
SUSTAINABILITY: FOR A BETTER TOMORROW



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© Dr. Hansraj Thorat
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Second Edition-2017

ISBN: 978-81-922746-7-6

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Published by,

Pimpri Chinchwad Education Trust's
S. B. Patil Institute of Management
Sector-26, Pradhikaran, Nigdi, Pune-411044

Printed by,

Success Publications

Radha Krishna Apartment, 535, Shaniwar Peth,
Opp. Prabhat Theater, Pune-411030
Contact-9422025610, 8806664858, 020-24434662
Email-marketing@sharpmultinational.com
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DIRECTOR'S MESSAGE

It gives me an immense pleasure to release the 2nd edition of "SUSTAINABILITY: FOR A BETTER TOMORROW". The main motto of preparing this book is to improve the awareness amongst the people about the problems of Sustainability. Sustainability is the need for the day; it can contribute accurately as per the need of the society. The Research center has been established at SBPIM in 2011-12. The Research Centre is conducting various research activities for students and faculty members such as Ph.D. Research Program for faculty of management, Publication of bi-annual Research Journal entitled JOMAT - Journal of Management and Administration Tomorrow, Conducting International, National and State level Seminars, Conferences, Workshops and Symposia, Guidance to faculty members for doing Minor and Major Research Projects, Guidance to faculty members to write Research Papers and their presentation at various seminars and publications in refereed research journals, Guidance to MBA students for Summer Internship Projects (SIPs) and to do Industrial Research, Preparing Monographs on various subjects etc. Publication of the edited book entitled as "SUSTAINABILITY: FOR A BETTER TOMORROW" is an important activity of our research Centre. The concept of sustainable development formed in the basis of the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992. Sustainability inhabits the prominent stage in our life in the fast changing world. Sustainability is much more than a recent buzzword- a way of life and living in harmony with nature. Sustainability envisions a just and peaceful self-sustaining society that embraces the basic principles and value system of symbiotic living. Sustainable development has been the central focus for the future development strategies. The biggest challenge to sustainability is the fact that the Earth has finite resources but an indefinitely growing population. By the year 2050, there will be over 9 billion people on Earth whose livelihood will depend on these finite resources. This presents us with a situation where we need to rethink and rework on how to turn around the rate of degradation and depletion of the ecosystem and conserve and maintain the balance between supply from the nature and consumption by mankind. Despite of the quantum progress and achievement in industrial and economic growth, human civilization has failed to meet of its most basic prerequisites- to live in harmony with nature and with each other. If we do not want to understand the deep consequences of these environmental and social changes the benefits and achievements of this modern society will be mere transitory. Thus it is absolutely important to learn how to live personally and professionally in a manner that supports environmentally, socially and economically healthy environments and living communities. This will be possible only through better awareness of generation, education and understanding about sustainability and through an absolutely new approach of leadership in the development.

The book will bring together leading researchers, entrepreneurs, farmers and academicians in the domain of interest from around the world. All selected papers are published as chapters in the edited book. I appreciate the efforts taken by our Research Centre.

Dr. Daniel Penkar
Director, SBPIM

EDITOR'S MESSAGE

Decades of reckless economic growth pursuits have left an indelible mark on our planet Earth. Not all outcomes of this economic growth paradigm have been positive. Negative impacts of our greed for profitable growth and increased materialistic lifestyle include environmental disasters, higher social and environmental activism, and increased pollution on the planet. However, with social and digital media, consumers and non-profit organizations have increasingly bringing accountability in the society due to which the firms had to alter and align their business processes and even mind-set aligned to these burning issues. From this churn the concept of sustainability was born and today it's not just a fashionable jargon, but an integral component of corporate strategy and all business practices. But despite efforts made by firms to blend its business practices with sustainability, the society at large is concerned over the footprint it creates on the environment. At the very least, impactful and meaningful implementation of the sustainability depends to a large extent on the institutionalization of the right mind-set, attitudes as well as behavior within the organizations of its employees, customers, shareholders, and all other stakeholders as well. Prof Muhammad Yunus for example, has successfully shown how corporates can contribute towards society in more meaningful ways such as by adopting social businesses within their firms. Since the domain of sustainability is still evolving, it is an opportune time for academics and practitioners to get together to share their ideas, projects, academic articles, as well as experiences, to learn from each other while generating food for thought for researchers to take the knowledge to the next level. If the academic and business community as well as the Government, NGOs and civil society groups are really serious about the issue of sustainability then one must explore into the exploration of the very roots from where the concern for Sustainability emerges.

Many thanks to all the authors for their contribution in this edited book in their interested areas of Sustainability. We take this opportunity to express special thanks to all teaching and non-teaching staff members, M.B.A. and Ph.D. students of PCET's S.B. Patil Institute of Management. We take the privilege to thank our trustees of Pimpri Chinchwad Education Trust, for their continuous motivation and support. We expect the feedback and suggestions from the readers on e-mail id: hdthorat@yahoo.co.in which could become the guidelines for publication of further edited books.

Dr. Hansraj Thorat
Chief Editor

Dr. Padmalochana Bisoyi
Editor

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**A COMPARITIVE STUDY OF FINANCIAL HEALTH OF BRIHAN MUMBAI
ELECTRIC SUPPLY AND TRANSPORT (BEST) WITH PUNE MAHANAGAR
PARIVAHAN MAHAMANDAL LIMITED (PMPML)**

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ABSTRACT

Urbanization has triggered the enormous potential for growth in the urban passenger transport undertakings. In India the road transport undertakings are blemished by the inefficient cost control systems, rising cost and increasing tax structure. Moreover, Poor capital structure increases cost of capital and creates a huge burden of interest and affects capital outlay decisions and working capital of the undertakings. The banks are at stake to finance these undertakings without viable business plans. This study focuses on the financial soundness of the two major urban passenger transport undertakings in Maharashtra in terms of revenue as well as no of passengers carried namely BEST and PMPML. To predict the financial solvency, Altaman's Z-Score (E.I) was used by analyzing the last five years financial statements.

Keywords: *Urban Passenger Transport, Financial health, Financial Soundness, Solvency and Z-Score.*

INTRODUCTION

In India, rail and roads are considered to be the dominant modes than air and water for passenger traffic. According to NTDPC report “The share of roads in passenger traffic (billion passenger kilometer or bpkm) in total passenger traffic carried by rail and roads has increased from 32% in 1951 to 90% in 2011-12” (India Transport Moving India to 2032). Moreover total passenger traffic is expected to grow at about 15% per annum to reach 1,68,875 bpkm in 2031-32 from 10,375 bpkm in 2011-12 but expected growth road traffic is 15.4% per annum”. This unveils a lot of growth potential for the urban passenger transport undertakings. But to tackle this enormous growth urban passenger transport undertaking are not capable because of their poor financial health. Both BEST and PMPML are suffering from huge losses due to poor operational efficiency.

“According to a government report, most SRTUs are unprofitable. The combined net loss of 47 SRTUs in 2015-16 was Rs. 11,349 crore, 7.2% higher than in 2014-15. Topping the list was the Delhi Transport Corporation (DTC), with a loss of Rs 3,411 crore. It was followed by the Brihanmumbai Electric Supply and Transport (BEST) at Rs 1,061 crore,

and the Kerala State Road Transport Corporation (KSRTC) at Rs 738 crore.” (How poor operational efficiency bleeds India’s public bus transport undertakings). In India State transport undertaking and Municipal transport undertaking contribute Rs.35928.73 crores to GDP and provide employment to 727,990 during 2011-12.

BEST

The Brihan Mumbai Electric Supply and Transport Undertaking is the civic transport and electricity provider public body based in Mumbai, Maharashtra, India. In 1926, the BEST also became an operator of motor buses. The Undertaking operates one of India's largest fleets of buses. The bus transport service covers the entire city and also extends its operations outside city limits into neighbouring urban areas. In addition to buses, it also operates a ferry service in the northern reaches of the city.

