economy becomes more productive, innovative and competitive through the existence of more skilled human potential. The composition of employment and growth of employment opportunity indicate the process of development

in any economy. Increasing pace of globalization and technical changes provide both challenges and growing opportunities for economic expansion and job creation. For taking advantage of these opportunities the level and quality of skills that a nation possess are becoming critical factors. Countries with higher and better levels of skills stand more effectively to the challenge and opportunity of globalization.

Steps taken by the government for vocational education

The government has formulated the national policy on skill development and set a target of providing skills to 5o crore people by 2022. In the current framework the ministry of labor and employment is implementing various schemes. Other ministries such as the ministry of human resource development, the ministry of rural development, the ministry of urban development and poverty alleviation have also launched skill development initiatives and self employment schemes. In addition, as part of national skill development mission, the government has established the national skill development corporation to facilitate large and high quality skills.

Suggestions

As we know that vocational education is very beneficial for people as far as job opportunity is concern, so following points should be taken in to consideration to take it's maximum benefit-

- The training courses lack focus on the changing market. As a result the number of students is declining for long term vocational courses. So the training policy should be framed out according to the job market.
- To attract more students in school level, orientation of vocational courses needed.
- Lack of accountability and training management are also major problems, so it should be improved.
- In our country different institutes impart vocational training but they do not have co-ordination among themselves. So we need to create a central database

from where one can get full access of vocational training system right from school level to ITI/ICT institutes.

References

1. *Annual Report (2008): Ministry of human resource development, department of education, India.*

2. *Goel, V.P.(2012): Technical and vocational education and training in India for sustainable development.*

3. *India Year Book (2008): A Reference Manual. India: Ministry of Information and Broadcasting.*

4. *Indranil, B. (2008): Vocational Education in India. www.nistads.res.in.*

5. *Khan, Z. (2009): Aims and Objectives of vocational education in India.www.yourarticlelibrary.com.*

6. *National Development Council Document (2008): Planning Commission India.*

7. *National Sample Survey Organization Report (2005): Status of education and vocational training in India (2004-2005).*

8. *Skill formation and employment assurance in unorganized sector(2009): National commission for enterprises in unorganized sector.*

9. *Technical Vocational Education and Training in India (Nov.2008): Report compiled by Perya Short, Educational Counselor(South Asia).*

10. *World Bank Report: Skill Development in India: The Vocational Education and Training System (Report no.22)*

11. *http:/www.vocationalstudies-australia.com.au*

12. *www.aicte-india.org/vocationaledu: Vocational Education- AICTE*

SDIS-039

Antifungal activity of different extracts from different parts of *Nycatanthes arbor-tristis* Linn. (Parijat) against clinical pathogens

Laxmi Verma[1*], Vaibhav Tamrakar[2], Nurul Haque[2] and Anil Kumar[1]

*[*1]Department of Biotechnology, Govt. V. Y. T. P. G. Autonomous College, Durg*
[2]SoS Life Sciences, Pt. Ravishankar Shukla University, Raipur
Corresponding author: vermalaxmi016@gmail.com

Abstract

Ayurveda is one of the oldest medication systems that uses plants and their extracts for treatment of various diseases. *Nycatanthes arbor-tristis* is an important shrub of tropical and subtropical regions in the world and here we communicate its antifungal activity. The antifungal activity of different parts (dried leaves, seeds, stem, bark and flowers) of plant *N. arbor-tristis* was evaluated by preparing extracts in three different solvents i.e. distilled water, methanol and chloroform. Their antifungal potential was measured by well diffusion method in terms of "zone of inhibition" of fungal growth. Three most prevalent clinical pathogens *Aspergillus niger, Penicillium* and *Aspergillus flavus* were used as fungal specimens for this study. The methanolic extract from leaves, stem and bark exhibited antifungal activity against respective fungus species. The inhibition of *A. flavus* by distilled water and methanolic extract of *N. arbor-tristis* flowers indicated higher potency. Chloroform extract of only leaves have also shown antifungal activity against *A. flavus*. The most significant antifungal activity is shown by methanolic extract of seeds and bark.

Key words: *Nycatanthes arbor-tristis*, Antifungal, *Aspergillus niger, Aspergillus flavus* and *Penicillium,*

Introduction

Nycatanthes arbor-tristis, (Figure 1) is well known in India and its neighbouring countries as one of the most versatile medicinal plants. It is usually a shrub or small tree. *N. arbor-tristis*, is popularly known as 'Night Jasmine' (English) or 'Harsinghar' (Hindi) in India, due to the fact that its flowers emit a very strong and pleasant fragrance during the whole night.

The flowers start falling after midnight and by the day break, the plant appears dull. The generic name 'Nyctanthes' has been coined from two Greek words 'Nykhta' (Night) and 'anthos' (flower) (Vats, et al. 2009) (Meshram, et al. 2012). The specific name 'arbortristis' meaning 'the sad tree' is supposedly derived from dull looks of the tree during daytime.

Figure 1 Nycatanthes arbor-tristis

Extract of different parts of the plant are used in ayurvedic medicine in treatment of many diseases. Leaves of *N. arbor-tristis* have reported contents of D- Mannitol, β-sitosterol, Flavanol, Glycosides- Astragalin, Nicotiflorin, Oleanolic acid, Nyctanthic acid, tannic acid, ascorbic acid, methyl salicyclate, carotene, friedeline, lupeol, mannitol, Glucose and fructose, iridoid glycosides and benzoic acid. It has antibacterial, anthelminthic, (Mahida and Mohan 2007) anti-inflammatory (Saxena, Gupta, et al. 1984), hepato-protective (Vishwanathan and Juvekar 2010), immunopotential (Alamgir and Uddin 2010), analgesic, antipyretic, ulcerogenic (Saxena, Gupta, et al. 1987) and antioxidant (Rathee, Hassarajani and Chattopadhya 2007) properties. In stem Glycoside-naringenin-4'-0-β-glucapyranosyl-α-xylopyranoside and β-sitosterol are present. It shows antipyretic, antioxidant (Thagavelu and Thomas 2010) properties. Even the bark contains some glycosides and alkaloids (Vats, et al. 2009). In flower nyctanthin, D-mannitol, Tannin and glucose, Crotenoid, Glycosides viz. β-monogenitobioside ester of α-crocetin (or crocin-3), β-monogentiobioside-β-D monoglucoside ester of α-crocetin, β-digenitiobioside ester of α-crocetin and β-digentiobioside ester of α-crocetin are present. Flower are bitter in taste & used as sedative (Ratnasooriya, et al. 2005). In seeds Arbortristoside A&B, Glycerides of linoleic oleic, lignoceric, stearic, palmitic and myristic acids, nyctanthic acid, 3-4 secotriterpene acid. stearic, palmitic, meristic acids are present. The seeds of this plant are known for their use in Ayurvedic system of medicine for throat, leprosy, eye diseases, skin infections and intestinal worm infection treatment (Singh and Jindal 1985).

The three fungal species used for this study were *Aspergillus niger, Penicillium* and *Aspergillus flavus.* These fungal species were chosen because these are the three most prevalent clinical pathogens. *Aspergillus niger* is a fungus and one of the most common species of the genus *Aspergillus*. It causes a disease called black mould on certain fruits and vegetables, and is a common contaminant of food. It is abundant in soil and is commonly reported from indoor environments. Some strains of *A. niger* have been reported to produce potent mycotoxins called ochratoxins (Abarca, et al. 1994). *Penicillium* is a genus of ascomycetous fungi of major importance in the natural environment as well as food and drug production. The thallus (mycelium) typically consists of a highly branched network of multinucleate, septate, usually colourless hyphae. Many-branched conidiophores sprout on the mycelia, bearing individually constricted conidiospores. The conidiospores are the main dispersal route of the fungi, and often are green in colour. Its main function in nature is the decomposition of organic materials, where species cause devastating rots as pre- and postharvest pathogens on food crops (Frisvad and Samson 2004), (Samson, et al. 2010), as well as producing a diverse range of mycotoxins (Frisvad, Smedsgaard, et al. 2004) *Aspergillus flavus* is a saprotrophic and pathogenic fungus with a cosmopolitan distribution. It is best known for its colonisation of cereal grains, legumes, and tree nuts. Postharvest rot typically develops during harvest, storage, and/or transit. *A. flavus* infections can occur while hosts are still in the field (pre-harvest), but often show no symptoms (dormancy) until postharvest storage and/or transport. In addition to causing pre-harvest and postharvest infections, many strains produce significant quantities of toxic compounds known as mycotoxins, which, when consumed, are toxic to mammals. (Agrios 2004). *A. flavus* is also an opportunistic human and animal pathogen, causing aspergillosis in immunocompromised individuals (Amaike and Keller 2011).

Material & Methods

Fresh & mature leaves, seeds, stem, bark and flowers were collected from Durg (21.19°N 81.28°E) District in the state of Chhattisgarh (India) and identified according to their floral characteristics. The fungal specimens are isolated from the soil and identified on the basis of their morphological studies through light microscopy. 500g of powder of the

dried leaves, seeds, stem, bark and flower was used respectively for extraction. Extraction of leaves with distilled water, methanol, and chloroform were carried out for 24 hours using a Borosil Soxhlet apparatus. At end of extraction, each extract was passed through *Whatman* filter paper no. 1 & the filtrate obtained were stored in freeze. The media used for antifungal test was Potato Dextrose Agar (PDA) with following composition Potato infusion - 200gm, Dextrose-20gm, Agar-15gm, distilled water-1000ml, pH- 7.4 (at 25°C). The clinical fungal test organism used for study are *A. niger, A. flavus* and *Penicillium*. The fungal strains are inoculated in PDA media for 24 hrs. Antifungal activity was shown by well diffusion method. Their antifungal potential was measured by well diffusion method in terms of zone of inhibition of fungal growth.
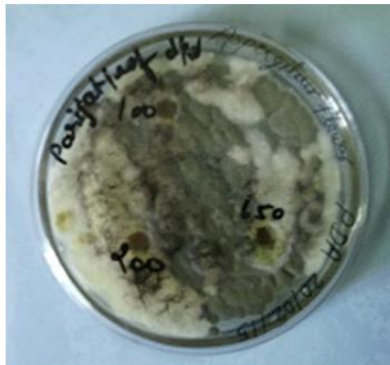
Result and Discussion

In present investigation antifungal activity was shown by well diffusion method and found that the distilled water extract of only stem and bark showed antifungal activity only against *A. niger*. This research work suggests that the methanolic extract of leaves, stem and bark parts of *N. arbor-tristis* has more effective antifungal potential against both *Aspergillus* and *Penicillium*. Chloroform extract of leaves is effective only against *A. flavus*.

Five pathogenic fungi, namely *Aspergillus flavus, A. niger, Penicillium citrinum, Alternaria padwickii* and *Rhizopus oryzae* were isolated from different varieties of rice seeds (Uma and Wesely 2013). So, the methanolic extract of *N. arbor-tristis* leaves, stem or bark can be used as an effective control for reducing radial growth of 3 agents of fungal pathogens of rice viz. *Aspergillus* and *Penicillium*. The wide spread use of the plant in traditional system of medicine for varied ailments is supported by our study emphasizing its pharmacological evaluations. Though plant has been found to be safe but the potent curative effects of the plant against particular human ailments need to be verified by more controlled and exhaustive clinical trials.

(Note + =Antifungal, - = No effect)

A. niger with Parijat leaf (Distilled water) extract

Penicillium with Parijat leaf (Distilled water) extract

Aspergillus flavus with Parijat leaf (Distilled water) extract

A. niger with Parijat leaf (Methanol) extract

Penicillium with Parijat leaf (Methanol) extract

Aspergillus flavus with Parijat leaf (Methanol) extract

A. niger with Parijat leaf (Chloroform) extract

Penicillium with Parijat leaf (Chloroform) extract

Aspergillus flavus with Parijat leaf (Chloroform) extract

A. niger with Parijat stem (Distilled water) extract

Panicillium with Parijat stem (Distilled water) extract

Aspergillus flavus with Parijat stem (Distilled water) extract

A. niger with Parijat stem (Methanol) extract

Penicillium with Parijat stem (Methanol) extract

Aspergillus flavus with Parijat (Methanol) extract

A. niger with Parijat stem(Chloroform) extract

Penicillium with Parijat stem (Chloroform) extract

Aspergillus flavus with Parijat (Chloroform) extract

A. niger with Parijat bark (Distilled water) extract

Panicillium with Parijat bark (Distilled water) extract

Aspergillus flavus with Parijat bar (Distilled water) extract

A. niger with Parijat bark (Methanol) extract

Penicillium with Parijat bark (Methanol) extract

Aspergillus flavus with Parijat ba (Methanol) extract

A. niger with Parijat bark (Chloroform) extract

Penicillium with Parijat bark (Chloroform) extract

Aspergillus flavus with Parijat bark (Chloroform) extract

A. niger with Parijat seed (Distilled water) extract

Penicillium with Parijat seed (Distilled water) extract

Aspergillus flavus with Parijat seed (Distillled water) extract

A. niger with Parijat seed(Methanol) extract

Penicillium with Parijat seed (Methanol) extract

Aspergillus flavus with Parijat seed (Methanol) extract

A. niger with Parijat seed (Chloroform) extract

Penicillium with Parijat seed (Chloroform) extract

Aspergillus flavus with Parijat seed (Chloroform) extract

A. niger with Parijat flower (Distilled water) extract

Penicillium with Parijat flower (Distilled water) extract

Aspergillus flavus with Parijat flower (Distilled water) extract

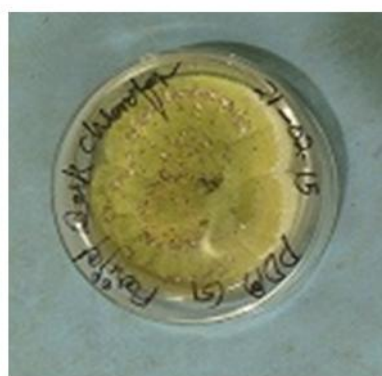*A. niger* with Parijat flower (Methanol) extract

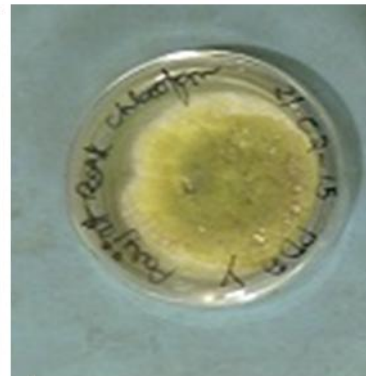*Penicillium* with Parijat flower (Methanol) extract

Aspergillus flavus with Parijat flower (Methanol) extract

A. niger with Parijat flower (Chloroform) extract

Penicillium with Parijat flower (Chloroform) extract

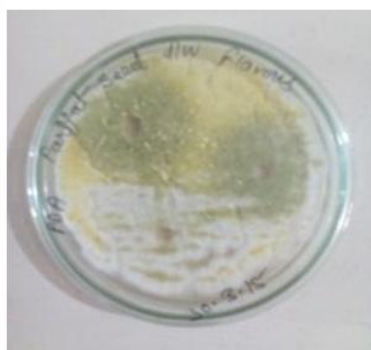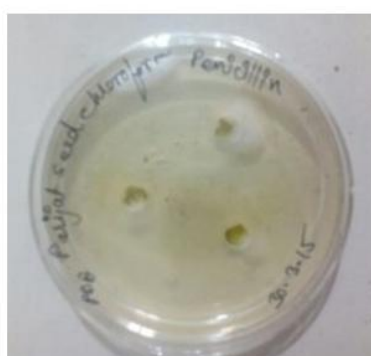*Aspergillus flavus* with Parijat flower (Chloroform) extract

Conclusion

Nycatanthes arbor-tristis is an easily available plant and no special conditions are required for its cultivation. It's a rich source of bioactive compounds, which would attract the attention of drug discovery and development groups to discover novel bioactive molecules for safer and effective treatment of fungal diseases as well as storage of herbal drugs and food items. As per our study, the methanolic extract of leaves, stem and bark of N. arbor-tristis is the most effective as an antifungal against both Aspergillus and Penicillium.

Acknowledgement

References

Abarca, M L, M R Bragulat, G Castellá, and F J Caba. 1994. "Ochratoxin A Production by Strains of Aspergillus niger var. niger." APPLIED AND ENVIRONMENTAL MICROBIOLOGY 60 (7): 2650-2652.

Agrios, George N. 2004. Plant Pathology. 5. Massachusetts.

Alamgir, M, and S J Uddin. 2010. "Recent advances on the ethnomedicinal plants as immunomodulatory agents." In Ethnomedicine: A Source of Complementary Therapeutics, by Debprasad Chattopadhyay, 227-244. Trivandrum: Research Signpost.

Amaike, Saori, and Nancy P Keller. 2011. "Aspergillus flavus." Annual Review of Phytopathology 49: 107-33.

Frisvad, J C, and R A Samson. 2004. "Polyphasic taxonomy of Penicillium subgenus Penicillium. A guide to identification of food and air-borne terverticillate Penicillia and their mycotoxins." Studies in Mycology 49: 1–174.

Frisvad, J C, J Smedsgaard, T O Larsen, R Samson, and R A Samson. 2004. "Mycotoxins, drugs and other extrolites produced by species in Penicillium subgenus Penicillium." Studies in Mycology 49: 201-241.

Mahida, Y, and JSS Mohan. 2007. "Screening of plants for their potential antibacterial activity against staphyllococcus and salmonella spp." Nat. Prod. Rad. 6 (4): 301-305.

Meshram, M M, S B Rangari, S B Kshirsagar, S Gajbiye, M R Trivedi, and R S Sahane. 2012. "Nyctanthes arbor tristis A herbal panacea." International Journal of Pharmaceutical Sciences and Research 3 (8): 2432-2440.

Rathee, J S, S A Hassarajani, and S Chattopadhya. 2007. "Antioxidant activity of Nyctanthes arbor-tristis leaf extract." Food Chemistry 103: 1350-1357.

Ratnasooriya, W D, J. R.A.C. Jayakodya, A D.I. Hettiarachchia, and M G Dharmasiria. 2005. "Sedative Effects of Hot Flower Infusion of Nyctanthes arbo-tristis. on Rats." Pharmaceutical Biology 43 (2): 140-146.

Rout, G R, A Mahato, and S K Senapati. 2007. "In vitro clonal propagation of Nyctanthes arbortristis Linn. – a medicinal tree." horticultural Science (Prague) 34 (2007): 84-89.

Samson, R A, J Houbraken, U Thrane, J C Frisvad,, and B Andersen. 2010. Food and indoor fungi. Vol. 2. Utrecht: The Netherlands: CBS-KNAW Fungal Biodiversity Centre. CBS Laboratory Manual Series.

Saxena, R S, B Gupta, K K Saxena, R C Singh, and D N Prasad. 1984. "Study of antiinflammatory activity in the leaves of Nyctanthes arbor-tristis Linn. -An Indian medicinal plant." J Ethanopharmacol 11: 319-330.

Saxena, R S, B Gupta, K K Saxena, V K Shrivastava, and D N Prasad. 1987. "Analgesic, antipyretic and ulcerogenic activity of Nyctanthes arbor tristis leaf extract." J Ethnopharmacol. 19: 193-200.

Siddiqui, Iram, M. Anis, and Anushi A. Jahan. 2006. "Rapid multiplication of Nyctanthes arbor-tristis through in-vitro auxillary shoots proliferation." World Journal of Agricultural Science 2 (2): 188-192.

Singh, R B, and V K Jindal. 1985. "Polysaccharide from Nyctanthes arbor tristis Linn. Seeds-isolation, purification and preliminary analysis of polysaccharide." Journal of the Indian Chemical Society 62: 627-628.

Thagavelu, N R, and R Thomas. 2010. "In vitro antioxidant studies on ethanolic extracts of leaves and stems of Nyctanthes arbor-tristis L. (Night Flowering Jasmine)." Int. J Bol Med Res 4: 188-192.

Uma, V, and E G Wesely. 2013. "Seed borne fungi of rice from South Tamil Nadu." J. Acad. Indus. Res. 1 (10): 612-614.

Vats, M, R Sharma, R P Saxena, K C Saxena, J S Tandon, and V Srivastava. 2009. "Immunostimulant activity of Nyctanthes arbor-tris Linn. (Oleaceaae)." Int. J. Pharmacog Phytochem Res 1 (1): 12-14.

Vishwanathan, M, and A R Juvekar. 2010. "Hepatogenerative effect of Nyctanthes arbor-tristis Linn. on acetaaminophen induced oxidative damage in rats." Int J Pharma Tech Res. 2 (2): 1291-1297.

SDIS-41

Making Intelligent Smart Teachers- Multiple Intelligences as a Process to Reform Teacher Education

Dr. Stanley John

Assistant Professor & Head, Planning Management Cell, District Institute of Education & Training, Bastar, Chhattisgarh, Mail: dr.stanvjohn@gmail.com, Phone: +91 9893817007

Abstract

The idea behind the present study was to understand and compare multiple intelligences profile of teacher trainees enrolled in two groups -Normal course and the DNS course, of the Diploma in education first year course in the District Institute of Education and Training of Bastar in Chhattisgarh. Results from Multiple Intelligences scale administered on 74 participants indicate that mean values on three dimensions of multiple intelligences: linguistic, logical and spatial of the DNS group participants are significantly better than those of the Normal group. However, Normal group excelled in interpersonal and intrapersonal intelligences than their DNS counterparts. Correlations between pairs of seven intelligences for both the groups yielded interesting results. Spatial intelligence is found to be correlated with all other intelligences for the DNS group whereas interpersonal intelligence is correlated with all other intelligences for the Normal group. Findings, should add to the thought process evaluating the curriculum and the mechanism to prepare intelligent smart teachers.

Background

Modern ideas in education focus on individualized education and learner autonomy. Since students are supposed to be responsible for their own learning, situations today demands that they should be made aware of their strengths and weaknesses. Use of IQ to measure intelligence and then develop strategies for students have been done in many researches and projects. This traditional method of measuring intelligence was questioned by Harvard University Professor, Gardner in his own work in the field of neuropsychological and child development during 1980s. Gardner (1988), looks at intelligence in a wider perspective and indicates that human talents and intelligences are so much more than that the traditional IQ tests have shown. It is no longer a question how intelligent people are, it

is how their intelligence works. He introduced a new vision on intelligence and his theory is a pluralistic view of mind which recognizes different sides of cognition and cognitive styles. Gardner's ideas about intelligence show us that children learn differently and one child can, for example, be excellent in science but be weaker in learning languages and vice versa. The theory of Multiple Intelligences, claims that each person possesses different combinations of seven intelligences (Gardner, 1983). In education, it advocates that teachers should address students' personal uniqueness and provide a wide range of intelligence-oriented activities and experiences to facilitate learning, which is consistent with the core idea of India's National Curriculum Framework (2005). Gardner distinguished his theory of intelligence from others by defining intelligence as the ability to solve problems or to create products that are valued within one or more cultural settings.

According to Gardner's (1999) theory (1) several intelligences are at work, not just one; (2) intelligence is expressed in our performances, products, and ideas, not through a test score; and (3) how the intelligences are expressed is culturally defined. Gardner's definition claims that intelligence represents potential that will or will not be brought to bear, depending on the values, available opportunities, as well as personal decisions made by individuals of a particular culture. This definition locates intelligence in what people can do and the products they can create in the real world, in contrast to the implied intelligence indicated by a test. It suggests a qualitative expression, a description, of an individual's collection of intelligences, rather than a single quantitative expression of a set of narrowly defined paper-and- pencil tasks (Gardner, 1983).

According to the theory of Multiple Intelligences, intelligence is pluralistic with each individual possessing at least seven intelligences that are reflections of the influences of inherited biology, environmental culture and life experiences (Gardner 1991). According to this theory, typically, individuals display 'jagged' intelligence profiles with strength in one area not necessarily predicting strength in another area. These seven intelligences and their associated abilities are summarized below (Gardner, 1989).

Linguistic Intelligence *– sensitivity to, and capacity to discern, logical or numerical patterns; ability to handle long chains of reasoning*

Logical Intelligence – *sensitivity to the sounds, rhythms and meanings of words; sensitivity to the different functions of language.*

Musical Intelligence –*abilities to produce and appreciate rhythm, pitch and timber; appreciations of the forms of musical expressiveness.*

Spatial Intelligence – *capacities to perceive the visual-spatial world accurately and to perform transformations on one's initial perceptions.*

Bodily (Kinesthetic) Intelligence – *Abilities to control one's body movements and to handle objects skillfully.*

Interpersonal Intelligence – *capacities to discern and respond appropriately to the moods, temperaments, motivations and desires of other people.*

Intrapersonal Intelligence – *access to one's own feelings and the ability to discriminate among them and draw upon them to guide behavior; knowledge of one's own strengths, weaknesses, desires and intelligences.*

Understanding Multiple Intelligences (MI) for effective classroom transaction

According to the theory of Multiple Intelligences (Gardner, 1991), traditional learning environments tend to stimulate only two intelligences (linguistic and logical). Such environments are therefore less engaging to those high in other intelligences since each individual displays a unique MI profile. Considering this, it is obvious that personalization of learning is the key consideration of an MI approach that is based on engaging the learner through their own abilities and preferences. Learning that is informed by MI offers the possibility of a more inclusive pedagogy in classroom because it takes a wide view of intelligence and allows students to learn through their own varying intelligence strengths and not be marginalized by traditional ways of learning (Barrington 2004). A comparison of key principles of multiple intelligences, learning styles, and cognitive based education by Guild (1997) concluded that these approaches intersect significantly in learner centered approach with emphasis on designing curricula with depth and breadth. The MI approach is congruent with many contemporary theorists who have emphasized that optimum instruction can be achieved when the learner is profiled by learning need, learning style, intelligences and presentation preferences. In this way content and learner can then be uniquely matched (Reigeluth 1999). Therefore an

understanding of multiple intelligences of students can equip the teacher with basic tool to create space for enriched learning in classroom. It is thus evident that MI activities in classrooms would develop students to their full potentials.

Purpose of the Study

Preparing teacher trainees so that they are able to drive classroom activities to bring out full potential of each student is a challenge that demands knowledge and understanding on the part of every teacher trainee. The Diploma in Education curriculum of District Institutes of Education and Training in Chhattisgarh, India aims at preparing teacher trainees for effective classroom management in terms of learning outcomes. The Necessary Teacher Training programme (DNS) as developed by the Humana People to People, India (International NGO working in the field of teacher education in Chhattisgarh- 2009 to 2011) had identified and developed modules in nine subject areas pertaining to pre-service teacher training course to suit the needs of future teachers. This was in addition to the six subjects that were a part of the curriculum of the Diploma in Education (first year) programme as designed by the State Council of Educational Research and Training (SCERT) of Chhattisgarh. Teacher trainees admitted in the first year course during session 2010-11 in the District Institute of Education and Training at Bastar were offered option to choose either the Normal course or the DNS course. Thus there were two groups of teacher trainees in the first year course, one enrolled in the Normal course with six subjects and the other enrolled in the DNS course with the six subjects plus additional nine subjects.

During the first part of their course, teacher trainees get a good exposure on elementary school systems as they are assigned different schools for school observation followed by classroom teaching and other activities. During the latter part of their course, they study course subjects through discussion and presentations along with usual classroom learning processes. With this background, the present study aimed at understanding the Multiple Intelligences (MI) of teacher trainees enrolled in DIET Bastar which was followed by a project to equip them with the understanding of multiple intelligences as explained by Gardner (1983) and providing opportunities and organizing activities to enhance their multiple intelligences. The study aimed at comparing the two groups (Normal course and

DNS course) of teacher trainees, on various dimensions of multiple intelligences and also to examine relationships among the various dimensions of intelligences.

Method

Participants

88 teacher trainees selected on the basis of the State Pre-Diploma in Education test were enrolled in the first year of Diploma in Education (D.Ed) course in the District Institute of Education and Training (DIET) of Bastar district for the session 2010-11. Out of these 44 students opted for Diploma in Education (D.Ed) through the DNS programme. Rest of the teacher trainees were enrolled in the normal D.Ed course. Thus there were two sections or groups of D.Ed first year.

Normal Course: 44 teacher trainees enrolled in this class studied the normal course (6 subjects) of D.Ed as prescribed by SCERT, Chhattisgarh. This group is termed **Normal Course Group** in this paper.

DNS Course: 44 teacher trainees enrolled in this class studied 9 subjects in addition to the 6 subjects in the normal course of D.Ed. This group is termed **DNS Course Group** in this paper.

38 students from **Normal Course Group** and 36 students from **DNS Course Group** participated in the study, constituting the sample.

Tool

Multiple Intelligences Scale (John & Jha 2010) was used to prepare the MI profile of the participant teacher trainees. The scale consisted of 35 items covering seven dimensions of MI on which respondents had to rate themselves on a 5 point scale from "mostly agree" to "mostly disagree".

Procedure

The tool was administered on the sample (N=74) during March 2011 to obtain individual multiple intelligences profile of the participants.

Results

Table 1 depicts means and standard deviations of the seven dimensions of MI of the teacher trainees (D.Ed- first year) enrolled in Normal course and DNS course in DIET Bastar.

Table 1- Comparison of multiple intelligences of teacher trainees enrolled in Normal and DNS course.

S.No.	Name of Intelligence	Normal Course Group		DNS Course Group		t
		Mean	SD	Mean	SD	
1	Linguistic (LIN)	16.50	3.72	20.50	2.17	4.64**
2	Logical (LOG)	13.46	2.82	19.42	2.65	7.80**
3	Spatial (SPA)	13.36	2.11	20.67	1.58	13.94**
4	Musical (MUS)	13.57	4.04	14.00	2.86	0.43
5	Kinesthetic (KIN)	13.07	3.40	13.96	4.12	0.85
6	Interpersonal (INTER)	18.68	2.97	13.83	2.62	6.19**
7	Intrapersonal (INTRA)	20.32	3.41	14.79	3.90	5.46**

** significant at 0.01 level

Figure 1. Multiple Intelligences of Normal and DNS Course Groups
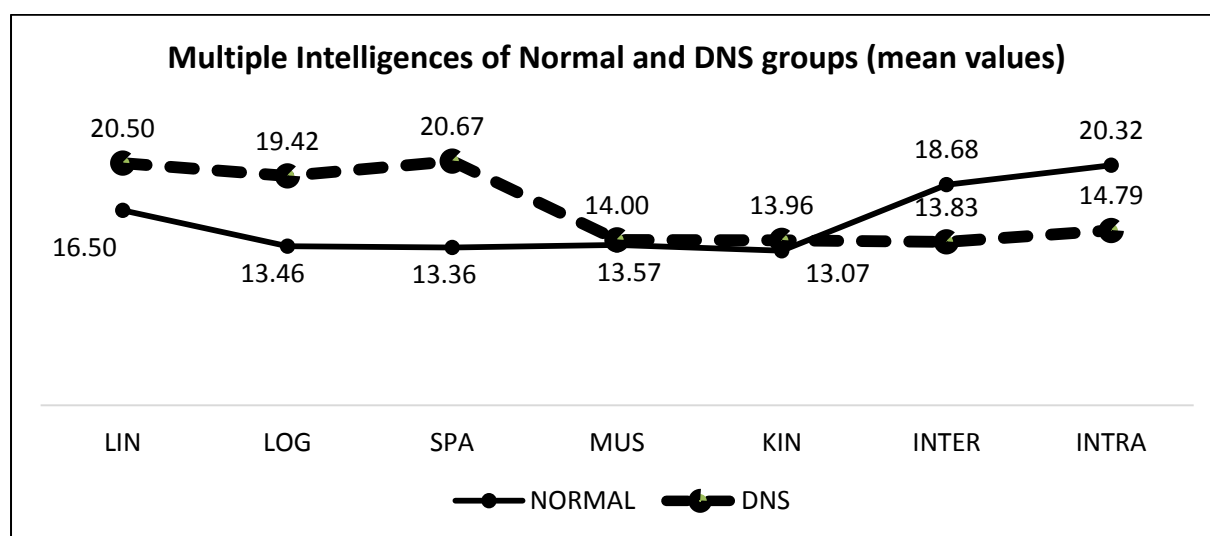
It is observed that there is significant difference between both the groups on five dimensions of intelligences. DNS group was significantly better than the Normal group on three intelligences- Linguistic, Logical and Spatial. However, the Normal group was significantly better in the interpersonal and intrapersonal intelligences than the DNS group. Figure 1 depicts the MI profile of both the groups. The leading intelligence in

Normal group is interpersonal whereas spatial intelligence is found to be leading dimension in the DNS group.

To understand the relation among various dimensions of intelligences, correlation was calculated which is shown in Table 2.

Table 2- Correlation between multiple intelligences of teacher trainees enrolled in Normal and DNS course

Correlation (Pearson) between intelligences	Course	
	Normal	**DNS**
Linguistic-Logical	0.757**	0.628**
Linguistic-Spatial		0.440**
Linguistic-Musical	0.459*	0.477*
Linguistic-Kinesthetic	0.375*	0.561**
Linguistic-Interpersonal	0.603**	0.672**
Linguistic-Intrapersonal	0.524**	
Logical-Spatial		0.437*
Logical-Musical		0.558**
Logical-Kinesthetic		
Logical-Interpersonal	0.426*	
Logical-Intrapersonal	0.559**	
Spatial-Musical		0.451*
Spatial -Kinesthetic	0.399*	0.765**
Spatial -Interpersonal	0.478*	0.719**
Spatial -Intrapersonal		0.437*
Musical -Kinesthetic	0.374*	0.509*
Musical -Interpersonal	0.536**	0.472*
Musical -Intrapersonal		
Kinesthetic -Interpersonal	0.599**	0.758**
Kinesthetic -Intrapersonal	0.385*	0.408*
Interpersonal -Intrapersonal	0.509**	

** significant at .01 level; * significant at .05 level

Correlation values in Table 2 show that spatial intelligence is correlated with all other six intelligences in the case of DNS group. Such a relation is not observed for Normal group with regard to spatial intelligence. However, in the case of Normal group interpersonal intelligence is found to have significant correlations with all the other six intelligences.

Out of the 21 correlations, neither of the groups has shown significant correlations between Logical- Kinesthetic and Musical –Intrapersonal intelligences.

Discussion

The curriculum of Diploma in Education programme aimed at preparing elementary school teachers is based on active learning. The first year course includes six theory subject areas: Art Education, Child Development and learning, School and Community, Knowledge, Curriculum and Pedagogy, Mathematics and its Teaching, Language and Language Teaching and practical computer knowledge. The curriculum transaction involves student participation and cooperative learning in discussion and presentation mode. Students who opted for DNS programme were equipped in *nine extra subjects* (other than the normal six subjects mentioned above) that include *Means of communication, Computer skills, English, Yoga with Physical education plus knowledge of diet and Nutrition, Construction, The world in which we live in, Charter subject (Health, community, 1 month community work), Specialization: pedagogy and Our Country India.* In *Construction,* the students were trained in budget making, experience in developing designs and field exercise like cleaning and toilet construction and repair works, whitewashing etc. This is supported by the strong correlation (.765**) between spatial and kinesthetic intelligences. In case of correlations of other intelligences with interpersonal intelligences, the Normal group is found better. This may be because they have more time and invest more energy in interaction and peer group dynamics, likely enabling them in interpersonal interactions and introspective behavior.

Conclusion and recommendations

Our system of education traditionally favours those students who excel in linguistic and logical (mathematical) areas because these skills are highly valued in our societies. Unfortunately, this situation leaves certain students to stumble blindly through an educational system that ignores certain unique abilities. The situation today demands that both traditional and non-traditional approaches should be combined to design methods of teaching. The present study recommends inclusion of some special areas as discussed above in the curriculum of teacher trainees of elementary level schooling in our state.

Teacher training, both pre-service and in-service should also involve knowledge and understanding of multiple intelligences framework so that they may comprehensively evaluate each student and be equipped to mentor the whole classroom as per visualised in the Right to Education Act, 2009.

References

1. *Barrington, E. (2004). Teaching to student diversity in higher education: how multiple intelligence theory can help. Teaching in Higher Education, 9(4), 421-434.*

2. *Gardner, H. (1983). Frames of mind: The theory of multiple intelligences. New York: Basic Books. (Tenth edition, 1993)*

3. *Gardner, H. (1988). Toward more effective arts education. Journal of Aesthetic Education, 22(1), 157167.*

4. *Gardner, H. (1989). Multiple Intelligences Go to School: Educational Implications of the Theory of Multiple Intelligences. Educational Researcher, 18(8), 4-10*

5. *Gardner, H. (1991). The unschooled mind: How children think, how school should teach. New York: Basic Books.*

6. *Gardner, H. (1999). Intelligence Reframed. New York: Basic Books*

7. *Guild, P. (1997). Where do learning theories overlap? Educational Leadership, 9, 4, 30-32.*

8. *John, Stanley & Jha, Heemanshu (2010). Multiple Intelligences Scale. Unpublished scale.*

9. *Reigeluth, C. ed. (1999) Instructional-Design Theories and Models A New Paradigm of Instructional Design Volume 2. USA. Lawrence Erlbaum Inc*

SDIS-042

Comparative analysis on photosynthetic responses in three varieties of Indian mustard (brassica juncea , brassica campestris) at FACE SYSTEM

Mukata Rao

Christ College, Jagdalpur, District Bastar, C.G., India

Abstract

Day by day air pollution is increasing which causes higher $[CO_2]$ concentration in environment surpass to 600ppm by the end of century. Testing the findings and hypotheses under truly open-air field conditions became increasingly apparent, leading to the development of a new technology, Free-Air Carbon dioxide Enrichment (FACE).such a change of the atmosphere will obviously bring shift in overall agriculture globally. Free-Air Carbon dioxide Enrichment (FACE)is a method that increases $[CO_2]$ concentration of plant growth to be measured experiment .result suggest $[CO_2]$ assimilation of the three varieties of brassica at FACE is increased which leads to high carbohydrate content and protein content declined. In comparison of three varieties of brassica campestris(pusa gold) ,brassica juncea(pusa bold , brassica jaikisan)have highest carbohydrate content and lowest protein content.

Keywords: carbon dioxide, FACE, brassica campestris, brassica juncea, carbohydrate, photosynthesis

Introduction

It has been established that rising [CO2] is increasing globally and is expected to reach 600 ppm at the end of century at present [CO2] is 330 ppm (IPCC, 2007). It has been established that rising [CO2] will stimulate plant growth . Indeed , climate change associated with rising atmospheric [CO2] has already altered ecosystem carbon balance through rising temperature , increased growing season and increased atmospheric water content .Rising atmospheric [CO2] has the potential to stimulate carbon accumulation in plants through direct effects on photosynthesis and growth of plants . testing's and finding suggests the impact of elevated [CO2] on the mechanism that regulate carbon dioxide assimilation , organic decomposition , ecosystem and plant respiration , transpiration and carbon storage.

How Do Plants Sense and Respond to Rising [CO_2]in the Short Term

Rubisco is at current [CO_2] substrate limited by its principal substrate, [CO_2]. Thus only Rubisco has the potential to meaningfully respond to increasing [CO_2] and also function as a key metabolic step with sufficient regulatory control that a change in reaction rate would alter the flux through a major metabolic pathway. At a physiological level, C3 photosynthesis, dark respiration, and stomatal conductance have all been reported to respond to instantaneous elevation of [CO_2](Drake et al., 1997).

The direct increase in photosynthesis due to elevation of[CO_2] results from two properties of Rubisco of terrestrial C3 plants. (a) The Km of the enzyme for [CO_2] is close to the current atmospheric concentration, so elevated[CO_2] increases the velocity of carboxylation. (b) [CO_2] competitively inhibits the oxygenation reaction, which produces glycolate leading to photorespiration. This latter effect is particularly important because it increases the efficiency of net carbon [CO_2] uptake by decreasing photorespiratory [CO_2] loss and diverting ATP and NADPH (generated by the light reactions) away from photorespiratory metabolism to photosynthetic assimilation.

For a leaf temperature of $25°C$, the increase in atmospheric[CO_2] from today's 37_2 μmol mol mol−1 to 550 μmol mol mol−1 by the middle of this century would increase Rubisco-limited and ribulose bisphosphate (RuBP)-limited photosynthesis by 36% and 1_2%, respectively, and the predicted increase to 700 μmol mol mol−1 by the end of the century would cause respective increases of 63% and 18%.

Although the short-term response of C3 photosynthesis to increased[CO_2] may be closely predicted from Rubisco's properties, mystery still surrounds the mechanism by which stomatal aperture responds to variation in[CO_2] (Morison,1998). In sum, in the short term C3 land plants appear to sense and respond directly to rising[CO_2] exclusively through direct effects of increased carboxylation by Rubisco and decreased stomatal opening. Figure $_2$ shows the implications of these changes to plant growth, as a first approximation. For a plant growing in isolation, increased[CO_2] by increasing efficiency of light use in net [CO_2] uptake, results in increased growth and therefore an increased rate of production of leaf area providing a feed-forward enhancement.