Table 1 – Descriptive Statistics of BEST for the period 2010-15

BEST					
Particulars	2010-11	2011-12	2012-13	2013-14	2014-15
No of Buses	4652	4669	4259	4314	4247
No of Passenger in Lakhs	15352	14395	14096	13068	12216

Source: [www.data.gov.in/physical performance for the period 2010-2015](http://www.data.gov.in/physical-performance-for-the-period-2010-2015)

PMPML

Pune Mahanagar Parivahan Mahamandal Ltd (PMPML) is the public transport service provider for the city of Pune and Pune Metropolitan region, which includes areas surrounding of Pune and Pimpri Chinchwad. PMPML was created following a merger between the Pune Municipal Transport (PMT) and Pimpri-Chinchwad Municipal Transport (PCMT) during 2007. Formerly, PMT was responsible for public bus operations in the Pune city limits and PCMT ran buses in the neighboring city of Pimpri-Chinchwad in Pune Metropolitan Area.

Table 2 – Descriptive Statistics of PMPML for the period 2010-15

PMPML					
Particulars	2010-11	2011-12	2012-13	2013-14	2014-15
No of Buses	1549	1634	1832	1841	2087
No of Passenger in Lakhs	4500	4496.98	4604.88	4248.94	4433.57

Source: [www.data.gov.in/physical performance for the period 2010-2015](http://www.data.gov.in/physical-performance-for-the-period-2010-2015)

REVIEW OF LITERATURE

(Bhargava), in their paper has studied the financial distress in selected SRTUs using Logit Probability analysis. He found that SRTC under his study were not financially

sound and the probability of Gujrat State road transport Corporation, Rajasthan State Road Transport corporation, and Kadamba Transport Corporation is 1. (Bhushan Pardeshi), in their research paper studied the solvency of Kingfisher Airline Ltd, Jet Airways Ltd, SpiceJet Ltd using Z Score. They found that the Kingfisher Airlines Ltd. is in a Gray Zone, Jet Airways Ltd was in a financially distress zone and SpiceJet Ltd. was in a safe zone.

NEED OF THE STUDY

NTDPC report predicts that 15% increase in the passenger population every year. This study is conducted whether these transport corporations are equipped to tackle the opportunity. Financial health check-up portrays whether the financial position is sound. Moreover the saying “Prevention is better than cure”. Early detection of financial sickness will help the organization to formulate strategies so that they can revamp their financial strength.

OBJECTIVES OF THE STUDY

- To evaluate the financial performance of BEST and PMPML
- To assess the financial solvency using Z-Score analysis

HYPOTHESIS

H₀: There is no financial distress in BEST and PMPML

H₁: There is financial distress in BEST and PMPML

RESEARCH METHODOLOGY

The data were collected from CIRT ‘s State Transport Undertakings Profile reports and the physical and financial performance reports from www.data.gov.in. The researcher was interested to find out how these monopoly urban passengers lost their market share to Uber and Ola. The major reason was they did not equip themselves to increase the number of buses due to shortage of funds to buy new buses and replenish the existing old vehicles etc. Hence it threw the light to check the financial solvency position. The period of the study pertains to 01/04/2011 to 31/03/2015.

Z- Score Model

It was developed by Altman Z-score gauges the probability of becoming bankruptcy and portrays the financial health. It is based on five financial ratios that can be calculated from data found on a company's annual report. It uses profitability, leverage, liquidity, solvency and activity to predict whether a company has a high degree of probability of being insolvent.

“In its initial test, the Altman Z-Score was found to be 72% accurate in predicting bankruptcy two years before the event, with a Type II error (false negatives) of 6% (Altman, 1968). In a series of subsequent tests covering three periods over the next 31 years (up until 1999), the model was found to be approximately 80%–90% accurate in predicting bankruptcy one year before the event, with a Type II error (classifying the firm as bankrupt when it does not go bankrupt) of approximately 15%–20%” (Altman, 2000) (Wikipedia)

Z Score Bankruptcy Model		
<p>Public Manufacturing Companies</p> <p>Z-Score Bankruptcy</p> $Z' = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5$	<p>Private Manufacturing Companies</p> <p>Z-Score Bankruptcy</p> $Z' = .717 X_1 + .847 aX_2 + 3.107 X_3 + .420 X_4 + .998 X_5$	<p>Private General companies</p> <p>Z-Score Bankruptcy</p> $Z' = 6.56 X_1 + 3.26 X_2 + 6.72 X_3 + 1.05 X_4$ <p>Emerging Markets</p> $Z = 3.25 + 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$
<p>Zones of Discrimination</p> <p>$Z > 2.99$ – “Safe” Zone $1.8 < Z < 2.99$ – “Grey” $Z < 1.80$ – “Distress” Zone</p>	<p>Zones of discrimination</p> <p>$Z' > 2.9$ – “Safe” Zone $1.23 < Z' < 2.9$ – “Grey” $Z' < 1.23$ – “Distress” Zone</p>	<p>Zones of discrimination</p> <p>$Z > 2.6$ – “Safe” Zone $1.1 < Z < 2.6$ – “Grey” zone $Z < 1.1$ – “Distress” Zone</p>

X_1 = Working capital / Total assets
 X_2 = Retained earnings / Total assets
 X_3 = Earnings before interest and taxes / Total assets
 X_4 = Market value of equity / Total liabilities

Z Score Model was designed by Altman originally to check the bankruptcy of the manufacturing firm, since the sample companies he chose were engaged in manufacturing. The recent developments and evolution in the public service companies motivated him to design a second Z-Score model for non-manufacturing companies as follows

$$\text{Z-Score} = Z' = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4$$

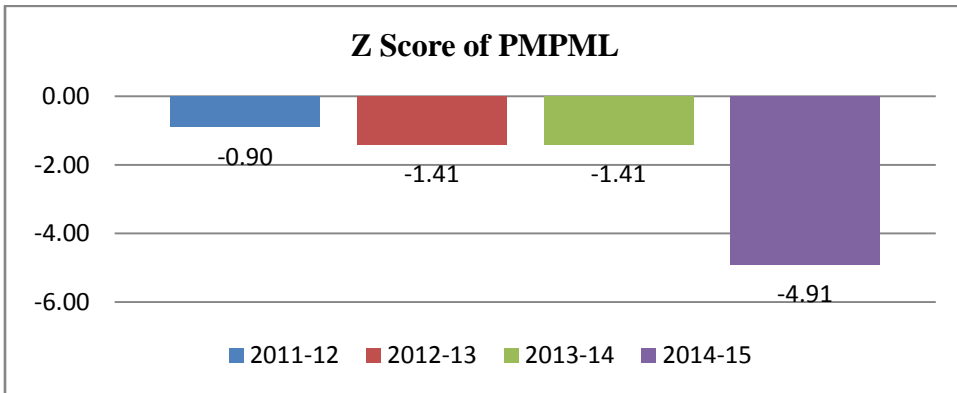
The first ratio X_1 indicates the ability of the company to repay its debt the next few months. The second ratio X_2 indicates the history of the profitability position. The third ratio X_3 is a measure of efficiency in that it indicates how the company generates revenue from the assets it owns. The fourth ratio is indicates the market's "confidence" in the company. (www.investinganswers.com)

Table -3 – Z’ Score of PMPML for the period 2011-15

PMPML

	Weighing Factor	Working capital / Total Assets	Weighing Factor	Retained earnings / Total Assets	Weighing Factor	EBIT/ Total Assets	Weighing Factor	Market value of Equity / Total Liabilities	Z Score
2011-12	1.2	-0.38	1.40	0.00	3.30	-0.13	0.60	0.00	-0.90
2012-13	1.2	-0.67	1.40	0.58	3.30	-0.43	0.60	0.00	-1.41
2013-14	1.2	-0.67	1.40	0.58	3.30	-0.43	0.60	0.00	-1.41
2014-15	1.2	-1.59	1.40	0.30	3.30	-1.03	0.60	0.00	-4.91

Fig 1- Z Score of PMPML for the period 2011-12 to 2014-15



Interpretation

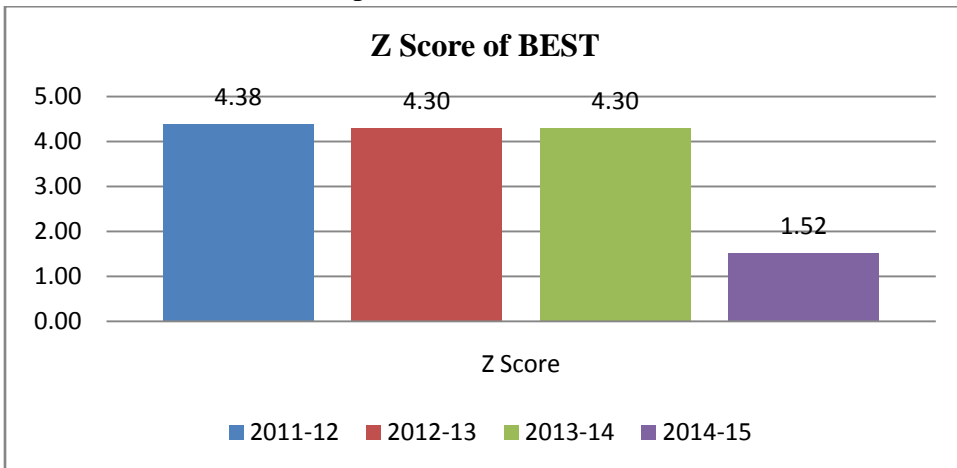
PMPML Z Score is less than 1.8 for the period 2010-15 and follows severe decreasing trend which implies that it at distress zone. The major reason is PMPML does not have sufficient capital. Moreover the working capital is negative. Because of the shortage of the funds, the transport undertakings could not function properly.

Table -4 – Z’ Score of BEST for the period 2011-12

BEST

	Weighing Factor	Working capital / Total Assets	Weighing Factor	Retained earnings / Total Assets	Weighing Factor	EBIT/ Total Assets	Weighing Factor	Market value of Equity / Total Liabilities	Z Score
2011-12	1.2	3.24	1.40	-3.73	3.30	1.73	0.60	0.00	4.38
2012-13	1.2	0.49	1.40	3.47	3.30	-0.35	0.60	0.00	4.30
2013-14	1.2	0.49	1.40	3.47	3.30	-0.35	0.60	0.00	4.30
2014-15	1.2	-1.25	1.40	4.89	3.30	-1.16	0.60	0.00	1.52

Fig 2- Z Score of PMPML for the period 2011-12 to 2014-15



Interpretation

BEST Z Score is greater than 2.8 for the period 2011-12 to 2013-14 which depicts that its financial position is in safe zone. But during the year 2014-15, it was less than 1.52 which implies that BEST is stepping into the distress zone. The major reason for this shift is due to the Bank was overdrawn by 795.25 crore during 2014-15

FINDINGS AND CONCLUSION

It is found that PMPML financial health is too worst. State Government and Municipal corporations have to focus on this issue and infuse capital so that these corporations can invest properly in assets and working capital. This gap is grabbed by the Uber and Ola market. When compared to PMPML, BEST undertaking financial health is sound. But it is signaling that BEST is stepping into the distress zone. Hence the government should intervene and assist these undertakings to improve the capital. We have to learn the lesson from the Delhi Transport Corporation, if this issue is not addressed, unauthorized private vehicles and no of vehicles on the road will increase the pollution, traffic congestion and Maharashtra will not be good place to live in. As per the 135 of the companies act, Indian companies crossing the threshold limit should share are applicable to CSR Policy. Hence Government can open an avenue to divert the funds for strengthening the capital of these undertakings so that citizen can commute safely.

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A STUDY OF WORK CULTURE AND EMPLOYEE EMPOWERMENT IN SELECT MULTINATIONAL COMPANIES

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ABSTRACT

Since Independence the growth of Industrialization in India was slow. After economic reforms, India came out of this slow growth rate. These reforms aimed at transforming India from an underdeveloped economy into an open and progressive one. These reforms cemented a healthy economic growth, which is now one of the world's fastest economies. With the reforms in Industrial sector, the Industrial work culture has changed drastically. Multinational corporations have started introducing their project in India with new opportunities of employment at all levels from Management to worker. In recent few years there is increase in numbers of MNC's in our industry. We know that, even though the number of Multinational corporations is very less as compared to Local Companies, still they are the centre of attraction with regards to employment. Today every individual is trying to become a member of these multinational corporations by getting employed. The Work Culture & Employee Empowerment is gradually admired and appreciated. It is said that multinational corporations provide atmosphere that encourage employees to initiative and take decision to solve problems and improve service and performance. MNC's managers unavoidably deal with miscommunication and lack of cultural awareness. Right from the initial stage of establishment they have to go across the barriers of Local Industrial Policies / Environment / Resources, Language & Socio-cultural factors. Hence the title of the study is "A Study of Work Culture and Employee Empowerment Practices in select Multi National Companies".

Key words: - work culture, employee empowerment, company and multinational companies

INTRODUCTION

The Industrial Revolution began in Great Britain in 1760 and spread to Western Europe and the United States. After Industrial Revolution, traditional ways of manufacturing were replaced with automated machines resulting in growth of company due to mass production in short period. Increased production meant that industrialized

nations produced more than could be consumed internally. Now Companies sensed the limitation of local market and started exploring and acquiring new location in various countries for their business. The companies that manage production or offer services in more than one country are named as Multi National Company.

“They came, they saw, they conquered”. In the modern world if any organization deserves this description, it is the Multi National Corporation which are playing leading role in Global economic integration.

As per the concept of economies of scale, Multinational corporations can be expressed as “the bigger the better”. In Global economy 51 of the 100 largest economies in the world are Multinational corporations. The Top 500 multinational corporations account for nearly 70 percent of the worldwide trade; this percentage has steadily increased over the past twenty years.

In India in 16th century the British East India Company& Dutch East India Company can be called as multinational corporations. They had their Factory in South India and were involved in Spice Trade. After Independence in 1991 during the critical face of Indian economy, India opens its door to FDI inflows and adopted a more liberal foreign policy in order to restore the confidence of foreign investors. Today there are 3269 active Multinational corporations in India.

- A) Company** - A group of persons in a considerable number, interested in a common object uniting themselves for industrial undertakings or business organization.
- B) Multi National Company (MNC's)** – An enterprise operating in several countries but managed from home country such company that derives revenue from operations outside of its home country.
- C) Work Culture** - Work Culture is a concept which deals in the study of Beliefs, thought processes, attitudes of the employees & ideologies and principles of organization.
- D) Employee Empowerment** – Employee Empowerment is a strategy and philosophy to make decision about their jobs.

OBJECTIVES

- E)** To study the Work Culture about the Multinational Corporations.
- F)** To know about practices in Multinational Corporations Employee Involvement and about Interpersonal Communication.
- G)** To understand the practices initiated for Employee Empowerment & there impact on motivational status of employees.

HYPOTHESIS

- 1.** The Prevailing practices of Employee Empowerment have Positive impact on work culture.

2. The prevailing practices of empowerment in decision making have positive impact on superior-subordinate relationship in organization.

RESEARCH METHODOLOGY

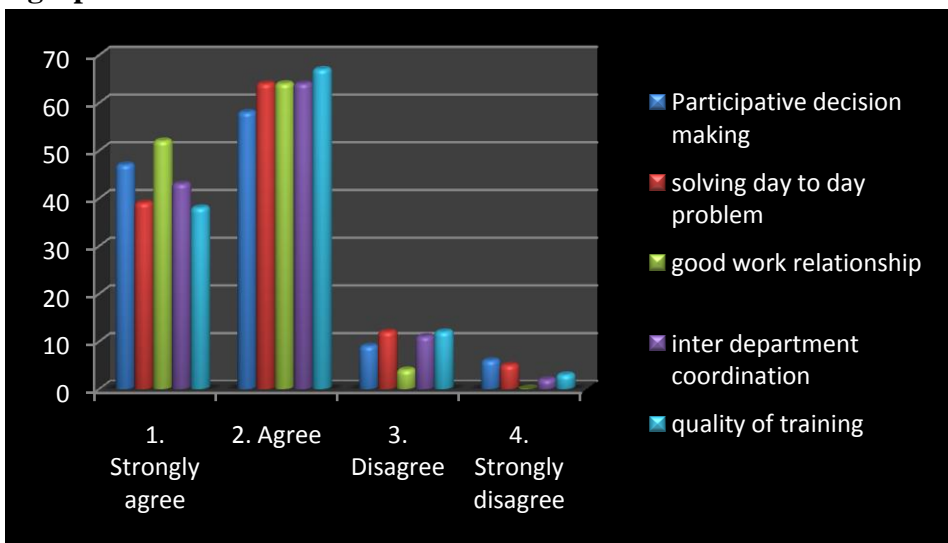
The present study is carried out in Pune district. Data source, both primary and secondary data have been used to draw the conclusions. For collecting primary data a structured questionnaire has been prepared. In order to ensure an acceptable number of responses, a simple random sample method was applied. The sample was drawn from Pune district only. The sample size was 120 workers respondents from multinational corporations of Pune district only. For the purpose of secondary data the researcher has gone through the different types of reference books, journals, research articles etc.