Free Air Carbon dioxide enrichment (FACE) facility built in the campus of Jawaharlal Nehru University. Mustard (Brassica pusa gold, pusa bold, pusa jaiskisan) plants are grown inside FACE Rings maintained at elevated [CO_2] (600 ppm)

What is FACE

 MiniFACE systems as small as 1-m diameter have been developed (Miglietta et al.,1996), they do not escape all of the problems of enclosures outlined above. This review is therefore limited to full-size FACE systems of >8-m diameter plots. A single FACE plot of this type is approximately circular and surrounded by a ring of pipes that release [CO_2], or air enriched with [CO_2], at vertical intervals from just above the ground surface to just above the top of the plant canopy. Wind direction, wind velocity, and[CO_2] are measured at the center of each plot and this information is used by a computer-controlled system to adjust [CO_2] flow rate, controlled by a mass-flow control valve, to maintain the target elevated[CO_2], typically either 550 μmol mol−1 or 600 μmol mol−1. Only pipes on the upwind side of the plots release [CO_2], unless wind velocity is less than 0.4 m s−1 when it is released alternately from adjacent release points (McLeod & Long, 1999). For vegetation of low stature, e.g., a wheat crop, only one or two vertical release points are necessary, whereas for tall vegetation, e.g., 12 m pine forest, several vertical

release points are needed to enrich the whole canopy (Hendrey et al,1999; Lewin et al.,1992;McLeod & Long, 1999, Miglietta et al.,2

Materials and Method

Brassica campestris (Pusa gold) and Brassica juncea (Pusa Jai Kisan & Pusa Bold) were grown at ambient carbon dioxide (380 ppm) and at elevated carbon dioxide (600ppm) in Free air Carbon dioxide enrichment) facility built in the campus of Jawaharlal Nehru University.

Chlorophyll estimation

The extraction of Chlorophylls from leaves was done under a dim, green safe light. Leaf tissues were homogenized in 90% chilled ammonical acetone (10 ml) in a pre-chilled mortar and pestle. For preparing 90% ammonical acetone, 1 N ammonia solution (7.48 ml in 100 ml distilled water) was prepared and then diluted ten times. This 0.1N ammonia solution was taken and acetone was added so as to obtain 90% ammonical solution. Three replicates were taken for each batch. Homogenate was centrifuged at 10,000 rpm for 10 min at 40C. Supernatant was taken for estimating chlorophyll. Absorbance was taken at 663 nm, 645 nm and 470 nm. Reference cuvette contained 90% ammonical acetone. Chlorophyll was calculated as described by Porra et al., 1989.

Chl a = (14.21 x OD663 – 3.01 x OD645) V/W

Chl b = (25.23 x OD645 – 5.16 x OD663) V/W

Chl (a+b) = (9.05 x OD663 + 22.2 x OD645) V/W

Extraction of Total protein from leaves:

To extract total proteins, leaves were homogenized in liquid nitrogen in mortar and pestle. To the powdered tissues 1 ml of extraction buffer consisting of 56 mM Na_2CO_3, 5 mM DTT, 10 mM isoascorbate, 12% sucrose, 2 mM EDTA, and 2% SDS was added. The homogenate was transferred to eppendorf tube and the samples were vortexed thoroughly. They were incubated at 800C for 20 min and were centrifuged at 13000 rpm for 5 min in a micro centrifuge. The supernatant was transferred to a fresh eppendorf tube. To the

supernatant ice-cold acetone (final concentration should be 90%) containing 0.1% v/v β-mercaptoethanol was added, mixed properly and kept at –200C for 1h. Samples were centrifuged at 13000 rpm for 10 min in a refrigerated microfuge. The pellet was dissolved in 100 μl of NaOH (0.1M).

Protein estimation:

Estimation of protein concentration in various extracts was determined according to Bradford's method (Bradford, 1976). Bradford's reagent was prepared by dissolving Coomassie brilliant blue G-250 in 40 ml of 95% ethanol. The solution was mixed gently with 40 ml 85% phosphoric acid with constant stirring. The final volume was adjusted to 480ml with distilled water. Bradford's reagent was stored in brown bottles. Bradford microassay was performed by adding 1 ml of reagent to 2-10 μl of protein sample and absorbance was taken at 595 nm within 5 min. BSA was used as test protein for plotting a standard curve for each time.

Starch Estimation:

Starch Estimation method was adapted from Viles and Silverman (1949) and McCready et al. (1950). This method uses hot ethand to remove sugars and other interfering substances and to gelatinize the starch, immersion in 35% perchloric acid to solubilize starch, 75% sulfuric acid to hydrolyze starch, and anthrone reagent for colorimetric analysis. The color solution is stable for up to 6 h. 0.50 g of plant tissue was taken into a 25-mL test tube with 10 mL of acetone and allowed to sit several hours/overnight. Acetone was poured off and this step was repeated until the extract became colorless. Acetone-extracted sample was placed in a 100-mL test tube, covered with 80% ethanol, and place in a water bath to boil gently. The tubes were capped with a screw-top lid to ensure adequate reflux of the boiling alcohol solution, but not tightened hard enough to seal the tube. After 1-2 h, the supernatant was poured off and the extraction was repeated until the solution became colorless. Three extractions were performed over a 4-h period. Three rinses were performed, 5 mL each, of 35% perchloric acid to wash the sample off. The solution was transferred to a 100- mL volumetric flask and bring to volume with dd H2O. this was shaked and mixed well.

For Colorimetric Determination: 0.5 mL of each starch solution was added to a 15-mL test tube in a rack immersed in ice water. A set of at least six glucose standards was prepared from 0 to 50 mg/100 mL with each batch of samples.

5 mL of anthrone solution (500 mL of concentrated sulfuric acid to 200 mL of water in a heavy glass bottle on a magnetic stir plate, preferably in an ice-water bath to speed cooling. This makes 655 mL of 72 5% sulfuric acid. 1.146 g of anthrone powder to this acid solution allowed to mix for 2 or more h on a magnetic stir plate away from bright light) was added to each tube, the test tubes loosely covered with a plastic cap, and mixed briefly on a vortex mixer. The rack of test tubes was placed into a large container of vigorously boiling water 10 cm deep for 12 min and then the rack was set in ice watert o cool the samples. Samples were covered to prevent exposure to bright light. Reading was taken at 625 nm on a spectrophotometer. The content was calculated using the regression formula as

$$yg = a + b(x)$$

where yg is milligrams per 100 mL of glucose, a is the intercept, b is the slope, and x is the absorbance units at 625 nm.

RESULT

CHLOROPHYLL AND PROTIEN CONTENT

Total Chlorophyll content and protein content of Pusa Gold (*Brassica campestris*), Pusa Bold and Pusa Jai kisan genotypes of *Brassica juncea* grown in ambient and elevated CO_2 in the FACE ring.
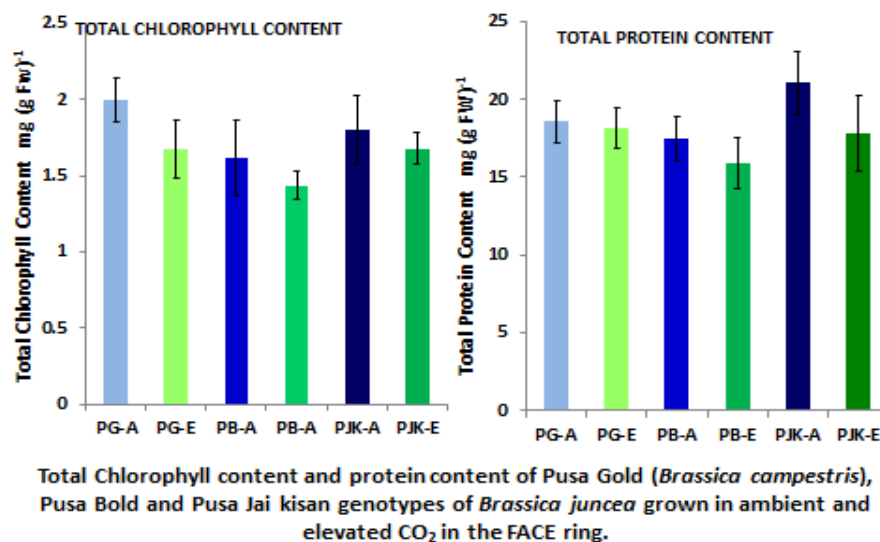
figure suggests in three varieties of brassica at FACE chlorophyll content is declined by 10 to 20 % in that pusa gold declined by 20%, pusa bold 10% and pusa jaikisan by 5% meanwhile protein content is also decline by three varieties of brassica due to nitrogen uptake in comparison pusa gold reduced by 5%, pusa bold by 10 % and maximum decline by jaikisan 18%.

Starch Content
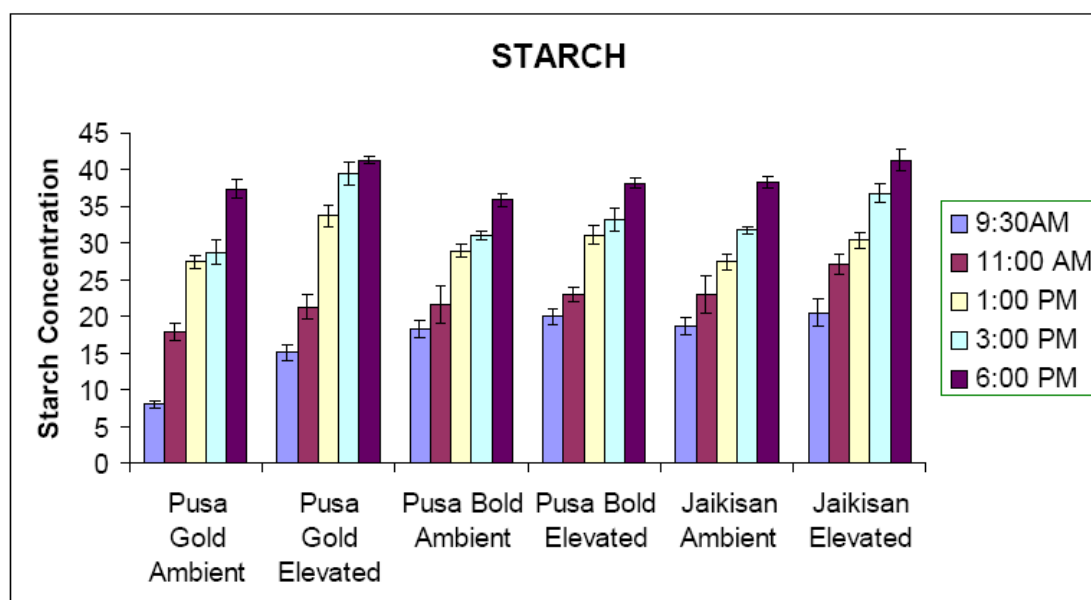
Starch contents of Pusa Gold, Pusa Bold and Jaikisan genotypes of Brassica plants grown at ambient (385 ppm) and elevated (600 ppm) [CO2] inside the FACE ring.

At different time interval starch content has been recorded result suggests increase in starch content maximum between 3-6 pm in the day time in three varities of brassica at FACE. Results revealed in pusa gold maximum increment of starch has been recorded as compare to pusa bold and pusa jaikisan

Discussion

Free-Air Carbon dioxide Enrichment (FACE).such a change of the atmosphere will obviously bring shift in overall agriculture globally. Free-Air Carbon dioxide Enrichment (FACE)is a method that increases $[CO_2]$ concentration of plant growth to be measured experiment .result suggest $[CO_2]$ assimilation of the three varieties of brassica at FACE is

increased which leads to high carbohydrate content protein content and chlorophyll declined especially during flowering face which affect the grain yield . In comparison of three varieties of brassica campestris(pusa gold) ,brassica juncea(pusa bold , brassica jaikisan)have highest carbohydrate content and lowest protein content. Reduced protein content will affect grain yield , nutrition value and plant productivity. Legumes and their symbiotic nitrogen fixing bacteria appear to benefit more from maximum carbon dioxide levels.

 Conclution

Rising atmospheric change takes place in our environment due to pollution   which increases[CO_2] in atmosphere. The [CO_2] assimilation rates saturated at 1000 micro mole photons/m$_2$/s in Brassica plant grown at elevated [CO_2].

Results reveal protein content of pusa jaikisan reduced maximum to other varieties of brassica

Cholorophyll content reduced maximum in pusa gold

In all genotypes starch content increased maximum between 3 – 6 pm at day time. However in the brassica varieties starch content in pusa gold is relatively high.

References

1. *Arp WJ. (1991). Effects of source-sink relations on photosynthetic acclimation to elevated[CO2]. Plant Cell Environ. 14:869– 75*

2. *Conley MM, Kimball BA, Brooks TJ, Pinter PJ, Hunsaker DJ, et al. (2001). [CO2] enrichment increases water-use efficiency in sorghum. New Phytol. 151:407–12*

3. *Cousins AB, Adam NR, Wall GW, Kimball BA, Pinter PJ, et al. (2001). Reduced photorespiration and increased energyuse efficiency in young [CO2]-enriched sorghum leaves. New Phytol. 150:275–84*

4. *Cousins AB, Adam NR, Wall GW, Kimball BA, Pinter PJ, et al. (2002). Photosystem II energy use, non-photochemical quenching and the xanthophyll cycle in Sorghum bicolor grown under drought and free-air [CO2] enrichment (FACE) conditions. Plant Cell Environ. 25:1551–59*

5. *Curtis PS. (1996). A meta-analysis of leaf gas exchange and nitrogen in trees grown under elevated carbon dioxide. Plant Cell Environ. 19:127–37*

6. *Curtis PS, Wang XZ. (1998). A metaanalysis of elevated [CO2] effects onwoody plant mass, form, and physiology. Oecologia 113:299–313*

7. *Day FP, Weber EP, Hinkle CR, Drake BG. (1996). Effects of elevated atmospheric [CO2] on fine root length and distribution in an oak-palmetto scrub ecosystem in central Florida. Global Change Biol. 2:143–48*

8. *Derner JD, Johnson HB, Kimball BA, Pinter PJ, Polley HW, et al. (2003). Above and below-ground responses of C3-C4 species mixtures to elevated [CO2] and soil water availability. Global Change Biol.9:452–60*

9. *Drake BG, Leadley PW, Arp WJ, Nassiry D, Curtis PS. (1989). An open top chamber for field studies of elevated atmospheric [CO2] concentration on saltmarsh vegetation. Funct. Ecol. 3:363–71*

10. *Drake BG, Gonz`alez-Meler MA, Long SP. (1997). More efficient plants: A consequence of rising atmospheric [CO2]? Annu. Rev. Plant Physiol. Plant Mol. Biol. 48:609–39*

11. *Heagle AS, Philbeck RB, Ferrell RE, HeckWW. (1989). Design and performance of a large, Field exposure chamber to measure effects of air-quality on plants. J. Environ. Qual. 18:361–68*

12. *Hendrey GR, Ellsworth DS, Lewin KF, Nagy J. (1999). A free-air enrichment system for exposing tall forest vegetation to elevated atmospheric [CO2]. Global Change Biol. 5:293–309*

13. *Long SP. (1991). Modification of the response of photosynthetic productivity to rising temperature by atmospheric [CO2] concentrations. Has its importance been underestimated? Plant Cell Environ. 14:729–39*

14. *Lewin KF, Hendrey GR, Kolber Z. (1992). Brookhaven National Laboratory free-air carbon-dioxide enrichment facility. Crit. Rev. Plant Sci. 11:135–41*

15. *McLeod AR, Long SP. (1999). Free-air carbon dioxide enrichment (FACE) in Global Change Research: A review. Adv. Ecol.Res. 28:1–55*

16. *Miglietta F, Peressotti A, Vaccari FP, Zaldei A, de Angelis P, Scarascia-Mugnozza G. (2001). Free-air [CO2] enrichment (FACE) of a poplar plantation: the POPFACE fumigation system. New Phytol.150:465–76*

17. *Miglietta F, Magliulo V, Bindi M, Cerio L, Vaccari FP, et al. (1998). Free air [CO2] enrichment of potato (Solanum tuberosum L.): development, growth and yield.Global Change Biol. 4:163–72*

18. *Morison JIL. (1998). Stomatal response to increased [CO2] concentration. J. Exp. Bot. 49:443–52*

19. *Murray MB, Leith ID, Jarvis PG. (1996). The effect of long term [CO2] enrichment on the growth, biomass partitioning and mineral nutrition of Sitka Spruce (Picea sitchensis (Bong) Carr). Trees Struct.Funct. 10:393–402*

20. *Ottman MJ, Kimball BA, Pinter PJ, Wall GW, Vanderlip RL, et al. (2001). Elevated [CO2] increases sorghum biomass under drought conditions. New Phytol. 150:261–73*

SDIS-043

Role of Capacity Building of Librarians in Digital Era

Dr. Sanjay Kumar Dongre
Bastar University, Jagdalpur, District Bastar, Chhattisgarh, 494001, India

Abstract

The digitalization is paving a way to knowledge eruption; the librarians have great responsibility to channelize this knowledge. In the Digital Age, librarians can no longer be simply information providers or the keepers of knowledge. Technological changes and the use of electronically stored and retrieval information systems have changed the way students, academicians, education administrators and researchers are able to access, retrieve, congregate and use information.

Introduction

The librarians are the information mangers and they provide tools and techniques to the library users. In the digital era the users are more relying on the digital information so that the librarians' role became very vital. The librarians should be proactive and receptive in their day to day tasks. A librarian must be able to participate actively in the knowledge sharing and educational process rather than gathering and disseminating information to the library users through workshops, orientations, training etc. They must ensure that there is effective and efficient flow of accurate information from the generators to library users in the digital environment.

The librarians are the key service providers in any organizations and they need special skills and talents to help the library users. In the age of digital era they should acquire such techniques and skills. The librarians must be able to address the changing and challenging trends to make libraries more accessible and information systems and services in the Digital era with an emphasis on examining contemporary problems, advances and solutions. The capacity building is necessary to librarians to translate information in to knowledge for the organizations and users.

The *Business Dictionary* defines "capacity building" as "planned development of knowledge, skills and other capabilities of an organization through acquisition, inducements, technology and training."[1] Capacity building takes place not only at the

organizational level, it can also occur at the individual level. Its set of procedures allows individuals, groups, organizations and societies to develop skills that enable them to function effectively and overcome pressing challenges.[2] Capacity building has also been defined as the acquisition of abilities, skills, understandings, attitudes, principles, associations, practices, incentives, means and conditions that enable individuals, organizations, networks and broader social systems to function and accomplish development objectives over time.[3]

A growing body of literature examines the importance of capacity building for librarians in the Digital era. They have to get new skills and techniques to support the library users. But a modern-day librarian in the Digital Age must be sound in the storage, retrieval and dissemination of information with the aid of information communication technology (ICT).

Some of various factors are responsible for channelize these:

- e-learning
- Open Archives
- Library Consortia
- Metadata Standards
- Resource Sharing
- Industrial Interaction
- Digital Library Initiatives
- Recent Trends and Developments

New technologies like ICT's are affected to main role of libraries. They changes in

➢ Society
➢ Culture
➢ Organisation and
➢ Professional learning in the digital era.

Libraries in the "age of innovation" Libraries today operate in a drastically new context

➢ Knowledge intensity,
➢ A rapid pace of technological innovation and
➢ Global economic dynamics characterize today's (industrialized) societies.

Due to technological change the role of books as sources of information and dissemination of knowledge, and the exchange and communication of knowledge via a variety of multimedia formats - including e-books - is emerging. This digital revolution has an immense impact on the library as a place of knowledge centred around a collection of books and information materials. Library users' behaviour is changing, the diversity in society is increasing and trends are emerging in rapid succession.

Some Challenges in India facing by Libraries

Now a day library facing some challenges in India some are:

- Effectiveness of IT based services

- Demand and supply of quality based library products and services

- Necessary of development of digital library Infrastructure

- Necessary of web based services

- Implement 4th law of library science save the time of user

- Concept of 24 X 7 services

- Resource sharing

- Advance tools and techniques of information storage and retrival

- Helpdesk

- Effective monitoring and feedback system

- Motivation of users behavior and reading habits

- Explosive growth of electronic reading information

- Increased production cost of Printed materials

- Need to develop healthy and user friendly environment

- Library networking and networks

In view of the above factors, Indian Library and Information Managers and Teachers are seriously engaged to organize various professional events and specialized training programs. Indian Library Association (ILA), Indian Association of Special Libraries and Information Centers (IASLIC), Medical Library Association of India (MLAI), Society for Information Science (SIS), Information Library Network (INFLIBNET), Developing Library Network (DELNET), Indian National Digital Library in Engineering Sciences and Technology (INDEST), Madras Library Network (MALIBNET), Society for the

Advancement of Library & Information Science (SALIS). Madras Library Association (MALA), Indian Association of Teachers of Library and Information Science (IATLIS), Libraries of Indian Institutes of Technology (IITs), Indian Institute of Science (IISc), Indian Institutes of Management (IIMs), National Institutes of Technology (NITs) various Departments of Library and Information Science of Universities are seriously engaged to update and upgrade the existing level of knowledge of library and information workers in India through conducting various professional training programs. These are the followings major areas:

- Capacity Building for specific sectors
- Implementation of Digital Libraries
- Information Literacy Program
- Implementation of Consortia Based Subscription for e-Journals/e-databases
- Creating the Awareness about the Open Source Software & Information Materials
- Creating E-Repositories and Digital Archives
- Digital Asset Management
- Creating Digital Culture
- Implementing TQM and ISO-9001: 2000
- Reorienting and redesigning the Curriculum for UG and PG Library and Information Science Programs conducted by the Departments of Library and Information Science of various Universities
- Building ICT Infrastructure
- Participation in Global Library and Information Science Activities

On conducting literature review and interaction with various professionals, it has been observed that Indian Academic Administrators of various leading technical Institutions in India are very cooperative and encouraging the Library and Information Managers to face the challenges of the changes to meet the increased and changed aspirations of users effectively and efficiently through working out an integrated and appropriate action strategy.

Capacity Building

It has been realized in every walk of life that the competency is the key to face the developmental challenges in the corporate world. It is fact that the success or failure of an individual or Institution largely depends on the level and the type of competency exist with particular institution or individual. It's known that competencies and skill are the basic building blocks of human resource management. In view of this fact, various institutions are deeply engaged in recruiting, training, evaluating, promoting, and paying for the competencies and skills available with their employees. The proper identification of employee's competencies and skills are the major concerns of various organizations globally. The competencies can be defined as the characteristics of individual, which affect the performance and behavior at work. The types of competencies, abilities, aptitude, and behavior are the main support ways of an organization's goals and strategies. The competencies have great practical and potential role to play in the development of individual and organization to ensure better results. Broadly the competencies can help individual and organization in the following ways:

- Translating strategic direction into action
- Helping to improve difficult relationships
- Clarification of behaviors that support important values and principles
- Establishment of standards of excellence
- Shifting the focus on organizational development
- Providing a base of feedback and evaluation of performances
- Inculcating open learning culture and environment
- Facilitating self directed work culture
- Creating interest for continuing development
- Promoting continuing professional education programme

Impact of Competency

The major impact of competency can be seen on the following aspects:

- Transparency and dynamism in library administration
- Closer and positive relations
- Innovation in library and information services

- ➢ Effective teamwork
- ➢ Enhanced self confidence amongst library professionals
- ➢ Flexibility and adaptability in attitude
- ➢ Increased strong interpersonal relations
- ➢ Organizational development
- ➢ Quality based library and information services

Capacity Building Roadmap for Technical Libraries

Based on experience of technical libraries, a road map can be worked out for the small, medium and large technical libraries keeping in view of the following factors:

- ➢ Self Analysis and Feasibility Study
- ➢ Developing Systems and Procedures
- ➢ Proper Documentation of Forms and Necessary Documents
- ➢ Team Building
- ➢ Resources Allocation
- ➢ Identification of Training Needs and Preparation of Training Calendar
- ➢ Strengthening Staff Users Interface
- ➢ Periodical Review and Monitoring
- ➢ Continual Improvement

Methodology

To know the importance of capacity building the researcher had conducted a empirical study in Bastar University Library with library users like teachers, students and researchers.

Sample Size   :   100

Time Frame   :   1 Month

Tolls used   :   Questioner, FGD and Interviews

Data Analysis

Table – 1

Social Characters

Variable	Percentage (n=100)
Male	68.0
Female	32.0
Respondents	
Teachers	21.0
Students	73.0
Researchers	6.0

The data revealed that 68.0 per cent of the respondents are male and 32.0 per cent were female. As regards to respondents 73.0 per cent of the respondents were students, 21.0 per cent of the respondents were teachers and 6.0 per cent were researchers.

Table – 2

Need to digitalize the Libraries

Variable	Percentage (n=100)
Yes	97.0
No	3.0

The data portrayed that 97.0 per cent of the respondents stated that the libraries needs to be digitalized and rest negated.

Table – 3

Librarians needs capacity building

Variable	Percentage (n=100)
Strongly Agree	81.0
Agree	15.0
Disagree	4.0

The data accentuated that most of the respondents (81.0%) strongly agreed and 15.0 per cent of the respondents agreed to have capacity building.

Recommendations

➢ University need to build the capacities of the librarians

➢ The universities should digitalize the libraries

References

1. *Businessdictionary.com.http://www.businessdictionary.com/definition/capacity-building.html#ixzz3BKqAI4uW.*

2. *P. Ballantyne, R. Labelle, and S. Rudgard, "In-formation and Knowledge Management: Challenges for Capacity Builders," Policy Management Brief 11 (2000).*

3. *J. Bolger, "Capacity Development: Why, What and How in Capacity Development," in Oc-casional Series. Canada: CIDA, Policy Branch, 2000.*

Motivation and Employee Engagement in the 21st Century

Ayushi Singh

Christ College, Jagdalpur, District Bastar, Chhattisgarh, India

Abstract

Employee engagement is a concept which is momentous in the 21st century. But the mode of keeping employees engaged along with the changing trends is the greatest challenge for enterprises. One probable approach of keeping employees' engaged in organization is by providing psychological satisfaction in their work, which can be done through motivation. Organizations which have employees who are meticulously motivated and engaged appear to have competitive advantage over those organizations which do not have. An attempt is made by the researcher to examine the influence of motivation on employee engagement. Results indicate that there exists a positive relationship between motivation and employee engagement. Hence it can be implied that motivation is a means of keeping employees' engaged in organizations.

As from past several years, 'Employee Engagement' has been a hot topic in the corporate circles. It is a buzz word that employers think they understand, but face difficulties and challenges while practicing. Many organizations copy 'Employee Engagement' activities from the best practices, looking at the benefits enjoyed by their competitors; however , most lose track after a few strides ahead. 'Employee Engagement' cannot be a cosmetic intervention in enhancing commitment towards job, motivation or productivity. Corporate culture has an important role in enduring positive impact of such engagement programs. This article throws light on how 'Employee Engagement' can be increased. This work also tries to identify the key drivers of 'Employee Engagement', its different attributes together with the ways to measure it, how to handle disengaged employees and modern 'Employee Engagement' practices in corporate. Findings from various researches and surveys are used in the present work to measure the effect of 'Employee Engagement' which includes issues like productivity, profitability, focus on customer and various other related matters.

Keywords: Employee engagement, psychological satisfaction, motivation, Corporate Culture, Commitment towards job, Productivity, Profitability.

Introduction

The concept Employee engagement is rapidly gaining popularity, use and importance in the workplace. Employee engagement scales typically combine job satisfaction, organizational commitment and other performance-related signs of an engaged employee. A recent synthesis of approaches to measuring employee engagement identified three dimensions of engagement: emotional, rational, and behavioural. Employee engagement is the psychology of how each employee connects with customers and with the organization. Engaged employees feel a strong emotional bond to the organization that employs them, which results in higher retention levels and productivity levels and lower absenteeism. Employee engagement is influenced by factors like corporate values, communication, nature of the work and many more.

Motivation is an employee's intrinsic enthusiasm about and drives to accomplish activities related to work. Motivation is that interior drive that causes a person to decide to take action. An individual's motivation is influenced by biological, intellectual, social and emotional factors. Motivation is an emotional fact which means needs and wants of the organization have to be tackled by framing an incentive plan. It is the process of inspiring people to actions to achieve the goals. In the work goal background, the psychological factors motivating the people's behavior can be Leadership style, the reward system, organizational climate.

The relationship between engagement and motivation is a two faced; improve one and you also improve the other. So the key to understanding how to benefit from improved levels of engagement is firstly to understand what motivates us – why do we really do the things we do..? To understand what really motivates us we need to strip away all the factors which might merely influence us; in other words, we need to identify what lies at the very heart of our motivation to do something.

As the best resources to any organization is always its human resources, the attainment of an Work place with high caliber employees are the key to success & the way to set

competitive advantage in the global scenario. A well functioning organization is the product of its healthy, committed and motivated employees, who can be termed as 'engaged employees'. Engagement takes place when employees are committed to their job. They are interested and indeed excited about what they do. It involves loyalty, faith and pride in the organization, a willingness to advocate for his organization and a sense of personal responsibility. Global economy has experienced significant shifts in the recent past which have accelerated the need for organizations to find innovative ways to address new technological, demographic and market place realities. These shifts made the organizations to re evaluate costs associated with talent. High workforce performance and organizational success must be maintained along with changes in strategies. Research has consistently shown that employee engagement is powerfully linked to a range of business success factors such as:

1. Employee performance/efficiency

2. Productivity

3. Safety

4. Attendance and retention

5. Customer service and satisfaction

6. Customer loyalty and retention

7. Profitability

During economic down turn, many organizations focused less on how to manage their talent and engage their employees, instead focusing on how to reduce costs by cutting salaries, bonuses, rewards and development costs. Some short sighted leaders may even think that employee engagement no longer matters because their employees have fewer options and will stay because of their need for job security. However, smart leaders realize that while they may need to find short term solutions to cut costs, they must also identify longer term talent management strategies to remain viable.

Once the focus of a debate held predominantly among organisational psychologists and business academics, Employee Engagement has become one of the most heavily

marketed HR 'buzz words' around – but how compatible is it with so-called 'constrained' work, where opportunities for enrichment and intrinsic reward are apparently limited? Is it realistic to expect that engagement and discretionary effort can be harnessed among people in 'constrained' jobs?

Over the past decade, employee engagement has emerged as a core priority for business strategists and senior leaders in a bid to improve organisational performance. The collection and benchmarking of employee engagement data has also become a profitable industry in itself, with many HR consultancies offering organisations the opportunity to measure the engagement levels of their workforce.

Challenges:

In the last 2 decades of 20th century, there has been a fundamental sectoral shift in employment away from manufacturing and the public sector – sectors renowned for more formalized HR systems, high levels of trade union membership, and larger employment units – towards the more informal, relatively trade union free and smaller employment units of the service sector. This trend is continued in the first decade of 21st century. Retention of these knowledge workers is a challenge to these organizations. The second challenge, being faced by the employers, is planning and developing employee engagement strategies without any solid research base; in the process it loses the focus and momentum.

Objectives:

1. To assess the relationship between employee engagement and motivation.

2. To assess the impact of motivation on employee engagement.

3. To assess the findings on the effect of employee engagement on productivity, profitability, customer satisfaction.

Methodology

The purpose of the study is to assess the relationship and impact of motivation and employee engagement. To fulfill the objectives of the study a observation method has

been prepared in consultation with the experts. Also to accomplish the purpose of the study the researcher has collected necessary information from employees of various organisation.

Research Design

The research work is based on Experimental and Observation research design which evaluates the role and causal relationship between motivation and employee engagement.

Data Collection

Data is collected through both primary and secondary sources.

Primary data is collected through direct observation method.

Secondary data is collected from various journals, research articles, websites for compiling and reviewing the literature.

Findings

In the Study nine performance outcomes were studied: Customer loyalty/engagement, profitability, productivity, turnover, safety incidents, shrinkage, absenteeism, patient safety incidents and quality (defects). Employee engagement is related to each of the nine performance outcome studied. Results show consistent correlation across different organizations. The correlation between employee engagement and composite performance found to be 0.48. Findings showed correlations between job satisfaction and organizational commitment translate into lower turnover. Thus higher levels of employee commitment, i.e., how likely they were to stay with the organization, indicate higher levels of employee engagement. According to Gallup, there are three types of employees in an organization –

1. **Engaged** – These employees are the builders. They are eager to know the expectations from their role so that they can meet and exceed them.

2. **Not Engaged** – These employees tend to concentrate on tasks rather than the goals and outcomes. They need others to drive them.

3. **Actively disengaged** – These employees are consistently against virtual everything. They are not just unhappy at work they show their unhappiness openly. In world class organizations, the ratio of engaged to actively disengaged employees is: 9.57: 1. In average organizations, the ratio of engaged to actively disengaged employees is 1.83:1Studies by Gallup organizations released in 2013 show that only 29% of workers were engaged in their work, 54 % were not engaged and 17% were actively disengaged. Employee engagement creates greater motivation within employees for the work they do and increases their commitment to the organization. It is about creating an enthusiasm for their roles, their work and the organization and ensuring they are aligned with the values of the organization, well informed and well integrated with their colleagues and the culture of the organization.

As per the 2013 Association for Training and Development (ASTD) Employee Engagement study, top 3 business benefits derived from engagement are –

1. Enhance customer service and drive customer satisfaction.

2. Improve organizational productivity

3. Improve the bottom line.

Top 3 factors that positively influence employee engagement are –

1. Quality of training and learning opportunities

2. Learning through stretch assignments

3. Frequency of learning opportunities.

An IRS Survey in 2014 established that the following were the top five influences on commitment and employee satisfaction. :

1. Relationship with Manager : 63%

2. Relationship with Colleagues : 60%

3. Quality of line management : 62%

4. Recognition of contribution : 56%

5. Leadership : Visibility and confidence : 55%

Global Workforce study showed that 21 % of employees were engaged, 41% were enrolled, 30% were disenchanted and 8 % were disengaged. Recent researches by Towers Perrine found that the level of employee engagement had an interesting relationship to retention indicators. Researchers found that although higher levels of engagement indicate higher levels of retention those in the 'engaged' group still passively seek new jobs. They also found that 15% of actively disengaged employees do not seek other employment.

Though Indian firms have benefited from rapid growth and healthy profitability, HR processes have suggested keeping up with the growth and dynamic nature of India's workforce. Right Management study showed that organizations that seek to improve engagement measures experience significant differences country wise in engagement levels from 45% in India to only 11% in Japan.

Conclusion

After reviewing research & survey findings , it can be certainly concluded that high levels of employee engagement will lead to improved employee commitment & involvement towards job and thus creating a motivated workforce – that will work together to achieve the common goals of the organization . Highly engaged workforce will definitely make an organization more successful in terms of financial & nonfinancial parameters. Engaged employees demonstrate three general characteristics:

(i) Say – They consistently speak positively about the organization to colleagues,

customers, family & friends.

(ii) Stay – They have strong desire to be with the organization even if they get job offers outside.

(iii) Strive – They put in extra time, effort and initiative to contribute to business performance.

Employee Engagement depends on four major conditions in the workplace: Organization's culture, continuous reinforcement of people focused policies, meaningful metrices and organizational performance. Corporate culture helps an organization to connect with the employees, gives them empowerment in decision making process and develops them to shoulder greater responsibilities. Continuous reinforcement happens when an organization frames policies which act as facilitator towards accomplishment of goals by the employees and thereby the organization itself. Meaningful metrices refers to devising performance measurement criterion in such a way that employees are clear about their goals.

Organizational performance leads to pride, job satisfaction, trust and a sense of belongingness to the organization. Employees should have the feeling that they possess the right kind of physical, cognitive and emotional resources to perform their job at optimum level. An organization should also know how to project and communicate the success stories of the organization to the employees. Thus employees are able to relate their individual performances with the success and also understand how their performance has a direct impact on the performance of the organization as a whole. This contributes towards enhanced employee engagement. The employees, who perceive their organization to be the best place to work, contribute more. High engagement leads to higher financial performance, higher productivity, higher customer satisfaction and lower manpower turnover.

References

1. *Making performance work effectively: - Philip Tom: McGraw Hill Book Company: England: 1983.*

2. *Principles and procedures in evaluating performance: John C. Flanagan: volume 28.*

3. *Research Methodology Methods and Techniques: Kothari C. R.: Willey Easter: New Delhi.*

4. *P. Jyothi, P., Venkatesh, D.N., Human Resource Management*

5. *Kothari, C. R., Methods and Techniques, New Delhi, New Age International Publications.*

6. The Employee Engagement Equation in India: Presented By Blessing White.

7. Employee Engagement: Maximizing Organizational Performance: Right Management.

8. The Economic Case for People Performance Management and Measurement – Profile International

9. "An Empirical Analysis of the Relationship between Employee Attitudes,

Customer Attitudes and Customer Spending

10. Employee Engagement & Corporate Culture Research Study – by White Board

11. The Godrej House Magazine and Gallup Management Journal, referred during April 2011.

12. Engaging the Aging Workforce: The Relationship between Perceived Age Similarities, Satisfaction with Co workers, and Employee Engagement. Derek R. Avery & Patrick F. McKay (Journal of Applied Psychology 2007, 92(6), pp 1542– 1556)

13. Reengaging with engagement – Economist Intelligence Unit – The Economist

14. Engaging and enabling employees to improve performance outcome: Hay Group Insight, Hay Group's survey research division, 2009

15. http://www.mobilityagenda.org/gallup.pdf, accessed during April 2011.

16. Time Magazine.

17. CfA Business Skills @ Work. (2012). Contact Centre Operations Labour Market Report. London: CfA Business Skills @ Work.

18. www.wiki.com

19. www.google.com

SDIS-048

Use of Internet by B.Ed. Students of Christ College Jagdalpur

Sohan Kumar Mishra

Christ College Jagdalpur, District Bastar, Chhattisgarh, 494001, India

Abstract

This study wants to examine the use of internet by B.Ed. Students of CHRIST COLLEGE Jagdalpur. The present study proved that 100% Students were aware to use internet services. The objectives of the study are satisfactorily most of the students are satisfied with internet service available to them. A well structured questionnaire was distributed among the 80 students of the college.

The convergence of information and communication technologies as typified by the Internet is increasingly having more influence on all aspects of the society as it has become an integral part of the daily lives of many people. It has had a transformative impact on the mode of information sharing and access globally. Information and knowledge disseminated through the slow process of oral communications or with paper materials can now be transferred rapidly from an individual to an infinite number of users through a number of media and formats. The Internet is the fastest growing communication technology and has emerged as a major source of information that connects people, data and other computers.

Introduction

The Internet plays an important role in the field of teaching, research and learning. Internet is a most important in our Education and personal life. Internet is considered a vital part of human life in the 21st century. It has changed the way of seeking information. The Internet has made tremendous impact on the academic activities with the students. With the use of Internet, a significant transition can be seen in their approach and the way they seek information and the methods they employ for research and learning activities. Internet is now facilitating. This paper is based on a survey given to student of B.Ed. students of college.

About Jagdalpur

Jagdalpur is a city and a municipality in Bastar district in the Indian state of Chhattisgarh. Jadgalpur is the administrative headquarters of Bastar District and Bastar Division, and was the capital of the erstwhile princely state of Bastar. Jagdalpur is well known for its greenery, filled with lush green mountains, deep valleys, dense forests, streams, waterfalls, caves, natural parks, magnificent monuments, rich natural resources, magic herbs, exuberant festivity and blissful solitude, Bastar, the very name spells magic, conjures up images of the royal past and the tribes.

As of the 2011 census, Jagdalpur municipality had a population of 100,00,000 . The municipality had a sex ratio of 961 females per 1,000 males and 11.0% of the population was under six years old. Effective literacy was 85.44%; male literacy was 91.51% and female literacy was 79.16%.

Background of Christ College

Christ College (Jagdalpur), was founded in 2001 by Carmelites of Mary Immaculate (CMI), with a view to blend sacred and secular education. It is a self-financing religious minority institution for higher education affiliated to Bastar Vishwavidyalaya, Jagdalpur. CMI is the first indigenous religious congregation in India with a membership of more than 2000. It renders service to humanity in educational, social, healthcare and other fields aiming at integral development. From the early decades of 1970s, CMI has been dedicated to uplifting the lives of people of Bastar district. CMI has been instrumental in establishing the following institutions in Jagdalpur. Nirmal Vidyalaya Nirmal Province Vidya Jyoti School M.P.M. Hospital The planned and efficient leadership and farsightedness of the pioneers of this mission resulted in the establishment of Christ College, Jagdalpur.

Objectives of Research

1. To find out the purpose of using Internet
2. To Know the Place of access to Internet

Methods

The questionnaire method has been used to collect data for the present study and to select the sample population. Target sampling method has been used. The questionnaire was distributed among B.Ed. students of Christ College Jagdalpur.

Hypotheses

Table- 1 describes the place of access to internet. The Students are mostly use the internet in Library 60(75%) and Home 15(18.75%), Cyber cafe 5(6.25%),

All B.Ed. Students use internet.

Analysis of Data

Describe the use of internet by B.Ed. Students. It is evident that all B.Ed. Students are using the Internet. It also indicates that the information available on the internet has proved to be a great asset for many of the respondents. Total 80 Students were given the questionnaires, all questionnaires filled by the students.

1-Place of access to Internet

Table 2: Place of access to Internet

S.N.	Place	No. of Respondents	%
1	Library	60	75
2	Home	15	18.75
3	Cyber Cafe	5	6.25
	Total	80	100
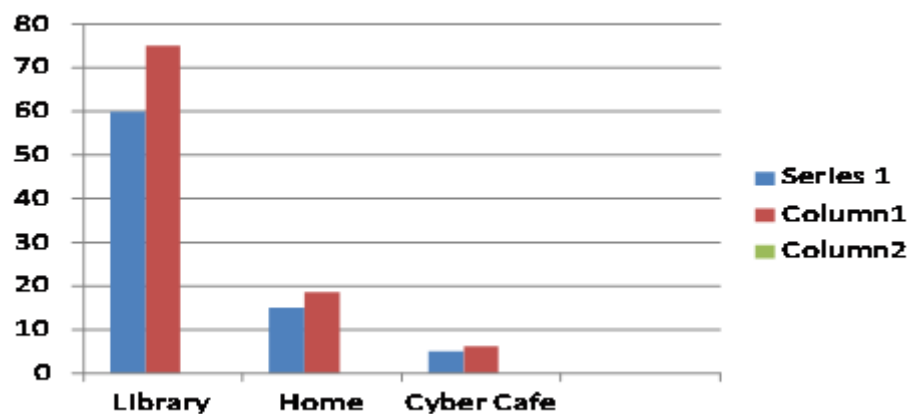
2- Purpose of using Internet

S.N.	Purpose	No. of Respondents	%
1	For Entertainment	5	87.50
2	For Seminar	70	6.25
3	For General Purpose	5	6.25
	Total	80	100

Table -2 describes the Purpose of using Internet. The Students are mostly use the internet I for Entertainment 5(6.25%), Seminar 70(87.50%), and General Purpose 5(6.25%),
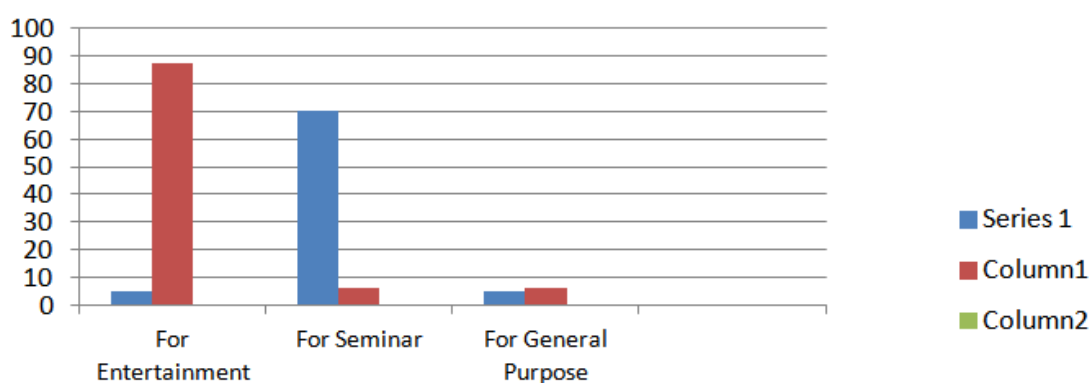
Conclusion

The Internet has provided a lot of information. The Internet is an inseparable part of today's educational system. The dependency on the Internet and its services is increasing day by day and the users of colleges too are depending more and more on the Internet for their various educational purposes. The Internet facility has enabled the students to enhance their academic achievement.

References

1. *Internet Use by Teachers and Students in Engineering Colleges of Punjab, Haryana, and Himachal Pradesh States of India: An Analysis :-Rajeev Kumar, Library Assistant Shaheed Bhagat Singh College of Engineering & Technology, Ferozepur, India*

2 *Use of Internet By P.G. Students of Bastar Vishwavidyalaya Jagdalpur:- D.S. Mahipal.*

Webliography

1. *www.christcollegejagdalpur.in*

2. *www.bvv.jdp.ac.in*

Questionnaire for Internet Users

Please tick mark (√) where necessary.

Name --

1-Place of access to Internet

PLACE	Yes	No
Library		
Home		
Cyber Cafe		

2- Purpose of using Internet

PLACE	Yes	No
For Entertainment		
For Seminar		
For General Purpose		

SDIS-049

Analysis of Modus Operendi of Marketing Federation in Chhattisgarh

Vikas Dua & Anju Verma

AVS Presidency International College, Raipur, India, duavikas13@gmail.com

Abstract

Agriculture is the chief economic occupation of Chhattisgarh. According to the government the gross sown area is 5.788 million hectares (approximately). About 75% of the total population of the state lives in rural area and their main livelihood is agriculture and agriculture based small industries. Here the agriculture is characterized with small and medium size holding, low income generation, low saving, and exploitation of farmers; as a result the farmers are not able to utilize their land optimally. In order to overcome this problem the farmers make a group of 20 or more; and create cooperative society and which is registered under Chhattisgarh Cooperative Society act 1960. The total number of registered cooperative societies in state is 8266 out of which the primary farmer federation societies are 1333. These cooperative societies joined together and formed Cooperative Marketing Federation (MARKFED). The Chhattisgarh State Cooperative Marketing Federation Ltd is a semi-government organization and is an apex level federation of Cooperative Marketing Society in Chhattisgarh. The some major activities of MARKFED are: marketing of agricultural inputs such as pesticides and chemical fertilizers, paddy procurement kharif marketing year, storage facilities and kisan rice mills, etc. The whole working of Chhattisgarh State Cooperative Marketing Federation Ltd is computerized through National Information Center (NIC). The paper focuses on the modus operendi (modes of operation) of the MARKFED and the people who are benefited and how. The study will be based on the efficiency parameters relating to the promotion of excellence, improvement of operational efficiency, training and strengthening of financial resource base and the growth and development of cooperatives and people associated.

Key Words: MARKFED in Chhattisgarh, Chhattisgarh Market, Modus Operendi, Benefits

Introduction

India is the third largest nation holding the land capacity and it is fifth largest economy in the world. India is full of diversified culture, religion, caste and crude with "unity in diversity." Agriculture, with its allied sectors has the largest contribution in the Indian economy, as it is the largest livelihood provider in the India. Most of the industries also depend upon the agriculture sector for the raw-materials. Indian agriculture has undergone a rapid transformation in the past two decades with globalization and liberalization.

Chhattisgarh is a state in central India and is about 10th largest state in India with an area of 135,190 km², with a population 25.5 million, and is 16th most populated state on the nation. Chhattisgarh is one of the emerging states with relatively high growth rates of Net State Domestic Product is 8.5% and reach Rs. 91,933 crore in 2012-13 (Survey February 22, 2013). Chhattisgarh is also known as Dhaan ka Katora".

Agriculture is counted to be the major occupation of the state. According to the government estimates net sown are of the state is 4.828 million hectares and gross sown area is 5.788 million hectares. Major crop of the state include paddy, wheat, maize, gram, pulses, oilseeds. About 80% of the total population of the state lives in the rural areas and their main lively hood is based on agriculture and agriculture based small industries. Majority of the farmers still practice traditional method of cultivation and dependent on the monsoon for irrigation. Which results in there low productivity and low growth rate.

Rural area are characterized with the small holding of land, low productivity, less money to invest, low income generation, etc. leading to exploitation of the farmers. In order to overcome this problems farmers join together to form a society (20 or more). These societies are called the cooperative societies when registered to the registrar of cooperative society. All the cooperative societies come to a common platform and form an organization called Chhattisgarh State Cooperative Marketing Federation Ltd. Raipur

Chhattisgarh Marketing Federation

The apex level federation of cooperative marketing societies in the Chhattisgarh State is Chhattisgarh State cooperative Marketing Federation Limited, Raipur. This organization came in to existence with the creation of Chhattisgarh State on 1st November 2000. The

marketing federation brings all the cooperative societies together for the purpose of supporting the small and limited farmers in the state for their financial growth and development with the ample amount production of crop and also to avail the basic requirement for the production. It carry out the work of collection of paddy produced and make sure that the paddy so produced by the farmers are taken at the minimum support price as ordered by the government in order to check the exploitation of the farmers from the middlemen.

The state government of India has appointed marketing federation as an agency under the minimum support plan. There are 8266 registered cooperative societies in the Chhattisgarh state. With the direction of the state government from 1333 Primary Farmer Credit Cooperative Societies the procurement of the paddy is done since 1975. In the year 2007-08 the whole work of the credit societies are made online so as to ensure the efficiency and effectiveness in the work along with maintenance of transparency. This online procurement scheme was appraised by the state government and given the award of E- governance.

CG MARKFED is wholly a semi-government company, which is engaged in promoting the agro potential of the Chhattisgarh. The whole work of the CG MARKFED is done on the credit basis. A part of finance taken from the budget approved by the State Government, some part is done after the procured crop of the season is sold out in the market and some part is taken from the public and the other banks like NABARD, NCDC and other financial institutions. The major activities of the CG MARKFED are:

- Marketing of agriculture inputs like; fertilizers, pesticides, seeds, etc.
- Paddy procurement of Kharif marketing year.
- Milling of produced paddy.
- Storage facilities.
- Cattle Feed Factory
- Chemical fertilizers business
- Plant protection business
- Providing incentives declared by the central government as well as state government on different incentive schemes

Research Objectives

This paper emphasis on how efficiently and effectively the work of the CG MARKFED are carried. The main objective of this paper is to find out the modes of operation of CG MARKFED.

- To find out the modus of operation for the distribution of the fertilizers and the paddy seeds.
- To find out the modus of operation for the procurement of the paddy as an output.
- To find out the level of the level of transparency maintained by the organization.

Research Methodology

The present study is descriptive in context with the modus operendi of CG MARKFED. The primary data was collected from the different people associated with the CG MARKFED. The secondary data were collected from the reliable data base of the CG Government and the departments of CG MARKFED.

CG Markfed Modus of Operation

CG MARKFED is a nodal agency which is engaged in the providing the inputs to the farmers through cooperative societies and procuring the paddy so produced in the state by the farmers with a minimum support price as decide by the state government. The whole work of providing inputs i.e. fertilizers and pesticides by Markfed and procuring the output i.e paddy is done by National Informatics Centre (NIC) both online. Working of the CG MARKFED is divided into two parts they are as follows:

Providing Inputs

CG MARKFED provides the inputs to the cooperative societies in the form of fertilizers. The fertilizers are UREA, DAP, SSP, NDP, MOP and others. Distribution of the fertilizers all over the state is done online since the year 2010-11. This application software is developed and implemented by the CG MARKFED itself. Fertilizer distribution of in the state is done in two seasons.

- Kharif season: which starts from the 1st April to 30th September
- Rabi Season : which starts from 1st October to 31st March.

Year	Target	Storage		Lifting	
		Quantity (metric ton)	Amount Rs.(crore)	Quantity (metric ton)	Amount Rs.(crore)
2011-12	795000	702567	627.47	688406	533.85
2012-13	832000	940282	1216.49	697680	889.11
Kharif 2013	1698100	654687	796.90	554719	668.54
Rabi 2013-14	230000	203159	273.45	114339	156.16
Possible supply till date 2013-14		100536	174.31	42322	85.43

The State Government in the yearly budget makes the target for the year in the two seasons. The table shows the details of the target and lifting of fertilizers in the state since 2011 to 2014.

The following table shows the target and the supply done by the MARKFED in the years.

Year	Target credit distribution (in lakhs)	Supply of credit (in lakhs)	% of credit
2011-12	180000	148126	82
2012-13	210000	204201	97
2013-14 (31.12.13 till)	300000	216302	72

In the 27 districts of the state the fertilizers are distribute with the 1333 primary cooperative societies. These cooperative societies have 107 fertilizer storage centers through which the target set by the state government is made. The effective fertilizer distribution of the fertilizers is possible through the online distribution system. Following is the process of the process of online distribution of fertilizers:

Step 1: With the direction and the target given by the State Government the purchase order is released by the CG MARKFED head quarter. This is done in the form of request of tenders from the various fertilizer supplying companies. The quotation price of the company is less the order is released by the head quarter.

Step 2: The fertilizers supplied by the fertilizer companies is being allotted to the 107 various fertilizer storage centers of the 1333 cooperative societies. This cooperative society's send requirement to the various financial institutions for the requirement of the

money and bank provide the money in the form of DD or release order RO to the cooperative societies.

Step 3: After the receipt of the money the fertilizer storage centers send a confirmation to the CG MARKFED head quarter which is being supplied to the fertilizer companies and the fertilizers are supplied to the Railwal Rack Points of the fertilizer storage centers.

This whole work is done online and all the bodies associated with the distribution of the fertilizers are registered under the CG MARKFED. Year wise growth of the fertilizer distribution in both the season is as follows:

Khariff Year Wise Fertilizer Sale (Values in Mt.)

Rabi Year Wise Fertilizer Sale (Values in Mt.)
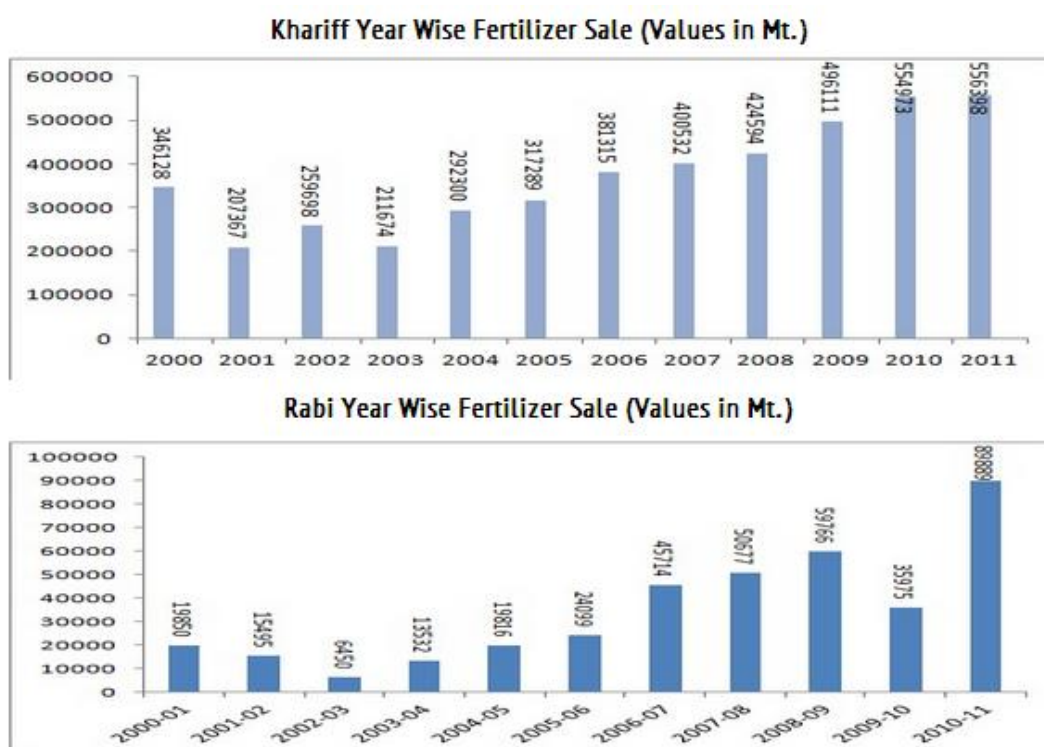
Target fixed for the distribution of Fertilizers

Year	Distribution target (in tonn)	Fertilizers distribution (in tonn)	Amount (in lakhs)
2011-12	795000	688406	70238
2012-13	842000	697680	88897
2013-14(31.12.13 till)	928100	564088	69021

Procuring outputs.

Paddy is the major crop produced in the Chhattisgarh state because of the climatic conditions of the region. The pre hectare land is expected to produce at least 50 kg of rice. In this year the procurement of rice is around 80 lack million ton. This is procured from the registered farmers in the cooperative societies. There are 1333 cooperative societies in the state and these societies have 1975 procurement centers. The cooperative society's purchases paddy in two forms common and grade A. This paddy is procured for a minimum support price set by the State Government. Following is the table showing the price of paddy:

Year wise MSP price list of Paddy ::

| | | | Price in Rs. | |
| | | | Bonus | |
KMS-Year	Commom Paddy	Grade-A Paddy	Central Government	State Government
2000-01	510	540		
2001-02	530	560		
2002-03	530	560	20	
2003-04	550	580		
2004-05	560	590		
2005-06	570	600		
2006-07	580	610	40	
2007-08	645	675	100	
2008-09	850	880	50	220
2009-10	950	980	50	50
2010-11	1000	1030	0	50
2011-12	1050	1080	0	0
2012-13	1250	1280	0	270
2013-14	1310	1345	0	0

The procurement of paddy is also done online through the National Informatics Centre (NIC). With the online trading the paddy procurement has touched new heights which are shown in the following table:

Year wise paddy procurement

	Quantity in MT and Price in Crore		
S.No.	KMS-Year	Paddy procurement Quantity	Price
1	2000-01	463104	243.84
2	2001-02	1334227	725.46
3	2002-03	1474382	823.48
4	2003-04	2705067	1519.95
5	2004-05	2886730	1651.9
6	2005-06	3586742	2089.98
7	2006-07	3714281	2384.96
8	2007-08	3151005	2074.56
9	2008-09	3747000	3225.8
10	2009-10	4408696	4238.15
11	2010-11	5073384	5131.06
12	2011-12	5900572	6436.09
13	2012-13	7121939	8992.44

The procurement of paddy is done in the following steps:

Step 1: The paddy is purchased from the farmers with the minimum support price from the 1975 procurement centers of the cooperative societies in common or grade A form.

Step 2: This paddy is procured in the form of LAMPS and PACS in the cooperative society or the 80 storage centers of the MARKFD.

Step 3: The paddy procured is issued to the millers for converting them into rice. The miller has to be either the producer of Raw Rice (Arva) or Bioled Rice (Usna). This millers are registered online under the food officer on behalf of the collector. The miller takes permission from the District Marketing Office, and signs the agreement for producing the rice against CMR of Bank guaranty. This CMR is the 67% Raw Rice (Arva) or 68% Boiled Rice (Usna) of the total production of rice the miller wants to produce. Then the District Marketing Office issues the Delivery order to the Miller.

Step 4: The CMR is thus submitted to the Food Corporation of India (FCI) or Nagrik Aapurti Nigam (NAN) which issues the delivery of the paddy. The order is done in the lot basis, each lot comprises of the 250 quintals.

Findings

From the above study it was found that there was a growth in the distribution of the seeds and fertilizers after the trading of CG MARKFED is done online as compared to the years before 2007- 08. There was a substantial growth in the paddy procurement after the year 2007-08 from which the trading was made online. There was full transparency in the working of the CG MARKFED as all the work is done online and the data are cross verified from the other parts of the whole system.

Conclusion

With the growth and development of the economy the growth of the technology leads to the remarkable changes. In every State of the country MARKFED exist and works but CG MARKFED with its remarkable work has become a nodal agency, who work with the farmers, for the farmers and by the farmers. It has maintained transparency and reduced exploitation by doing all the process through online and has eliminated the middle men. With the help of this system the distribution of 5, 54,719 metric ton fertilizer was distributed in the year 2013 and the procurement was done about 80 lakh metric ton in the year 2013.

References

[1] Wikipedia, http://en.wikipedia.org/wiki/Chhattisgarh

[2] Markfed, http://cgmarkfed.in/msp%20of%20paddy.htm

[3] Markfed, http://cgmarkfed.in/eprocurement.htm

[4] Markfed, http://cgmarkfed.in/msp%20of%20paddy.htm

[5] Economics times, http://articles.economictimes.indiatimes.com/2013-08-30/news/41618996_1_gdp-foodgrains-allied-sectors

[6] Business standards, http://www.business-standard.com/article/economy-policy/agriculture-s-share-in-gdp-may-fall-to-13-7-in-fy13-113031500309_1.html

[7] Agriculture, http://www.ibef.org/industry/agriculture-india.aspx

[8] India Fact Sheets,

    http://www.in.undp.org/content/dam/india/docs/chhattisgarh_factsheet.pdf

[9] Fertilizer, http://cgurvarak.in/

[10]   Paddy procurement, http://cg.nic.in/khadya/

SDIS-050

Learning: Paradigm Shift in Education

Sonali Channawar

MAT's University, Raipur, Chhattisgarh

Abstract

The main aim of the article to study the of paradigm shift in education that means we change the way of teaching-learning strategies, method, pattern and activity in an act. The concept of paradigm shift offers one means of making such connections. Paradigm shift as a change from one way of thinking to another. In education standard shift, technology evolves and student habits change, schools are being forced to consider new ways of framing curriculum and engaging students in the classroom.

This article describes nine learning model of Wendell Berry. .These nine changes are: Learning Actuators (motor), Changing Habits in learning, Transparency in Teaching and learning, Self-Initiated transfer of creative learning, Mentoring and community in learning Programs, Changing Roles in Learning, and Climate of assessment, Thought and Abstraction, Expanding Literacy.

Introduction

Learning is the act of acquiring new, or modifying and reinforcing, existing knowledge, behaviours, skill, values, or preferences and may involve synthesize different way of information. Education in its general sense is form of learning. In which knowledge, skill and habits of group of people are transferred from one generation to the next through teaching training, research, or simply through auto didacticism. Generally, it occurs through any experience that has a formative effect on the way one thinks, feels, or acts.

Paradigm is a distinct set of concept or thought patterns, including theories, research methods, postulates and standard for what constitutes legitimate contributions to a field. Paradigm shift as a change from one way of thinking to another (In 1962, Thomas Kuhn).the term used first by the us science theorist and historian Thomas Kuhn (1922-96).In this book" The structure of scientific thinking and practices operates.

The paradigm shift 4 goals of 21ˢᵗ century learning

1. Self-Knowledge

2. Meaningful community interaction

3. Adaptive critical thinking

4. New (digital) media area

This shift involves the adoption of a new outlook on the part of researcher and other in that community. The term "paradigm shift" has been used as a means of thinking about change in education.Project based learning is among the most successful and powerful of these possibilities. As both a planning and a learning tool, project-based learning challenges teachers to make new decision about how they plans student learning experiences, while simultaneously empowering students to take amore active role in the learning process.

Principal that guide this change in learning process.

An instruction paradigm, in which an instructor transfers knowledge to students to learning paradigm, in which a teacher's role is that of

1] Student and teacher share responsibility for the quality of the student's learning process.

2] Compulsory motivation, for both student and teacher is satisfaction derived from improving the quality of each student's learning.

Discuss learning model inspired by Wendell Berry

1] Learning Actuators (motor)

Learning actuators is a type of motor that is responsible for moving or controlling a mechanism or system of learning. It is operated by a source of energy, typically electric current and converts that energy into motion.

1. Project based learning

2. Directed and non-directed play

3. Video games and learning stimulations

4. Connected mentoring academic practice

2] Changing Habits in learning

Changing habits can be thought of a mental attitudes and behavioral practices that facilitate a student's learning and make both learning and development possible during schooling. These habits are at the core of how a student learns and are the methods through which they assimilate any course material.

1. Acknowledge limits and scale

2. Reflect on independence

3. Honor uncertainty

4. Fertilize innovation and design.

5. Require versatility in face of change.

3] Transparency in Teaching and learning

The transparency in teaching and learning project aims to improve higher education teaching and learning experiences for faculty and student through two main activities

- promoting students conscious understanding of how they learn ,and

- Enabling faculty to gather, share and promptly benefit from current data about student 'learning by coordinating their efforts across disciplines, institution and countries.

1. Between communities learner and school.

2. Learning standards outcomes.

4] Self-Initiated transfer of creative learning

A self-initiated activity is an activity wholly decided on by the child and is the result of an intrinsic motivation to explore a project, or express an idea. In doing this the child may make use of a variety of resources demonstrate a complex range of knowledge, skill and understanding.

1. Applying old thinking in constantly changing and unfamiliar circumstance as constant matter of practice

2. Project based learning, blended learning and place based education available to facilitate highly constructivist approach.

5] Mentoring and community in learning Programs.

Mentoring is one of the oldest forms of teaching. Our parents and grandparents are our earliest mentors; later, we may be mentored by- or act as mentors to brother, sister and friend. Mentoring and community in learning programs work because they provide encouragement and guidance to each adolescent or child that participates.

1. "Accountability" via the performance of project based ideas in authentic local and global environments.

2. Local action-global.

3. Active mentoring via physical and digital networking.

4. Commercial constructivism, Meta cognition and cognitive coaching.

6] Changing Roles in Learning

Greatest change in schools today is not the integration of technology, not the way classrooms are being built, not even the changes in curriculum and assessment, but that the role of the teacher in the classroom is being transformed in ways and also a learner change his role in classroom.

1. Learner as knowledge makers.

2. Teachers as expert of assessment and resource.

3. Classrooms as think-tanks.

4. Families as designers and content resource.

5. Extensive mentoring from relevant organizations.

7] Climate of assessment

1. Constant minor assessment replace exam

2. Data stream inform progress and suggest pathways.

3. Academic standards functioning as anchors

4. Products simulation performance, self knowledge delegates academia to new role of refinement of thought.

8] Thought and Abstraction

Thought is the process or power of thinking. Abstraction begins with action, with lines drawn and a cleavage made. It is commonly used as quantity that can be possessed we can speak of abstraction in painting, in poetry, in thought, in any number of media –yet fundamentally the term necessitates a move, and one with direction.

1. Abstraction honors not just art, philosophy and other humanities, but the uncertain, incomplete and subjective nature of knowledge

2. In this model, struggle and abstraction are expected outcomes of increasing complexity and real world uncertainty.

9] Expanding Literacy

Literacy has a truly become a keystone for all other learning and it   is very important to develop in every student for literacy skill.

1. Analyses, evolutions and synthesizes credible information.

2. Media design for authentic purpose.

"Research is a bricks. Educated institution is the mortar. It's impossible   to construct a worthy structure without either one"-Dr. Michael Allen, Ezine January 26,2006.

 To learn is the change .Education is a process that changes the learner.

Conclusion

In this article, we studied that many of changes from an underlying paradigm shift .By examining this shift and looking for connections between various changes in our field, these changes can be better understood. Implementation change is difficult. Perhaps this is where the nine changes we discussed, teacher as co-learner, play the crucial role. We need to change the therapy of learning and paradigm shift is necessary to learner for their development. So that we can continue to help our field develops. It is also important to pull teaching back toward the traditional paradigm, even when teachers and others are striving to go toward the new paradigm.

 Bibliography

1. *Ausubel, D.P.(1968).Educational Psychology: A cognitive View. New York Holt, Rinehart, and Winston*
2. *Jacobs,G.M(2001)Paradigm shift: Understanding and implementing Change in Second language Education Vol.5.No.1,A-1.*
3. *Lawrie,J.(1987).How to establish a mentoring program. Training and Development Journal, 41(3), 25-27.*
4. *Princeton Encyclopedia of poetry and Poetics. Entry for "Concrete and Abstract"Princeton Up,1974.*
5. *The Oxford desk Dictionary and Thesaures.American Edition.Berkley Books.Oxfored UniversityPress, Inc.1997.*
6. *Thomas Kuhn.Princeton and London:Princeton University Press and Acumen Press,2000.ISBN 1-902683-10-21*
7. *TurchinV.Abstraction.1997.http:11pespmc1.vub.ac.bc/ABSTRACT.html.*
8. *Vygotsky,L.s. (1978).Mind in Society(ed.by M.Cole,V.John-Steiner,S. Scribner,and E.Souberman).Cambridge,MA:Harvard University Press.*

SDIS-052

Conflict status on facilities and conditions of primary education structure in C.G

Dr. Ashish Dubey & Swati Tikam
Vivekanand Mahavidyalay, Raipur

Abstract

The purpose of the paper is to find out the changes and development in the Education structure in Chhattisgarh state. Secondly, to throw light on present rural education status. The paper is based on secondary sources. Findings of the study shows, the facts of the rural school facilities of various districts of Chhattisgarh state which are very poor.

Key Words- NEP, School facilities

Introduction

The education in India has a rich and interesting history. It is believed that in the ancient days, the education was imparted orally by the sages and the scholars and the information was passed on from one generation to the other.

After the development of letters, it took form of writing using the palm leaves and the barks of trees. This also helped in spreading the written literature. The temples and the community centers formed the role of schools. Later, the Gurukul system of education came into existence.

The present system of education was introduced and founded by the British in the 20th century, by the recommendations of Macaulay. It has western style and content. The British government did not recognize the traditional structures and so they have declined. It is said that even Gandhi described the traditional educational system as a beautiful tree which was destroyed during the British rule.[1]

The objectives of the study

- To know the various plans/policies formulated by CG Govt.
- To evaluate the present educational infrastructure
- To know about the fulfillment of essential requirement of school in state

National Education Policy

The central government through the Ministry of Human Resource Development's of Education and the governments at the states formulated the education policy and planning (NPE) in 1986.

NPE (1986): Having announced that a new policy was in development in January, 1985, the government of Prime Minister Rajiv Gandhi introduced a new National Policy on Education in May, 1986. The new policy called for "special emphasis on the removal of disparities and to equalize educational opportunity," especially for Indian women, Scheduled Tribes (ST) and the Scheduled Caste (SC) communities. To achieve these, the policy called for expanding scholarships, adult education, recruiting more teachers from the SCs, incentives for poor families to send their children to school regularly, development of new institutions and providing housing and services. The NPE called for a "child-centered approach" in primary education, and launched "Operation Blackboard" to improve primary schools nationwide. The policy expanded the open-university system with the Indira Gandhi National Open University, which had been created in 1985. The policy also called for the creation of the "rural university" model, based on the philosophy of Indian leader Mahatma Gandhi, to promote economic and social development at the grassroots level in rural India.

(1992) The 1986 National Policy on Education was modified in 1992 by the P.V. Narasimha Rao government. In 2005, Prime Minister Manmohan Singh adopted a new policy based on the "Common Minimum Programme" of his United Progressive Alliance (UPA) government. Programme of Action (PoA), 1992 under the National Policy on Education (NPE), 1986 envisaged conduct of a common entrance examination on all India basis for admission to professional and technical programmes in the country. For admission to Engineering and Architecture/Planning programmes, Government of India vide Resolution dated 18 October 2001 has laid down a Three – Exam Scheme (JEE and AIEEE at the National Level and the State Level Engineering Entrance Examinations (SLEEE) for State Level Institutions – with an option to join AIEEE). This takes care of varying admission standards in these programmes and helps in maintenance of professional standards. This also solves problems of overlaps and reduces physical,

mental and financial burden on students and their parents due to multiplicity of entrance examinations.

Recent Developments

Last one decade there are so many education programs has been implemented by the state and central government for the up-liftment of school education in rural and urban area of the country. In 2001 Sarva Shiksha Abhiyan (SSA) 2001 /Right to Education (RTE) 2009 and Rashtriya Madhyamik Shiksha Abhiyan (RMSA) in 2009, have been implemented. These are the mile stone programs in the area of education, because all the components of school education has been included in this program i.e, mid day meal , free education, basic facility in schools , minimum working hours in schools in a week, teachers parent meetings etc.

Methodology

The study is based on content analysis; secondary data which is provided by local agencies and news papers for the study was collected, to evaluate the primary education structure of the state. We tried to get the facts of educational structure, find out some suggestion to bring improvement in education structure in our state.

After state formation too-many dreams are there for the betterment in living status for our peoples, now after the completion of approximately 15 years, it is required to evaluate the related things. For the purpose of that we have selected the primary rural education status in state and discover the facts. We have collected some data which are as below.

Status of School Buildings

RTE Act explains the rules and guidelines towards the schemes of education which also provides the guidelines and schemes for infrastructure. School building is one of the essential requirement to run a school, either puccka or kacha building is required. Similarly the present study was complete to ensure that the said policies/schemes: like school building facility and number of teachers in rural schools, have been implemented or not, or up to which level and the fact can be seen in the table given below.

Table 1
Status of School Buildings

No	Building Status	No. of schools
1	Without building	1073
2	Under construction	1008
3	Damaged	1429
4	With-out rent	2158
5	On rent	476

Sources- daily news paper Patrika dated-6/8/2015 pg-4

At present our state is divided into 29 Districts and on an average approximately more than 500 schools in every Dist. The above date show the details of the rural schools suffering for the suitable infrastructure for education, it shows the actual unfavorable conditions of rural schooling in state. A part of that some data is available which shows less (inadequate) of basic requirements of rural schooling one of them is teachers in the backward dist schools. The detail is given below.

Teachers in schools:

For giving education in schools it is very important to have teachers. RTI act 2009 has given the guide lines of minimum requirement of teachers in primary schools. One regular teacher for the basic subject is needed

Are the schools following the guidelines given in the policies/Act. We have tried to evaluate the present status of school education facilities. Govt. have formulated so many schemes for the development in education area, but we are unable to take the advantages due to in-proper implementation.

Table 2.1
Schools with single teachers

No	Districts	No. of schools	No. of Students
1	Bastar	441	10970
2	Bijapur	363	8305
3	Korba	301	10244
4	Kondagaon	262	7572
5	Balrampur	251	8022

Table 2.2
Schools with-out teachers

No	Districts	No. of schools	No. of Students
1	Sukma	150	10985
2	Bejapur	121	14820
3	Bastar	53	896
4	Dentawada	27	7366
5	Kondagaon	25	768

Sources- daily news paper Patrika dated-7/8/2015 pg-7

According to available data the findings shown that in our state around 6000 schools do not have its own building and approximately 2000 schools are operated in rental buildings, here approximately 5,00,000 students are involved in the education activity. A part of that near about 4000 schools are operated by single teacher and 540 schools are operated with-out a teacher or responsible person which is affecting around 2,00,000 children's education.

Findings

After the completion of 67 years of Independence Chhattisgarh state has failed to provide essential infrastructural basic educational facilities. The present study shows that in state there are 6155 schools do not have their own building and 20 schools out of them are situated in the capital city.

In the present education secession it is found that approximately 1,28,000 children education is affected by the causes of in-availability of teachers. The percent data shows that 1420 schools are capable to get more than 300 admissions in their schools. In the tribal areas the state totally failed to provide education rights to tribal children's, here education facilities are highly affected by the weaker education policies and its implementation.

Conclusion

If we look at the present situation of our state education system, we find that our education system is highly affected by the Government Policies. Somewhere

bureaucracy is also responsible for that. After the formation of state, many dreams have been planned for the development of state and its citizens. For that a strong educational infrastructure is essential and our administration failed to do so.

In a recent policy here proposal raised to full- fill the requirement of teachers by out-source sing it is highly objectionable for the development of strong education system in state.

Suggestion

It is required to create a new education policy as per basic requirement of our state, full-fill the requirement of teachers from local level and provide them trainings to make them professional, they are more effective to attract and develop educational infrastructure in whole state, make a strong policy to full-fill basic requirement of a school. Strengthen the School Management Committees to have collective action from time to time.

Reference

1. *http://education.newkerala.com/india-education/Brief-History-of-Education-in-India.html-8/7/15*
2. *National Education Policy 1986.Web. 12 August 2015*
   <http://www.worldlibrary.in/articles/National_Policy_on_Education>
3. *National Policy on Education, 1986 (As modified in 1992)*
   <mhrd.gov.in/sites/upload_files/mhrd/files/.../NPE86-mod92>
4. *Upagade,Vijay., Arvind Shende. Resaarch Methodology. New Delhi: S. Chand & Company, 2013. Print.*
5. *Sahu,S., Ray,B.K.S. "More than four thousand schools with single teachers" Patrika 7 August.2015:7.Print*

SDIS-053

ALZHEIMERS, THE IRREVERSIBLE BRAIN DISEASE. A REVIEW

Dr. Anita R Nair

Department of Life Sciences, Christ College, Jagdalpur (Bastar) Chhattisgarh,494001

Abstract

 Alzheimers is the common form of dementia diagnosed in people over 60 years of age.It is characterized by   decline in cognitive function In advanced stage people need help with basic activities of daily life and in advan-ced stages people loose the ability to communicate. It is characterised by accumulation of plaques and tangles in brain. Alterations of different neurotrophic factors occurs in AD. Warning signs of Alzheimers include memory loss, not able to do familiar tasks,confusion and decreased poor judgement. Risk factors include advancing age,genetic factors and cardiovascular diseases, diagnosis is done by clinical examination, ,electrophysiologic methods,computerised tomography and examination of body fluids. Drug treatment includes Exelon and memantine which has possible side effects,Supplements with vitamins may help to slow down the disease

Key words: AD-Alzheimers Disease,CSF- Cerebrospinal fluid,rCBF- Regional cerebral blood flow,P300-P3,event related potential(ERP)

Introduction

Alzheimer's disease, first described by the German neurologist Alois Alzheimer,in 1906 is a disease affecting the brain. During the course of the disease, protein 'plaques' and 'tangles' develop in the structure of the brain, leading to the death of brain cells. People with Alzheimer's also have a shortage of some important chemicals in their brain. These chemicals are involved with the transmission of messages within the brain. It is a progressive disease, which means that gradually, over time, more parts of the brain are damaged.[8] AD is diagnosed in people over 65 years of age,[2] although the less-prevalent early-onset Alzheimer's can occur much earlier. In 2006, there were 26.6 million people worldwide with AD. Alzheimer's is predicted to affect 1 in 85 people

globally by 2050. [3] It is the most common <u>cause of dementia</u> with an estimated prevalence of 30 million people worldwide, a number that is expected to quadruple in 40 years. There currently is no effective treatment that delays the onset or slows the progression of AD. However, major scientific advances in the areas of genetics, biochemistry, cell biology, and neuroscience over the past 25 years have changed the way we think about AD[5].

Disease description

Alzheimer disease (AD) is characterized by a progressive decline in cognitive function. AD is substantially increased among people aged 65 years or more, with a progressive decline in memory, thinking, language and learning capacity. AD should be differentiated from normal age-related decline in cognitive function, which is more gradual and associated with less disability[6]   Individuals progress from mild Alzheimer's disease to moderate and severe disease at different rates. As the disease progresses, the individual's cognitive and functional abilities decline. In advanced Alzheimers people need help with basic activities of daily living

(ADLs), such as bathing, dressing, eating and using the bathroom. Those in the final stages of the disease lose their ability to communicate, fail to recognize loved ones and become bed-bound and reliant on around-the-clock care. When an individual has difficulty moving because of Alzheimer's disease, they are more vulnerable to infections, including pneumonia (infection of the lungs). Alzheimer's-related pneumonia is often a contributing factor to the death of people with Alzheimer's disease[4]

The amyloid beta protein is neurotrophic to undifferentiated hippocampal neurons at low concentrations and neurotoxic to mature neurons at higher concentrations. In differentiated neurons, amyloid beta protein caused dendritic and axonal retraction followed by neuronal death[Aβ progressively accumulates in mitochondria and mediates mitochondrial toxicity. Interaction of mitochondrial Aβ with mitochondrial enzymes such as amyloid β binding alcohol dehydrogenase (ABAD) exaggerates mitochondrial stress by inhibiting the enzyme activity, releasing reactive oxygen species (ROS), and affecting glycolytic, Krebs cycle and/or the respiratory chain pathways through the accumulation of deleterious intermediate metabolites. The pathways proposed may play a key role in the

pathogenesis of this devastating neurodegenerative disorder, Various inflammatory processes and cytokines may also have a role in the pathology of Alzheimer's disease. Inflammation is a general marker of tissue damage in any disease, and may be either secondary to tissue damage in AD or a marker of an immunological response.[88] Alterations in the distribution of different neurotrophic factors and in the expression of their receptors such as the brain-derived neurotrophic factor (BDNF) have been described in AD.
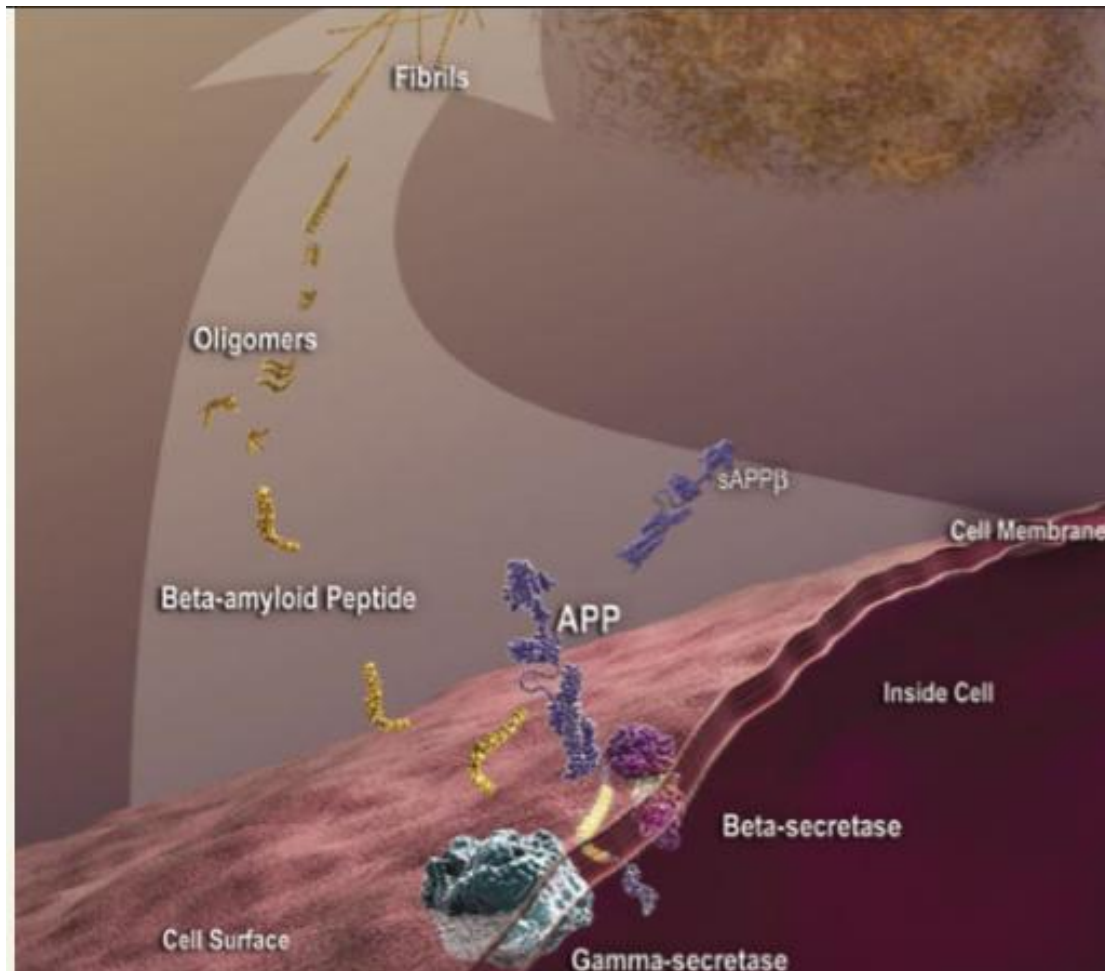

Fig-1 From APP to Beta-Amyloid Plaque

Warning signs of Alzheimers:

Memory loss that disrupts daily life

One of the most common signs of Alzheimer's is memory loss, especially forgetting recently learned information. Others include forgetting important dates or events; asking for the same information over and over; increasingly needing to rely on memory aids like

reminder notes or electronic devices or family members for things they used to handle on their own.