ANALYSIS OF DATA

Particulars	Frequency	Percentage
Participative decision making is very much encouraged in your organization?		
1. Strongly agree	47	39.16
2. Agree	58	48.33
3. Disagree	09	7.5
4. Strongly disagree	06	5
Through regular meeting and joined forums employees are involved in solving day to day problem?		
1. Strongly agree	39	46.8
2. Agree	64	53.33
3. Disagree	12	14.4
4. Strongly disagree	05	6
In your organization there exists a good work relationship between the middle management and lower level management?		
1. Strongly agree	52	62.4
2. Agree	64	53.33
3. Disagree	04	3.3
4. Strongly disagree	00	00
In your organization the inter department coordination is very good?		
1. Strongly agree	43	51.6
2. Agree	64	53.33
3. Disagree	11	9.16
4. Strongly disagree	02	1.66
Are your employees satisfied with quality of training received so far?		
1. Very good extent	38	31.66
2. Good extent	67	53.33
3. Low extent	12	14.4
4. Very low extent	03	2.5

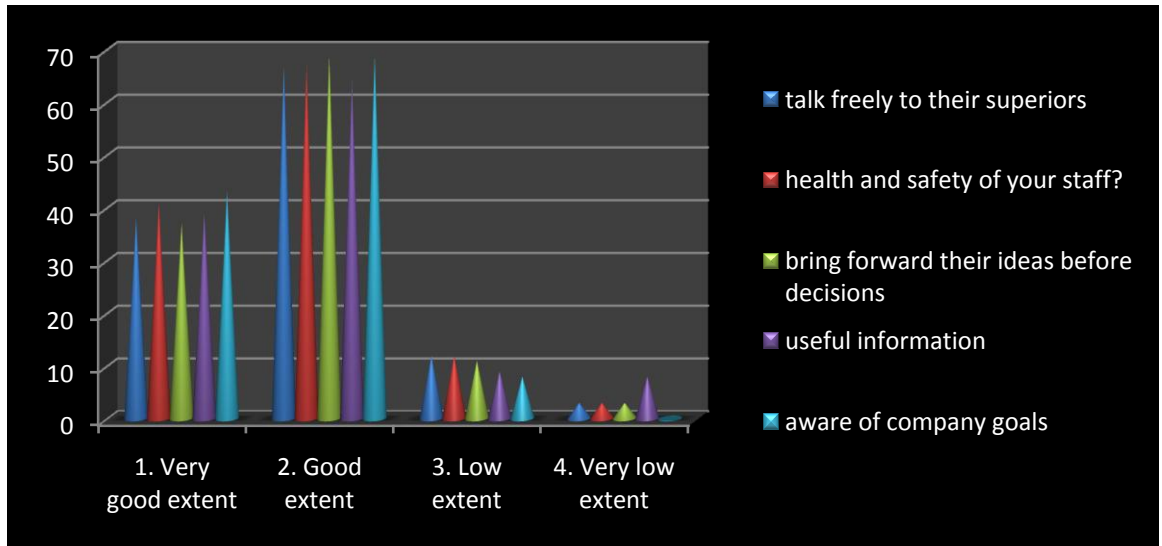
<p>Can people talk freely to their superiors about their task related problem?</p> <p>1. Very good extent 2. Good extent 3. Low extent 4. Very low extent</p>	<p>38 67 12 03</p>	<p>31.66 53.33 14.4 2.5</p>
<p>Is your organization concerned about health and safety of your staff?</p> <p>1. Very good extent 2. Good extent 3. Low extent 4. Very low extent</p>	<p>41 67 12 03</p>	<p>34.16 55.83 6.66 3.33</p>
<p>In your organisation there is opportunity for employees to bring forward their ideas before decisions.</p> <p>1. Very good extent 2. Good extent 3. Low extent 4. Very low extent</p>	<p>37 69 11 03</p>	<p>30.83 57.5 9.16 2.5</p>
<p>In your organisation employees are provided with useful information about their own functioning.</p> <p>1. Very good extent 2. Good extent 3. Low extent 4. Very low extent</p>	<p>39 64 09 08</p>	<p>32.5 53.33 7.5 6.66</p>
<p>You are aware of company goals policies.</p> <p>1. Very good extent 2 Good extent 3. Low extent 4. Very low extent</p>	<p>43 69 08 00</p>	<p>35.83 57.5 6.6 00</p>

Analysis graph no.1



As per the above analysis researcher has opined that in the organisation there is a participative decision making style was applied where they working. In case of the solving day to day problems faced by the workers they argued that there management is actively participated in solving day to day problems faced by the workers. There is a good working relationship between the workers and officers, it helps to increase the level of confidence in the minds of workers about there organisation. As per the workers opinion there is a good inter department coordination among the workers as well as managerial personnel. In case of the training provided by the organisation to the workers is in a satisfied manner.

Analysis graph no.2



In above research the researcher opined that the workers were had freedom to talk freely with their superiors on time to time. The organisation focussed towards the health and safety of there working staff with the help of different types of actions. Employees have freedom to bring forward their ideas before decisions; it will help to expand the levels of opinions. In case of the awareness about the goals of the company most of the workers were positively argued about the same.

VERIFICATION OF HYPOTHESIS

The hypothesis formulated for the purpose of the study has been verified in the following manner.

H1 –“The Prevailing practices of Employee Empowerment have Positive impact on work culture”.

H2-“The prevailing practices of empowerment and anatomy in decision making have positive impact on superior-subordinate relationship in organization”.

According to the general observation of the researcher and his interpretation of data collected it has been found out that the prevailing practices of employee empowerment have positive impact on work culture.

The prevailing practices of empowerment and anatomy in decision making have positive impact on superior-subordinate relationship in organization.

Hence the hypothesis of the study has been verified.

SUGGESTIONS

1. In case of the competition among the member regarding credit and promotion, so many workers are not in a competition among their team members regarding credit and promotion, hence such companies should motivate to such kind of officers towards competition about credit and promotion.
2. Proper training programs should be conducted among the staff in connection with their routine work as well as for enhancing their level of skills also.
3. Multinational corporations should concentrate much towards the retirement plans as well as life insurance facilities provided to the workers of the organisation.
4. Most of the multinational corporations were not provide the leave salary facility to their facility to their workers hence it is the prime duty of the multinational corporation to facilitate the adequate numbers of leave salary facility.
5. Today's world is becoming more risky and uncertain because of the mechanisation, hence for avoiding the ratio of accidents the companies should give training about safety and accident prevention.
6. Multinational corporation's management should aware and motivate to adopt changes which are decided by the management.
7. There should be proper communication between the officers and workers; it helps to remove misunderstanding between them. Ultimately it will beneficial to the organisation.

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ATTAINING SUSTAINABILITY THROUGH CORPORATE SOCIAL RESPONSIBILITY: A STUDY

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ABSTRACT

India is a country of myriad contradictions. On the one hand, it has grown to be one of the largest economies in the world, and an increasingly important player in the emerging global order, on the other hand, it is still home to the largest number of people living in absolute poverty (even if the proportion of poor people has decreased) and the largest number of undernourished children. What emerges is a picture of uneven distribution of the benefits of growth which many believe, is the root cause of social unrest.

The last three decades have witnessed a lively debate over the role of corporations in society. Although businesses have started to acknowledge the importance of CSR, and a wide variety of initiatives have come to light (Nelson, 2004), the recent spate of corporate scandals, accounting frauds, allegations of executive greed and dubious business practices have given ammunition to critics who have levelled a variety of charges, ranging from deception (Lantos, 1999), and manipulating perceptions (Wicks, 2001), to piecemeal ad hocism (Porter & Kramer, 2002). Today's climate of heightened scrutiny towards corporate behaviour (Raar, 2002; Waddock, 2000) under scores, perhaps as never before, the need for conceptual robustness to guide CSR engagements under taken by firms.