Challenges in planning or solving problems

People with Alzheimer's often find it hard to complete daily tasks. Sometimes, people may have trouble driving to a familiar location, managing a budget at work or remembering the rules of a favorite game.

e people may experience changes in their ability to develop and follow a plan or work with numbers. They may have trouble following a familiar recipe or keeping track of monthly bills. They may have difficulty concentrating and take much longer to do things than they did before

Difficulty completing familiar tasks at <u>home</u>, at work or at leisure

People with Alzheimer's often find it hard to complete daily tasks. Sometimes, people may have trouble driving to a familiar location, managing a budget at work or remembering the rules of a favorite game

Confusion with time or place.

People with Alzheimer's can lose track of dates, seasons and the passage of time. They may have trouble understanding something if it is not happening immediately. Sometimes they may forget where they are or how they got there

New problems with words in speaking or writing

People with Alzheimer's may have trouble following or joining a conversation. They may stop in the middle of a conversation and have no idea how to continue or they may repeat themselves. They may struggle with vocabulary, have problems finding the right word or call things by the wrong name

Misplacing things and losing ability to retrace steps

A person with Alzheimer's disease may put things in unusual places. They may lose things and be unable to go <u>back</u> over their steps to find them again. Sometimes, they may accuse others of stealing. This may occur more frequently over time.

Decreased and Poor Judgement

People with Alzheimer's may experience changes in judgment or decision-making. For example, they may use poor judgment when dealing with money, giving large amounts to telemarketers. They may pay less attention to grooming or keeping themselves <u>clean</u>.

Withdrawl from work or Social activities

A person with Alzheimer's may start to remove themselves from hobbies, social activities, work projects or sports. They may have trouble keeping up with a favorite sports team or remembering how to complete a favorite hobby. They may also avoid being social because of the changes they have experienced.

Changes in mood and Personality

The mood and personalities of people with Alzheimer's can change. They can become confused, suspicious, depressed, fearful or anxious. They may be easily upset at home, at work, with friends or in places where they are out of their comfort zone(alz.org.)

Risk Factors for Alzheimer's Disease

Many factors contribute to one's likelihood of developing Alzheimer's. The greatest risk factor for Alzheimer's disease is advancing age, but Alzheimer's is not a typical part of aging. Most people with Alzheimer's disease are diagnosed at age 65 or older. However ,people younger than 65 can also develop the disease, although this is much more rare. Advancing age is not the only risk factor for Alzheimer's disease. The following sections describe other risk factors. Family History Individuals who have a parent, brother or sister with Alzheimer's are more likely to develop the disease than those who do not have a first-degree relative with Alzheimer's.(21-23) Those who have more than one first-degree relative with Alzheimer' are at even higher risk of developing the d isease.(24) When diseases run in families, heredity (genetics), shared environmental and lifestyle factors, or both, may play a role. The increased risk associated with having a family history of Alzheimer's is not entirely explained by whether the individual has inherited the apolipoprotein E-e4 risk gene. Apolipoprotein E-e4 (APOE-e4) Gene The APOE

gene provides the blueprint for a protein that carries cholesterol in the bloodstream. Everyone inherits one form of the APOEgene — e2, e3 or e4 —   from   each   parent.

The e3 form is the most common,(25) with about 60 percent of   the   U.S.   population inheriting e3 from both parents.(26) The e2 and e4 forms are much less common. An estimated 20 to   30 percent of individuals in the United States have one or two copies of the e4 form(25-26); approximately 2 percent of   the U.S. population has two copies of e4.(26) The remaining 10 to 20 percent have one or two copies of e2.Havinng the e3 form is believed to neither increase nor decrease one's risk of Alzheimer's, while having the e2 form may decrease one's risk. The e4 form, however, increases the risk of developing Alzheimer's disease and of developing it at a younger age. Those who inherit two e4 genes have an even higher risk. Researchers estimate that between 40 and 65 percent of people diagnosed with Alzheimer's have one or two copies of the APOE-e4 gene.(25,27-28)

Inheriting the APOE-e4 gene does not guarantee that an individual will develop Alzheimer's. This is also   true for several genes that appear to increase risk of Alzheimer's, but have a limited overall effect in the population because they are rare or only slightly increase risk. Many factors other than genetics are believed to contribute to the development of Alzheimer' disease. Mild Cognitive Impairment (MCI) MCI is a condition in which an individual has mild but measurable changes in thinking abilities that are noticeable to the person affected and to family members and friends, but that do not affect the individual's ability to carry out everyday activities.People with MCI, especially MCI involving memory problems, are more likely to develop Alzheimer's and other dementias than people without MCI However, MCI does not always lead to dementia. For some individuals, MCI reverts to normal cognition on its own or remains stable. In other cases, such as when a medication causes cognitive impairment, MCI is mistakenly diagnosed. Therefore, it's important that people experiencing cognitive impairment seek help as soon as possible for diagnosis and possible treatment.

Cardiovascular Disease Risk Factors Growing evidence suggests that the   health of   the brai- n is closely linked to the overall health of the heart and blood vessels. The brain is

nourished by one of the body's richest networks of blood vessels. A healthy heart helps ensure that enough blood is pumped through these blood vessels to the brain, and healthy blood vessels help ensure that the brain is supplied with the oxygen- and   nutrient-rich blood it needs to function normally.

Many factors that increase the risk of cardiovascular disease are also associated with a higher risk of developing Alzheimer's and other dementias. These factors include smoking,(29-31) obesity (especially in midlife),(32-37) diabetes,(31,   38-41)   high cholesterol in midlife(34, 42) and hypertension in midlife.(34,37 43-45) A pattern that has emerged from these findings, taken together, is that dementia risk may increase with the presence of the "metabolic syndrome," a collection of conditions occurring together specifically, three   or more of the following: hypertension, high blood glucose, central obesity (obesity in which excess weight predominantly carried at the waist) and abnormal blood cholesterol levels(40) years.
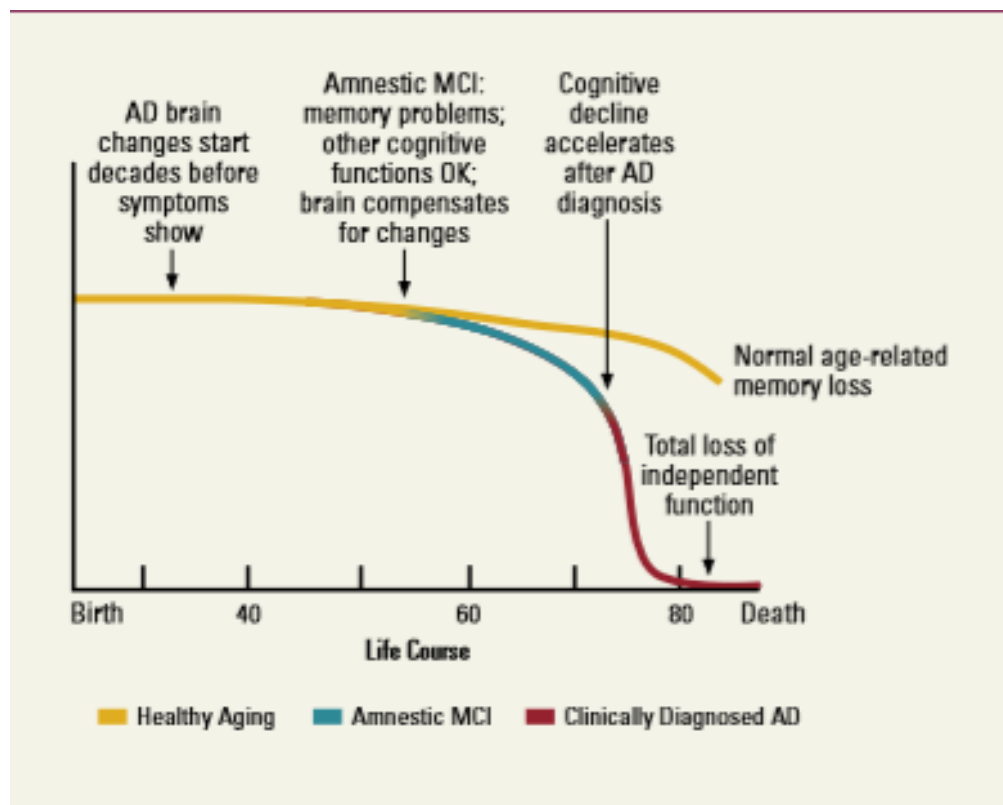

Fig 2   Charting the course from healthy aging to AD

Clinical Diagnosis for Alzheimers

Medical history. A medical history should be taken from the patient and from an informant who is well acquainted with the affected individual. This approach is essential to establish a history of pro- gressive deterioration and for identifying tasks that the patient can no longer perform adequately. A diary maintained by an observer may be very helpful in documenting changes in various functions.. Common complaints of patients or families include forgetfulness about appointments or errands; inability to find the way to an accustomed destina- tion; inability to use money and instruments of daily living such as a telephone; deterioration in work or homemaking performance; difficulty adapting to changes in the workplace; difficulties in dressing, reading, and writing; and inability to recognize pre- viously familiar individuals

Clinical examination. Mental status testing, an essential component of the clinical examination, includes specific assessment of orien- tation, registration, attention, calculation, recent re- call, naming, repeating, understanding, reading, writing, and ability to draw or copy. A complete psychiatric evaluation is needed to exclude the various psychiatric disorders. Complete examination of sensory and motor sys- tems (including cranial nerves, tone, reflexes, coordi- nation, gait, and proprioception) is needed to exclude other neurologic disorders. In early stages, patients are alert and free of other neurologic changes related to the dementia except for the occasional presence of snout reflex, jaw jerk, rigidity, or myoclonus, all of which may be encountered in nondemented elderly people. As the disease progresses, some patients be- come apathetic or show irritability, agitation, para- noid ideas, sleep disorders, or incontinence. In the very advanced stages, patients may become mute and lose all ability to communicate.

Neuropsychological testing. Neuropsychological tests may provide additional information for the di- agnosis of dementia. Because there are no normative population standards for many of these tests, abnor- mal performance can be determined only by com- parison with a normal control group matched for age, sex, and local education. A score falling in the lowest fifth percentile of an individual's normal control group may be designated as "abnormal." One or more abnormal scores will identify an individual for re-

search purposes who is highly likely to be cognitively impaired. Progressive worsening can be established by comparison with the patient's previous perfor- mance on these tests. Con- firmation of the dementia syndrome by neuro- psychological tests should be based on measurable abnormalities in two or more aspects of cognition. In longitudinal assessment, many patients with Alzheimer's disease show progressive loss of recent memory followed by disorders of language, praxis, or visual perception. In some patients with Alzheimer's disease, however, the first symptoms are difficulty in finding words, impaired visual perception, or aprax- ia, with memory impairment and other symptoms and signs appearing later.

Electrophysiologic methods.

The EEG of some patients with Alzheimer's disease shows increased slow-wave activity that may become more pro- nounced with progression of the disease. Evoked po- tentials (EP) are brain waves associated with sensory or other events that may be auditory, somatosensory, or visual. Endogenous or cognitive potentials, such as P300, are thought to reflect speed of cognition. The latency of P300 is altered with age, and there appears to be an increased latency of P300 potentials in 50 to 80% of patients with Alzheimer's disease compared with age-matched control subjects. These changes occur in different dementias and are not specific to Alzheimer's disease. The P300 wave, how- ever, is normal in depressive syndromes and may therefore be useful in differentiating the dementia of Alzheimer's disease from the dementia of depressive syndromes, particularly when adequate normal data become available

Computerized tomography

. CT is useful in the diagnosis of Alzheimer's disease because it permits the exclusion of other disorders such as subdural hematoma, brain tumor, hydrocephalus, and demen- tia associated with vascular disease. The technique can delineate gyri and sulci and quantitative tissue densities, ventricular size, CSF volume, and brain mass. In Alzheimer's disease, the volume of the ven- tricular system and the width of the third ventricle are increased, gyri are narrowed, and sulci are wid- ened; however, these general patterns may not be particularly useful as diagnostic criteria in individual cases.

Positron emission tomography (PET)

It is a research technique that allows quantitative assessment of the rate of glucose utilization, oxygen consumption, and rCBF. With some isotopes, these characteristics can be assessed during neuropsychological testing; moreover, ^{11}C- markers may permit the use of retest paradigms. Early reports suggest that rCBF determined by PET may be reduced in areas of encephalomalacia. In contrast, most patients with Alzheimer's disease show cerebral hypometabolism when compared with age-matched controls. These changes correlate with disease severity and may be correlated with neuro- psychological test performance Different approaches may be necessary for delineating presynaptic and postsynaptic markers of transmitter systems, as recently achieved with PET images of the dopamine system. Since PET reveals a significant variation even among normal subjects, any changes may have to be severe to be detected.

. Magnetic resonance imaging.

The proton nuclear magnetic resonance (NMR) image, or magnetic reso- nance imaging (MRI), reveals the demarcation of gray and white matter of the brain and has therefore proved useful in studies of demyelinating disorders. Although the method has not been applied sys- tematically to the study of dementia, it has potential for differentiating between Alzheimer's disease, multi-infarct dementia, and low-pressure hydro- cephalus disease

. Examination of body fluids and nonneural tissues.

In the diagnosis of Alzheimer's disease, studies of blood and CSF are helpful in excluding chronic infec- tions, such as cryptococcal meningitis and syphilis, and other disorders. To date, definitive diagnostic information about Alzheimer's disease from blood or CSF has not been sought consistently, but CSF should be studied to demonstrate neurotransmitters, metabolites, and synthesizing and degradative en- zymes. Other techniques, such as sophisticated ra- dioimmunoassays with specific antibodies, may be useful for detecting markers of the disease, such as constituents associated with the development of neurofibrillary tangles and neuritic plaques. Specific abnormalities have not been detected in nonneural tissues(Mckhan etal).

Fig-4 Estimated prevalence of dementia for persons aged 60 and over, standardized to Western Europe population, by Global Burden of Disease region
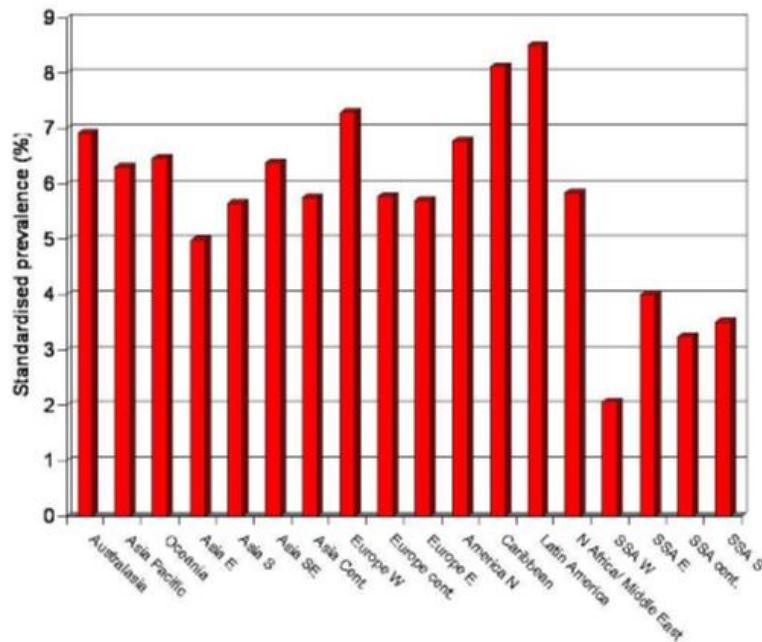
Source: Source: Dementia: a public health priority. WHO, 2012. Note: *Regions used here are those used in the Global Burden of Disease 2010 Study

TREATMENT

DRUG TREATMENT

Medicines are used to help slow down the rate at which symptoms become worse. Medicines for AD include:Donepezil (Aricept), rivastigmine (Exelon), and galantamine (Razadyne, formerly called Reminyl). Side effects include stomach upset, diarrhea, vomiting, muscle cramps, and fatigue. Memantine (Namenda). Possible side effects include agitation or anxiety. Other medicines may be needed to control aggressive, agitated, or dangerous behaviors. Examples include haloperidol, risperidone, and quetiapine. These are usually given in very low doses due to the risk of side effects including an increased risk of death.

It may be necessary to stop any medications that make confusion worse. Such medicines may include painkillers, cimetidine, central nervous system depressants, antihistamines, sleeping pills(Qaseem et al)

Supplements

Some people believe certain vitamins and herbs may help prevent or slowdown AD.There is no strong evidence that Folate (vitamin B6), vitamin B12, and vitamin E prevent AD or slows the disease once it occurs.(Aisen et al) High-quality studies have not shown that ginkgo biloba lowers the chance of developing dementia. Don not use ginkgo if you take blood-thinning medications like warfarin (Coumadin) or a class of antidepressants called monoamine oxidase inhibitors MAOIs(Dekosky et al). Herbs and supplements available are not regulated by the FDA(Food and Drug Administration)

References:

1. *Ahtiluoto S, Polvikoski T, Peltonen M, Solomon A, Tuomilehto J Winblad B,e tal diabetes,Alzheimer disease, and vasculardementia: A population-based neuropathologic study.Neurology 2010;75(13):1195–202.*

2. *Aisen PS, Schneider LS, Sano M, Diaz-Arrastia R, van Dyck CH, et al. High-dose B vitamin supplementation and cognitive decline in Alzheimer's disease: a randomized controlled trial. JAMA . 2008;300:1774-1783*

3. *Albert MS, DeKosky ST, Dickson D, Dubois B, Feldman HH, Fox N, et al. The diagnosis of impairment   due to Alzheimer's disease: Recommendations from the National Institute on Aging–Alzheimer's Association workgroups on diagnostic guidelines for   Alzheimer's disease Alzheimers Dementia 2011;7(3):270–9.*

4. *American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition. Washington,D.C.: American Psychiatric Press, 1994*

5. *Anstey KJ, von Sanden C, Salim A, O'Kearney R. Smokingas a risk factor for dementia and cognitive decline: A meta-analysis of prospective studies. Am J Epidemiology 2007;166(4):367–78*

6. *Alzheimer's Association. **Alzheimer's disease: Risk factors.** Published online, accessed November 1st, 2013.*

7. *Alzheimer's Association, 2013 Alzheimer's Disease Facts and Figures, Alzheimer's & , Vol 9 issue 2*

8. *Brookmeyer R, Johnson E, Ziegles Graham K, Arrighi HM. Forecasting the global of disease Alzhemia Dementia 2007[Retrieved 18 June 2008]; 3(3): 186-9 doi: 10.1016/j:jalz 2007.04 381. PMID 19595937*

9. *Chen X, Yan SD. Mitochondrial Abeta: A Potential Cause of Metabolic Dysfunction in Alzheimer's Disease. IUBMBLife. 2006;58 (12):686–94 doi:10.1080/152165406011047767.PMID1742907*

10. *Clarfield AM. The decreasing prevalence of reversible dementias: An updated meta-analysis. Arch Intern Med 2003;163(18):2219–29*

11. *DeKosky ST, Williamson JD, Fitzpatrick AL, Kronmal RA, Ives DG, Saxton JA, et al Ginkgo biloba for prevention of dementia: a randomized controlled trial. JAMA . 2008;300:2253-226*

12. *David MH, John CM, Alison MG,Neurodegenerative disease, Alzheimers disease; the Challenge of second centuty,13,5 sci,Transmed6 April 2011; vol. 3, issue 77,p 77srl Sci; Transl.med.DoI;10.1126/Sci translmed.3002369*

13. *Farrer LA, Cupples LA, Haines JL, Hyman B, Kukull WA, Mayeux R, et al. Effects of age sex and ethinicity on the association between apolipoprotei n E genotype and Alzheimer disease: A meta-analysis. JAMA 1997;278:1349–56*

14. *Fitzpatrick AL, Kuller LH Lopez O Dieh P O'Mear ES;66(3): , Longstreth WT et al. Midlifeand late-life obesity risk of dementia; Cardiovascular Health   Study Cardiovascular Health   Study336-42*

15 *Fratiglion L, Ahlbom A,Viitanen M Winblad B. Risk factors for late-onset Alzheimer disease A population based, case- control study. Ann Neurol 993;33(3):258–66*

16 *Ganguli M, Snit BE Saxton JA Chan CH Lee C Vanderbilt J, et al. Outcomes of mild cognitive impairment by definition: A population study. Arch 2011:68(8) 761-7*

17 *Green RC, Cupples LA, Go R,   Benk KS,   Edeki T, Griffit   PA, et al. Risk of dementia among white   and African American relatives of   patients withAlzheimer   disease JAMA2002 287(3):329–36*

18. *Greig NH, Mattson MP, Perry T, Chan SL, Giordano T, Sambamurti K, JT, Ovadi . H, Lahiri DK. New Therapeutic Strategies and Drug Candidates for Neurodegenerative Diseases: P53and TNF-alpha Inhibitors, and GLP-1 Receptor Agonists. Annals of the New York Academy Sciences, 2004;1035:290–315.doi:10.1196/annals.1332.018. PMID 15681814*

19 *Guy McKhann, David Drachman, Marshall Folstein, et al. and Human Services Task Force on   Alzheimer's Disease ADRDA Work Group* under the auspices of Department of Health − Clinical diagnosis of Alzheimer's disease: Report of the NINCD Neurology 1984;34;939*

20 *Hanninen T, Hallikainen M, Tuomaine S, Vanhane M Soinine H.Prevalence of mild cognitive impairment: A population-based study in elderly subjects Acta Neurol Scand 2002; 106:148-54*

21   HymanBT, Phelps, CH,Beach TG, BigioEH, Cairns NJ, Carrillo MC, et al. National Institute on Aging–Alzheimer's Association gui delines on neuropathologic assessment of Alheimer Dementia 2012; 8(1);1-13

22   Jack CR,Albert MS, Knopman DS, McKhann GM,Sperling RA, Carrillo MC,et Introduction To the recommendations from theNational Institute on Aging– Alzheimer's Association workgroups on diagnostic guidelines for Alzheimer's disease Dementia 2011:7(3):257-62

23   Jellinger KA The enigma of mixed dementia Alzheimers Dementia 2007:3(1):40-53

24   Kivipelto, M N, I gandu, T, Frateiglioni,G, Vitaneen, m,B, Kareholt,I, Winbla eta Obesity andvascular risk factors at midlife and therisk of alzheimers disease Arch Neurol 2005; 62,156-60

25   Lautenschlager NT, Cupples LA, Rao VS, Auerbach SA, Becker R, Burke J,etal Risk of dementia among relatives of Alzheimer's disease patients in the mirage study: st :What is in store for the oldest old? Neurology 1996;46(3):641–50

26   Lopez OL, Jagust WJ DeKosky ST, Becker JT, Fitzpatrick A, Dulberg C, et al. Preva- Lence and classification of mild cognitive   impairment in theCardiovascular Health   Study Cognition Study. Arch Neurol 2003;60:1385–9

25   Launer LJ, Ross GW Petrovitch H,   Masaki K Foley D, White LR, et al. Midlife blood Pressure and dementia: The Honolulu-Asia Aging Study. Neurobiol Aging 2000;21(1)   49-55

26   Mayeux R, Sano M, Chen J, Tatemichi T, Stern Y. Risk of dementia in first-degree relat- ives of patients with Alzheimer's disease and related disorders. Arch Neurol 1991:48(3):269- 97

27   Manly JJ, Tang MX, Schupf N, Stern Y, Vonsattel JP, Mayeux R. Frequency and course of Mild cognitive impairment in a multiethnic community. Ann Neurol 2008;63:494–506

28   McKhann GM, Knopma DS, Chertkow H, Hyman BT, Jack CR, CH et al, The diagnosis Of dementia due to Alzheimers disease: Recommendations from the National Institute on Aging–Alzheimer's Association workgroups on diagnostic guidelines for Alzheimer's disease. Alzheimers Dementia 2011;7(3):263–9

29   Pendlebury ST,Rothwell PM. Prevalence, incidence, and factorsassociatedwith pre-stroke and post-stroke dementia: A systematic review and meta analysis. Lancet Neurol 2009;   ; 8(11):1006–18

30   Petersen RC, Smith GE, Waring SC, Ivnik RJ, Tangalos EG, Kokmen E. Mild cognitive impairment Clinical characterization and outcome. Arch Neurol 1999;56:303–8

31   Qaseem A, et al., American College of Physicians/American Academy of Family Physicians Panel on Dementia. Current pharmacologic treatment of dementia: a clinical practice guideline from the American College of Physicians and the American Academy of Family Physicians An n. Intern Med 2008 Mar 4:148(5) 370-8

32   Raji CA Ho AJ, Parikshak NN, Becker JT, Lopez OL, Kuller LH, etal. Brain structure and obe sity, Hum Brain Mapp 2010;31(3):353–64.

33   Raber J, Huang Y, Ashford JW. ApoE genotype accounts for the vast majority of Ad risk and AD pathology y. Neurobio Aging 2004;25:641–50.

34   Reitz C, Brayne C, Mayeux R. Epidemiology of Alzheimer disease. Nat Rev Neurol 2011:7(3 :137-52

35   Reitz C,   Brayne C, Mayeux R. Epidemiology of Alzheimer disease. Nat Rev Neuol 2011 ;7(3):137–5238 Roberts RO, Geda YE, KnopmanDS, Cha RH, Pankrat VS, Boev BF, et al.

The Mayo Clinic Study of Aging: Design   and sampling, participation, baseline measures and sample characteristics Neuroepidemiology 2008;30:58–69

36   Rönnemaa E,Zetheliu B, Lannfelt L, Kilander L. Vascular risk factors and dementia; 40-year follow-up of a population-based cohort. Dementia Geriatr Cogn Disord 2011;31(6):460–6.

37   Rusanen M, Kivipelto M, Quesenberry CP, ZhouWhitmer RA Heavysmoking inmidlife and long term risk of Alzheimer disease and vascular dementia. Arch Intern Med 2010;171(4):333–9

38   Saloni Tanna, Priority Medicines for Europe and the Worl "A Public Health Approach to Innovation" Update on 2004 Background Paper

39   Saunders AM, Strittmatter WJ, Schmechel D, George-Hyslop PH, Pericakvance MA, Joo SH Et al Association of apolipopro- tein E allele epsilon 4 with late-onset familial and sporadic Alzheimer's disease. Neurology 1993;43:1467–72

40   Schneider JA, Arvanitakis Z, Bang W, Bennett DA.Mixed brain pathologies account for most dementia cases in community- dwelling older persons Neurology 2007: 69: 2197-204

41   Solomon A, Kivipelto M, Wolozin B, Zhou, J, Whitmer, RA. Midlife serum cholesterol and And increased risk of Alzheimer's and vascular dementia three decades later Dementia and Geriatr Disord 2009;28:75–80

42   Sperling RA, Aisen PS, Beckett LA, Bennett DA, Craft S, Fagan AM, et al. Toward defining the   preclinical stages of Alzheimer's disease: Recommendations from the National Institute on - aging Alzheimer'sAssociation workgroups on diagnostic guidelines for Alzheimer's disease. - alzheim ers Dement 2011: 7(3): 280-92

43   Tapia-Arancibia L, Aliaga E, Silhol M, Arancibia S. New insightsinto brain BDNF function in   normal aging and Alzheimer disease. Brain Research Reviews. 2008;59(1):201–20 doi;10.106 /jbrainresrev.2008.07.007. PMID 18708092

44   Viswanathan A,   Rocca WA, Tzourio C. Vascular risk factors and dementia: How to move forward ? . Neurology 2009;72:368–74

45   "What is Alzheimer's disease?". Alzheimers.org.uk.   August 2007. Retrieved 21 February 2008

46   Wu W,Brickman AM, Luchsinger J, Ferrazzano P, Pichiule P, Yoshita M, et al The brain in the age of old: The hippocampal formation is targeted differentially by diseases of late life, Ann Neurol 2008;64:698–706

47   Whitmer RA, Gustafson   DR, Barrett-Connor E, Haan MN,Gunderson EP, Yaffe K. Central obesity and increased risk of dementia more than three decades later. Neurology 2008;71:1057–64

48   WL, Atti AR, Gatz M, Pedersen NL, JohanssonB, Fratiglioni L Midlife and obesity increase Late-life dementia risk; A population-based twin study. Neurology 2011;3;76(18):1568–74.

49   Xu WL, Atti AR,Gatz M,Pedersen NL, JohanssonB, Fratiglioni L Midlife and obesity increase late-life dementia risk: A population-based twin study. Neurology 2011;3;76(18):1568–74.

50   Yanker, BA,Duffy,LK,Kirschner,DA.. Neurotrophic and neurotoxic effects of neuropeptide amyloid beta protein: reversal by tachykinis neuropeptides 86 Science. 1990 Oct 12; 250(4978): 279-82

SDIS-054

Studies on Prosessing and Preservation of Major Edible Non Timber Forest Products (NTFPS) in Bastar Forests (C.G.)

Vinod Kumar Soni *and Seetu Sonkar **
* Assistant Professor (Forestry & Wildlife)
** M.Sc. Forestry & Wildlife Student
School of studies in Forestry & Wildlife
Bastar Vishwavidyalaya , Jagdalpur (CG)
Corresponding author : sonivinod69@gmail.com

Abstract

The lifestyles and economy of indigenous communities of forest dwellers such as Abujhamaria, Maria, Muria, Gond, Kanwar, Binjwar, Pradhan, Baiga, Korwa, Kondh, Saora, Kharia etc. in Chhattisgarh. are greatly relied on NTFPs since time immemorial. However, recent demand for timber, expansion of Agricultural activities, shifting cultivation and other Anthropogenic activities are causing degradation of Natural forests. Under these circumstances, the extraction of NTFPs by local communities was widely proposed as a strategy to decrease the rate of Deforestation while enhancing livelihoods.

*The studies entitle "**Studies on Processing and Preservation of Major Edible NTFPs in Baster Forest.**" was carried out during 2014. Bakawand block in Bastar districts (CG) were taken for present study. it was found that seven (07) NTFPs species were extracted in the study area. Data collection from two villages of Bakawand block in Bastar districts (CG) were analyzed*

A total of 20 households were selected in present study. NTFPs were Average for annual household income followed by forest labor and agriculture. NTFPs alone contribute 40-50% of that house hold income. Various studies show that the some poorest rural people are the most dependent on NTFPs to sustain their total livelihood needs. Men & woman both are role played in collection and marketing of NTFPs except in the collection of fuel wood while woman was dominant in processing activities. Woman spent more time in collection of fuel NTFPs, which mainly for the purpose of food preparation and family support programs.

The increase in agriculture income and wage income tends to reduce the probability of a household going in for NTFPs collection. Hence, development of agriculture as an economic occupation and providing the household with more wage employment opportunities will not only add to the household income but will also reduce the pressure on NTFPs.

Key words : Forest dwellers , livelihoods , processing , NTFPs, income, employment etc.

Introduction

India posses a rich of NTFPs in its 64 million ha. Of State managed forests. Among 15000 plant species, approximately 3000 species (20%) yield NTFPs. however, only 126 species (0.8%) have been commercially exploited (Maithani, 1994). In India, nearly 500 million people living in and around forest depend on NTFPs as a critical component for their sustenance (water resources Institute, 1990). After implementation of forest conservation act in 1980, the felling of green trees is almost banned and the revenue from timber is drastically declined in the Country. Subsequently, the share of NTFPs for total forest revenue increased from 20-50% (Campbell etal.,2003) found that in India during 1986 . NTFPs accounted for almost 40% of forest department revenues, 75% of net export earnings from forest produce. The opportunity for self-employment which NTFPs based enterprises provide to the forest dwellers was estimated 3.3 million person years in India.

About one third of population of the state belong to indigenous tribes directly depend on NTFPs for their livelihood and subsistence. The lifestyles and economy of indigenous communities of forest dwellers such as Abujhamaria, Maria, Muria, Gond, Kanwar, Binjwar, Pradhan, Baiga, Korwa, Kondh, Saora, Kharia etc. are greatly relied on NTFPs since time immemorial. However, recent demand for timber, expansion of Agricultural activities, shifting cultivation and other Anthropogenic activities are causing degradation of Natural forests. Under these circumstances, the extraction of NTFPs by local communities was widely proposed as a strategy to decrease the rate of Deforestation while enhancing livelihoods. As a result, this good extra-activism approach, on that preserves natural resources while enhancing income has spawned much research on the role of NTFPs on forest conservation and livelihood.

At global level, more than two billion people are dwelling in forest, depending on NTFPs for subsistence, income and livelihood security (Vantomme, 2003). NTFPs are considered to be important for sustaining rural livelihoods, reducing rural poverty, biodiversity conservation, and facilitating rural economic growth (Global NTFP partnership, 2005). It is an important source of income for the poor in many developing countries. In addition, several opportunities for improved rural development are linked to NTFPs (Adepoju,

2007). In India over 50 million people are dependent on NTFPs for their subsistence and cash income (Hegde et al., 1996). Thus it can be depicted that NTFPs form one of the mainstays of income and sustenance for many tribal communities (Rao, 1987; Gauraha, 1992; Chopra, 1993; Mallik, 2000).

The collection of NTFPs in Chhattisgarh by the tribal's and other Villagers is done for both domestic and for commercial purposes. Domestic purpose includes the utilization of NTFPs for folklore medicines, spiritual and traditional uses. The NTFPs like Tendu leaves, Sal seed, Harra, Dhawra and other Gums etc. are collected through cooperatives under the supervision of forest department since all these falls under nationalized forest products.

The income generated from Nationalized NTFPs is very significant for the total forest revenue in Chhattisgarh. According to an estimate made in Bastar District of Chhattisgarh, the maximum sustained timber yield from one hectare of forest was about 10m³ every 20 years yielding a net value of Rs. 20,000 while, NTFPs harvested every year produced a net income of Rs.2,00,000 for the same period(Tiwari,1993). In the year 2003-04, the total income generated from Nationalized NTFPs was substantial, where Tendu leaves accounted 150.08 crores, Sal seed 55.40 crores (collection expenditure) and Harra 1.54 crores [Chhattisgarh state minor forest produce federation Ltd. 2004]. Besides, other NTFPs like Mahua flower, Mahua seed, medicinal plant, Amla, Mahul leaves etc. commercially traded which may earn more than 5-10 times higher revenue than the Nationalized products, that is currently unaccounted.

The forests of Bastar District, which comprises more than 70% of the total land area, constitute a variable storehouse of industrial raw material for forest based industries. The forests are located on comparatively easy terrain and it is one of the rare forest areas in the Country where Sal, Teak, and Miscellaneous forests naturally occur over extensive areas.

NTFPs are one of the thematic areas of collectives of integrated livelihood initiatives focusing on central Indian tribal belt. NTFPs play a vital role in augmentation of tribal household income, especially in the remote and isolated pockets near and around the fringe of open forest, sanctuary and reserve forest areas. These underserviced pockets of

civilizations are greatly dependent on forest and forest based livelihoods for their daily living. Collectives of Integrated Livelihood Initiatives, consider that this sector provides enormous scope for intervention and growth

Information on diversity of NTFP, and their marketing pattern is currently unavailable in Bastar division in Chhattisgarh. Both qualitative and information is needed for sustainable management of Non-timber forest resource. Therefore, the present study "Processing Preservation and Value Addition of Major Edible NTFPs in Bastar Forest" was undertaken with following objectives; Survey collection and identification edible NTFPs , Processing and preservation of important edible NTFPs ,Market potential of some edible NTFPs and Value addition of tribal uses edible NTFPs etc.

Methods and Material

The study on **"Processing and Preservation of Major Edible NTFPs in Bastar Forest"** was carried out at Bakawand forest of Bastar District of Chhattisgarh. The data was collected from 2 village namely; Sandhkarmari and Sonpur villages of Bakawand forest Range of Bastar forest division, Chhattisgarh . A total of 20 Householders respondents were surveyed. The primary data was collected from the sampled respondents through intensive personal interviews with the help of pre-tested semi structured Performa. The schedule contains information on collection, utilization and marketing pattern of NTFPs social and economic status of Tribal's and Villages, infrastructure of Villages etc. was observed.

Results and Discussion

After completion of observation and data collection, the data is analyzed and the information were presented as under

The data collected from the different forest villages and villagers were analysed . The investigator used multipurpose data collection techniques like questioner, focused group discussions, personal interviews, and observational visits and from the secondary data.

The Availability of NWFPs resource at Sandhkarmari village of Bakawand Forest Range was surveyed and data is tabulated (Table No. 01). During the survey; seven (7)

edible NTFPs were collected these are Mahua , Amla , Imli ,Mango ,Char, Jamun and Tendu etc. Maximum collection of *Tamarindus indica* was 1415 Kg and *Madhuca inndica was* 315kg, *Maganifara indica* 145Kg, Buchanania lanzan 98 Kg, Diospyros melanoxylon 65 Kg, Syzygium cumini 60 Kg respectively by the tribal household whereas minimum collection of *Emblica officinalis was* 40Kg. at Village Sandhkarmari . The collection season of all the edible NTFPs are also recorded during study . Most of the species are found in the study village in   between the month of February to June in a year. Total collection of all the edible products were estimated which was 2138 kg. at village Sandhkarmari .

Table No.1 Availability of NTFPs resources at Sandhkarmari Village at Baster Forest Division (C.G.)

S. No	Local Name	Botanical Name	Family Name	Collection seasons	House hold collection percentage (%)	Total collection of NTFPs
1.	Mahua	*Madhuca Indica*	*Sapotaceae*	May- June	31.5%	315 Kg.
2.	Amla	*Emblica officinalis*	*Euphorbiaceae*	Feb-April	4%	40 Kg.
3.	Imli	*Tamarindus indica*	*Fabaceae*	Feb.-March	141.5%	1415 Kg.
4.	Mango	*Maganifara indica*	*Ancaediaceae*	April-May	14.5%	145 Kg.
5.	Char	*Buchanania lanzan*	Anacardiaceae	April-June	9.8%	98 Kg.
6.	Jamun	*Syzygium cumini*	Myrtaceae	May-June	6%	60 Kg
7.	tendu	*Diospyros melanoxylon*	Ebenaceae	April-May	6.5%	65 Kg.
						Grand Total = 2138 Kg

Fig . 1 : Total NTFPs collection at Sandhkarmari Village
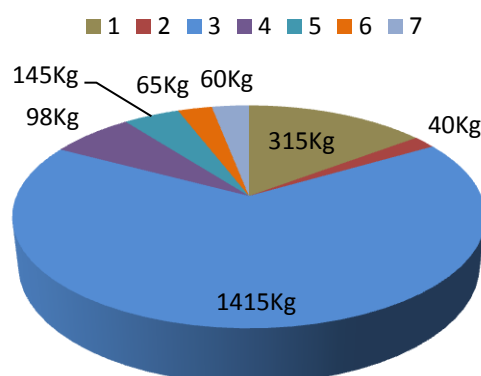
Availability of NTFPs Resources at Sonpur Village

The information on availblity of important edible NTFPs are tabulated (Table No. 02). During the survey; five (5) edible NTFPs were collected these are Mahua, Imli , Mango ,Char, and Tendu etc. Maximum collection of *Tamarindus indica* was 400 Kg. and Buchanania lanzan 275 Kg, Diospyros melanoxylo 170 Kg, *Madhuca Indica* 130Kg, by the tribal household whereas minimum collection of *Maganifara indica* 90Kg.