INTRODUCTION

In India, the recent enacted Companies Act, 2013 made the CSR obligatory with clear cut guidelines for its implementation. The Section 135 of Schedule VII of the Companies Act, as well as the provisions of the Companies (Corporate Social Responsibility Policy) Rules, 2014 became effective from April 1, 2014 and provided the list of CSR activities to be undertaken and guidelines for its implementation. One of the activities is to ensure environmental sustainability, ecological balance, protection of flora and fauna, animal welfare, agro-forestry, conservation of natural resources and maintaining quality of soil, air and water. Environmental sustainability has now turned into the key issue for corporate economic growth, environmental management and community development. Ignoring environmental problems can lead to degradation and depletion of natural resources which could prove detrimental to both the corporate sector business and the

society. The activities which are undertaken by the corporate and business houses for the societal welfare and also for ensuring healthy environment fall under the ambit of Corporate Social Responsibility (CSR). In the past CSR activities were taken in philanthropic and charity mode which has now become the mandatory for corporate industries. According to Indian Institute of Corporate Affairs, a minimum of 6,000 Indian companies will be required to undertake CSR projects in order to comply with the provisions of the Companies Act, 2013 with many companies undertaking these initiatives for the first time. Further, some estimates indicate that CSR commitments from companies can amount to as much as 20,000 crore INR.

OBJECTIVES

1. To understand the concept of Corporate Social Responsibility.
2. To study Sustainability in the context of CSR activities in India.

CORPORATE SOCIAL RESPONSIBILITY (CSR)

Different organizations have framed different definitions about CSR - although there is considerable common ground between them. Today corporate leaders face a dynamic and challenging task in attempting to apply societal ethical standards to responsible business practice (Morimoto et al., 2005). Nowadays corporate social responsibility is an integral part of the business vocabulary and is regarded as a crucially important issue in management (Cornelius et al., 2008; Humphreys & Brown, 2008)

Corporate social responsibility is a concept whereby companies fulfil accountability to their stakeholders by integrating social and environmental concerns in their business operations (Tanimoto, Suzuki, 2005). Companies will necessarily have to take into account cultural differences when defining their CSR policies and communicating to stakeholders in different countries (Bird, Smucker, 2007).

According to Ruževičius and Serafinas (2007), the image and reputation of organization in the social and environmental fields, affect consumers and customers more and more. The labour market is very competitive and qualified workers prefer to work for and to stay at those companies that do care about their employees.

The tendency to invest in companies that practice and report CSR is increasing (Sleeper et al., 2006). Corporate social responsibility forces repositioning of strategies from profit-driven organizations to organizations with attention for the companies influence on social and environmental aspects (Quaak et al., 2007).

Corporate social responsibility (CSR) has become an increasingly important aspect of doing business in the 21st century for most multinational corporations (MNCs). CSR in its broadest sense can be defined as “a view of the corporation and its role in society that assumes a responsibility among firms to pursue goals in addition to profit maximization

and a responsibility among a firm's stakeholders to hold the firm accountable for its actions" (Chandler and Werther, 2014, p.6). CSR activities have also been described as "the actions a company initiates to further some social good beyond its own interests, going beyond compliance and exceeding legal obligations" (Jones and Jonas, 2011, p.65). These actions could include charitable endeavours, fair labor practices, mitigating harmful environmental impacts, fair trade, and sustainability practices such as reclaiming packaging material and minimizing water usage and waste products (Jones and Jonas, 2011)

WHAT IS SUSTAINABILITY?

There is no universally agreed definition on what sustainability means. There are many different views on what it is and how it can be achieved. The idea of sustainability stems from the concept of sustainable development which became common language at the World's first Earth Summit in Rio in 1992.

The original definition of sustainable development is usually considered to be "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs" Bruntland Report for the World Commission on Environment and Development (1992)

Some quotes given below provide some ideas on what constitutes sustainable development and sustainability." A process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations" (The World Commission on Environment and Development)"Sustainable development is a dynamic process which enables people to realise their potential and improve their quality of life in ways which simultaneously protect and enhance the earth's life support systems" (Forum for the Future)"In essence sustainable development is about five key principles: quality of life; fairness and equity; participation and partnership; care for our environment and respect for ecological constraints - recognising there are 'environmental limits'; and thought for the future and the precautionary principle". (From Making London Work by Forum for the Future's Sustainable Wealth London project)"The environment must be protected... to preserve essential ecosystem functions and to provide for the wellbeing of future generations; environmental and economic policy must be integrated; the goal of policy should be an improvement in the overall quality of life, not just income growth; poverty must be ended and resources distributed more equally; and all sections of society must be involved in decision making". (The Real World Coalition 1996, a definition based on the work of the World Commission on Environment and Development)"We cannot just add sustainable development to our current list of things to do but must learn to integrate the

concepts into everything that we do." (The Dorset Education for Sustainability Network)"A sustainable future is one in which a healthy environment, economic prosperity and social justice are pursued simultaneously to ensure the well-being and quality of life of present and future generations. Education is crucial to attaining that future." (Learning for a Sustainable Future - Teacher Centre)

"The first and perhaps most difficult problem, one that seldom gets addressed, is the time frame...Is a sustainable society one that endures for a decade, a human lifetime, or a thousand years?" (The shaky ground of Sustainable Development Donald Worster in Global Ecology 1993)

Sustainability has often been defined as how biological systems endure and remain diverse and productive. But, the 21st-century definition of sustainability goes far beyond these narrow parameters. Today, it refers to the need to develop the sustainable models necessary for both the human race and planet Earth to survive.

Sustainability is a balancing act. The United Nation's 1987 Report of the World Commission on Environment and Development: Our Common Future noted that sustainable development meets the needs of the present without compromising the well-being of future generations.

The concept continues to expand in scope. In 2000, the Earth Charter broadened the definition of sustainability to include the idea of a global society "founded on respect for nature, universal human rights, economic justice, and a culture of peace."

To achieve these lofty goals, humans will have to re-examine their policies on:

- Environmental protection.
- Social responsibility.
- Economic practice.

Old models of consumption and industrialization will not support the world's growing population. If humans wish to have the water, materials and natural resources needed to thrive, a new approach to living is called for.

The first secret is a focus on the long-term. Sustainable businesses anticipate the future and act to create stronger, richer markets for business to sell into. We know what doesn't work. As Samuel J Dipiazza Jr, president of PricewaterhouseCoopers has said "the current financial crisis is the result of short term and unsustainable business models".

The second secret of sustainable business is that long term success is based on how employees and customers act today.

This is about the actions of executives. For example, this year, Richard Evans, president of PepsiCo for UK and Ireland has promised to be a "powerful agent of positive change"

in the food and drinks sector. A major part of this involves a promise to "renovate the core of our business....by 2020 I want our profit and growth to be driven by healthier products." In the new lexicon, this is the world of choice architecture and choice editing. This is about the actions of customers. Companies will support customers who wish to act to recycle more, reduce food waste, save energy or eat well. This is the new world of corporate social marketing – mentioned by the marketing gurus Philip Kotler and Nancy Lee in 2004 as the "best of breed" in CSR strategies by linking real social change with measurable commercial benefit.

The third secret of sustainable businesses

This focus on action leads naturally on to the third secret of sustainable business. Sustainable success is based on freedom to innovate within a strategic framework. People with an interest in your world are actively involved to help you achieve your purpose.

Companies will increasingly define a sustainable business model that is fit for purpose for their business. Unilever have their vitality framework and Procter & Gamble have their sustainability report card.

But once the framework has been defined, ideas are invited from others through open innovation. It's an approach actively championed with measurable commercial results by companies like Philips, Procter & Gamble and Reckitt Benckiser. IBM held a web-based "innovation jam" in 2006 that involved 150,000 people in 104 countries and led to 10 new IBM businesses. In the new world, we all have power.

The new approach to sustainable business is a commercial opportunity. The alternative is a business risk. So, if your current CSR model is based on compliance and an annual CSR report and your approach to business is based solely on short term financial targets, you may wish to look again. The world has turned. Sustainable business is here and it is here today.