Table No. 2 Availability of NTFPs resources at Sonpur village at Baster Forest Division (C.G.)

S.No	Local Name	Botanical Name	Family Name	Collection Seasons	House hold collection percentage (%)	Total NTFPs
1.	Mahua	*Madhuca Indica*	*Sapotaceae*	May- June	13%	130 Kg.
2.	Imli	*Tamarindus indica*	*Fabaceae*	Fab-March	40%	400 Kg.
3.	Mango	*Maganifara indica*	*Ancaediaceae*	April-May	9%	90 Kg.
4.	Char	Buchanania lanzan	Anacardiaceae	April-June	27.5%	275 Kg.
5.	Tendu	Diospyros melanoxylon	Ebenaceae	April-May	17%	170 Kg.
					Grand Total = 1065Kg.	

Fig . 2 :Total NTFPs collection at Sonpur village
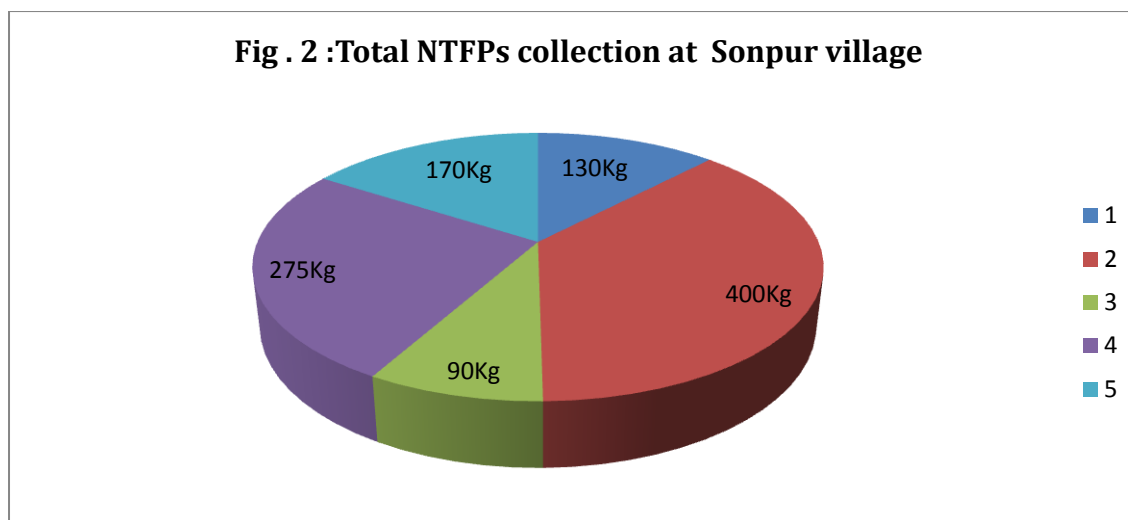
Processing at household level in Sandhkarmari Village:

Household level processing activities are common, based on season of availability of various products. Group based NTFP processing and value addition is rarely available as an organized activity, which is more in the form of demonstration unit in many Forests Divisions. By and large, primary processing is done by community to make NTFPs item either eatable or salable in market. The NTFPs items which are used for consumption purposes fall in two types of categories from their processing point of view. NTFPs, which are largely perishable, consumed as soon as they are brought from forest or private lands after cleaning, grading and washing like Mushroom, Karil, Charotabhaji, Poibhaji, Gunjiharibhaji, etc. The other category of NTFPs items such as Mahua flower, Imli, Honey, Tori (Mahua seed), etc that are also collected for consumption purpose but their primary and secondary level processing are done to make them consumable and so on for storage for a longer period. In former category, there are also some NTFPs items like Charota bhaji, Gunjiharibhaji, Karil, etc. that are processed and stored by the rural people particularly the poor for use in lean seasons.

Mahua, after bringing from the field is dried on sun and thereafter mud or any other impurities are removed from it. After drying the Mahua is bitten by the help of a stick so that the inner polygrain is removed then it is packed in the sacks or in the bamboo baskets until it is sold or used. It was found that the involvement of womens in processing and storage of Mahua flower is higher than man people . Similarly, in case of Tori (Mahsua

seed), which is used for extraction of edible oil by the tribal, processing like removing top shell, sun drying of the seed and extracting oil from it is also done by women. Oil extraction is done by the people using indigenous method of extracting oil by putting the seed cake in between the wooden plates for crushing. Side by side, there are places where oil extraction plants are established by traders. Villagers take dried seeds of Mahua to nearest oil extraction plant. The mill owner does not charge anything for oil extraction. He keeps the remnants of extraction (khari) for himself.

The NTFPs that are collected for commercial purposes do require some degree of primary processing like cleaning, drying, grading, deseeding, etc, to make them saleable according to the requirement of the market. Processing of Tendu leaves requires intensive Engagement as they plucked from the forest area. For sorting and making bundles of Tendu leaves maximum family members including children get involved. These bundles are sold at the collection centre of the cooperative societies. Similarly, a minimum required primary level processing is done for almost all the NTFPs by the rural households as per the demand of the market.

All the processing ways that are being followed by the people are still traditional indigenous methods that are being adopted form the ancestors and all the generations are keeping on following the same techniques that are being coming on from a long time. Neither advance neither processing tools nor processing knowledge were found at household level in the study area which can be used for secondary or tertiary level processing of NTFPs items collected for commercial purposes so as to get better prices on the sale.

Role of women in NTFPs processing

As processing of most of the NTFPs is a time consuming task fetches less return in comparison to other works and therefore, women have a major role to play in processing of NTFPs at household level at village Sandhkarmari . Firstly they start basic processing like drying. Drying, cleaning, grading, decorticating of Mahua seeds, de-shelling, de-seeding and pulping of Tamarind, leaf plate making, broom making etc. are done primarily by women. Household processing of NTFPs allows women to be engaged in

profitable work without having to move out of the home too much. This also enables widows and old women living in all female households to obtain employment and allows pregnant and nursing women to be profitably (from a financial sense) engaged during this period. They can engage in processing activities together with household works. Processing of many NTFPs especially those which are used for consumption purposes is done solely by women in Chhattisgarh State.

Group Processing System

In order to increase stake of primary forest produce gatherers in the value chain of various NTFPs and thereby enhance their income level from the sector, the CGMFP Federation has taken initiative for establishing group based processing units in different part of state.

Processing units for different NTFPs have been established in the areas by Forest department , C.G. Govt., where they are available in abundance. The small processing units have been handed over to local SHGs. At the time of this study, 65 processing centres (15 for lac production and 1 for processing, 4 for Honey collection, 11 for collection of raw NTFPs, 9 for Mahul leaf processing, for Anola processing, 3 for making herbal products, 2 for processing Chirinji, 1 for cashew-nut processing, 3 for oil seeds processing, 5 for Tamarind processing, 2 for collection of herbal medicines and 1 for processing herbal foods) had been established in various parts of the state with financial support .

The processing of NTFPs starts with the primary forest produce gatherers. In order to ensure better quality of NTFPs, primary level processing such as drying, cleaning, grading, etc. is done by villagers, village level SHGs and *haat-bazar* level SHGs. The SHGs which run processing units collect the required raw material directly from the forest as well as purchase it from villagers and SHGs. Final processing, packaging and labeling of these produces are done in the processing centre and the final product is sold to concerned NTFP-MARTs under Chhattisgarh Herbal brand. For standardization of the processing techniques of different herbal products, support has been taken from institutions like Central Food Training and Research Institute (CFTRI), Mysore; Central Drug Research Institute (CDRI); Central Lac Research Institute, Ranchi; Central Institute

of Medicinal and Aromatic Plants (CIMAP), Lucknow, etc. The Prices of herbal products/medicines produced by processing units are also decided by the Task Force of Federation every year, keeping in view the product cost incurred and prevailing market rates. The processing centre level SHG gets 30 per cent commission on the MRP of the products.

The initiative of promoting group based processing have been successful to a large extend in the state and about 50 herbal products are being produced and sold by NTFPs-Mart and Sanjeevani retail outlets. The demand for these products is also increasing day by day. However, there were also some group processing centre which could not performed as envisaged for range of reasons lack of regular supply of raw material, lack of adequate technical know-how for processing the MFPs, lack of know-how and infrastructure for research and development, lack of infrastructure and machineries for processing, low quality of products, lack of market and demand in interior areas, etc. As a result, some of them particularly the processing centre established for manufacturing herbal medicines were not provided certificate for drug manufacturing by the Drugs Control Board.

Processing at industry level

NTFPs based processing industries have been in existence in the state due to availability of huge MFPs especially herbals in the forest areas. Over time, with increasing demand for herbal products in market and enabling policy regime coupled with capital and subsidy for herbal industries has resulted in new industries coming into existence with advance processing technologies. There is a vast network of small to big herbal industries across the state and Dhamtari, Raipur, Jagdalur, Mahasamund, Raigarh have emerged as major hub of herbal industries in the state.

Different level of processing for different NTFPs is done in these industries according to the demand of market and availability of technology with the concerned industry. The small industries are generally located in the areas where particular NTFPs item is available and collected in large quantity. In general, secondary level of processing is done in these industries due to lack of advance technologies and low capital investment and therefore, the semi processed NTFPs are supplied to bigger industries located in big cities

of the state and outside the state. In case of herbal products and medicines, final processing, packaging and labeling is done in the herbal industries. Different value addition chain has evolved for different NTFPs according to their production and demand within and outside the Country.

Processing facilities at household level in Sonpur village

Almost all the sample households were found in collection and processing largely primary processing of NTFPs in the study area. As far as, processing facilities at household level is concerned no separate processing facilities were found in rural households for processing of and value addition in NTFPs they collect from forest and private lands. Generally, roof of houses, open spaces within house and open fenced backyards are used for drying, cleaning and grading of NTFPs. Collection of NTFPs is seasonal activities that occur round the year so, same open spaces and facilities are used for different NTFPs in different time. It was found that almost all the houses of the sample population are kuchcha houses therefore, during primary processing lot of impurities get involved in the NTFPs that significantly decreases the prices of them while sale.

Processing facilities at group level

To ensure supply of quality NTFPs from the rural population and provide them better prices, concrete cemented platforms have been created by CGMFPs Federation in many villages to ease primary level processing like drying, cleaning and grading of the MFPs. Pucca buildings and drying platforms have been constructed for the group processing centres to ensure quality processing of different NTFPs. This initiative has helped the rural people to ensure supply of good quality raw and semi processed NTFPs to market. However, the extend of these initiatives is limited available in few villages only and therefore, its impacts have been restricted to few villages only.

Woman's involvement in NTFPs collection

Due to the majority of Tribal over general caste in Chhattisgarh, women's participation was found higher in collection of NTFPs than man in households of all social categories.

They gather NTFPs alone as well as with male member and children of family. Therefore, their cumulative participation in gathering NTFPs is higher than male members. NTFPs especially those which are used for consumption purpose and found in vicinity of village are largely gathered by women only. NTFPs of commercial importance are collected by women and men both and some time by whole family like Tendu leaves, Imali, Jamun, Mahua, Char, Mango, which is commercially important and remain available for short duration (one to two weeks).

All NTFPs are not extracted in the study area, only those NTFPs which have commercial and domestic value, are extracted. Although medicinal wealth is abundant in wild, number of edible product was collected in the study area. The products are mainly Mahua, Char, Amla, Imali, Jamun, Tendu, Aam etc. Among the edible sources, fruit and seed are largely extracted. Locally available wild food plant serve as alternative to staple food during hardest month of the food availability are a voluble supplement for a nutritionally balanced diet during famines and lean seasons. Forest dwellers of study area exclusively depend of the wild food plants for meeting their dietary and nutritional need more over; the indigenous communities had sufficient traditional knowledge for using wild food.

The highest number of NTFPs was extracted by Sandhkarmari village presented in table no.1 Whereas the table no.2 shows that the lowest amount of NTFPs was extracted by Sonpur village. Almost all edible product 100% were domestically utilized only the surplus quantity were sold in local markets. The utilization of extracted NTFPs in area varied from highest in Sandhkarmari and lowest in Sonpur.

The sample households consumed significant proportion of Mahua flower, seed and edible products for home consumption where as surplus products like Amla fruit, Mahua, Imali, Cha, Tendu, Jamun, Aam etc were generally sold in villages itself or local primary tribal markets.

Conclusion

The livelihood of the household in the study area depends on portfolio of activities in which NWFPs is one of the major role play. The collection of NWFPs is the major cash income source to this rural people particularly for the poor as they have less alternatives

sources of income. The use of these products adds crucial dimension to a diversified livelihood base, thus act as a safety net particularly when there is a short fall in agricultural production to minimize risk and fill the gap of food shortage. Strategies institutional and organizational changes, on the local regional and national level through social, tacked in order to encourage NWFP conservation and local community participation in an appropriate way. Any new policy aimed at NWFP need to be applied with extreme prudence, as the outcome will not only affect some society's poorest members. If seeking to promote reforestation and use of NWFP, it is importance to give land to the landless and to concentrate on tenure per se does necessarily have a positive influence on sustainability, it could provide an incentive, which in turn can be used to promote sustainability and accountability of the users.

Communities must encourage permanent training, technical assistance and transfer of technical knowledge within and between communities, if they want to compete in formal competitive methods. A strong leadership within the organization is needed, in order to manage the required balance between satisfying internal needs, copying with external pressures from assisting organizations NGO's) Government, Buyers) and finding a path to successful business.

Women play a vital role in the context of NWFPs right from stage of collection, processing, value addition, transport tills its marketing. In each of the stages NWFPs trade women's involvement is quite significant. The NWFP collectors were not aware of value addition techniques other than making wine from Mahua. Oil extraction for commercial purposes is not done due to lack of resources, lack of knowledge and in most cases due to lack of interest. Most of the NWFPs are collected and sold when their seasons arrive, without much effort towards value addition or even storing for future sale. We can understand crucial role of the NWFP in light of tribal economy in case of sector wise income distribution. The results of study revealed that, NWFPs played greater economic role among low of livelihood. It also becomes a primary activity during certain period of the year for those not having agriculture land. Thus households were found to depend on NWFP not only for their livelihood but also to earn cash income, which in turn make them to increase their purchasing power to buy food.

References

1.*Acharya, K. (2007). ENVIRONMENT-INDIA: Tribal's distressed by ban on forest gathering. In: Inter press news agency.*

2.*Adepoju, A. A. and Salau, A. S. (2007). Economic valuation of non-timber forest products (NTFPs), Munich Personal Re Pac Archive (MPRA).*

3.*Basavarajappa P.T. (2008). Non-Timber Forest Products (NTFPs) for Food and Livelihood Security: An Economic Study of Tribal Economy in Western Ghats of Karnataka, India.*

4.*Clark, L. (2001) . Non-timber forest products economics and conservation potential, Central African Regional Program for the Environment.*

5.*Dogra K.R.(2012). Networking Project on Non-Timber Forest Products. National project director, forestry education ICFRE. 1-9.*

6.*Ganeshaiah, K.N., Uma Shaanker, R., Murali, K.S., and Bawa, K.S. (1998). Extraction of non-timber forest products in the forests of Biligiri Rangan Hills. Economic Botany 52: 316–319.*

7.*Gautam S.R. & Bhattacharya P., Mukta R., Contribution of Non-Timber Forest Products (NTFPs) in Rural Economy of Chhattisgarh State.pp.,5-6.*

8.*Gubbi Sanjay and Douglas C. MacMillan (2008). Can non-timber forest products solve livelihood problems? A case study from Periyar Tiger Reserve, India Fauna and Flora International, Oryx, 42(2), 22.*

9.*Malhotra, K.C. and Prodyut Bhattacharya (2010) Forest and Livelihood. Published by CESS, Hyderabad , pp. 246*

10. *Murali, K.S., Uma Shankar, R., Ganeshaiah, K.N. and Bawa, K.S. (1996). Impact of NTFPs extraction on regeneration, population structure and species composition. Economic Botany 50: 251–269.*

11. *Paul, B. Soni., V. K. and Das. A. (2013). Forest dependency of Dhurwa tibe found in Bastar plateau of Chhattisgarh . Life Sciences Leaflets 3:01-05, 2013 pp 1-5*

12. *Rai, N.D. and Uhl , C.F. (2004). Forest product use, conservation and livelihoods: the case of Up page fruit harvest in the Western Ghats, India. Conservation & Society, 2, 289–313.*

13. **Rao,B Gautam (2007).** *"Market potential of Non-Timber Forest Products in West and Central Bastar , Chhattisgarh Dissertation submitted at Bastar Vishwavidyalaya , Jagdalpur .pp. 5-6 & 15-20.*

14. **Shahabuddin, G. and Prasad, S. (2004).** *Assessing ecological sustainability of non-timber forest produce extraction: the Indian scenario. Conservation & Society, 2, 235–250.*

15. **Tewari, D.N. (1993).** *Non-timber forests produce in poverty alleviation. Indian Forester Dec: 959–968.*

16. **Ticktin, T. (2004).** *The ecological implication of harvesting non timber forest products. J. Applied Ecol., 41: 11-21.*

17. **Tiwari , K.P. (1995).** *Collection of aonla (Emblica officinalis) fruits from forest: an impact assessment. Vainiki Sandesh, (14) 1–5.*

18. **Yavad, M. and Dugaya, D. (2016)** *Non-timber forest products certification in India: opportunities and challenges. IIFM publication Bhopal 15:567–586 .*

SDIS-055

New Science – Computerized Music & Digital Recording

Prabodh Kumar Gupta

I.K.S. University, Khairagarh, rprabodh@gmail.com

Abstract

With the use of New Science - Computers and Digital Devices, the processes of music composition and its production have become intertwined with the scientific and technical resources of society to a greater extent than ever before. The use of technology in music is not new; however, it has reached a new level of pertinence with the rapid development of computer systems. Modern computer systems encompass concepts that extend far beyond those that are intrinsic to the physical machines themselves. Programming involves mental processes and rigorous attention to detail not unlike those involved in composition. In the 2000s, many performers have recorded albums using only a <u>personal computer</u> as a tracking machine. To use a personal computer as a multi-tracking device, the computer must have an <u>analog to digital interface</u> and multi-track recording software must be installed. Although the traditional musical instruments constitute a rich sound space indeed, it has been many decades since composers' imaginations have conjured up sound based on the interpolation and extrapolation of those found in nature but which are not realizable with acoustical or analog electronic instruments. With the elimination of constraints imposed by the medium on digital recording, there nonetheless remains an enormous barrier which the composer must overcome in order to make use of this potential. The fundamental assumptions in designing a computer programming language is generality, the range of practical applications of any given high-level language is enormous and obviously includes music. The gaining of some competence at programming can be rewarding to a composer as it is the key to a general understanding of computer systems. The programming of musical structure is another opportunity which programming competence can provide.

With the use of computers and digital devices, the processes of music composition and its production have become intertwined with the scientific and technical resources of society

to a greater extent than ever before. Through extensive application of computers in the generation and processing of sound and the composition of music from levels of the micro-formal to the macro-formal, composers, from creative necessity, have provoked a robust interdependence between domains of scientific and musical thought. Not only have science and technology enriched contemporary music, but the converse is also true : problems of particular musical importance in some cases suggest or pose directly problems of scientific and technological importance, as well. Each having their own motivations, music and science depend on one another and in so ding define a unique relationship to their mutual benefit.

The use of technology in music is not new; however, it has reached a new level of pertinence with the rapid development of computer systems. Modern computer systems encompass concepts that extend far beyond those that are intrinsic to the physical machines themselves. One of the distinctive attributes of computing is programmability and hence programming languages. High-level programming languages, representing centuries of thought about thinking, are the means by which computers become accessible to diverse disciplines.

Programming involves mental processes and rigorous attention to detail not unlike those involved in composition. Thus, it is not surprising that composers were the first artists to make substantive use of computers. There were compelling reasons to integrate some essential scientific knowledge and concepts into the musical consciousness and to gain competence in areas which are seemingly foreign to music. Two reasons are particularly compelling :

(1) the generality of sound synthesis by computer,

(2) the power of programming in relation to the musical structure and the process of composition.

Computer

The late 1950s, 1960s and 1970s had the development of large mainframe computer synthesis. Starting in 1957, Bell Labs developed the MUSIC programs, culminating in MUSIC, a direct digital synthesis language.

In the 2000s, many performers have recorded albums using only a personal computer as a tracking machine. To use a personal computer as a multi-tracking device, the computer must have an analog to digital interface, and multi-track recording software must be installed (software is available at all price ranges or even free, in the case of free software or open source). As well, a microphone is needed to record the vocals of a singer or any other sources of sound or a line-level input to accept analog signals from other equipment.

This is all that is needed to use a computer as a digital multi-track. Alternately, a standard personal computer sound card can be used to capture sounds. This is done simply by attaching either a microphone to the microphone input jack if a vocal track is to be recorded, or a stereo cable from the electronic device (such as a synthesizer or a guitar amplifier) to the line input of the sound card. Computers with appropriate software and hardware can record multiple audio tracks at once. This audio interface hardware sends audio signals to the computer and may interface with the computer via a PCI card or USB connections. The instruments and singers' voices are recorded as individual files on the computer's hard drive and function as tracks as per traditional multi-tracking. Effects such as reverb, chorus and delays can be applied by the computer software. When the musicians are happy with the sound, the multiple tracks are mixed down onto two clean tracks, again within the multi-tracking software. Finally, the final stereo recording can be burned to a CD/DVD, which can be copied and distributed.

Sound Synthesis

Although the traditional musical instruments constitute a rich sound space indeed, it has been many decades since composers' imaginations have conjured up sound based on the interpolation and extrapolation of those found in nature but which are not realizable with acoustical or analog electronic instruments. A loudspeaker controlled by a

computer is the most general synthesis medium in existence. Any sound, from the simplest to the most complex, that can be produced through a loudspeaker can be synthesized with this medium. This generality of computer synthesis implies an extraordinarily larger sound space, which has an obvious attraction to composers. This is because computer sound synthesis is the bridge between that which can be imagined and that which can be heard.

With the elimination of constraints imposed by the medium on sound production, there nonetheless remains an enormous barrier which the composer must overcome in order to make use of this potential. That barrier is one of lack of knowledge –knowledge that is required for the composer to be able to effectively instruct the computer in the synthesis process. To some extent this technical knowledge relates to computers; this is rather easily acquired. But it mostly has to do with the physical description and perceptual correlates of sound. Curiously, the knowledge required does not exist, for the most part, in those areas of scientific inquiry where one would most expect to find it, that is, physical acoustics and psychobiology, for these disciplines often provide either inexact or no data at those levels of detail with which a composer is ultimately most concerned. In the past, scientific data and conclusions were used to try to replicate natural sounds as a way of gaining information about sound in general. Musicians and musician scientists were quick to point out that most of the conclusions and data were insufficient. The synthesis of sounds which approach in aural complexity the simplest natural sound demands detailed knowledge about the temporal evolution of the various components of the sound.

There is a much deeper understanding of timber, and composers have a much richer sound palette with which to work; new efficient synthesis techniques have been discovered and developed that are based upon modeling the perceptual attributes of sound rather than the physical attributes; powerful programs have been developed for the purposes of editing and mixing synthesized and/or digitally recorded sound; experiments in perceptual fusion have led to novel and musically useful research in sound source identification and auditory images; finally, special purpose computer-synthesizers are

being designed and built. These real-time performance systems incorporate many advances in knowledge and technique.

Programming and Composition

Because on the of the fundamental assumptions in designing a computer programming language is generality, the range of practical applications of any given high-level language is enormous and obviously includes music. Programs have been written in a variety of programming languages for various musical purposes. Those that have been most useful and with which composers have gained the most experience are programs for the synthesis and processing of sound and programs that translate musical specifications of a piece of music into physical specifications required by the synthesis program.

The gaining of some competence at programming can be rewarding to a composer as it is the key to a general understanding of computer systems. Although systems are composed of programs of great complexity and written using techniques not easily learned by non-specialists, programming ability enables the composer to understand the overall workings of a system to the extent required for its effective use. Programming ability also gives the composer certain independence at those levels of computing where independence is most desirable- synthesis. Similar to the case in traditional orchestration, the choices made in the synthesis of tones, having to do with timbre and micro-articulation, are often highly subjective. The process is greatly enhanced by the ability of the composer to alter synthesis algorithms freely.

The programming of musical structure is another opportunity which programming competence can provide. To the extent that compositional processes can be formulated in a more or less precise manner they may be implemented in the form of a program. A musical structure that is based upon some iterative process, for example, might be appropriately realized by means of programming.

But there is a less tangible effect of programming competence which results from the contact of the composer with the concepts of a programming language. While the function a program is to perform can influence the choice of language in which the program is written, it is also true that a programming language can influence the

conception of a program's function. In a more general sense, programming concepts can suggest functions that might not occur to one outside of the context of programming. This is of signal importance in music composition, since the integration of programming concepts into the musical imagination can extend the boundaries of the imagination itself. That is, the language is not simply a tool with which some preconceived task or function can be accomplished; it is an extensive basis of structure with which the imagination can interact, as well.

Although computer synthesis of sound involves physical and psychophysical concepts derived from the analysis of natural sounds, when joined with higher-level programming of musical structure the implications extend far beyond timbre. Unlike the condition that exists in composition for traditional instruments where the relation of vibration modes of an instrument is largely beyond compositional influence, computer synthesis allows for the composition of music's microstructure.

In the context of computing, then, the microstructure of music is not necessarily of predetermined form-associated with a specific articulation of a particular instrument. Rather, it can be subjected to the same thought processes and be as freely determined in the imagination of the composer as every other aspect of the work.

Conclusion

Physics, Psychology, Computer Science, and Mathematics have, however, provided powerful tools and concepts. When these concepts are integrated with musical knowledge and aural sensitivity, they allow musicians, scientists, and technician, working together, to carve out new concepts, physical and psychophysical descriptions of sound at levels of detail that are of use to the composer in meeting the exact requirements of the ear and imagination.

References

[1] http://computer.howstuffworks.com/drm.htm

[2] http://en.wikipedia.org/wiki/Amazon.com

[3]   http://www.apple.com/pr/library/2007/04/02Apple-Unveils-Higher-Quality-DRM-Free-Music-on-the-iTunes-Store.html

[4] http://www.emusic.com/info/how-it-works/

[5] news.sciencemag.org/2013/04/why-your-brain-loves-new-song

[6] www.bbc.com/news/science-environment-22096764

[7] www.avclub.com/.../new-study-shows-people-stop-listening-new-music

SDIS-056

Boosting Employability amongst Graduates – An Industry and Academia Interface

Dr Smitha Pillai & Mrs. Sheeba Joseph
BSSS College, Bhopal, M.P., India

Abstract

Industries play an important role in the economic development of any nation. Without industries, economic development is impossible. In a developing economy like India industries are indispensable. Although India wants to be a knowledge hub, there is no uniformity in the quality and standards of education, and formal education does not guarantee employability. To make the education more purposeful the University - Industry Collaboration is absolutely essential. It is the need of the hour that higher education curriculum should be designed by taking inputs from the industry. There should be experts from each sector to design the curriculum. The success of any curriculum depends on the quality of the teachers. The intensifying demand of higher education due to changing demographic profile of the country as well as the rising demand from the industry for skilled and employable graduates puts added stress on teachers to produce the desired results. For that the faculty should be trained or get familiarize with industrial practices.

Through this paper the researchers made an attempt to explore how higher education institutions can join hands with industry, identify the possible areas where industry involvement become more meaningful and purposeful.

Key Words: Industry-Academia interface, Higher Education, Curriculum

Introduction

Of the five million odd graduates that India produces annually, only a little over half are employable in any sector of the knowledge economy. Inadequate English and computer skills are key factors holding back students, especially those from smaller towns. The National Employability Report by Aspiring Minds, an employability solutions company, revealed this, based on the computer adaptive test on 60,000 Indian graduates. The students were tested communication skills in English, computer knowledge, analytical, cognitive skills and basic accounting knowledge. According to the report, women show

similar or higher employability compared to men, despite them scoring lower than men on many parameters barring English or analytical skills. Predictably, arts stream had the highest proportion of women, followed by commerce. Science and accounts had the lowest. The one area where women could needed help seems to be computer programming skills.

About 16% and 14% of the graduates were employable in sales and customer service or operations jobs, respectively. These require communication, cognitive skills and personality traits such as friendliness and agreeableness and in the latter numerical ability too. Over one third of the graduates (36%) were suitable for employment in clerical/secretarial jobs, the sector showing highest employability for graduates, followed by IT-enabled services and BPO. These show 21.4% employability as they require relatively low skills. However, when it comes to IT services and IT operations, only 13% and 16%, respectively are employable. Just 2% are employable in corporate communication or content development, for which the primary requirement is exceptional command over English and basic analytical skills. Only 3% are employable as analysts and a mere 2% in accounting. In teaching, the employability was just 15%.

The city from where the students graduate also influences employability. Employability is highest in the bigger Tier I cities (over 25 lakh population). The drop in employability is maximum for jobs of analysts and corporate communication, all jobs that require high competence in cognitive skills and English.

Estimated Skill Shortage by 2022 (in millions)

Infrastructure	103
Auto & auto Components	35
Building & Construction	33
Textile & Clothing	26.2
Transport & logistics	17.7
Organized Retail	17.3
Real Estate Services	14
Health care	12.7
Food Processing	9.3
Education & Skill development services	5.8

Source: Business today

An interaction with the business house reveals that nowadays none of the graduates are having the knowledge of real business operations and they found a big gap between education and employment. It was found that the higher the skill requirement for a job, the greater the gap between employability in Tier I compared with Tier II and III cities. Tier III cities (less than five lakh population) seem worst off when it comes to exposure to computers, while in English both Tier II and Tier III need help. When it comes to a drop in skills from Tier II to Tier III cities, it is noticeable that the drop in cognitive skills is the highest among management and engineering students. Non-metro cities have lower employability across all sectors. When students from non-metros shifted to the metros for graduation, they have scores similar to the metro students in English and cognitive skills. The difference doesn't close for computer fundamentals, despite higher education in a metro incidentally, when metro students moved to non-metros, they did worse on all scores than non-metro students who continued where they were.

Need for Academia-Industry Interface

Gap between the needs of the industry and aspirations of academic community is very large. Academicians always have a strong feeling that unless these initiatives find a place in industrial sector, this interaction will be confined to only developmental activities. There is a strong mismatch in perceptions of the two on the issues related to technology development. At present, the academic community is not geared to face this challenge of translating evolving idea into technology development

One important way of facilitating interaction between academia and industry is for teachers to take sabbatical at business organisations in their field of expertise. Such involvement will facilitate mutual understanding of each other's strengths and challenges.

In order to ensure that the teaching programmes and the curricula meet the challenging needs of the industry, senior personnel from industry should be involved as expert members of the committees which vet changes in curricula as well as new academic programmes. To provide a real-life exposure of the industrial world to its students, a vacation training programme can be organised. Programme can include industrial training

of faculty and students with a built-in provision of incentives as well as for the appointment of adjunct faculty from the industry.

Industry needs and expectations

Large industrial houses have the resources to invest in technology development initiatives. Academic participation is often needed in minor technological innovation. Small scale industries often depend on support in the areas of design, process improvement and machinery performance etc. They also rely on processes to yield a product which already exists. In some cases, problem solving may simply amount to product testing and production enhancement in terms of quantity and quality. In such interactions, industry's expected time frames have been immediate and investment is directed towards efforts that promise result oriented solutions.

Academia expectations

An academician shows interest normally in problems that are intellectually challenging. His areas of interest lie in technology development initiatives and methods related to process and design improvement. Researchers have strong preference for working towards creation of knowledge in specialised areas. For industry-related problems, a researcher has to explore a variety of options which is time consuming.

Objectives of the study

The primary research has been taken up with following objectives:

- To identify the areas where academic institutions can include industry participation.
- To know various approaches for industry-academia interface.

Methodology

Primary data has been collected from 15 academicians teaching different subjects from various autonomous colleges from the Bhopal City. They were personally interviewed and sent across a structured questionnaire. They were asked to rate on Higher education Institutions collaborating with industry on 9 listed areas on a scale

of 1 to 5. (1 being the lowest level of collaboration/ or the benefit accrued and 5 being the highest degree of collaboration/ or benefit accrued). The mean of the responses were taken to get degree of collaboration and the perceived benefit in specific areas.

Data Analysis & Interpretation

The main question that the survey asked from academicians was on various modes of Academia-Industry interface that they use. Table 1 and 2 depicts the summary of responses on various aspects.

According to the data, guest lectures are the most popular mode of industry interface. Guest lectures are sessions taken up by executives in addition to classes taken up by professional teachers. The objective of this is to give students an overview of industry practices and help them relate the theory to real life applications. It actually bridge the gap between theory and practical applications.

The second most preferred mode is establishing partnership through training and internships/fieldwork of students and thus increasing their placement opportunities and strengthening long term relationship between the two entities. Involving industry in student training and internships has become mandatory in the curriculum of all graduate and post graduate courses under Madhya Pradesh Higher Education. All students have to spend minimum 60 hours with corporate working on a specific project to gain hands on experience.

Extent of collaboration with the industry

The top five modes by which the colleges collaborate with industry are:

Table 1

S. No.	Areas of collaboration	Mean score	Standard Deviation
1	Guest Lectures	4.86	0.33
2	Training and Internship of students	4.5	0.62
3	Including industry into Board of studies	3.93	0.57
4	Including industry in Placements	3.5	0.75
5	Industry inputs in curriculum designing	3.9	0.44

The least preferred modes of collaboration are:

Table 2

S. No.	Areas of collaboration	Mean score	Standard Deviation
1	Faculty selection	2.1	0.33
2	Joint community development services	1.2	0.4
3	Helping industry in training and selection of their staff	1.13	0.3
4	Financial support from industry for academic activities	2.6	1.4

The inclusion of executives in the Governing Bodies and Board of Studies in autonomous colleges is yet another preferred mode of collaboration. The objective of having industry representation is to include the latter's view in governance and other activities of colleges.

Finally, good higher educational institutes' faculty is slowly integrating the industry's views into their curriculum. Many universities in India have been inviting suggestions from industry to update their curriculum and include the topics of present day relevance. This is done with a view of imparting the knowledge and skills set, needed by graduating students in constantly changing global business environment.

It is evident from the Table 2 that the autonomous colleges don't involve industry in their internal matters like recruitment of the faculty and their training and development etc where the involvement of industries is not very much appreciated. But it is learnt that some colleges do involve industries for financial support for various activities they conduct at state as well as national level like college fest, conference, seminar etc.

Various Approaches of Interface

During the interaction with the business houses, the following areas were identified as approaches for interface

Knowledge transfer

The industry can hire significant number of students. This is a highly effective form of technology transfer.

Industry and government research relationships

Many researchers are working in advisory or consulting capacities with a number of companies. In some cases principal investigators in research hold positions on the technical advisory board. Large scale collaborative projects are also being carried out in certain institutions.

Summer camps

These can be arranged in collaboration with the industry to expose the students to various academic and extra curricular activities. These can comprise a series of lectures and presentations from distinguished professionals from the industry and academia, video shows on some industry projects, group discussions, debates and field trip to some industrial houses. These camps serve as a forum for the development of over all personality, leadership, organisational skills and exemplary team work which are essential for a successful career in addition to academic activities.

Camps provide a platform for professionals to enrich the participants with their first hand experiences in the field and their professional expertise.

Provision for scale up operation

Most of our students develop new products or processes which are restricted as bench experiments. Due to non-availability of scale up processes as a result of capital and operational cost, the research is not able to reach the market.Interaction and informal tie ups can ensure successful implementation of work developed in the institution.

Consultancy services

Academic institutions can help the industrial houses by providing consultancy services which are sought by small-scale entrepreneurs having no access to R&D and quality control facilities. It can be in the form of evaluation of products, processes, software development etc.

Important principles for industry academic interaction

Following principles can be used as guidelines:

a) Open academic environment: It is the responsibility of the administration, the academic council and departmental faculty to establish appropriate norms for existence of an open environment

b) Freedom to publish: Freedom to publish is fundamental to the university and is a major criterion for the research project. Faculty should be encouraged to engage in outside projects. These at the same time, should not interfere with their performance of teaching and research duties.

Conclusion

A support system is needed to ensure a focused involvement of both academia and industry. Academic institutions should develop systems and procedures to ensure that industry expectations are met without any compromise on academic aspirations. Initially, academia should conceive and take up short term, small budget projects which would instill confidence in industry and encourage it to start development projects. Industry also has to give a fresh look to its R&D efforts. This process must be guided by a complete shift from trading set up to a technologically- driven entrepreneurial set up. Academia should tilt the focus of basic research to applicative research. Research initiatives involving industry people with flexible formats could serve as the first step in this direction.

Venues should be created for close interaction starting from conceptualization down to commercialization. Setting up of technology incubation centers in close proximity of academic institutions could provide for fostering wholesome technology development.

References

1. *Aggarwal A., Rizvi I.A & Popli S. (2004), "Global Branding of Business Schools: An Indian Perspective", Welingkars Research Journal, Volume II, Issue-4, pp 2-31.*

2. *Dhawan Rani (2000). "Impact of Academic Staff Colleges Programmes on Teachers and Students", Uni-versity News, Vol. 38 (16), pp14-20*

3. *Duderstadt James J, 2005, "University-Industry-Government Partnerships for a 21st Century Global, Knowledge-Driven Economy: An American Perspec-tive", from http://milproj.dc.umich.edu/publications/glion_05/index.html accessed 20th February 2014*

4. *Ernst and Young, 2012, "Higher Education in India: Twelfth Five Year Plan (2012-17) and Beyond", from http://www.ey.com/Publication/vwLUAssets/Higher_Education_in_India/$File/EY -FICC_Higher_Education_Report_Nov12.pdf accessed 31st November 2013*

5. *Indian Express, 2012, "'Section 25 cos may start teachers training course"'Indian Express dated 20th Au-gust 2012 from http://indianexpress.com/article/news-archive/web/section-25-cos-may-start-teachers-training-course/ accessed 20th December 2013*

CYBER SECURITY AWARENESS IN BASTAR DISTRICT AMONG THE STUDENTS

Jay Shankar Sahu

Asst. Professor Christ College Jagdalpur

Abstract

Information security is not only about physical and logical measures such as locks, firewalls or anti-virus software. These technical measures may protect against many network attacks, but cannot protect against soft attacks, such as social engineering. Some of security countermeasures are technical but most of security measures rely on users. Teaching security awareness for students through an interactive program is essential for reducing the risks that could affect them. A strong information technology (IT) security program cannot be executed successfully without training users on security threats, policies and techniques to protect the assets or other useful data.

In this research paper we tried to describe some security issues of social networks and access of internet that can be harmful for user and also describe what protection can be adopted against them.

Keywords: - *Cyber security, social networks, network attacks.*

Introduction

The objective of this research is to educate and create cyber security awareness in the Bastar district located in chhatishgarh among the student community which covers Christ College, Government Post Graduate College, Christ Nursing College, Surya College, and Polytechnic College.

"Cyber Security" means protecting information, equipment, devices, computer, computer resources and information stored from unauthorized access, use, disclosure, disruption, modification and destruction.

Need of Cyber Security Awareness

Identity Theft is common and Dangerous

Theft Identity theft is a term used to refer to fraud that involves stealing money. Stolen identities of students could put their future in jeopardy and make them immediate financial loss. This is a crime that does not make itself immediately obvious; many students do not realize their identities have been stolen until they apply for financial aid or a loan. The Federal Trade Commission estimates that the identities of more than 10 million people are stolen each year. Cyber criminals use social engineering or phishing attacks to steal Social Security numbers, which can be used to obtain credit cards and even buy houses. Institutions should encourage their students to regularly have their credit checked to ensure their identity remains uncompromised.

Cyber Crime

Awareness for student's curiosity may be primary reason to get motivated for a cyber crime. Most of the times students are not aware about the implication of cyber crime Girls are most found victim of cyber crime. Cyber pornography covers pornographic websites; magazines produced using computer and internet. The CEO of Software Company in Pune (India) was arrested for sending highly obscene email to a former employee.

Phishing Attacks

Phishing is the attempt to acquire sensitive information such as usernames, passwords, and credit card details (and sometimes, indirectly, money), often for malicious reasons, by masquerading as a trustworthy entity in an electronic communication. Phishing is a continual threat, and the risk is even larger in social media such as Facebook, Twitter, and Google+. Hackers could create a clone of a website and tell you to enter personal information, which is then emailed to them. Today social networks sites make it very simple for people around the world to communicate and interact with each other. Most users from different ages login to social networks to share security mechanism.

Email Bombing

Email bomb is a form of net abuse consisting of sending huge volumes of <u>email</u> to an address in an attempt to overflow the mail.

Objectives

1. To develop cyber security awareness in Bastar district among the college students.
2. To find out what mechanism are adopted for security purpose by the students.
3. To find out through which device they are accessing social networks and other internet access.

Methodology

1. **Collection of Samples - Samples** were collected from different colleges of Bastar region. Especially from urban area where social networks sites and internet are accessed for various purposes.
2. **Analysis of Sample –** Analysis of sample is done by some security factors like use of internet, which device they often use for accessing internet and other social network site.
3. **Analysis of data through Direct Interaction –** To analyze the data we directly interact with student of who directly or indirectly daily or seldom uses social networks site and internet and takes the benefit of these

To achieve security awareness we asked the following questions to students

1. **Do you have security awareness that support safety when using social network websites or internet?**
   To answer this question first we need survey for internet users. Survey was divided into different section. First section was generally about their use of electronic device. The next part was about their use of social media websites. We evaluate their security awareness understanding based on their answers to the questions of these sections.
2. **Which of the following device do you most use often uses to connect the internet?**

The answer of this question again require a survey of devices uses to access the internet by the students .To accomplish this task we divide devices into four category IPAD users, Laptop users Desktop users and Smartphone users.

Result

After analyzing of sample of 100 incident of various college students of Bastar region we cover Christ College, Government Post Graduate College, Christ Nursing College, Surya College and Polytechnic College and get the following responses.

1. Do you have security awareness that support safety when using social network websites or internet?

   In general, the security awareness of the Internet users according to their answers is sufficient to protect them. Among 100 participants, 94.5% of them always use the Internet. After first part of a survey it is finding that only 5% students leave computer or device ON.85% students never leave computer ON.5% students sometime leave computer ON and 5% student not aware about it. Second part of survey covers signing off from social networks sites 40% students always log off their sites after surfing 30% students never log off ,20% students sometimes log off and 10% students don't know about log out process they only use internet. Next part of survey based on sharing of daily life activity where 70% users never share their daily life activity like picture or some information, 30% users always post their picture or other activity in social network sites like facebook or whatsapp.

   One of our most important surveys was based on customization of our security services provided by the social networks sites. 80 % of users never customize their security, 10% users aware about it they daily check this as all social networks sites always changes their security policies and 5 % percent users are don't know anything about customization of security policies. Next part of survey was based on inspection of cookies and history 75 % users never check their status, 10% users always check their cookies and delete history of browser.

Result of password security is most important part of cyber security which keeps important role. The survey finds that 85% users remember their password in their mind, 10% users write it into paper and 10 % users save their password in browser and few users are not aware of password. Result of our survey is tabulated in following manner.

S N	Question	Always	Never	Sometimes	I don't Know
1	How often you leave your computer or device "ON" after finishing your work.	5%	85%	5%	5%
2	Do you Sign off/ Log out from the social network when you finishing work.	40%	30%	20%	10%
3	How often do you share your daily life activities(with or without picture)	30%	70%	10%	10%
4	Do you customize the security setting in your security program?	10%	80%	5%	5%
5	Do you inspect the cookies and the history o internet browser?	5%	75%	5%	15%

Table 1: Responses of Cyber Security awareness questions

2. Which of the following device do you most use often uses to connect the internet? In our first survey Smart phones are most likely to be used to surf the Internet and the social media websites.90% users uses smart phones for connecting internet,4% users uses desktop,5% users uses laptop and only1 % users uses IPAD.

SN	Question	IPAD	Laptop	Desktop	Smartphone
1	Device do you most use often uses to connect the internet.	1%	5%	4%	90%
2	Device do you use for Social network (You may choose more than one).	1%	10%	5%	84%

Table 2: Responses of Most often used Device to surf internet

Descussion and Recmmendats

This research is based on survey of college students in Bastar District Chhattisgarh which covers Christ College, Government Post Graduate College, Surya College and Christ Nursing College. We find 95 % of students are directly or indirectly connected with internet for education, entertainment and other activities. But most of them are not aware about security policies. Students need one source of information that teaches them through a variety of methods about safety procedures. The common policies applied to college students especially in urban area who are using most of their time in internet and other social websites.

Cyber Security Awareness Training program for students

We recommend that students should be provided security program including their parent. Technical procedures and public laws should be included in the program. The findings show that both of them do not have sufficient knowledge in either the technical procedures or the policies provided.

With the prevalence of mobile devices, more than ever, it's easy for us to share our lives with the world. And yes, social networks are all about staying in touch with friends and family, and sharing events in your life, but perhaps it's too easy to share information?

With just a few clicks, posts and messages, you could give away enough personal information to compromise your privacy and even open yourself up to identity theft. So that's why it's critical that you know how to protect yourself when using these sites. Here some tips are listed:

When you sign up the social network sets your privacy controls to default

When you sign up for a social network, the network sets your privacy controls to its default settings. The default settings vary from network to network, so it is unwise to assume that all of your information is private unless you indicate otherwise. Some social networks default privacy setting to "public," meaning that anyone on the entire Internet can see the information posted on your Page. In order to achieve the right level of privacy protection, utilize your privacy controls and Take the time to set them appropriately.

 Read the social network's privacy control Guideline

Each social network has its own unique system of privacy controls. Read the network's guidelines for privacy setting, which are usually contained within the privacy policy. Because each network uses its own terminology, this may help you understand whom you are sharing your information with. For example your Facebook privacy setting can be set to everyone friend of friend, friend only or custom.

Social networks set their controls to "public"

Many people believe that "public," "anyone," and "everyone" settings apply only to people on   the social network, but nothing could be further from the truth. In the case of social Network everyone means everyone. If you set your profile to public, everyone, or a similar Setting, It means that you are making your profile information available to everyone on the internet.

Don't overlook communications' settings

Another common mistake that people make on social networking websites is the failure to use communication settings that control who can contact you. MySpace, Facebook, Twitter,   and Other social networks all allow you to block specific users from seeing your information   or communicating with you via the social network. In some cases, social networks also allow only People who can verify they know you to contact you or send you friend requests.

Don't accept blanket settings on your social networking

One of the most common social networking privacy mistakes is to accept blanket privacy setting on your social networking accounts. There are some pieces of information you may wish to Protect such as personal contact information, date of birth, hometown, or other private data. Most social networks allow you to customize your privacy setting so

that you make some information more private than other. Use these custom settings for maximum privacy protection. Many social networks also allow you to set any post, picture or comment with custom privacy setting for greater privacy protection.

Protect your privacy

Social networking sites frequently change their privacy controls. Stay abreast of any changes to privacy controls by regularly reading the network's privacy policy and monitoring your personal privacy settings.Realize that social network "applications" may use your private information differently than the social networks do.

Exercise caution when clicking on links: Even if they're from friends. Hackers prey on social networks because you are more likely to click on something from your friends. Also be wary of offers with the word "free" in them, or ones that sound too good to be true, as they usually are.

Manage your privacy settings: Make sure that you are only sharing information with friends and family and check them regularly in case there are any changes.

Be aware of the fact that the information you share on one social network may be linked to another: For instance, a photo you post to Twitter may automatically post to your Facebook profile.

Don't reveal personal information: Be suspicious of anyone who asks for your personal information online and never share your home address, phone number, Social Security number, or other personal identifying information.

Turn off the GPS function on your Smartphone camera: If you plan to share images online, make sure that you turn off the GPS on your device to keep your exact location private.

Don't enable auto login: Make sure that you don't have your apps set to automatically log you in and that you don't have your computer's browser "remember" your login and password. That way if someone does get access to your devices, they can't automatically access your social sites.

Change your passwords frequently: Choose hard-to-guess passwords that are at least eight characters long and a combination of letters, numbers, and symbols, and change them regularly. Also make sure you use different passwords for each account.

Close old accounts that you don't use anymore: Don't risk leaving personal data in an old account, such as a MySpace page you haven't used in years, or on an online dating site you no longer need. Instead, close the accounts you don't use and delete as much personal information from them as possible.

Conclusion

Ultimately, all colleges and universities must make cyber awareness training part of the formal university strategic plan and must require stakeholders to participate in annual training, just as major corporations do.

We discussed the benefits of using technology especially in the field of cyber security and awareness program.

Students need to be trained on how to respond to social engineering and phishing attacks. To protect against social engineering, stakeholders must verify the identity of individuals before giving out information or even replying to messages. Many Colleges tend to forget about nontechnical measures to ensure security of their assets. Technical measures alone are not enough to ensure security of student records. Nontechnical measures, such as awareness training, are a critical measure to ensure data confidentiality, integrity and availability.

References

[1] R.Kellough and N.Kellough. A Guide to method and recourse, RICE 1999.

[2] J.A.Corrigan "The implantation of e-tutoring in secondary school: A diffusion study" computer and education, vol 59, No-3, pp.925-936, 2012.

[3] Shahkandrap "Cyber security awareness for student".

   http://www.slideshare.net/skandarp/cyber-security-awareness-for-students

[4] http://evolllution.com/opinions/cybersecurity-awareness-training-9010-rule:

[5] K.Stacy Teicher, "Not just 4 texting 1 in 3 college's uses smart phones for homework.

   http://search.proquest.com.ezproxy.rit.edu/docview/1220717477?accountid=108

[6] K. F. Durkin, "Misuse of the internet by pedophiles: Implications for law enforcement And probation practice," Federal Probation, vol. 61, no. 3, p. 14, 1997.

SDIS-59

Utilization pattern, collection and processing of medicinal and aromatic plant parts

Dr Sharad Nema

Associate Professor & Head (Forestry), School of Studies in Forestry & Wildlife),
Bastar University, Jagdalpur (C.G.) Email: sharadnema@rediffmail.com

Abstract

India has 16 agro-climatic zones, 45000 different plant species and 15000 medicinal plants that include 7000 plants used in Ayurveda, 700 in Unani medicine, 600 in Siddha medicine, 450 in Homoeopathy and 30 in modern medicine. Because of this facts and figure, India one among the 12 mega biodiverse countries of the world and despite having only 2% of the total land area, the country account for over 8% of the recorded species of the world. India, with its diversified medicinal biodiversity has tremendous potential and a natural advantage in this emerging area. Today medicinal plants is becoming scarcer day by day because of over exploitation and unscientific harvesting practices for their useful parts. The sustainable management, utilization and harvesting of medicinal plant can conserve biodiversity, promote environment health, generate employment opportunities and provide affordable drugs and augment exports. The cultivation and processing of medicinal & aromatic plants can provide handsome returns to farmers and growers besides their development and sustainable use of medicinal plants in the country. The 31 potential medicinal plants species which are high in demand both in domestic and international markets are prioritized in India whereas 10 potential medicinal plants in Chhattisgarh State has identified and priorities for cultivation, as these plants constitute a bulk of the ingradients used in the preparation of ISM & H and herbal product. The some of the important plants are Ghikanvar (Aloe vera), Kalmegh (Andrographis paniculata), Satawar (Asparagus racemosus), Sadasawagan (Catharanthus roseus), Mulethi (Glycyrrhiza glabra), Pashan bheda (Coleus barbatus), Gudmar (Gymnema sylvestre), Tulsi (Ocimum sanctum), Bhui amola (Phyllanthus amarus), Chitrak (Plumbago zeylanica), Sarpgandha (Rauvolfia serpentina), Giloe (Tinospora cordifolia), Ashwagandha

(Withania somnifera), Kalihari (Gloriosa superba), Makoy (Solanum nigrum), Isabgol (Plantago ovata), Pippal (Piper longum), Baibidang (Embelia ribes), Sated Musli (Chlorophytum arundinaceum/ C. borivillianum), Senna (Cassia angustifolia), Aonla (Emblica officinalis), Ashoka (Saraca asoka), Guggal (Commiphora wightii/ C.mukul), Chandan (Santalurn album), Brahmi (Bacopa monnieri), Atees (Aconitum heterophyllum), Chirata (Swertia chirata), Jatamansi (Nardostachys jatamansi), Kokam (Garcinia indica), Kuth (Saussurea costus), Kutki (Picrorhiza kurroa), Daruhaldi (Berberis aristata), Vatsnabh (Aconitum ferox).

Medicinal properties of these plants can be derived from the different parts of a plant includs leaves, roots, bark, fruit, seeds, flowers, stem etc. The different parts of plants can contain different active ingredients within one plant. Thus, one part of the plant could be toxic while another portion of the same plant could be useful for curing the various ailments. Today these biodiversity dependent rural and tribal communities are facing a serious resource threat because of the rapid loss of natural habitats and the over exploitation of medicinal plants from the wild by the destructive and unscientific collection method. This biodiversity loss is not only a threat to ecology of the planet but a more immediate threat to the livelihood security of rural and tribal communities. This paper dealt with proper utilization, collection, harvesting and processing techniques of valuable and life saving durg yielding plants of medicinal plants for their sustainable utilization and management.

Key word: *medicinal and aromatic plants, collection, processing, storage*

Introduction

Because of this facts and figure, India one among the 12 mega biodiverse countries of the world and despite having only 2% of the total land area, the country account for over 8% of the recorded species of the world. India, with its diversified biodiversity (Fig 1) has tremendous potential and a natural advantage in this emerging area. Today medicinal plants is becoming scarcer day by day because of over exploitation and

unscientific harvesting practices for their useful parts (Fig 2). The sustainable management and harvesting of medicinal plant can conserve biodiversity, promote environment health, generate employment opportunities, provide affordable drugs and augment exports. Cultivation of medicinal plants can provide handsome returns to farmers and growers.

The Government of India under Ministry of Health and family Welfare, Department of ISM & Homoeopathy, New Delhi has set up a National Medicinal Plant Board for the development and sustainable use of 31 priorities & potential medicinal plants in the country which are in high in demand both in domestic and international markets has identified and priorities for cultivation, as these constitute a bulk of the ingradients used in the preparation of ISM & H and herbal product (Fig.3). However, according to the International Union of Conservation of Nature (IUCN, 1978), out of 17000 species of higher plants near 1256 species in India are threatened due to their importance and various other reasons.

Medicinal properties of plants can be derived from the different parts of a plant includs leaves, roots, bark, fruit, seeds, flowers, stem etc. The different parts of plants can contain different active ingredients within one plant. Thus, one part of the plant could be toxic while another portion of the same plant could be useful for curing the various ailments. The plant roots specially tuberous roots such as *Chlorophytem borivellianum*, ashwagandha, serpgandha, kalihari, patharchur, etc were much useful than the tap root for example khamer, etc.

Medicinal properties can be derived from the following:

Bark: The protective outer layer of a tree trunk that is formed by layers of living cells above the wood. Active ingredients are often found in higher concentrations in the bark. Examples of bark used for medicinal properties are quinine bark, Arjun bark, oak bark, pepperbark, and willow bark.

Essential Oil: These are defined as volatile oils that are generally extracted from plants using a steam distillation process. Examples include Citrenolla oil, Citriodora oil, Camphor oil, peppermint oil, lemongrass oil etc.
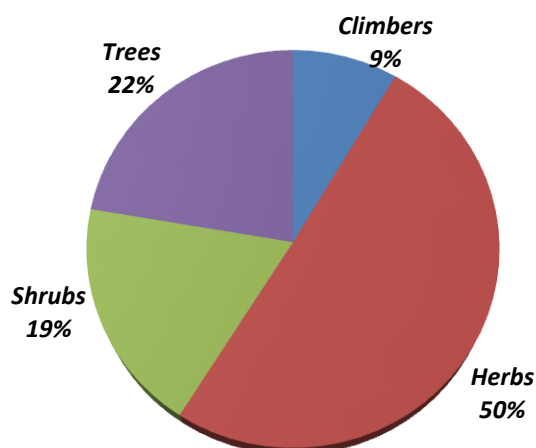
Fatty Oil: These are defined as non-volatile vegetable oils that are pressed from the seeds or fruits of plants and are insoluble in water. Examples of fatty oils used in medicine are castor oil, olive oil, mahua oil, Sal and safflower oil.

Leaf: The leaves of plants, shrubs, and trees can be used for medicinal properties. Leaves can be used alone or can be mixed with twigs, stems, and buds. Examples include Neem, Ashwagandha, Giloy, Gudmar, Currey leaves, Beal, Munga etc.
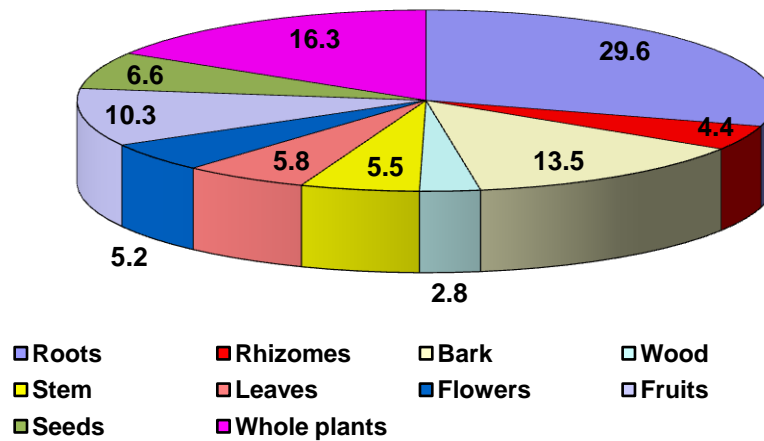
Flowers: The flowers of plants have always been popular in traditional medicine. Examples include clove, akarkara, aak, Chitrak, Adusa, Chamomile flowers, Mahua flower, Palas flower etc. Flower parts are also used such as saffron stamens, the stigmas of maize or pollen.

Fruit: Fruits have been heavily used for medicinal purposes. Dried whole fruits or portions of fruits can be used. Example Anola, Harra, Bahera, Beal, Jamun, Custard apple etc.
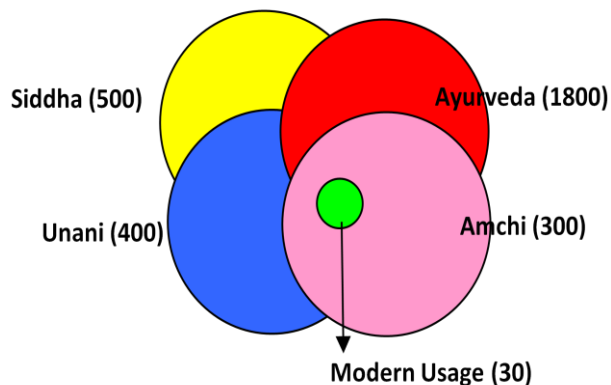
Fig.(1): Diversity of medicinal plants

Fig. (2): Medicinal plants by parts used

Legend:
- Roots
- Rhizomes
- Bark
- Wood
- Stem
- Leaves
- Flowers
- Fruits
- Seeds
- Whole plants

Values shown: 29.6, 4.4, 13.5, 2.8, 5.5, 5.8, 5.2, 10.3, 6.6, 16.3

Fig.(3): Medicinal plants used by traditional communities

Siddha (500), Ayurveda (1800), Unani (400), Amchi (300), Modern Usage (30)

Seed: The seeds of many plants are used for their medicinal properties. Seeds may be contained within a fruit or are sometimes used on their own. Examples are Ashwagandha, etc.

Roots: The fleshy or woody roots are used for medicinal purposes. Roots may be solid (ginseng), fibrous (stinging nettle), or fleshy (devil's claw). The plant roots specially tuberous roots such as Safed musli (*Chlorophytem borivellianum*), ashwagandha, serpgandha, kalihari, patharchur, etc were much useful than the tap root for example khamer, etc.

Tuber: A tuber is defined as a swollen, fleshy structure below ground. Tubers are usually of stem origin but can be partly stem and root in origin. Tubers used for medicinal properties include African potato and autumn crocus.

Rhizome: A rhizome is defined as a fleshy or woody elongated stem that usually grows horizontally below the ground. Rhizomes often produce leaves above the ground and roots into the ground. Several medicinal plants are used primarily for their rhizomes including: Buch, ginger, etc.

Bulb: A bulb is defined as a fleshy structure comprised of numerous layers of leaf bases otherwise known as bulb scales. Custus spiciosa, Onion and garlic bulbs are popular for medicinal uses.

Whole plant: In some plant all part on an plant is important and because of this whole plant is important. Examples are Kalmegh, Giloe, Tulsi, Ashwagandha, Brhami, Mandupparni etc.

Gum: Gums are solids that are mixtures of polysaccharides (sugars). They are water-soluble and are in part digestible by humans e.g. Sterculia urens, Anagessus latifolia, Acacia nilotica, Acacia senegal, Butea monosperma, Boswellia serrata, Buchnania lanzan, etc.

Resins: Resins are a mixture of essential oils and terpenes that are usually not soluble in water. They are excreted by specialized cells or in ducts of plants like Pine resine. Some time this resin mixed with the gum then it is called as Oleo-resin examples Guggul, Salai, etc.

Collection and post-harvest management of various

The whole plant and one or more part like root, bark, stem, leaves, flowers, fruits, seeds of the species which consists of useful active compound or active ingradient need special care with additional precausion while collecting or harvesting the particular parts of plant for their sustainable use. In general the collection or harvesting of medicinal plant parts at a season when it causes the minimum harm to

the plant is also important (Table 1). It is recommended that a collection and harvesting should be in order to minimize the harm to nature and to optimize the quality of the produce. Some of the important points, which need to be taken care while collecting and harvesting of medicinal plants of various categories, are as follows:

A. Underground parts:

  i. Roots of annual plants must be dug out at its maturity (when the plants are well developed and mature) or otherwise roots and rhizomes should be collected only after the seed shedding. It also facilitates regeneration of species.

 ii. Roots of perennials should be harvested late in the fall or early in the spring. Roots of biennial should be collected in either the fall of the first year or spring of the second year.

iii. The root material that is rich in essential oils should be handled carefully to prevent the loss of essential oil or its degradation from evaporation process.

 iv. Roots or rhizomes needs to be uprooted without harm to other plant species in the vicinity and underground parts should be collected with minimum possible digging by using appropriate tools.

  v. When roots of species that are propagated vegetatively in nature are collected, enough underground part should be left at site to allow regeneration.

B. Annual herbs/ Whole plants:

  i. When collecting whole herbaceous plant, or its aerial parts, the harvesting should be done at flower bud or flowering stage but prior to any visual decline in any of the plant parts.

 ii. While harvesting an adequate plants of the same species should be left in nature for regeneration to facilitate future collections.

iii.   Impurities like weeds, grasses, annuals, other undesired herbs should be easier to removed immediately after the collection rather than after drying.

 iv. In general medicinal and aromatic plants should be dried in the shade places as soon as the external moisture has been removed.

C. Stem Bark:

  i. Stem bark should not be harvested when the tree is under new growth (like spring season)

 ii. As far as possible, the bark should be collected from mature branches of the trees leaving the main trunk intact. Bark from entire branch or trunk should not be taken at one time.

iii. Girdling of trees or branches by removing the bark all the way around should not be done, unless the tree is to be felled for other purposes like, timber.

 iv. Bark should be stripped longitudinally (partially along the length of the stem) to allow smooth conduction of water and nutrients.

  v. Stem bark should not be collected again from same tree unless adequate time has been allowed for it to be reformed completely.

 vi. Bark should not be collected from immature trees or branches.

vii. The bark should be split in pieces of appropriate size to ensure complete drying.

viii. Unless otherwise required in specific cases, barks should be dried in direct sunlight

D. Stem or wood:

  i. Only select mature branches of a tree or shrub should be harvested at a time. The branches from the same plant should not be harvested every year. Where the trunk is used as medicinal produce, the main axis should be harvested.

 ii. The produce should be cut in smaller pieces to facilitate faster drying, packaging and storage of the produce.

iii. Unless otherwise required in specific cases, stems and woods should be dried in direct sunlight.

E. Leaves:

  i. The leaves of herbaceous plants should be collected before their flowering, unless otherwise specified.

 ii. As far as possible, leaves should be collected from mature plants/trees. Where bio-active contents in the leaves do not fluctuate with age, the collection could be extended to later stage also.

iii. The leaves from the source plant should not be removed completely to ensure normal physiological processes of the plant.

iv. Trees, shrubs or their branches should not be chopped to facilitate the collection of inaccessible leaves.

v. Tender leaves, leaves turned pale, infected, deficient and unhealthy should be discarded.

vi. Generally leaves should not be dried in direct sunlight, unless they have external moisture, and be shifted to shade or indirect sunlight as soon as the external moisture is wiped dry.

vii. Packing of the leaves should be done after ensuring the complete drying.

viii. Leaf material rich in essential oil must be handled carefully to avoid bruising of the leaves that could result in loss of essential oil or its degradation.

ix. The leaves should be harvested during the season when growth and leaf production is the highest while avoids the leaf collection during stressful period of the plants.

x. The collection of small size leaf should be least lowered as it indicates stressful condition.

xi. The small population size should be harvested at lowered rate.

xii. The rate of harvest should be decreased if there is heavy pressure from grazing, fire or other incidents that may negatively affect the plants.

F. Flower and floral parts:

i. Flowers must be harvested (or if specified, flowering tops) when they have just opened or shortly afterwards to capture its aroma.

ii. The flower buds must be collected before the buds open and in early morning hours. In this case the departure of insects must be encouraged by shaking the materials.

iii. The flowers rich in essential oils must be handled carefully to prevent bruising that could result in essential oil degradation.

iv. All the flowers from perennials like shrubs, trees and climbers should not be harvested completely. Similarly, flowers from a complete population of annual plants should not be collected at a time. Enough flowers must be left over the

plants to allow the natural process of pollination, fertilization, fruit/seed formation and dispersal.

v. Floral parts like stigma, anthers, petals etc should be collected at appropriate time of their maturity to ensure the availability of desired active substance.

vi. The delicate flowers and floral parts should not be dried in direct sun light. Flowers that are fleshy (like *Madhuca indica*) may be initially dried in sun to get rid of surface moisture and shifted to shade or indirect sunlight afterward.

vii. Medicinal plant produce consisting of flowers and floral parts should be packed in moisture resistant well-protected containers, away from direct sun light.

G. Fruits and seeds:

i. Fruits and seeds should be collected only on maturity unless immature ones constitute the medicinal produce (e.g. *Emblica officinalis*, *Aegle marmelos*) except the fruit of family Apiaceae that dehisce on drying should also be collected before maturation .

ii. In case of shrubs and trees, all the fruits from individual plant should not be collected at a time leaving behind a few healthy ones for further multiplication of the species. Similarly, the whole population of annuals should not be ripped off all the fruits and seeds at a time.

iii. Trees, shrubs or their branches should not be cut for ease of collection of fruits and seeds.

iv. Immature, infected and deformed fruits should be separated and discarded appropriately.

v. If the medicinal plant produce consists of fresh fruits (e.g. *Phyllanthus emblica*) the same should be transported to cold storage or pulping units immediately after harvesting.

vi. Wherever required, seeds should be removed completely from the fruit rind before they are traded.

vii. As per the need of the produce, fruits may be split or cut into small pieces to facilitate drying and packaging.

viii. Complete drying of fruits should be ensured before they are packed. Randomly selected individuals fruits should be dissected to ensure that there is no inherent moisture left.

H. **Gums and resins:**

i. Collectors/collection managers should ensure minimum harm to the mother plant while collecting the exudates. Only a few small longitudinal incisions should be made to collect the exudates and the exposed parts should be treated appropriately to avoid any fungal or bacterial infestation after the exudates has been collected.

ii. Incisions, too close to the ground, easily approachable by the cattle and wild animals, should be avoided. The collection container should be designed in a way to prevent rain, bird droppings and any other such possible contaminations.

iii. Where there is a likelihood of some foreign matter being mixed with the collect gums and resins, it should be carefully removed.

iv. Source tree or shrub should be allowed appropriate recovery period before collecting the exudates again from them.

v. Most of the gums and resins, being inflammable, should be packed in appropriate containers and stored at isolated places. The containers of resins like Damar (*Shorea robusta*) and Saral (*Pinus longifolia*) should be labeled as "Inflammable Material", while on transit and storage.

vi. No fire should be ignited near the base of the tree to increase gum/resin flow.

vii. Younger trees should not be tapped. The girth of the trees has to be decided below which tapping of gum/resin will not be allowed.

viii. Flow of gum is more in hot weather. Therefore, tapping in such species, should be done between June-October.

ix. Long sharp cut blazes are best as they give pure resin/gum and the bark heals faster. Irregular cuts add impurities to the resin. Long cuts are better as they provide more area for exudation and heal faster. Square and round cuts take longer time to heal as the distance between the two walls is more.

x. Sharp knives or chisels can be used to make blazes.

xi. Instead of letting the gum or resin solidify on the bark, it is better to fix a collection trough e.g. coconut shell, hollow bamboo etc.

xii. On the same tree more than one blaze is made, these should be staggered for optimum exudation. After 3 years of tapping, sufficient rest should be given to the tree to rejuvenate from the injury.

Table (1): Colletion period of medicinal and aromatic plant parts

Useful part	Collection period and time
Leaves	During the period of flowering
Flower	In dry months before the fruiting
Fruit	At the time of maturity or at just before the maturity
Bark	February –April
Roots or tubers or rhizome	Mainly from November to January
Whole plant	After flowering and fruiting and sheding of some seeds then the whole plant is uprooted for collection

Post Harvest Management of Medicinal & Aromatic plants

Primary Processing:

• Timely and right processing of medicinal plant produce after it has been collected or harvested is necessary to enhance shelf life of the produce and to avoid the quality deterioration. After harvesting, the produce should be separated from any organic or inorganic matter stuck to it. Any part of the mother plant, that does not constitute official medicinal plant produce.

• The underground part i.e. roots, taproot, tuber, bulbs should be removed carefully without damaging the quality for the soil and washed with water. In some plants, the primary scrapping, peeling or brushing is needed besides washing with water as primary processing before drying the same.

Drying:

The medicinal plant produce should be properly dried before it is packed for shipping or storage. Information on the optimum moisture content of particular produce may be

obtained from national pharmacopoeias and other monographs (7-13%). The general guidelines are given in the Table (2). Medicinal plant produce such as rhizomes (Buch), fleshy roots (Tuber), fleshy stem (Cissus), fleshy leaves (Aloe), pulpy fruits, woody parts, fleshy petals and those containing polysaccharides need more attention to ensure proper drying.

The following points may be useful to achieve better processing and drying of medicinal plant produce:

- Plant produce which is thick, fleshy or of bigger in size, it should be cut or sliced into small/ thin pieces to ensure proper drying and to maintain produce shape.

- The delicate plant parts of medicinal and aromatic constitute the produce should be dried only under shade.

- In case of open sun or air-drying, the medicinal plant produce must be spread out in a thin layer on a drying frame a sheet of cloth or tarpaulin can be used to spread the produce.

- During drying either shade or sun drying the care should be taken to protect from undesirable exposure to rain, night fog, etc.

- Oven dry may also be used for drying, however, the temperature and duration must be as per the standard to preserve the produce and their content.

Table (2): Methods of drying of medicinal plant parts

Class	Drying method
Leaves	In shade
Stem, root and seed	Sundry
Tuber & rhizome	In shade
Flower and aromatic parts	Always in shade

Packaging of Medicinal Plant

The storage containers of medicinal plant produce must provide protection from heat, humidity and temperature and at the same time should not contaminate the produce. Each category of produce requires specific packaging needs. Table (4) showed a few

packaging options for Indian medicinal plant produce, which can be adopted as a general.

The separate containers for separate medicinal plant produce should be used. The handling of bulk like lemongrass, leaves, shankhapushpi, bhumyamlaki, etc), effort should be made for compact packing, this help in minimizing the storage area and transport. Each container of medicinal plant produce should be labeled properly. The label should contain all the required information of medicinal plant produce.

Table (4): Packaging of Medicinal Plant

Name of collected MAPs produce	Packing material
Stem, wood, bark and root	Gunny bag
Leaves, climber, whole plant	Polythene bag
Flower, tender fruit and seed	Thick and quality polythene bag

Storage of Medicinal Plant

Storage of produce is of utmost importance in protection of quality of the medicinal plant produce. The following point should be considered during the storage or may be adopted, which will help protect the quality of the medicinal plant produce.

- The store in such away as to avoid entry of rodents, birds and other animals and should be free from dampness, dirt and dust. Medicinal plant produce should never be stored in open areas and in or near cattle sheds.
- Room should be well ventilated and moisture proof.
- Properly sealed and labeled containers of medicinal plant produce should be kept preferably on wooden pallets, at cool and dry places.
- Avoid the stacking of the containers, especially gunny bags, jute bags, woven sacks, corrugated box etc. directly on the floor.
- Bag in the store must be 2 feet away from the wall and should be above from the normal ground level.
- Containers of two or more medicinal plant produces should never be stacked one above the other.

- Each lot of the produce should have its shelf life clearly marked on its label and the produce should be used within the valid shelf life period.
- Inflammable produce like resins, gum-resins, oils etc. should be stored at isolated place in closed containers and clearly marked container.
- There store should have preferably the controlled conditions specially for temperature and humidity to create more congenial storage environment. Char, Temerind and anola should be stored in the cold storage
- Avoid to store in storage for longer period of time otherwise deteriorates the quality.

Literature cited:

1. *Bhattacherjee, S.K. 2000. Handbook of Aromatic Plants. Point Publishers, Jaipur.*
2. *Champion, H.G. and Seth, S.K.1968.A revised survey of forest types of India. Manger of publications, Delhi, India.*
3. *NMPB (2002). Cultivation practices of some commercially important medicinal plants. pp120*
4. *IUCN (1978). Plant Red Data Book, Royal Botanic Garden, Kew, England.*

SDIS-060

Isolation and Identification of M.vaccae From Cow Dung

Rahul SinghThakur, Manmohan Yadav, V.Shiv Padmini, Tilotama Das & Yogita Gawre

Christ College, Jagdalpur

Abstract

Mycobacterium vaccae, is a Nontuberculuos mycobacteria, as an environmental rapidly growing mycobacteria isolated from soil and water and even occur in Cowdung.It was previously considered as non-pathogenic and has found to be rare association with pulmonary infection and soft tissue infections Extract taken as a sample and serially diluted process represent random amplification through estimation and analysis of compound as *Mycobacterium* species such as *M. vaccae* an important gram negative bacteria froming smooth colonies on Tryptone soy agar plate and gone through acid fast stain and specific biochemical test assures the presence of *M.vaccae* in the given sample.

Introduction

Mycobacterium vaccae is a rapidly mycobacteria .It was first isolated from the environment including soil and water and especially in contact with cattle, such as in their cowdung as well as in another from as bovine lactic ducts skin nodules and milk products usually it has a strong association of this *Mycobacterium* species with cattle it was named *M.vaccae*, as "vaccae" is the latin word for cow *M.vaccae* , previously considered non-pathogenic, has found to be rare association with pulmonary infections and soft tissue infections it has been mainly studies for use as an immunotherapeutic agent with chemotheraphy in the treatment of tuberculosis and other diseases such as asthma, cancer, atopic dermatitis and psoriasis. Moreover it has also been recognized to play specific role in leveling down depression and boost serotonine or better understanding the major role whole genome sequence of *Mycobacterium* species reveals the reliable genetic identification.

MATERIALS AND METHOD

Sample collection

Environmental samples viz. cowdung was purely selected for the study. These sample were collected freshly and about 1gm was isolated at the core region. It was about to kept in certain temperature for drying condition. Weight of the chart again checked to be 1gm.

As the sample was concerned to be a level consisting of high concentration of other micro-organisms (as other *Mycobacteria* and other non-relevant species). It was then serially diluted inorder to reduce the concentration of the given micro-organisms and increase the chances of appearance of expectant micro-organisms

Preparation of media

The selective media which is responsible to increase the chances of appearance of required micro-organism is Tryptone Soy Agar media [Rm014]. For preparation of this media protocol of composition are as follows:

Tryptone-15mg

Soytone-5mg

Agar-15mg

Nacl-5mg

Distilled water-250 ml

pH- **± 6.5-7**

The media was put in autoclave at 121degree centigrade for 15 minutes and was then poured in the respective petriplates (amount 6 NO's) and left for solidification in a well maintained laminar air flow.

Spreading of serially diluted sample in a tryptone soy agar media

The selective serially diluted sample of test tube (10^{-3}),$(10^{-2})$and (10^{-1}) were spread about 6 plates,(two in each) respectively and were kept at incubator to provide the organism a favourable condition for its growth and multiplication.
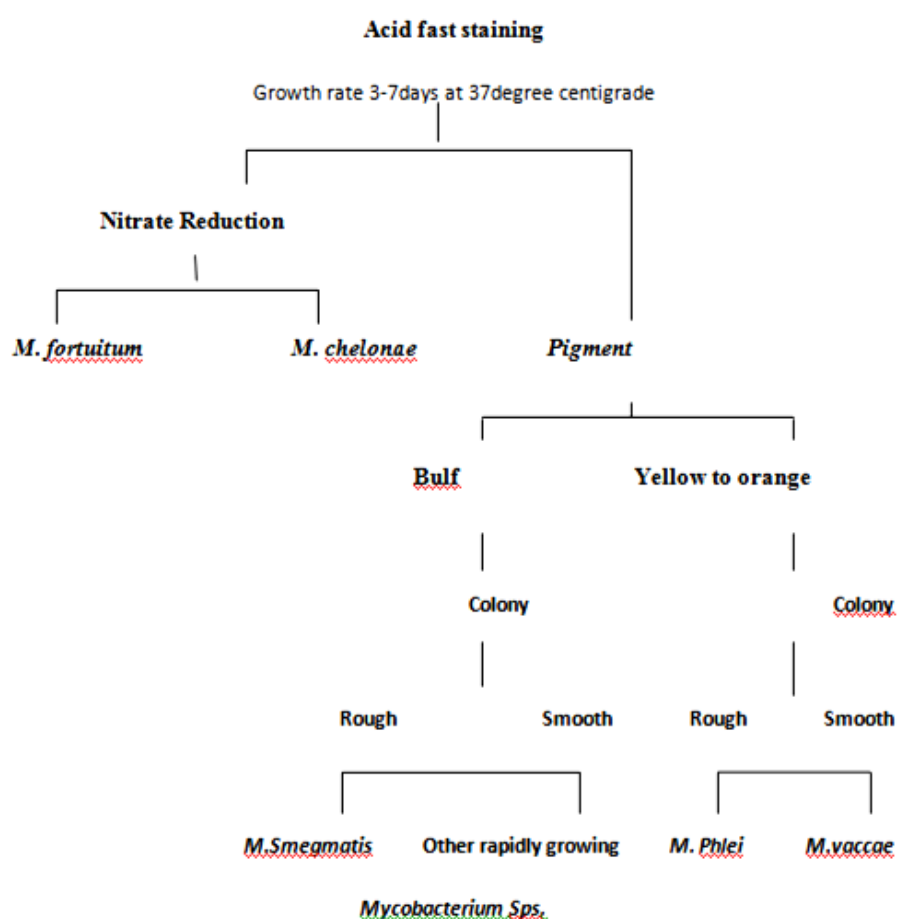
ANALYSIS

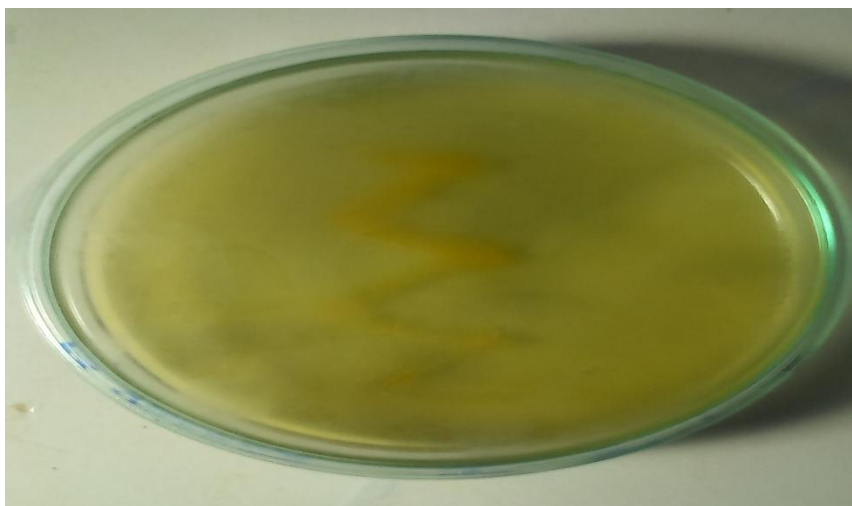Before predicting the assurance of the *M.vaccae*. The analytical steps were divided into two processes :-

Analysis through physical /visual observation

After a specific incubation provided to the *M.vaccae*. It was observed that ther occurs a golden yellow colonies smooth have been fully formed from 10^{-1} serially diluted sample which was providing an assurance test of the presence of *M.vaccae* but also increase the chances of other bacteria ie, *M.tuberculosis* and its genetically related species.
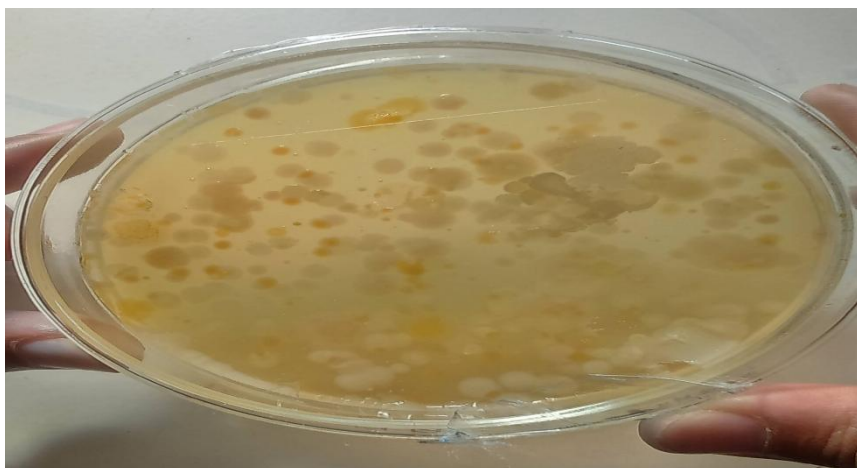
In 10^{-2} serially diluted plate there also show a visible appearance of golden yellow colonies smooth along with other rough colonies but increases the chances of cons parallely.