So here, in the new world, each of us uses our power for positive change. Where we live and where we work; in board rooms, committee rooms and living rooms, in homes and high streets, consumers and citizens, employees and shareholders are acting individually and together to create a stronger, richer world.

CSR AND SUSTAINABILITY

Sustainability (corporate sustainability) is derived from the concept of sustainable development which is defined by the Brundtland Commission as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” 4. Corporate sustainability essentially refers to the role that companies can play in meeting the agenda of sustainable development and entails a balanced approach to economic progress, social progress and environmental stewardship.

CSR in India tends to focus on what is done with profits after they are made. On the other hand, sustainability is about factoring the social and environmental impacts of conducting business, that is, how profits are made. Hence, much of the Indian practice of CSR is an important component of sustainability or responsible business, which is a larger idea, a fact that is evident from various sustainability frameworks. An interesting case in point is the NVGs for social, environmental and economic responsibilities of business issued by the Ministry of Corporate Affairs in June 2011. Principle eight relating to inclusive development encompasses most of the aspects covered by the CSR clause of the Companies Act, 2013. However, the remaining eight principles relate to other aspects of the business. The UN Global Compact, a widely used sustainability framework has 10 principles covering social, environmental, human rights and governance issues, and what is described as CSR is implicit rather than explicit in these principles.

Globally, the notion of CSR and sustainability seems to be converging, as is evident from the various definitions of CSR put forth by global organisations. The genesis of this convergence can be observed from the preamble to the recently released draft rules relating to the CSR clause within the Companies Act, 2013 which talks about stakeholders and integrating it with the social, environmental and economic objectives, all of which constitute the idea of a triple bottom line approach. It is also acknowledged in the Guidelines on Corporate Social Responsibility and Sustainability for Central Public Sector Enterprises issued by the DPE in April 2013⁵. The new guidelines, which have replaced two existing separate guidelines on CSR and sustainable development, issued in 2010 and 2011 respectively, mentions the following: “Since corporate social responsibility and sustainability are so closely entwined, it can be said that corporate social responsibility and sustainability is a company’s commitment to its stakeholders to conduct business in an economically, socially and environmentally sustainable manner that is transparent and ethical.”

Benefits of a robust CSR programme

As the business environment gets increasingly complex and stakeholders become vocal about their expectations, good CSR practices can only bring in greater benefits, some of which are as follows:

Communities provide the licence to operate: Apart from internal drivers such as values and ethos, some of the key stakeholders that influence corporate behaviour include governments (through laws and regulations), investors and customers. In India, a fourth and increasingly important stakeholder is the community, and many companies have started realising that the ‘licence to operate’ is no longer given by governments alone, but communities that are impacted by a company’s business operations. Thus, a robust CSR programme that meets the aspirations of these communities not only provides them with

the licence to operate, but also to maintain the licence, thereby precluding the ‘trust deficit’.

Attracting and retaining employees: Several human resource studies have linked a company’s ability to attract, retain and motivate employees with their CSR commitments. Interventions that encourage and enable employees to participate are shown to increase employee morale and a sense of belonging to the company.

Communities as suppliers: There are certain innovative CSR initiatives emerging, wherein companies have invested in enhancing community livelihood by incorporating them into their supply chain. This has benefitted communities and increased their income levels, while providing these companies with an additional and secure supply chain.

Enhancing corporate reputation: The traditional benefit of generating goodwill, creating a positive image and branding benefits continue to exist for companies that operate effective CSR programmes. This allows companies to position themselves as responsible corporate citizens

CSR IN INDIA

CSR in India has traditionally been seen as a philanthropic activity. And in keeping with the Indian tradition, it was an activity that was performed but not deliberated. As a result, there is limited documentation on specific activities related to this concept. However, what was clearly evident that much of this had a national character encapsulated within it, whether it was endowing institutions to actively participating in India’s freedom movement, and embedded in the idea of trusteeship.

The Companies Act, 2013 has introduced the idea of CSR to the forefront and through its disclose-or-explain mandate, is promoting greater transparency and disclosure. Schedule VII of the Act, which lists out the CSR activities, suggests communities to be the focal point. On the other hand, by discussing a company’s relationship to its stakeholders and integrating CSR into its core operations, the draft rules suggest that CSR needs to go beyond communities and beyond the concept of philanthropy. It will be interesting to observe the ways in which this will translate into action at the ground level, and how the understanding of CSR is set to undergo a change

THE COMPANIES ACT, 2013

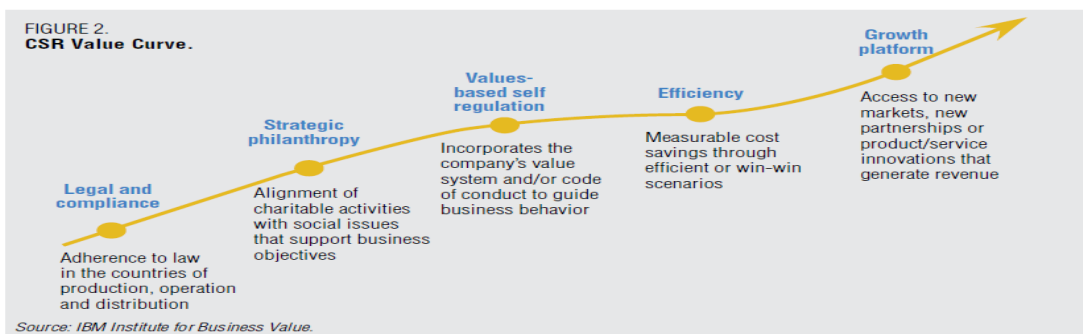
In India, the concept of CSR is governed by clause 135 of the Companies Act, 2013, which was passed by both Houses of the Parliament, and had received the assent of the President of India on 29 August 2013. The CSR provisions within the Act is applicable to companies with an annual turnover of 1,000 crore INR and more, or a net worth of 500 crore INR and more, or a net profit of five crore INR and more. The Act lists out a set of activities eligible under CSR. Companies may implement these activities taking into

account the local conditions after seeking board approval. The indicative activities which can be undertaken by a company under CSR have been specified under Schedule VII of the Act.

The draft rules (as of September 2013) provide a number of clarifications and while these are awaiting public comment before notification, some the highlights are as follows:

- Surplus arising out of CSR activities will have to be reinvested into CSR initiatives, and this will be over and above the 2% figure
- The company can implement its CSR activities through the following methods:
Directly on its own
- Through its own non-profit foundation set- up so as to facilitate this initiative
- Through independently registered non-profit organisations that have a record of at least three years in similar such related activities
- Collaborating or pooling their resources with other companies
- Only CSR activities undertaken in India will be taken into consideration
- Activities meant exclusively for employees and their families will not qualify
- A format for the board report on CSR has been provided which includes amongst others, activity-wise , reasons for spends under 2% of the average net profits of the previous three years and a responsibility statement that the CSR policy, implementation and monitoring process is in compliance with the CSR objectives, in letter and in spirit. This has to be signed by either the CEO, or the MD or a director of the company.

There is a lot of substantiation that affirms that organizations can do well by doing a good job. A growing body of evidence assert that corporations can do well by doing good. Well-known companies have already proven that they can differentiate their brands and reputations as well as their products and services if they take responsibility for the well-being of the societies and environments in which they operate. These companies are practicing Corporate Social Responsibility (CSR) in a manner that generates significant returns to their businesses.



As companies move from left to right on the value curve, greater returns are realized as CSR becomes more integrated into core business strategy.

India's Top 25 companies for Sustainability and CSR 2017

The Responsible Business Rankings study analyses India's top companies to create a quantitative, unbiased ranking of company performance on Sustainability and CSR parameters.

It is an analytical examination of Indian sustainability reports, annual reports and business responsibility reports. It covers industries as diverse as automobiles, banks, FMCG, infrastructure, information technology, metals and mining, oil, power, steel, pharmaceuticals, telecommunications and others.

The study focuses on four main criteria, Governance, Disclosure, Stakeholders and Sustainability. These four factors are assigned weights of 20% for Governance, 15% for Disclosure, 35% for Sustainability and 30% for Stakeholders respectively and form the basis of the ranking. These weights were based on the outcome of a Delphi study with industry leaders and academics.