The predictability of *M.vaccae* is to confirm is done by Acid Fast Staining technique. It was gone through certain staining and then given for certain biochemical test.

Acid fast staining

Growth rate 3-7days at 37degree centigrade

Nitrate Reduction

M. fortuitum   *M. chelonae*   *Pigment*

Bulf   **Yellow to orange**

Colony   Colony

Rough   Smooth   Rough   Smooth

M.Smegmatis   Other rapidly growing   *M. Phlei*   *M.vaccae*

Mycobacterium Sps.

Figure Representing Smooth Golden Yellow Colonies of Non Tuberculous
Mycobacterium


Figure Representing Pure Culture Of Isolated *M.Vaccae*

Analysis Through Biochemical Test

1. **Niaicin test:-** Most *Mycobacteria* process the enzyme that converts free niacin to nicacin ribonucleotide however ,95% of *M.tuberculosis* isolates also produces free niacin (nicotinic acid) because the species lacks the niacin connecting enzyme capability

of   85%to produce free niacin and are responsible to produce a yellow pigmented compound on test tube .
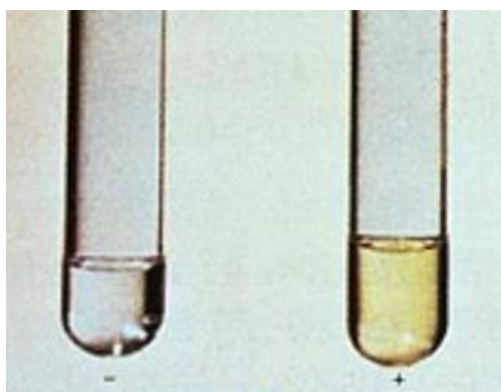
Niacin Test Showing Negative (-) as well as Positive (+) result respectly.

2. Nitrate reduction test:- The production of nitroreductase which catalyzes the reduction of nitrate to nitrite is relatively of nitrate to nitrite is relatively uncommon among mycobacterium species but positive result in M.vacce,   M .foriturium and *M. tubereculosis*. Hydrochrloric acid (50ml HCl in 50ml of water) sulfanilamide and N-naphthylenediamme dihydrochloride are then added .if the bacteria reduce the nitrate to nitrate red colour froms.

Nitrate Reduction Test Showing Negative (-) as well as Positive (+) result (Right Handed Test Tube) Respectly.

3. **Hydrolysis of tween-80:-** Some mycobacteria posses a lipase that can split the detergent Tween 80 into oleic acid and polyethylated sorbitol. The PH indicator neutral red is initially bound to Tween 80 and has an amber colour. After hydrolysis o Tween 80

neutral red can no longer bind and it is released causing a pink colour to form which only indicate definitely the presence of M.vaccae as a confirmatory biochemical test.

Result

The respective samples taken (ie. from cowdung to serially diluted plate), and after biochemical test confirms the presence of *M.vaccae* by specific biochemical reaction on using respective enzymatic method. Pertaining to presence of other *Mycobacterium* species, it majorly effects the result related to the deviation occurring in colony formation and specific biochemical test.

Discussion

The sample obtained from10^{-2} serially diluted plate represent variegated colonies and effects the biochemical test showing negative result which completely execute deviation from the standard results. The estimation of the compound during certain test show positive result and further collaboration is done on chromatography and PCR level for diagnostic use. Later the sample presenting positive result ie.10^{-1} was recognized to participate in therapeutic and pharmaceutical uses. It was also recognized to act as an immunosuppressant and act as a drug used during chemotherapy. It was also recognized to act as anti-depressant and functional to decreased the amount of serotonin and other neurohormones.

References

1.   *Balagon MV, et al. 2000. Improvement in psoriasis after intradermal administration of heat killed Mycobacterium vaccae. Int. J. Dermatol, 39:51-58.*

2.   *Yung S. Ho, et al 2012. Complete genome sequence of M.vaccae Type Strain ATCC 25954. American Journal Of Bacteriology, p6339-6340.*

3.   *Narang R, et al 2009.Isolation and Identification of NonTuberculous Mycobacteria From Water And Soil In Central India. Indian Journal Of Medical Microbiology,27(3):247-250.*

4.   *Narang P, et al 2004.Paraffin slide culture technique for Baiting Non-tuberculous Mycobacteria. Indian J Tuberc; 219-20.*

5.   *Shimizu K, Tsuneo Hirsoe, Sato M, Tsukamura M 1977. Isolation of Acid-Fast Organisms Resembling M.vaccae From A Lesion Of Bovine Nodular Thelitis. Microbiology and Immunology. Vol.21(8), p469-472.*

6.   *Bonicke,R.,and Juhasz, S.E,1964. Beschreibung der neun Species M.vaccae no. sp. Zentralbl.Bakteriol.Parasitenk.Infekt. Hyg, I Abt., Orig.A 192: 133-135.*

7.   *Connie R,Mahon, Donald C,Lehman, George Manuselis Jr. Biochemical test of M.tuberculosis and Nontuberculous Mycobacteria. Textbook of Diagnostic Microbiology,5th Edn,2015. Elsevier Publication.p. 583-586.*

SDIS-061

Pattern of Food Habit and Nutritional Status among Dhurwa tribe of Bastar

Dr. Anand Murti Mishra and Sushma Maurya

SOS Anthropology and Tribal Studies, Bastar University Jagdalpur, District Bastar (C.G.), India

Abstract

The health and nutrition problems of the vast tribal population of India are as varied as the tribal groups themselves who present a bewildering diversity and variety in their socio-economic, socio-cultural and ecological settings. Maternal malnutrition is quite common among the tribal women especially those who have many pregnancies too closely spaced (Salil Basu, 2000).Object of the present study is to know what is food habit and practices of Dhurwa tribe & Correlate between their food habit and their health status.The present data has been collected from the Dhurwa tribes (35 Dhurwa families) in Dhurguda villages of Bastar district, Chhattishgarh.The study was carried out by oral schedule, which comprised of questions regarding choice of foods, foods avoided in certain conditions, foods included in special conditions or festivals, food fallacies, also anthropometrical measurements, which included height and weight measurements of samples were taken. Then for dietary assessment, in accordance with the procedure of 24 hour's food intake for three consecutive days was recorded using recall method. Food and nutritional status both are inter-related things. There were lack of intake of food and nutrition is cause many deficiency in body as well as develop of diseases. In surveyed household 54.48 percent are in under nutrition according to the BMI.

Introduction

 Food is the basic need of any type of living body. It is one of way that nourishes the body very well. We defined it as anything eaten or drunk, and absorbed by the body for energy produce, building, regulating or protective purpose. In other way we define as food is material which is made our body. In food have come different nutrients such as carbohydrate, protein, fat, vitamins and minerals. These nutrients are essential for growth, development and maintenance of good health throughout life. They also play a vital role

in cases of the pregnancy and lactating women and patients recovering from illness. It also symbol of many life events for example sweet must preferred in mostly happiness condition as some festivals, ceremony and any type of success in life where as tilgur used in sakarant festivals, cakes related to Christmas and birthday etc.

The Dhurwa (also known as the Parji) are a sub-group of the Gond, the largest tribal group in India. Historically, the Gond was the most important group of original Indian tribes. The majority of Dhurwa live in south-east of Jagadalpur. The Dhurwa are originally a section of Parja community, who claims separate identity by abstaining from taking beef from the beef eating Parja. The Bastar Parja beyond the KolabSabari River in Sukma Zamindari Estate and around Mount Tulsidongri in Sukma and Jadgalpur tehsil bordering Jeypore-Koraput of Orissa now identified themselves as the Dhurwa and recent being called the Parja. Infact the name Parja is corrupt Aryan term Praja (means subject) which differs from Raja or ruler. The Dhurwas are basket makers and their habitats are located in such places where bamboo groove is abundant.

Object of study:
- To know what is food habit and practices of Dhurwa tribe.
- Correlate between their food habit and their health status.

Review of Literature

One of the major factors determining nutritional status of any community is the food consumption which is influenced by a wide range of factors like agro-climatic differences, foods grown and the availability. The dietary pattern of the aboriginal tribes of India living under various agro-climatic conditions in different isolated regions may vary widely. Studies on various tribal population of India reveal that the diets of a majority of the tribal population are nutritionally deficient (Sen Gupta, 1980; Pratap et al, 1976;).

The pattern of agriculture varies from one tribe to another depending partly upon the opportunities and partly upon the traditions of the people (Burling, 1965). A large part of the tribal cultivation and whenever possible a nearby water source is exploited to induce artificial irrigation. This is calles "Terrace" cultivation followed mainly in cultivating rice. The tribals who live on plains or lower regions of hills practice settled, and also wet

cultivation depending on the irrigation sources available (Bhowmik, 1971). Among the Indian tribes, tribes of NEFA, Gonds and Murias of Madhya Pradesh, Santhal tribes of Bihar (Sen Gupta, 1980) are reported to practice both shifting and settled agriculture.

Tribes of Bastar districts consider that rice gruel kept overnight with or without curd keep the stomach cool. Black gram and brinjal are belived to cause constipation. An herbal medicine of the bark of a mango tree ground with water and taken with sugar is believed to be effective in diarrhea (National Institute of Nutrition, 1983).

The health and nutrition problems of the vast tribal population of India are as varied as the tribal groups themselves who present a bewildering diversity and variety in their socio-economic, socio-cultural and ecological settings. Maternal malnutrition is quite common among the tribal women especially those who have many pregnancies too closely spaced (Salil Basu, 2000).

Research Methodology

The present data has been collected from the Dhurwa tribes (35 Dhurwa families) in Dhurguda villages of Bastar district, Chhattishgarh.The study was carried out by oral schedule, which comprised of questions regarding choice of foods, foods avoided in certain conditions, foods included in special conditions or festivals, food fallacies, also anthropometrical measurements, which included height and weight measurements of samples were taken. Then for dietary assessment, in accordance with the procedure of 24 hour's food intake for three consecutive days was recorded using recall method.

Result and discussion

Table 1: It is evident that distribution of age group among Dhurwa tribe of Bastar. The table shows that the highest percentage (31.03) of age group 15-29 year and the lowest percentage (6.90) of 60+ (senior citizen) age group in tribe. And respectively the percentage of 0-5 (12.41), 6-14(17.93), 30-34(13.10), and 45-59(18.62) has been found in the field village.

Table 1: Age group (year)

S. No.	Range	Number	%
1	0-5 year	18	12.41
2	6-14 year	26	17.93
3	15-29 year	45	31.03
4	30-44 year	19	13.10
5	45-59 year	27	18.62
6	60+	10	6.90
	Total	145	100.00

Table No.2 :Agriculture is the primary occupation of 57.14% of surveyed families and agriculture cum labor is the secondary occupation of the Dhurwa family. The families engaged in govt. job only 2.86 percent

Table 2: Occupation of Dhurwa families

Occupation	Primary		Secondary	
	No	*%*	*No*	*%*
Agriculture	20	57.14	0	0.00
Labour	13	37.14	16	45.71
Agriculture cum Labour	1	2.86	0	0.00
Service	1	2.86	0	0.00
Don't have	0	0.00	19	54.29
Total	**35**	**100.00**	**35**	**100.00**

Table No.3 :The data presents information about education level of the respondents. There is 51.03 percent respondents are illiterate and 48.97 percent are literate. Which have the highest percent is 42.25 percent they are in middle school education and the lowest are 5.63 percent during study the field they are in college. It is evident the table that the respondents have been aware about their children's education.

Table 3:   Education Level

Education Status	Number	Percent
Illiterate	74	51.03
Literate	71	48.97
Primary	24	33.80
Middle	30	42.25
High School	6	8.45
Higher Secondary	7	9.85
Graduate & Above	4	5.63

Table No.4 :Tribes have very simple living pattern. Most tribal people are under in below poverty line. In survey area 28.57 percent people's annual income is 55001-100000. it is due to basically they are dependent only agriculture and forest products and lobour work and very few percent only 14.29 percent have above 100000/- that means their annual income is not up to the mark.

Table 4: Annual Income

S. No.	Income (Rs.)	Number	Percent
1	15000 to 25000	9	25.71
2	25001 to 35000	7	20.00
3	35001 to 45000	2	5.71
4	45001 to 55000	2	5.71
5	55001 to 100000	10	28.57
6	Above 100000	5	14.29
Total		35	100.00

Table No.5 :There is many ways for source of staple food collection. 31.43 percent families used cultivation and govt. supply as source of food materials.

Table 5:   Cooking pattern

Pattern	Number	Percent
Boil	4	11.43
Boil + Fry	27	77.14
Boil + Fry + roasted	4	11.43
Total	35	100.00

Table No.6 :It is evident the table that information about types of cooking pots which is given below the maximum percentages were found from aluminum and earthen pots used by 42.86 families in surveyed area where as aluminum and aluminum + steel is used by 20.00 percent families.

Table 6: Information of Types of Cooking pot

s. no.	Pots	Number	Percent
1	Earthen + steel	6	17.14
2	Aluminum	7	20.00
3	Aluminum + Earthen	15	42.86
4	Aluminum +Steel	7	20.00
Total		35	100.00

Table No.7 :The data has been found the information about sources of drinking water the maximum 94.29 percent families depended on hand-pump for drinking water and 5.62 percent families depend on tape water (Nal Jal Yojana) supply.

Table 7:   Source of Drinking Water

S.no.	Sources	Number	Percent
1	Tape Water	2	5.62
2	Hand pump	33	94.29
Total		35	100.00

Table No.8:Mostly families are used mustard oil in cooking and some families use tora, alsi and soya oil for cooking. The highest percentages of 60.00 which is mustered oil and 8.57 percent is soya and soya + mustard oil. Whereas 11.43 percent is tora oil.

Table 8:   Type of Edible oil

S.N.	Types of Oil	Number	%
1	Mustard	21	**60.00**
2	Tora	4	11.43
3	Mustard + Tora + Alsi	4	11.43
4	Soya	3	8.57
5	Soya + Mustard	3	8.57
	Total	35	100.00

Table No.9 :The data has been found information about pattern of taking non-veg. It has been found that 65.71 percent use non-veg weekly and only 2.86 percent takes daily. Whereas 20 percent take any time it depends on their mood. And 20.00 percent respondents take monthly.

Table 9: Information of Pattern of taking non-veg

S No	Duration	Number	Percent
1	Daily	1	2.86
2	Weekly	23	65.71
3	Monthly	7	20.00
4	Any Time	4	11.43
	Total	35	100.00

Table No.10 :Almost tribes either male or female like narcotic drink. As same 68.57 percent families used *Mahua* drink and some of like *landa, salfi* too**.**

Table 10: Type of taking Narcotic beverage

S. no.	Bevereges	Number	Percent
1	Mahua	24	68.57
2	Mahua+Landa	4	11.43
3	Landa	2	5.71
4	Salfi	2	5.71
5	Chhind	3	8.57
Total		35	100.00

Table No.11: BMI range of Total population (>= 15 year): Body Mass Index (BMI) is a parameter for measuring of nutritional status. The data has been found information about BMI range of total population of the Dhurwa tribe of Dhurguda who is 15 year and above 15 year old. It is evident the table that the highest frequency (55.10) percent male are normal and only (2.04) percent are obese of Dhurwa male population.

BMI Range of Dhurwa Female population (>= 15 year): BMI is most popular technique for calculate and identified nutritional status of people. From the study of the field village has been found information about BMI range of female population (36.54) percent were found under weight and only (3.85) percent were found obesity-II.

Table 12: BMI of >=15 year male and female Population

BMI rate	Male		Female	
	Number	Percent	Number	Percent
<18.5 (Under Weight)	12	24.49	19	36.54
18.5-24.9 (Normal Weight)	27	55.10	14	26.92
25-29.9 (Over Weight)	5	10.20	7	13.46
30-34.9 (Obesity-I)	3	6.12	5	9.62
35-39.9 (Obesity-II)	1	2.04	2	3.85
>40 (Extreme Obesity)	1	2.04	5	9.62
Total	49	100.00	52	100.00

 Nutritional status of tribal area is effect by many factors as agro-climatic differences, grown of food, ecological factor and their availability. Traditional beliefs and customs are influenced food habit and nutritional status in tribal community. Tribal's cultural is

determines and extent of food behavior in different area in world. food and nutritional status both are inter-related things. There were lack of intake of food and nutrition is cause many deficiency in body as well as develop of diseases. In surveyed household 54.48 percent are in under nutrition according to the BMI. Whereas is danger for well development of future generation.

Refrence

Sen Gupta, P.N.	*1980*	*Food consumption and nutrition of regional tribes of India, Ecol, Food Nutr. 9.*
Sen Gupta, P.N.	*1960*	*Dietaries of primitive tribe, The Adibases, Revised Ed. Publications Division, Delhi.*
Robson, J.R.K. et. Al	*1977*	*The health and nutritional status of the Primitive population, Ecol. Food Nutr. 6.*
Burling, R. ed.	*1965*	*Hill farms and Paddy fields. Life in Main land South East Asia. Prentice, Hall, INC. Englewood, 58-59.*
Bhowmik,K.L.,S et.al.(eds)	*1971.*	*Tribal India: A profile in Indian Ethnology, The World Press Pvt. Ltd., Calcutta.*
Pratap, D.R.,	*1975*	*Tribes of Andhra Pradesh. World Telugu conference publication. 1st world Telugu conference office, Hyderabad, India.*

SDIS-062

A Study on Impact of Watershed Development Programe and its Skill Development and Socio-Economic Effects on Darbha Block of Bastar District (C.G.)

Rukhsar Qureshi, Anupam Kumar Tiwari and Sujeet Kashyap

School of Studies in Rural Technology, Bastar Vishwavidyalaya, Jagdalpur, Chhattisgarh,

qureshi.rukhsar50@gmail.com

Abstract

The Watershed Development Programme (WDP) initially envisaged as a measure for poverty alleviation and improved livelihoods has gained even greater importance in light of the worldwide recognition of its effectiveness in combating climatic change. In India several Ministries namely, Ministry of Agriculture, Ministry of Rural Development and Ministry of Environment and Forests have been involved in Watershed Development Programs with substantial variation in their approaches. The study involves a survey and impact analysis of five micro watershed villages in darbha block of bastar district. The study noticed changes in ground water level, surface water, irrigation facility, water regeneration capacity, land use pattern, cropping pattern, livestock production, employment generation, income generation etc. These changes are observed in all watershed development programmes with certain variations. But the changes like land use pattern, cropping pattern, crop diversification, etc. are more prominent in the watershed regions The programmes have been examined from the structural and functional dimensions and their effectiveness has been measured from the benefits accrued to various stakeholders.

Introduction

In a country like India, where a lot of running water goes waste, it becomes very important to apply the technology of watershed management to solve its annual problems of droughts and floods. It approaches the organization and planning of human activities on a watershed by recognizing the interrelationships among land use, soil and water as well as the linkage between uplands and downstream areas (Brooks *et al*., 2003).

The mission of watershed development department is to develop, promote and implement through participatory approaches, a decentralized, cost effective or productive,

transparent and sustainable watershed treatment packages which include, (a) To meet rural needs, (b) To enhance employment and income for the poor, (c) To improve the productive potential & (d) To reduce the degradation. Socio-economic development of a country depends on the proper utilization of natural resources. Despite having a strong base of natural resources, the condition of tribal area of Chhattisgarh is dismal. Watershed development programme play important role in present context because watershed management along with judicious use of water and land for raising crop is going to be instrument in sustainable agriculture production in our country.

The watershed approach enables planners to harmonize the use of soil, water and vegetation in a way that conserves these resources and maximize their productivity. The watershed is the appropriate hydrological unit for technical efforts to manage water and soil resources for production and conservation. But watershed management is complicated by the fact that watersheds rarely correspond to human-defined boundaries. The fundamental social problem of watershed development is that it often distributes benefits and costs unevenly, making it a likely source of disagreement and conflict. Mostly, watershed projects distribute costs and benefits unevenly, with costs incurred disproportionately upstream, typically among the poorer farmers, and benefits realized disproportionately downstream, where water use is concentrated and richer farmers own most of the land. The challenge is to internalize the costs and the benefits in such a way that all the stakeholders are part of a win-win scenario.

Components of Watershed Development Programme

The components of watershed development programme would include; (i) soil and land management (ii) water management (iii) crop management (iv) afforestation (v) pasture or fodder development (vi) livestock management (vii) rural energy management (viii) other farm and non-farm activities (ix) and development of community skills and resources. All these components are interdependent and interactive.

Participation

Experience has shown that sustainability of watershed management projects is closely linked to effective participation of the communities who derive their living from natural resources. The rural societies in the poor and developing countries are plural and

stratified, divisions are based on gender, caste and religious groups, and socioeconomic status including land tenure; ensuring participation of all sections becomes a major exercise in patience and social maneuvering. It is important to understand the conditions when people participate in watershed management programmes. These are: (i) making people aware of potential benefits of collective action in conserving and managing natural resources; (ii) including demand driven activities in the watershed program; (iii) empowering people in planning, implementing and managing watershed programs; and (iv) expecting high private economic benefits (Joshi et al., 2000). The major challenge is to benefit the landless, the socially disadvantaged and resource-poor participants who have low ability to pay for the different programmes.

Government- Non-government Organization Collaboration participation in general, government projects focus largely on technical improvements; the non-governmental organizations focus more on social organization and the collaborative projects try to draw on the strength of both the approaches. As such but with some exceptions, the performance of government-managed watersheds has been more modest while those managed by research institutions and reputed NGOs have been rather successful. The technocratic project officials who oversaw top down approaches for many years are increasingly being called on to increase the level of local participation in the new government projects. Expecting them to rapidly transform their mindset from supervisor to facilitator is unrealistic; it will take time, orientation, training where required, and encouragement. This calls for a consortium approach of watershed development, which capitalizes on the synergies of the government machinery and the capabilities and advantages of research institutes and non-governmental organizations. Given the limited number of such organizations in poor and developing countries on the one hand, and the massive need and ambitious plans for watershed development on the other, implementation capacity poses a serious challenge.

Socio-economic effects

Crops

Agriculture primarily depends upon water; but this is lacking of water harvesting structure in cluster villages .The surface water is scanty due to high runoff and ground

water is acidic with iron and manganese, which is suitable for crop production . All this can change with the integrated land and water management during the watershed project.

Migration

Low rainfall results in very little fodder availability in the locality. The relatively well off farmers bring fodder from jagdalpur (approx. 35 km away) collectively; but the resources poor can't afford it. On account of agriculture and animal husbandry providing only part time employment for some part of the year, the person migrates for the better half of the year for wage labor.

Ground water table

Rainfall has been scanty but demand for ground water has been increasing all the time. The ground water table thus has depleted over the years. Presently it stands at 13 mtr.

Drinking water

Many an effort at finding potable water at different other places in the same villages has failed. As a result of the watershed activities, it is expected that the quantity and quality water would improve.

Employment

Employment has been always been a problem in the village. The principle occupations of the people are dry land agriculture, animal husbandry and casual labour work. However, rain fall being very limited and erratic, agriculture suffers, i.e. at best they can take only a single crop, which keeps them partially engaged for about 4 months. Lack of fodder makes animal husbandry very difficult too. So, animal husbandry doesn't keep them engaged full time. Thus the people mainly depend upon casual labour, either in the village itself or outside it. The project plans for creation of both wage employment and self employment opportunities. Wage employment would be created by engaging people in watershed physical works like construction of earthen bunds, farm bunds, village pond, plantation etc. Self employment would be created by providing people with cash support in the form of direct livelihood activities like agriculture, animal husbandry and enterprise development.

Objective of the study

1. To study the impact of the programme on Soil & water conservation, area under cultivation and agriculture production.

2. To study the control damaging runoff and degradation and thereby conservation soil and water.

3. To study rehabilitate the deteriorating land.

4. To study the enhance ground water recharge.

5. To study the changes in the ground water level and soil, erosion.

6. To study the changes in cropping pattern, land use, crop productivity and improved livestock: Before & After completion of the project.

7. To study the socio-economic development of the community directly or indirectly dependent on the watershed.

Methodology

Darbha is a village panchayat located in the Bastar district of Chhattisgarh state, India. The latitude 18.87089 and longitude 81.86957 are the geocoordinate of the Darbha. The surrounding nearby villages and its distance from Darbha are tirathgarh 4.8 KM, dilmli 9.7 KM, Darbha is located around 26.8 kilometer away from its district head quarter jagdalpur.

Darbha tehsil is bounded by tokapal tehsil towards north, katekalyan tehsil towards west, jagdalpur tehsil towards north, lohandiguda tehsil towards north. It is in the 557 m elevation (altitude) for the purpose of identification of respondents, the investigator followed simple random sampling method where in the respondents were identified with the help of other respondents. Only after ascertaining that the respondents fit into the sampling frame they were selected.

The sample farmers were classified into three social divisions namely (1) Backward castes (2) Scheduled castes and (3) Scheduled tribes. It means all the castes found in each of the 5 villages were classified under four social divisions for the sake of convenience of the analysis. Further care was taken in the selection of sample farmers, to provide proper representation of the large, small and marginal farmers. The data for the study was

collected from both primary and secondary sources. The primary data were collected through a structured schedule, informal interviews (using detailed checklists), key informant interviews and observation. Secondary data and information were collected from IWMP, Block office of darbha of bastar district. The data collected from the sample beneficiary farmers had been analyzed and presented in the form of simple tables.

Result and Disscusion

Ecological benefits

In the project villages the ecological benefits increased and improved during the project. The data reveals that the respondent chooses ecological benefits were 31% increased water quantity, 9% increased water quality, 10% improved harvesting/collection of runoff, 30% increased soil moisture and 32% improved excess water drainage (Chopra, K. and S.C.Gulati. 2001) (Fig No.1).

Socio-cultural benefits

In the project villages the socio-cultural benefits increased and improved during the project. The data reveals that the respondent chooses socio-cultural benefits were 17% negligible, 59% little, 19% medium and 5% high on improved networking, 6% negligible, 41% little,51% medium and 2% high on improved conservation/erosion knowledge,27% little, 65% medium and 8% high on improved health & 1% little, 37 % medium and 62% high on reduction of migration (Deshpande, R.S. and Reddy, V.R. 1991) (Fig No.2).

Production & socio-economic benefits

In the project villages the production and socio-economic benefits increased and improved during the project. The data reveals that the respondent chooses production and socio-economic benefits were 15%little, 43% medium and 42% high in increase crop yield, 14% little, 49%medium, 37% highly increased fodder production, 9% negligible, 51% little,35% medium and 5% highly improved marketing/business skills,10% negligible, 32 % little, 47% medium and 11% highly increased irrigation on water availability/quality, 9% negligible, 53% little, 34 % medium and 4% highly increased drinking/household water availability and quality,37% negligible, 39% little, 17% medium and 7% highly decreased workload, 38% negligible, 27% little, 29% medium and 6% highly diversification of income source, 16% negligible, 30% little, 44% medium

and 10% highly increased farm income, 4% negligible, 17% little, 59% medium and 20% highly increased rain water availability, 9% little, 56% medium and 35% highly increased production area (Sastry *et al.,* 2003) **(**Fig No. 3).

Figure No.1 Ecological benefits
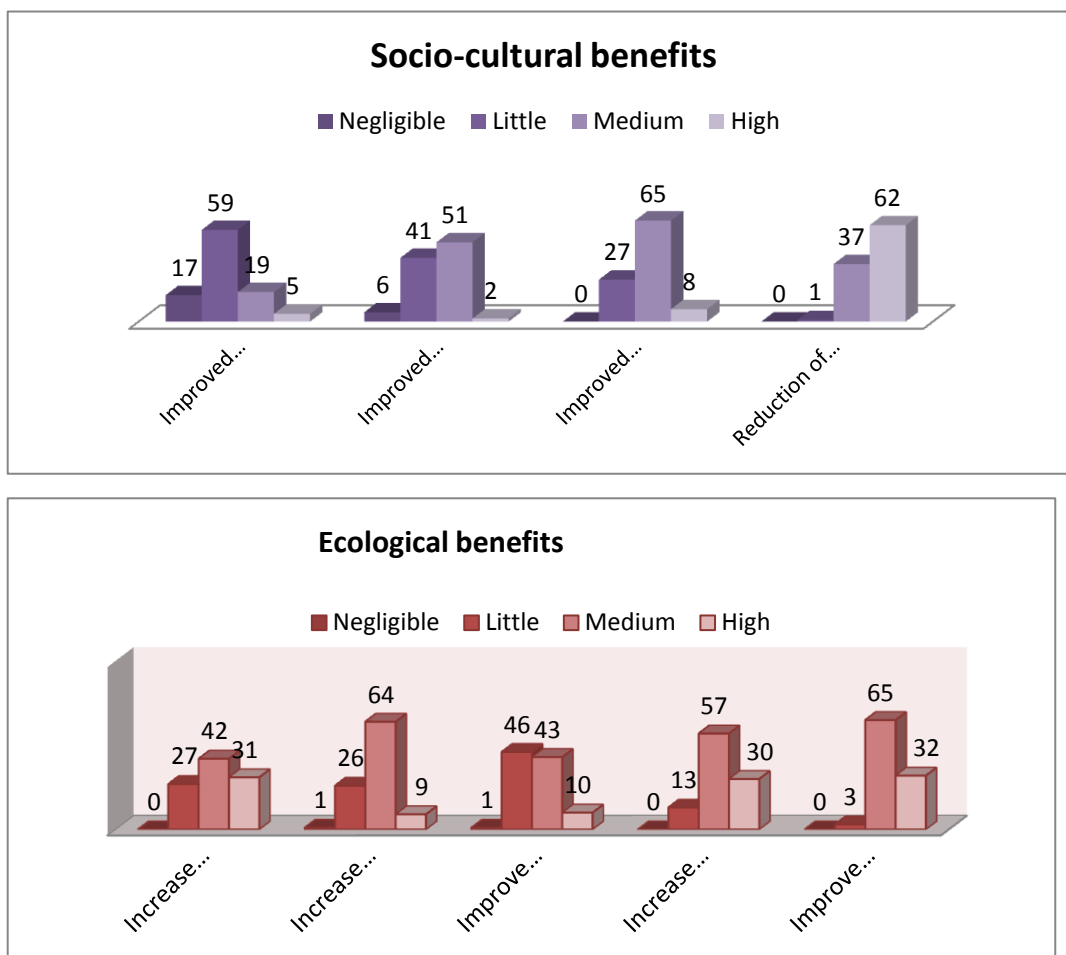
Figure No. 2 Socio-cultural benefits
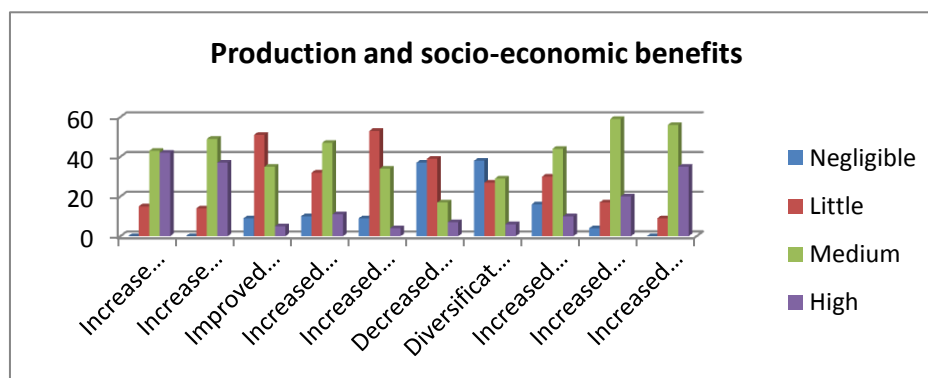
Figure No. 3 Production & socio-economic benefits

Major findings

- **Changes in cultivated area:-** The maximum Cultivable area 25 percent increased in the tuvaras micro watershed village.

- **Changes in irrigated area:-** The maximum 150 acres areas are irrigated in the dodgeras micro watershed village.

- **Reduced soil erosion :-** The maximum soil erosion reduced about 24 percent in the dodgeras micro watershed village

- **Changes in land use pattern:-** The maximum changes 51 acres increased in dodgeras micro watershed village.

- **Availability of water sources: -** The maximum availability of water sources in dodgeras and dhodrepal.

- **Changes in cropping pattern: -** The maximum changes on cultivation of paddy with increase the area of 81 acre and also increase its productivity. In also changes in cultivation of maize, sugarcane and vegetables increased the area with 48 acre, 25 acre and 13 acre and also increased its productivity.

- **Increment in average annual investment and income: -** The villager's average annual income is increased by this project.

- **Ecological benefits:** Villagers are accepted that 54.8%   benefits in ecological factors.

- **Socio-cultural benefits:** Villagers are accepted that 59.25 % benefits in Socio-cultural factors.

- **Production and socio-economic benefits: -** Villagers are accepted that 47.9% benefits in Production and socio-economic factors.

Conclusion

Watershed Development Programme (WDP) is one of the most popular development programmes implemented across the country. This programme has been directed towards the promotion of overall economic development and improvement of the socio-economic conditions of the resource poor sections of people inhabiting the programme areas through natural resource enhancement. Over the years there is much

visible impact of watershed development programmes among different communities across various regions.

It was found that there was good quality water harvesting structure in some watershed areas, but in some other watershed areas, it requires further attention. There was reduction in soil erosion in the watershed areas. There was marginal increase in ground water level. There is positive change in the land use pattern reported in most of the WDP regions. In these regions, more waste land was converted for productive use by the farmers. This has resulted increase in net sown area in majority of the villages. Further, better land use pattern has helped increase in agricultural intensification and thus enhance agricultural production.

Watershed programme resulted positively in reducing the workload of women in terms of fetching drinking water, collecting fuel wood and fodder for livestock in almost all the study area. Migration was mostly reduced during the project. It was realized that participation of local community member is key to success of the watershed projects. It was also found that majority of the households across all the study areas had reported slight improvement in their standard of living. The benefits of WSD have not been fully translated into disposable income or net gains to improve the standard of living.

The study also suggests that the impact of watershed is more focused towards physical and biological achievement, but the focus on social aspects is limited. There are certain positive trends towards growth of water level, soil regeneration capacity, land use pattern, cropping pattern, etc.

References

Brooks K. N., Folliott P. F., Gregersen H. M. and DeBano L. F. (2003). *"Hydrology and the Management of Watersheds." 3d ed. Ames.1A: Iowa State Press.*

Chopra, K. and S.C.Gulati. 2001. *Migration, Common Property Resources and Environmental Degradation and ecological benefits: Interlinkages in India's Arid and Semi-arid Regions. Sage Publications, India.*

Deshpande, R.S., and Reddy, V.R. 1991, *Differential impacts of watershed based technology: Some analytical issues. Indian Journal of Agricultural Economics. 46(3): 261-269.*

Joshi, P.K., Tewari, L., Jha, A.K. and Shiyani, R.L. 2000. *Meta analysis to assess impact of watershed. Proceedings Workshop on Institutions for Greater Impact of Technologies, National Centre for Agriculture Economics and Policy Research (ICAR), New Delhi, India.*

Sastry, G., Reddy, Y.V.R. and Om Prakash. 2003. *Impact of watershed management practices on sustainability of land productivity and socio-economic status (ROPS-14&14A). National Agricultural Technology Project, Central Research Institute for Dryland Agriculture (ICAR), Hyderabad, India.*

SDIS-063

A Study on Organic Farming: An Eco-Friendly Technology and Opportunities in its Sustainable Development in Bakawand Block of Bastar District (C.G.)

Devesh Chandravanshi, Neha Swain and Anupam Kumar Tiwari

School of Studies in Rural Technology, Bastar Vishwavidyalaya, Jagdalpur, Chhattisgarh

devesh.chandravanshi@gmail.com

Abstract

Organic farming is an environmentally friendly farming that has become a flourishing business. This thesis explores claims that organic agriculture may be an Eco-friendly and sustainable development strategy by investigating the impacts of conversion to organic farming systems on the lives of small-scale farmers in Bakawand Block. In this study, the different approaches to organic farming in the ten villages of Bakawand Block have been discussed.

Underlying the growth of certified organic operations and land area in Bakawand block are producers' motivations and perceptions regarding organic conversion. The main objective of this research is to compare organic farmers' perceptions and motives by the type of agricultural products produced on their farms.

Using a multiple case study methodology, this study compares the elements of the organic adoption decision among Bakawand's organic produce, row crop, livestock, and dairy farmers. In order to make comparisons between the farmer types, the study employs the concept of adoption from diffusion of innovations theory as a framework for understanding the elements of the farmers' organic adoption decisions. Comparing interview responses from organic farmers reveals that motivational and perceptual differences exist between farming sectors.

Introduction

Food is crucial to human life. The rapid growth of populations, which in turn entails increased demand for food, has led to changes in agricultural systems. Traditional agricultural techniques were replaced by the monoculture approach that became mainstream agriculture. Modern agricultural systems have been widely practiced in many

countries, with the aim of increasing competitiveness. Although conventional agriculture has many large-scale positive effects, such as high yields in crops and increased food supply through the adoption of new technologies, the intensive use of chemicals and mechanization has led to the destruction of the soil and water resources, and has damaged the important supporting ecosystems. The consequences, therefore, of conventional systems are environmental degradation, economic problems and increased health risks (Jitsanguan 2001; Sharma 2006; Uphoff 2002; Sununtapongsak 2006; Tancho 2006).

Organic agriculture has emerged as an innovative, sustainable approach to solving the problems encountered in conventional agriculture. Organic agriculture is defined by its input supply and the agricultural practices used. It involves the use of natural, non-chemical materials that can be collected on farms and/or in households; in organic agriculture, efforts are made to avoid the use of chemical inputs. The advantages of organic agriculture can include increased productivity and enhanced biodiversity of the farmlands and surrounding areas. It increases the quality of the water, is safer for animals, and is beneficial to plants. And, of course, organic agriculture is generally more advantageous for the well-being of farmers and consumers than conventional agriculture. Thus, organic agriculture is economically viable, environmentally sound and socially acceptable (Jitsanguan 2001; Dabbert 2003; Liebhardt 2003; Wood and others 2005).

The Four Pillars of Organic Farming

1) Organic standards.

2) Certification / Regulatory mechanism.

3) Technology packages.

4) Market network.

Potential benefits of organic farming

Natural plant nutrients from green manures, farmyard manures, composts and plant residues build organic content in the soil. It is reported that soil under organic farming conditions had lower bulk density, higher water holding capacity, higher microbial biomass carbon and nitrogen and higher soil respiration activities compared to the conventional farms (Sharma, 2003).

This indicates that sufficiently higher amounts of nutrients are made available to the crops due to enhanced microbial activity under organic farming. Several indirect benefits from organic farming are available to both the farmers and consumers. While the consumers get healthy foods with better palatability and taste and nutritive values, the farmers are indirectly benefited from healthy soils and farm production environment (Table no. 1).

Table 1 Benefits of organic farming

Parameter	Potential benefits
Agriculture	Increased diversity, long-term soil fertility, high food quality, reduced pest/disease, self-reliant production system, stable production
Environment	Reduced pollution, reduced dependence on non-renewable resources, negligible soil erosion, wildlife protection, resilient agro-ecosystem, compatibility of production with environment
Social conditions	Improved health, better education, stronger community, reduced rural migration, gender equality, increase employment, good quality work
Economic conditions	Stronger local economy, self-reliant economy, income security, increase returns, reduced cash investment, low risk
Organizational/institutional	Cohesiveness, stability, democratic organizations, enhanced capacity

Source: Singh, 2009; Stoll, 2002; Crucefix, 1998.

Bio-Farming for Sustainable Development

1. Farm Friendly Technology

In comparison of the conventional farm the biodynamical farm soils has better physical, chemical and biological properties such as the soil texture, depth and porosity, water holding capacity, organic matter content. The organic matter content, soil respiration, mineralizable nitrogen, and the ratio of mineralizable nitrogen to organic carbon are reported to be higher on the biodynamic farms i.e. higher microbial activity and thicker topsoil on biodynamic farms. Earth worms which are also called as farmer's farm factory are reported to be more than 25 times in number and 8 times in weight on the biodynamic farms as compared to the conventional farm. These characteristics make the biodynamic technology more a farm-friendly technology.

2. Export -Friendly Agriculture

The biodynamic farm products are certified organic or biodynamic products-Demeter certification. These bio-grown products are free from all the chemicals. The produce has better nutritive values, taste and due to the natural growth they have good storage capacity. Even perishable vegetables and other produce lost longer on biodynamic farms. The demand of biodynamic produce is increasingly growing in the national and international market. In most of the developed countries only certified food and agro-products are now getting entry and recognition. The cost of the bio-dynamically grown produce fetches premium price up to 25% to 35% higher than the market price of a similar conventional product.

3. Eco-Friendly

Biodynamic agriculture technology not uses any short of chemical application and the focus is on balance natural growth and recycling of natural resources. The preparations are produced from the plant parts and most of the applications are based on ecological principles. Organic farming helps to adopt a climate justice approach. Although, commercial organic agriculture with its rigorous quality assurance system is a new market controlled, consumer-centric agriculture system world over, but it has grown almost 25-30% per year during last 10 years. In spite of recession fears the growth of organic is going unaffected.

4. Sustainable

Organic agriculture is a good farming system and development concept for achieving sustainability in agriculture. National Planning Commission of India in 2000 recognized organic farming as a thrust area. Sustainable agriculture integrates three main goals– environmental health; economic profitability; and social and economic equity. Cycling of nutrient and quality farm produce in adequate amount with the entire environment safety and profit characters make organic farming system as sustainable. India has traditionally been a country of organic agriculture, but the growth of modern scientific, input intensive agriculture has pushed it to wall. But with the increasing awareness about the safety and quality of foods, long term sustainability of the system and accumulating evidences of being equally productive, the organic farming has emerged as an alternative system of farming which not only address the quality and sustainability concerns, but also ensures a debt free, profitable livelihood option.

5. Adoptable

The biodynamic agriculture is an activated system of organic farming. Most of the preparations are quite easy to prepare and based on the local resources. The preparations, understanding and application are easy and adoptable. In this farming system approach a piece of land is used optimally and to its fullest potential to produce a range of nutritious and healthy food and maintain soil health and productivity by agricultural practices based on principles of nature. Pests (both insects and diseases) are also controlled and managed by the selection of crop mixes and using biological control measures.

6. Marketing

The mechanism of organic marketing is quite different from that of regular marketing. Careful selection and development of large markets and distribution channels are of utmost importance. Such marketing requires not only additional costs but also specialized skills, know-how and experience — all of which the unorganized individual farmers are usually incapable to develop (Kasturi, 2007). About 85 per cent of the total organic production in the country heads for the export market.

The domestic market for organics is thus undeveloped in India. Lack of domestic marketing channels adds to the difficulties faced by the farmers converting to organic

methods in agriculture. Market access for small producers depends on (a) understanding the markets, (b) organization of the firm or operations, (c) communication and transport links, and (d) an appropriate policy, environment. In this changing scenario, small farmers mainly need better access to capital and education. Management capacity, which is as important as physical capital, is the most difficult thing to provide Small farmers require professional training in marketing as well as in the technical aspects of production.

7. Prospects for Organic Farming in India

India is endowed with various types of naturally viable organic form of nutrients across different regions of the country which will be helpful in organic cultivation of crops (Reddy, 2010). This will help substantially in organic cultivation of crops. There is a wide diversity in climate and eco-system. India has a strong traditional farming system with innovative farmers, vast dry lands and least use of chemicals. Infect, the rained tribal, north-east and hilly regions of the country where negligible chemicals are used in agriculture, have been practicing subsistence agriculture for a long period; such areas are organic by default

8. Special Benefits of Organic Farming in the Dry lands of India

Organic farming has assumed immense significance in the dry land areas also. Soil and climatic conditions in India's dry lands make them particularly well suited to organic agriculture. These marginal lands, with their marginal soils do not respond well to intensive farming practices. These are actually better suited to low-input farming systems that make ample use of the biodiversity (Reddy, 2010).In turn, organic farming with its central focus on maintaining and improving soil health, its avoidance of pollutants, and its reliance on local inputs and labor, can materially advance the economic and ecological health of the dry lands, as well as people who live there. Semiarid and arid dry land soils typically are poor in water-holding capacity as well as organic matter.

Objectives of the study

- To study the standards of eco-friendly and organic farming in international perspective.
- To identify the status of organic opportunities, sustainability and eco-friendly farming in Bakawand block of Bastar District.

- To look for the constraints and possibilities of eco-friendly farming in Bakawand block.

- To analyze the cost of and returns from organic farming practices vis-à-vis conventional farming practices.

- To assess the needs of farmers in relation to using eco-friendly practices and to find out the way of supporting farmers.

- To understand the need for organic farming in India in the light of the experiences of other countries.

- To assess and evaluate the factors which may facilitate the adoption of organic farming in the country.

Materials and Methods

This paper draws upon yearlong field research in tribal areas of Bastar District a community of small family farmers in the state of in Chhattisgarh. The present study has been conducted in ten villages i.e. Bakawand , Stosa, Rajnagar, Panarapara, Mooli, Karpawand, Kachnar, Borigaon and Bhejhripadar in Bakawand Block of Bastar District.

More specifically, it focuses on socio-ecological implications of organic agriculture for local livelihood strategies. Data were collected using a variety of methods. These included participant observation, open-ended interviews, archival research and surveys (both quantitative and qualitative). The sustainable rural livelihoods framework (Scoones, 1998) is the approach used in our analysis.

Result and Discussion

Organic vegetables are grown primarily for household consumption to reduce the households' expenses. They are planted in small beds, with a mixture of varieties that are suitable to the local climate and soil conditions, with a mind to avoiding or minimizing pest problems. Many organic farmers plant vegetables in their home gardens, among fruit trees in an orchard, and on earthen dikes around the paddy fields. Primarily indigenous and vegetables that can grow throughout the year are planted.

This study reveals that, 86% of respondent say their turnover of farm increased since converting to organic production. Rest 14% of respondents says their turnover of farm decreased since converting to organic production (fig no.1). Many of government

schemes are there for farmers in which government provide many facility and benefits to them. Survey reveals that, 49% of respondent taken benefits from government schemes. Rest 51% of respondent didn't take benefits from government schemes due to lack of awareness (Lockeretz & Madden, 1987).

Data reveals that, 44% of respondent opts all choices of opportunities in organic farming which is majorly. Rest 18% of respondent opts promotes for healthy marketing, 16% of respondent opts for sustainability of agriculture and 22% 0f respondent opts for sustainability of livelihood (fig no.2). We found that 100% of respondent majorly says that organic farming is eco-friendly farming (fig no.3). From the findings, we found that 52% of respondents opt for product distribution to society which is majority, 40% opt for direct distribute of product to consumer, and 8% of respondent opt for wholesaler for product distribution (Darnhofer *et al.,* 2005 and Midmore *et al*., 2001).

The data reveals (fig no.4) that, 33% of respondent are strongly agree with the statement i.e. organic product looks better than conventional products, 27% of respondent are strongly disagree, 6% of respondent are little agree and 34% of respondent are little disagree with above statement (Tress, 2001, Howlett *et al*., 2002, Lauwere *et al*., 2004). The finding of data reveals that, 42% of respondent are strongly agree with the statement i.e. consumer are prepared to pay a premium for all organic foods, 5% of respondent are strongly disagree, 23% of respondent are little agree and 30% of respondent are little disagree with above statement (fig no.5).

From the findings , we found that 95% of respondents opt strongly agree for the flavor of products from organic farming is better than product from conventional farming which is majority, and rest 5% of respondent chooses little agree (Fairweather 1999 & Kaltoft, 1999).

The data reveals (fig no.6) that, 30% of respondent are strongly agree with the statement i.e. the market potential for organic food is growing, 3% of respondent are strongly disagree, 35% of respondent are little agree and 33% of respondent are little disagree with above statement (Dubey Kumar Rajesh 2013). From the findings, we found that 79% of respondents opt strongly agree for the quality of organic product is better than products from conventional farming which is majority, and rest 7% of respondent chooses strongly
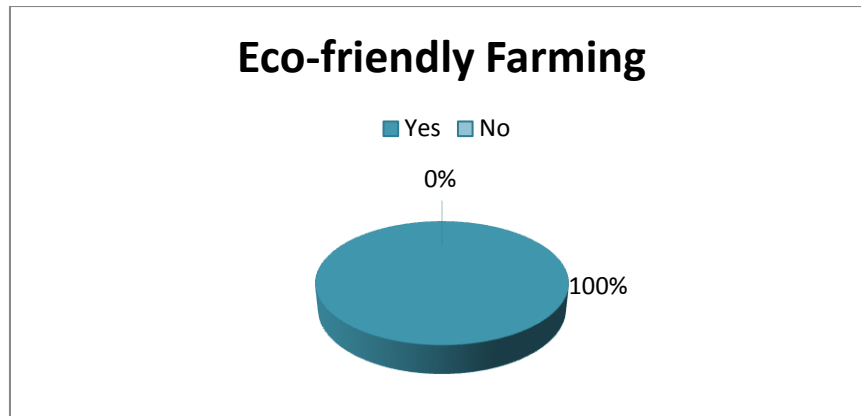
disagree, 6% of respondent opts for little agree and 8% of respondent opts for little disagree (fig no.7). From the findings, we found that 46% of respondents opt strongly a little agree for which is majority, and rest 5% of respondent chooses strongly disagree, 29% of respondent opts for little disagree and 29% of respondent opts for little disagree (Koesling *et al.,* 2009).
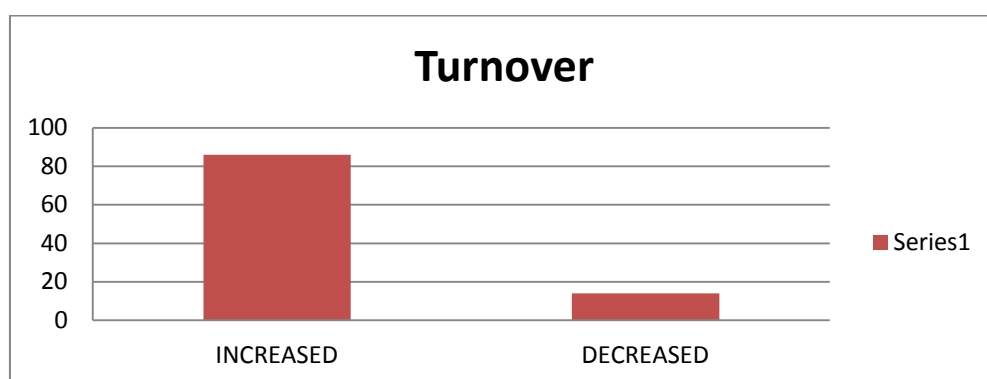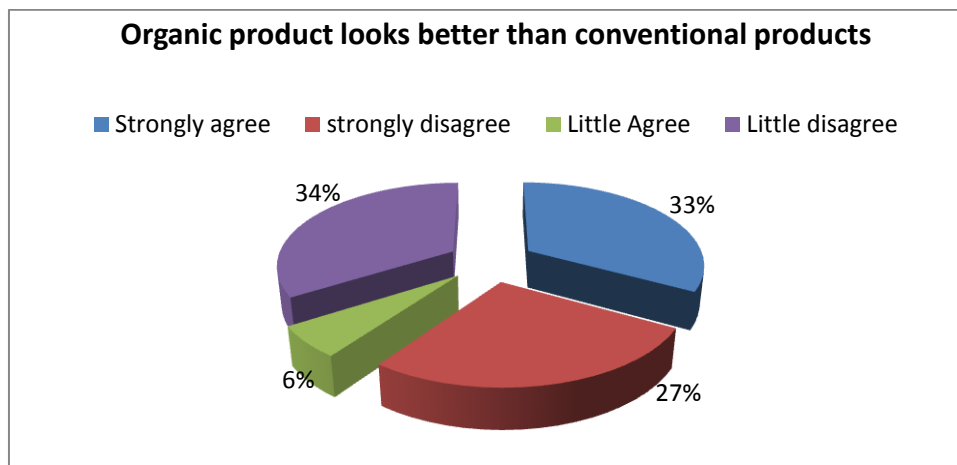

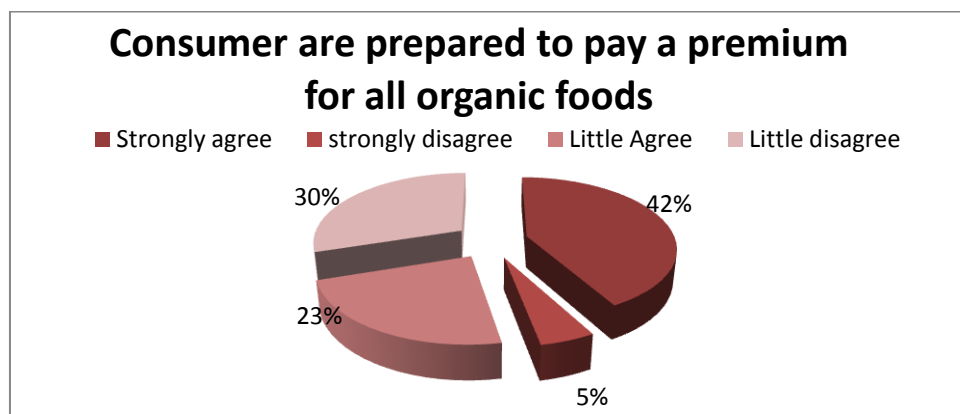**Fig No. 1 Has the Turnover of Farm Increased or Decreased Since Converting To Organic Production**
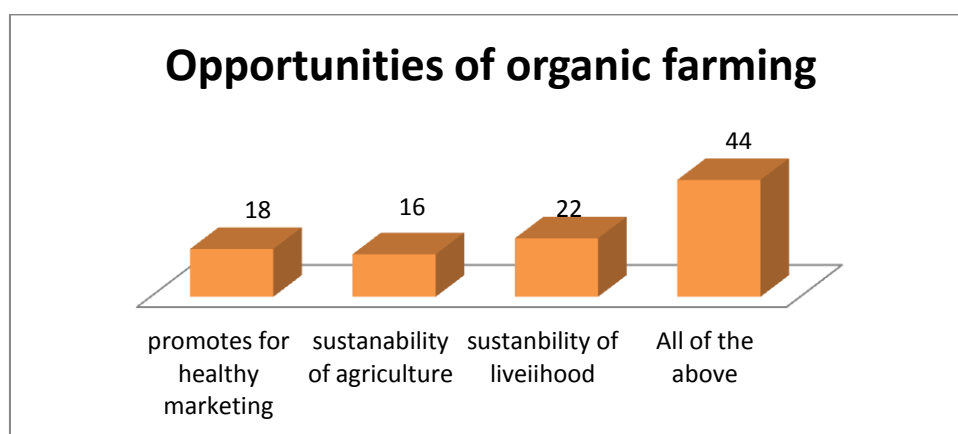
Fig. No. 2 Opportunities In Organic Farming

Eco-friendly Farming

■ Yes ■ No

0%

100%

Fig. No. 3 Organic Farming Is Eco-Friendly

Organic product looks better than conventional products

■ Strongly agree ■ strongly disagree ■ Little Agree ■ Little disagree

34%

33%

6%

27%

Fig No. 4 Organic product looks better than conventional products

Consumer are prepared to pay a premium for all organic foods

■ Strongly agree ■ strongly disagree ■ Little Agree ■ Little disagree

30%

42%

23%

5%

Fig No. 5 Consumer are prepared to pay a premium for all organic foods
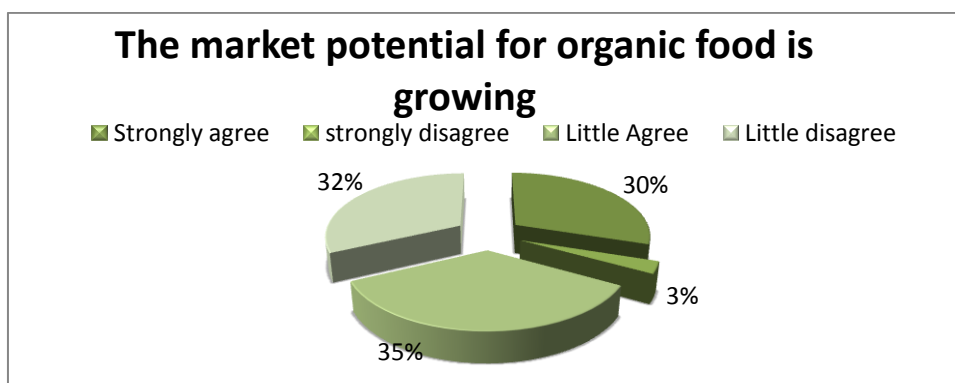
Fig No. 6 The market potential for organic food is growing
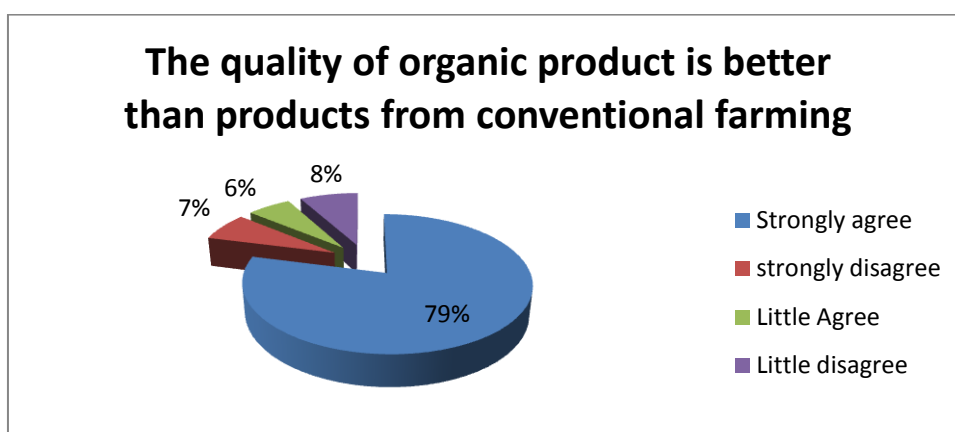
Fig No. 7 The quality of organic product is better than products from conventional farming

Conclusion

Agriculture plays a crucial role in overall economic development of agro –based developing countries like India. In those countries, green revolution emerged in 1960s with the slogan of 'produce more food'. Within a couple of years, farmers received 'package technologies' of HYV seed-fertilizer-irrigation. With the adoption of these technologies, farmers started to use chemicals and they were getting more production for a decade. Most of the newly developed inputs and technologies were subsidized, even free that time. After some years, farmers as well as policy makers get warning of yield reduction and large negative impact on human and the environment like degradation in

soil quality, contamination of groundwater, increased costs of production, health hazards, etc.

The study is an attempt to protect natural agricultural resource bases from further degradation in Bakawand Block and to ensure long term sustainability in agricultural system. With the concept of sustainability of agriculture, developed countries are practicing 'organic farming', where they strictly maintain standards and regulations. The developing countries are practicing organic for export and in many places, for local consumption, the farmers are trying to reduce the overall use or indiscriminate use of chemicals in agriculture – that is very often termed as 'eco-friendly'. Based on the overall situation, the objectives of the study are to compare Chhattisgarhi standards with international rules and to look for the constraints and possibilities of eco-friendly way of farming in Chhattisgarh.

The major barriers that have been found in this study could be classified as: government thinking of 'organic farming has negative impact of on food security', excessive promotion of hybrid seed in the name of 'availability of good quality seeds', allocation of budget to subsidy on chemical inputs, insufficiency of organic inputs, farmers poor knowledge, increase in the area under HYV, sales promotion by pesticide dealers and companies, regulation of pesticide marketing, lack of consumers awareness, lack of media campaign, problems of organic product marketing etc.

Still there are positive points that make us hopeful that 'organic way of farming' is possible in India. Researchers have pointed that organic agriculture could be a way to food security for small and marginal farmers as well as consumers. Now, it is also realized at policy level that 'we are at crossroads to review whether the current use of agro chemicals is appropriate.

References

Crucefix D. (1998) Organic Agriculture and sustainable rural livelihoods in Developing countries, Department for International Developmental Natural Resources, Advisors Conference, UK.

Dabbert, S. (2003). *"Organic agriculture and sustainability: environmental aspects", in Organisation for Economic Cooperation and Development, ed.,*

Organic Agriculture: Sustainability, Markets and Policies (Wellingford, CABI Publishing).

Darnhofer, I., W. Schneeberger, and B. Freyer. (2005a). *"Converting or not converting to organic farming in Austria: Farmer types and their rationale." Agriculture and Human Values 22: 39-52.*

Dubey Kumar Rajesh, *"Green Growth & Organic Agriculture as Livelihood Strategy- a Case Study in a Rural Community of Chhattisgarh," The Indian Journal of Research -Anvikshiki, 2013, v.7, n. 6, pp. 39-44.*

Fairweather, J. R. (1999). *"Understanding how farmers choose between organic and conventional production: Results from New Zealand and policy implications" Agriculture and Human Values. 16: 51-63. Kluwer Academic Publishers.*

Howlett, C., L. Connolly, C. Cowan, et al. (2002). *"Conversion to Organic Farming: Case Study Report Ireland." White paper prepared by The National Food Centre—*

Dublin, Ireland.Jitsanguan, T. (2001). *"Development of sustainable agriculture", paper presented at the policy meeting of Ministry of Agricultural and Cooperatives, Office of Agricultural Economics, Bangkok, 30 August.*

Kaltoft, P. (1999). *"Values about nature in organic farming practice and knowledge." Sociologia Ruralis 39: 40-53.*

Koesling, M., O. Flaten, & G. Lien. (2009). *"Factors Influencing the Conversion to Organic Farming in Norway." Int. J. Agricultural Resources, Governance, and Ecology 7.*

Lauwere, C. de, A. de Buck, A. Smit, L. Balk-Theuws, J. Buurma, and H. Prins. (2004) *"To Change or Not to Change? Farmers' Motives to Convert to Integrated or Organic Farming (or Not)" Acta Horticulturae. 655: 235-43.*

Liebhardt (2003). *"What is organic agriculture? What I learned from my transition", in Organisation for Economic Cooperation and Development, ed., Organic Agriculture: Sustainability, Markets and Policies (Wellingford, CABI Publishing).*

Lockeretz. W. and P. Madden. (1987). *"Midwestern organic farming: A ten-year follow up." American Journal of Alternative Agriculture 2: 57-63.*

Midmore. P., S. Padel., H. McClman., J. Isherwood., S. Fowler., and N. Lampking. (2001). *Attitudes Towards Conversion to Organic Production Systems: A study of Farmers in England. Aberystwyth: Institute of Rural Studies, University of Wales.*

Scoones, Ian (1998), *Sustainable Rural Livelihoods. A framework for analysis. Brighten: Institute of Development Studies.*

Sharma, A.B. (2006). *"Many India farmers returning to traditional ways of organic agriculture", Financial Express, New Delhi, 9 January, accessed on 29 September 2006 from www.organicconsumers.org/ofgu/traditional011306.cfm.*

Sharma P.D, *(2003) Prospects of organic farming in India, in proceedings of National seminar on Organic products and future prospects, Sher-e-Kashmir UAST, Srinagar, Pp: 21-29*

Singh S. (2009) *Organic produce supply chains in India: Organization and Governance, CMA publication no.222, IIM, Ahmedabad – 380015*

Sununtapongsak, W. (2006). *(Organic agriculture in Thailand), accessed on 29 December 2006 from www.ldd.go.th/pldweb/tech/meet7/book1/ f7.doc.*

Tancho, A. (2006). *(Applied natural agriculture: ideas, principles, and techniques in Thailand (Patum Thani, National Science and Technology Development Agency).*

Tress, B. (2001). *"Converting to organic agriculture: Danish farmers' views and motivations." Danish Journal of Geography. 101: 131-144.*

Uphoff, N. (2002). *"The agricultural development challenges we face", in N. Uphoff, ed., Agroecological Innovations: Increasing Food Production with Participatory Development (London, Earthscan Publications Ltd.), pp. 3-20.*

Wood, R., M. Lenzen, C. Dey and S. Lundie (2005). *"A comparative study of some environmental impacts of conventional and organic farming in Australia", Agricultural Systems, vol. 89, No. 2-3, pp. 324-348.*

SDIS-064

The Power of Innovation: Craft Revival, Empowerment and Sustainable Livelihood

{Research Study on Ghadwa Art (Dhokra / Bell Metal Art) & Artisan of Bastar}

Dr. Anupam Kumar Tiwari

Head & Asst. Professor, School of Studies in Rural Technology, Bastar Vishwavidyalaya, Jagdalpur, Chhattisgarh, anupam.praina@gmail.com

Abstract

An socio-economic investigation on Ghadwa art (Bell metal art) artisan families with special reference to Bastar District of Chhattisgarh was conducted to understand the traditional technique of Ghadwa art being used by the traditional artisans in Sidmud, Chilkuti and Erracote villages of Bastar District of Chhattisgarh. Empowering artisan through craft to benefit themselves and their families and develop in a sustainable way is the need of the hour. Agencies, both public and private, play an important role in the revival of the traditional arts and crafts. The research study aims at drawing a linkage between artisan and their role in the revival and preservation of crafts. The present study was done through structured questionnaires in consultations with the Ghadwa art artisans. Bastar's dhokhra work is certainly the most famous handicraft from this state and its fame has long reached the international stage. Bastar is only one region where master craftsmen churn out exquisite handicrafts. There is stone, wood, terracotta, wrought iron, there are paintings and tattoo work, bamboo and sisal work there is so much that the mind boggles with sheer variety. The Ghadwa art Chhattisgarh is famous for its unique tribal population along with tribal art for number of traditional art which is used by Tribal peoples for multipurpose uses and livelihood from time immemorial, so there is a need to study of Ghadwa art artisans family and their technique of Bastar region for the conservation purpose of this valuable gift of God. The artisans are persons who make different traditional items followed by traditional methods and provide showpiece and antique items. The study indicated the needs to support the artisans for their upgradtion though various activities like skill orientation activities /trainings, market availability, support of raw material and to provide innovation designs for their livelihood support and improvement.

Keywords- Craft Revival, Innovations, Empowerment, Sustainable Livelihood.

Introduction

The handicrafts industry has shown tremendous growth potential and works towards poverty alleviation through a twofold objective of employment generation and export promotion. Handicrafts are a source of livelihood to a large number of poor people in India and especially the rural poor. As the second largest employer in rural India after agriculture, the crafts sector is a source of supplementary income to the seasonal agricultural workers, who have limited alternative employment opportunities in the villages. It helps curb migration of workers from rural to urban areas for better employment to a certain extent. The crafts sector often provides part–time employment to rural women, who are traditionally endowed in the craft form.

India is well known for ancient arts and handicrafts creating unique identity throughout the world. In the state of Chhattisgarh, the Bastar Art which is having a distinctive characteristics and excellence in making exotic handicrafts with a wide variety of designs and shapes is still unreachable and unknown to the customers at national and international level. It is well known fact that all tribal craft are based by concept and by process, which does no harm to its heritage and environment. In fact by rituals and by folklore of this craft they communicate with there upcoming generation to keep them as necessary tradition. All these have survived for centuries. The region has a rich tradition of art and culture , various crafts such as Bell Matal,Terracotta and Wrought iron are also being persued in this region. Bastar art is all set to create a niche for ourselves in the world market.

Bastar a tribal district of Chhattisgarh is the Land of Handicrafts & Natural Resources. This Divine Land is also enriched with Natural Beauty which makes it a paradise for tourists. The deep forest area between bushes and bamboos where one always feel the absence of sunlight , wide and thick forests , between high mountains cool flowing streams , sky-touching mountains, caves , high waterfalls , and in the valleys the spread of greenery and in between this , the huts made by bamboo sticks, the fearless life style of the tribal's and their culture, one's heart and mind would be filled with new wonders and pleasure.

Bastar is the crown of Chhattisgarh. When the region's iron craft images and other art and craft forms first burst upon the urban art scene in 1980s, International art critics hailed it as India's 'true art' which has ancient roots.(The Hindu by Pushps Chari.)

Tribal artisans of Bastar attempt to bring myth and magic to the objects essential for survival. They are fine pieces of art and carry a raw look.(*Manu Aiyappa,2001*) Here the endless verity of Bastar Craftsmanship. Bamboo Craft, Cowrie Craft, Jute, Sisal, Carpet Weaving, Dhokra or Bell Metal, Kosa, Stone Carving,ClayReliefWork,Godna Printing,Pressed dry flower craft, Terracotta, Tribal Painting, Tumba, Wood Craft, Wrought Iron.

Ghadwa art (Bell Metel art)

The Bastar tribals are famous inmaking bell metal arts which are crafted by hand through the vanishing vax technique There has been a lot of product diversification. Dhokra meaning "oldest" is an ancient folk craft. The Bell Metal is an alloy known as the Panchadhatu (five metals). The process of moulding this alloy is quite intricate and even amazing. There are fine pieces of art such as figures of Gods, animals, birds, trees, the Tree of life, There are twelve stages for making these artifacts .The craftsmen procure the rawmaterials likemetal, wax, firewood and clay.

Looking to the importance and popularity of Ghadwa art in the region specifically and in the country and world too, the study needs to understand the socio-economic status of the artisans those who are engaged in Ghadwa art in the region, as it is the major source of dependent tribal group for their livelihood support. Hence, the study entitled "Socio-economic investigation on Ghadwa art (bell metal art) artisan families with special reference to Bastar district of Chhattisgarh" Was carried out to cover the following objectives-

- To understand the technique and Casting of Ghadwa art in Bastar.
- To study the Socio-economic status of artisans of Ghadwa art in Bastar region.
- To identify the support and subsidy sources for Ghadwa art artisans in the study area.
- To study the benefit sharing among the major stake holders;

- To study the socio-economic characteristics of people/artisans and the contribution of the

Methodology

For the purpose of analysis, primary as well as secondary data have been collected. Secondary data regarding number of bell metal industrial units, number of artisans, etc. The survey was conducted to collect the information regarding remote villages of Bastar district from Block Office. tribal villages or 3-5 traditional artisans in each villages were visited through periodical tour. The study was conducted in the month March- July 2012. With approximately all artisans informants in each Villages (total number of informants 35; {32 (91.42%) Man, 3(8.57%) Woman}). The methodology of the present work was adopted from some of the earlier workers like Jain (1988), Kochhar (2003), Tiwari (2012), Tiwari & Nema (2012) and Tiwari & Singh (2012) and the methods of socioeconomic studies have been summarized by Dewangan (2011), was also consulted in the present study.

Results and Discussion

Education is the basic necessity of the people at present. In all aspects, it is essential entity for the development of human qualities and personalities. Literacy and educational attainment level are considered as significant factors influencing socio-economic development of any society. Level of education among the bell metal artisans is very low. Majority of the artisans engaged in the bell metal industry are ignorant and illiterate which creates great obstacles in the way of modernisation and expansion of the industry (Deka, P.K. 1986). This study was observed that 17.5 per cent artisans are illiterate. It is also seen that out of the literate respondents, about 30.84 per cent studied up to class 7 standard, 18.34 per cent studied up to class 10th, 20 per cent HSLC passed, 10 per cent HS passed and 1.67 per cent was graduate. Thus, it is clear that educated youth are not interested in pursuing this age old occupation. Moreover, the attitude of the society is also not positive towards these handicrafts workers. Very low status is accorded to the artisans by the society. It may be perhaps due to low education level. They are neglected by the society which in turn discourages them. For ignorance, they use outdated methods of

production and thus cannot keep pace with other large-scale industries which in turn keep their income low.

A majority of the families were nuclear and a few were in joint family. Among them, 94.16 per cent are nuclear while 5.14 per cent were joint family. It is because of the fact that the poor artisans cannot support a joint family. Bell metal was observed to be the only source of livelihood for more than 97 per cent of the respondent. Only 2.5 per cent respondent was having other source of income. The other source of income is the agriculture for these few artisans. It is because of the fact that most of them do not have land other than their land for their dwelling house. Because of their low income, majority of them (82.5 per cent) is unable to save. Supply of safe drinking water in adequate quantities to all has been recognised as the basic need worldwide. Most of the artisans have not any safe drinking water facility. They take drinking water without filtering. Unfortunately, no one among the artisans is able to get the safe drinking water supply from any government scheme. Only 9.16 per cent have their own ring wells and 69.66 per cent possess tube wells. Some are carrying water from others' tube well and ring well. However, 21.66 per cent neither possess ring nor tube well. It is also observed that out of 120 respondents 107 families (89 per cent) have not any water filter facility. Only 1.66 per cent has readymade filter from market and remaining 9.16 prepare their own filter facility at their own home. It reflects their unhygienic iving condition.

Apart from drinking facilities, sanitation also reflects their poor socio-economic condition of the artisans. It is also observed from study that only 15.86 per cent respondents have pacca latrine whereas 49.16 per cent uses katcha latrine. It is observed that 35 per cent have neither pacca nor katcha latrine facilities. They have to use open space.

The housing condition of the artisans is poor. Most of the artisans live in katcha house. It is observed that only 18 workers i.e. 15 per cent workers have Assam type pacca house whereas 80 per cent workers live in tin roof katcha houses. Accordingly, 5 per cent workers live in thatch roof katcha houses.

The standard of living of the artisans is poor. It is observed from study that 52.50 per cent of total 35 families have electricity facilities whereas 35 per cent use kerosene as a source of lighting. Remaining 12.50 per cent use other source of light. It is observed that

majority of families, i.e. 57.50 per cent use firewood as a fuel whereas 40.83 per cent use LPG. Only, 1.66 per cent use cow dung a source of fuel.

It is also seen that 48.33 per cent does not possess any type of vehicles. However, 49.17 per cent have bicycles and 2.5 per cent motor cycles. It is also experienced that majority of families (i.e. 48.33 per cent) have not any tools of amusement. Only 6.66 per cent can enjoy T.V.

Distribution of Income

There is inequality in distribution of income among the artisans. Inequalities in income have artisan on the basis of role played by different categories of artisans. The income of most of the head artisan is much higher than that of other artisans. It is observed from study that the income of temporary artisans is the lowest among all. Their income is less than Rs 30000 per year. It is a so meagre income that obviously leads to poverty. It is due to irregular employment and lack of skill.

Conclusion and policy implications:

India a land of unity and diversity with many cultures and rituals is having a highly potential state like Chhattisgarh which is rich in tribal Handicraft. By promoting the handicraft of Bastar we are not only revealing the hidden talents of the artisans to the world but also strengthening the Indian culture by escalating it in the global scenario.

It is evident from the above discussion that bell metal industries of bastar district have been sufferings from various problems related to backward and forward linkages. It is no longer lucrative as a sequel for which the educated youth of the region are not interested in carrying out that activity. In future with its gloomy situation it may be continued with the few handful persons who have little traditional knowledge only. The artisans have been sufferings from basic facilities like drinking water and sanitation. As a result, health of the workers including their family members were not in good conditions as they were sufferings from various ailments. Vicious circle of poverty was very conspicuous among the workers. In view of this, it is suggested that Government of Chhattisgarh should come with economic package to save the enterprise.

References

Andrews, Fred H. (1942) "Indian art and crafts," The Studio, 1942, 124(593):33-80.

Aruna Chandra Gupta, 'Small Scale Industries', Khadi Gramodyog, Vol. 6

Baishya, P. 1986. The role of small scale and cottage industries; A case study in Kamrup district of Assam, unpublished Ph. D. thesis submitted at Gauhati University, Guwahati, Assam, 18-19.

Bedi, R.D., (1958)Theory History and Practice of Co-operation, Loyal Book Depot, New Delhi.1958

Deka, P.K. 1986. "Contribution of Bell Metal Workers on Assamese Society", Souvenir, Golden Jubilee Celebration of the Assam Co-Operative Bell Metal Utensils Manufacturing Societies Ltd.

Despande, M.U. Entrepreneurship and Small Scale Industries: Concept, Growth and Management,1984

Hacker, Katherine F. (2000). Traveling objects: "Brass images, artisans and audiences." Res: Anthropology and Aesthetics 37: (spring): 147–165.

Issac, Jayant and singh, Aakash.(2010)."Promotional techniques to uplift the latent handicrafts of Chhattisgarh" Sodh, Samiksha aor mulyankan an International referred Research Journal Vol. 2, No.-21, pp 34-35.

Jain, Jyotindra (1988) 'The Absent Form: Tribal Bronzes of India', New Delhi: Crafts Museum.

Kochhar, R. (2003), Dhokra: The Traditional Art of Metal Casting, New Delhi: Nistads Dhokra Museum.

Mahawer, K. 2012. Folk Arts and Craft of Bastar : A Study Research Link - 98, Vol - XI (3), , Page No. 114-115

Manu Aiyappa. 2001. .A Glimps of Bastar Art in mysore. The TimesOf India, Banglore.

Mohanty, Prafulla (2010) "Handicrafts : The Visible Cultural Symbol of Ganjam District" Orissa Review Journal pp 39-43.

Pushps Chari. Striking Art in Iron. The Hindu (Friday Review)

Richard L.Kohlis & Joseph N (2005), Marketing of Agricultural Products, 2005

Tiwari, Anupam (2009). "Chhattisgarh Aadivasi vikas karyakram ka abhinav prayas", Sundder Subhesh an International referred research Journal January Vol. 1, No.-1, pp 34-35.

Tiwari, Anupam and Nema, Sharad (2012) "Traditional technique of Bastar Arts and Crafts- options for livelihood of Bastar Tribes of Chhattisgarh" in National conferences on Interaction Between Traditional and Modern Technology, Organized by Council of Science and Technology, Raipur, C.G. & Chhattisgarh Vigyan Bharati, Raipur, C.G pp-263

Tiwari, Bhupesh (2002), Diagnostic study artisan the bell metal cluster kondagaon (chhattisgarh). The training programme for the cluster development agents, organised by UNIDO CDP New Delhi.http://cghandicraft.com

PLATE - I

Photograph shows with informants (artisans) families

Photograph shows finished Gadhwa art Item (Lamp)

PLATE - II
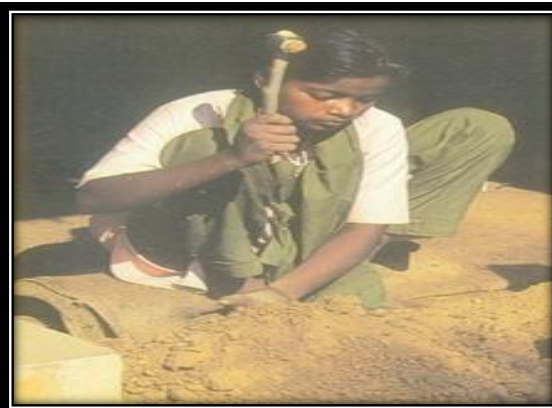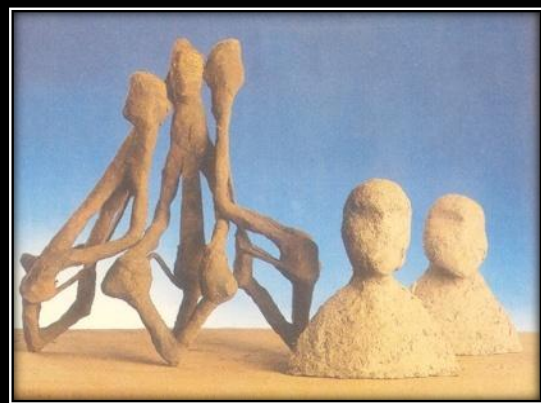
Process- 1	*Process- 2*
Process- 3	*Process- 4*
Process- 5	*Process- 6*
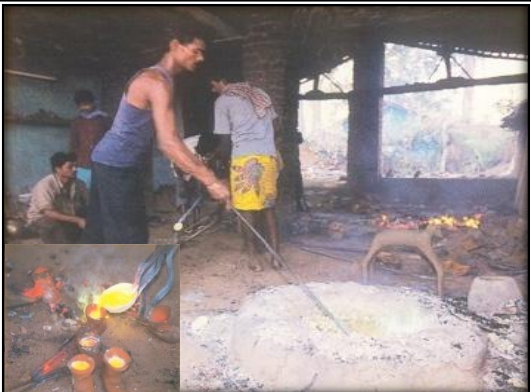
Process of Gadhwa art preparation

PLATE - III

Process- 7	*Process- 8*
Process- 9	*Process- 10*
Process- 11	*Process- 12*

Process of Gadhwa art preparation

PLATE - IV

Casting Process

Casting Process

PLATE - V

Mukahota (Mask)	***Nandi***
Tribes of Bastar	***Sulfee tree***
Traditional women	***God Ganesha***