Tata Chemical, Tata Steel Ltd, Tata Power Company, Shree Cements Ltd., Tata Motors Ltd. , Ultra Tech Cement Ltd., Mahindra & Mahindra Ltd., ACC Ltd., Ambuja Cements Ltd., ITC Ltd., Coca-Cola India Pvt. Ltd., Bharat Petroleum Corporation Ltd., Infosys Ltd., Cisco Systems India Pvt. Ltd., Reliance Industries Ltd., Larsen & Toubro Ltd., Indian Oil Corporation Ltd., Hindustan Unilever Ltd., HCL Technologies Ltd., Hindustan Zinc Ltd., Steel Authority of India (SAIL) Ltd., GAIL (India) Ltd., Oil and Natural Gas Corporation Ltd., Vedanta Ltd., Jubilant Life Sciences Ltd.

Under the Companies Act, 2013 any company with a

1. Net worth of the company to be Rs 500 crore or more or
2. Turnover of the company to be Rs 1000 crore or more or
3. Net profit of the company to be 5 crore or more.

has to spend at least 2% of the last 3 years average net profits on CSR activities as specified in Schedule VII and as amended from time to time. The rules came into effect from 1 April 2014.

- Further as per the CSR Rules, the provision of CSR are not only applicable to Indian companies, but also applicable to branch and project offices of a foreign company in India
- Further, the qualifying company will be required to constitute a CSR Committee consisting of 3 or more directors.
- The CSR Committee shall formulate and recommend to the Board, a policy which indicates the activities to be undertaken, allocate resources and monitor the CSR Policy of the company.
- If the company did not spend CSR, it has to disclose the reason for not spending. Non-disclosure or absence of the details will be penalised from Rs 50,000 to Rs 25 lakh or even imprisonment of up to 3 years

- India is the first country in the world to enshrine corporate giving into law.
Activities which can be carried on
CSR is a commitment to support initiatives that measurably improve the lives of underprivileged by one or more of the following focus areas as
 - Eradicating hunger, poverty & malnutrition
 - Promoting educating
 - Improving material & child health
 - Ensuring environmental sustainability
 - Protection of national heritage
 - Measures for the benefit of armed forces
 - Promoting sports
 - Contribution to the Prime Minister's National Relief
 - Slum area development etc.

CSR Activities of Some Indian Companies

Mahindra & Mahindra tops CSR list in India even as companies scale up operations. Better understand where individual companies are at, we have categorised them across four quadrants: pace setters, smart utilisers, starting out and low efficiency.

Key CSR Areas: Focus on the girl child, youth and farmers through programmes in the domains of education, public health and environment. Mahindra Pride Schools provide livelihood training to youth from socially and economically disadvantaged communities and have trained over 13,000 youth in Pune, Chennai, Patna, Chandigarh and Srinagar. M&M sponsors the Lifeline Express trains that take medical treatment to far flung communities. Then there's Project Hariyali, which has planted 7.9 .. 7.9 million trees till date, including four million trees in the tribal belt of Araku Valley. M&M has constructed 4,340 toilets in 1,171 locations across 11 states and 104 districts specifically for girls in government schools as part of Swachh Bharat Swachh Vidyalaya. Expenditure on CSR in the last fiscal was Rs 83.24 crore — 2% of PAT.

Flagship Programme: Set up by Anand Mahindra in 1996, Project Nanhi Kali supports the education of over 11 lakh underprivileged girls in ten states, providing material support (uniforms, bags, notebooks, shoes and socks) and academic support (workbooks, study classes). The key outcomes of the project include an increase in both enrolment of girls in schools and curtailing dropouts to less than 10% .

TATA POWER

Key CSR Areas: Education, environment, community development, health, safety, security, resource and energy conservation, women empowerment, skill development and livelihood generation. Its total CSR spending in FY15 stood at Rs 31.1 crore as against the 2% of PAT requirement of Rs 29.8 crore. Further, the CSR spending of subsidiaries

and joint ventures of the company was Rs 18.2 crore as against the requirement of Rs 17.2 crore.

Flagship Programme: 'Act for Mahseer', a conservation initiative started in 1975 for saving endangered species. Tata Power set up a breeding centre in Lonavala as part of its eco-restoration and eco-development project for the lakes. The programme has produced and distributed in various water bodies seeds of Mahseer in excess of 10 million in India and internationally.

TATA STEEL

Key CSR Areas: Education, healthcare, facilitation of empowerment and sustainable livelihood opportunities, preservation of ethnicity and culture of indigenous communities and sports. Initiatives run across ten districts in Jharkhand, Odisha and Chhattisgarh, covering nearly 500 core villages. Total spending in 2014-15 on CSR was Rs 171.46 crore, which is 2.04% of the average net profit of the last three fiscals.

Flagship Programme: Maternal and Newborn Survival Initiative (MANSI), a public-private initiative, is being implemented in 167 villages of the Seraikela block of Jharkhand's Seraikela-Kharsawan district since 2009. The project goals are to reduce child and infant mortality. MANSI has achieved improvement in all process and outcome indicators, such as reduction in neonatal mortality by 32.7%, reduction in infant mortality (up to the age of one year) rate by 26.5%, increase in institutional delivery from 58% to 81%. Based on the early evidence of success and learnings from the MANSI project, Tata Steel is scaling up the project to cover 1,500 villages.

L&T

Key CSR Areas: Water and sanitation, education, healthcare and skill building. L&T partners with local governments on health programmes focused on reproductive health, tuberculosis & leprosy control, integrated counselling & testing centres for HIV/AIDS. L&T's community health centres are located at Mumbai, Thane, Ahmednagar, Hazira, Vadodara, Coimbatore, Chennai, Lonavala and Kansbahal. L&T's Construction Skills Training Institutes (CSTIs), established in 1994, provide skills training to rural youth. In the last fiscal, L&T spent Rs 76.54 crore on CSR, amounting to 1.44% of the average net profit for the preceding three years.

Flagship Programme: L&T recently committed to the construction of 50 check dams in Talasari block of Palghar district in Maharashtra, taking the total number of check dams constructed over the years to 150. This will benefit over 75,000 villagers.

TATA CHEMICALS

Key CSR Areas: Focused on sustainable community development and preserving the ecosystem. The company has a climate change policy that maps its carbon footprint and is creating an abatement strategy for sustainable manufacturing. In the last fiscal, it spent Rs 12.76 crore on CSR, amounting to 2.93% of standalone PAT.

Flagship Programme: 'Save the Whale Shark Campaign', started in 2004, aims to spread awareness about the whale shark, the world's largest fish, which was fast depleting because of slaughter by fishermen along the Gujarat coast for export. After a decade of campaigning through street plays, games, posters, inflated shark flotillas, community meets, postage stamps and engaging with fishermen and school communities, more than 498 whale sharks have been saved. The company is now involved in the scientific study of the species to ensure its long-term survival.

TATA MOTORS

Key CSR Areas: Education and employability (skill development). Most programmes are in the vicinity of manufacturing locations but employability programmes focused on building skill of youth in automotive trades are implemented across India. The company has created a CSR Committee of the board under the chairmanship of RA Mashelkar, which monitors CSR performance. It spent Rs 18.62 crore on CSR in 2014-15, despite reporting a net loss.

Flagship Programme: Learn, Earn and Progress (LEAP) for mechanic motor vehicle training, a year-long programme where theoretical learning is supplemented through 'on-the-job' exposure at service centres. Tata Motors' Dealers, implementation partners (NGOs and Technical Training Institutes) are partners. Dealers provide the training and contribute two-thirds of monthly stipend of the trainee while Tata Motors contributes the rest. The implementation partner provides theory training.

GAIL

Key CSR Areas: Supporting communities in multiple thrust areas like health, sanitation, education, skill development, livelihood, and environment. Through GAIL Utkarsh, the company has helped over 500 students from economically backward communities join India's premier engineering institutes. They are provided residential coaching programmes and given monthly scholarships once they get into IITs/NITs. The GAIL Institute of Skills (GIS) is also working ..

Flagship Programme: GAIL has established GIS which addresses the issue of unemployment and skill gap, by providing job-linked skill training to local youth of communities in and around its areas of operation

BHARAT PETROLEUM

Key CSR Areas: Quality education (strengthening primary, secondary education and empowering teachers), water conservation, skill development (employment linked skill training to the underprivileged with an inclusive approach for women, unemployed youth and persons with disabilities), health/hygiene and rural development. In 2014-15, BPCLBSE -2.07 % had a CSR allocation of Rs 76 crore, of which it spent Rs 33.95 crore. The balance has been ..

Flagship Programme: Project BOOND, which has evolved from the construction of rain water harvesting structures to making villages drought-free. It began with four villages in Maharashtra, which were along BPCL's product pipeline. In the past 6 years, it has been extended to over 140 villages in Maharashtra, Tamil Nadu, Karnataka, Rajasthan, Uttar Pradesh and Andhra Pradesh, making them water positive. In 2014-15, 40 villages were made water positive by creating 7 Crore liters of water.

INFOSYS

Key CSR areas: Works with Infosys Foundation, headed by Sudha Murty, towards removing malnutrition, improving healthcare infrastructure, supporting primary education, rehabilitating abandoned women and children and preserving Indian art and culture. Infosys Foundation USA is focused on bridging the digital divide in America by supporting computer science education and training in underrepresented communities. In FY15, Infosys spent 2% of its average .. net profit for the three preceding financial years on CSR.

Flagship program: The Infosys Foundation mid-day meal program, an initiative in partnership with the Akshaya Patra Foundation, spans several states across India.

JUBILANT LIFE SCIENCES

Key CSR Areas: The Jubilant Bhartia Foundation (JBF) focuses on elementary education, improving health indices, employability and promoting social entrepreneurship. Jubilant's CSR programmes are implemented around its manufacturing locations in six areas in India.

Flagship Programme: To reduce malnourishment in children, JBF has proposed to develop an effective and affordable platform for real time growth monitoring process for improving the nutritional intake and status of children less than five years through focused expansion of home fortification and promotion of breastfeeding in village communities.

CSR TRENDS IN INDIA

FY 2015-16 witnessed a 28 percent growth in CSR spending in comparison to the previous year. Listed companies in India spent US\$1.23 billion (Rs 83.45 billion) in various programs ranging from educational programs, skill development, social welfare, healthcare, and environment conservation. The Prime Minister's Relief Fund saw an increase of 418 percent to US\$103 million (Rs 7.01 billion) in comparison to US\$24.5 million (Rs 1.68 billion) in 2014-15.

The education sector received the maximum funding of US\$300 million (Rs 20.42 billion) followed by healthcare at US\$240.88 million (Rs 16.38 billion), while programs such as child mortality, maternal health, gender equality, and social projects saw negligible spend. In terms of absolute spending, Reliance Industries spent the most

followed by the government-owned National Thermal Power Corporation (NTPC) and Oil & Natural Gas (ONGC). Projects implemented through foundations have gone up from 99 in FY15 to 153 in FY16 with an increasing number of companies setting up their own foundations rather than working with existing non-profits to have more control over their CSR spending. 2017 CSR spends are predicted to further rise with corporates aligning their initiatives with government programs such as Swachh Bharat (Clean India) and Digital India to foster inclusive growth.

CSR IN REALITY

Companies, businesses and society are more connected and interactive today than ever before. Corporations are more aware of their role towards the society. They are expected to be responsible bodies with a sense of duty towards common resources and the environment and there is a growing realisation that they, as an integral part of this society themselves, can contribute to its development. Consumers' and citizens' campaigns can make all the difference. Corporate Social Responsibility or CSR constitutes the foundation of the tripartite relationships among companies, society and the nation.

Corporate Social Responsibility (CSR) is expected to be integral to business today. It has also become the password to not only overcome competition but to ensure sustainable growth. It has been supported by the shareholders and stakeholders, by and large, encompassing the whole community. CSR in reality is the alignment of business operations with social values. It takes into account the interests of stakeholders in the company's business policies and actions. It focuses on the social, environmental, and financial success of a company--the so-called "triple bottom line"--with the aim to achieve social development while achieving business success. More importantly, CSR is the point of convergence of various initiatives aimed at ensuring socio-economic development of the community as a whole in a credible and sustainable manner. Individual efforts and even just government effort is not enough to bring changes at a pace that it is actually needed. Fortunately, with the popularity of CSR, more and more companies now perform in non-financial arenas such as human rights, business ethics, environmental policies, community development, corporate governance, and workplace issues. Now, social and environmental performances are considered side by side with financial performance. From local economic development concerns to international human rights policies, companies are being held accountable for their actions and their impacts. Companies are also more transparent in disclosing and communicating their policies and practices as these impact employees, communities, and the environment as per global reporting norms.

The belief among the companies is that every aspect of a corporation's CSR should be linked to corporate strategy by connecting it as tightly as possible to the company's

unique capabilities and competitive context. Infosys is an interesting example of this new-age CSR. The company is utilising its core competence in the area of technology to bring larger good to the community. We also have the ITC group whose socio-forestry initiative and e-choupal is an excellent paradigm where CSR and business have created harmonious associations. The cynic would however argue that 70% of ITCs revenues still come from tobacco and wonder whether its CSR is just a smokescreen.

Some companies, though fewer in number, are realising the advantages in linking corporate strategy with CSR. In order to work out a comprehensive plan for its not-for-profit initiatives, the Tata group has instituted the Tata Council for Community Initiatives--a central body that acts as a facilitator for the entire group's social initiatives. While the Tata group companies may continue to provide health services, education and other tangible benefits, its focus is more on building self-reliant communities, and working towards sustainable livelihoods. However after Singur and Kalinganagar even the fair name of the Tata group is sometimes controversial. Mahindra & Mahindra is one such company that decided in its 60th year to donate 1% of profits after tax (around Rs 1.3 crore as per figures shown) into CSR. Its activities include the K.C. Mahindra Education Trust, which promotes education at various levels and Nanhi Kali, a programme aimed at helping the under-privileged girl child at the Mahindra Foundation, the midday meal program in AP and Rajasthan, and Affirmative Action through Mahindra Pride Schools. The Foundation has constituted a CSR Council, with members being the heads of all its businesses from tractors to holiday homes. It has also the ESOPS program--"Employee Social Options" and not just a stock option--promotes volunteering and works in partnership with Naandi Foundation and other organizations. For all these current initiatives Mahindras were awarded the FICCI--SEDF award 2007, one of the first CSR awards in the country that includes a 360 degree reality check by the civil society who meet up with trade unions, Govt representatives, employees etc before presenting its findings to an eminent jury.

CONCLUSION

CSR has moved from being a public relations tool or a feel-good factor to a key parameter to keep companies open and transparent. It now no longer stands in isolation but has become a part of good Corporate Governance policies. The reality today is that companies are taking the issues of 'reputational risk' very seriously and it is no longer seen as an option. Most CSR models are based on the principle that goodwill earned from the stakeholders leads to benefits to the corporation. This in turn enables the corporation to further enhance stakeholder value.

In the traditional paradigm, most corporate bodies viewed CSR as the extension of a financial input for a humanitarian cause. However, the contemporary context is more complex. A company that undertakes activities aimed at communities (be they

philanthropic, social investment or commercial initiatives) but does not comply with ethical business practice cannot be termed socially responsible. Corporate Responsibility is increasingly becoming an important aspect of corporate behaviour. Corporate contribution to society, environment and business when guided by enlightened self-interest improves quality of life for all. Effective corporate responsibility requires a good level of commitment from the entire organisation and especially the top management who can ensure that not only is CSR practiced but also that it is practiced well.

There is also the eco-social perspective. The proponents of this perspective are the new generation of corporations and the new-economy entrepreneurs who created a tremendous amount of wealth in a relatively short span of time. They recognise the fact that social and environmental stability and sustainability are two important prerequisites for the sustainability of the market in the long run. They also recognize the fact that increasing poverty can lead to social and political instability. Such socio-political instability can, in turn, be detrimental to business, which operates from a variety of socio-political and cultural backgrounds. Seen from the eco-social perspective, corporate social responsibility is both a value and a strategy to ensuring the sustainability of business. It is a value because it stresses the fact that business and markets are essentially aimed at the well-being of society. It is a strategy because it helps reduce social tensions and facilitate markets.

Companies tend to give away financial resources to NGOs or organizations or charities and this continues to be the favoured route. Others set up their own in-house foundations such as Infosys and Wipro. India evolved a tradition of 'Trusteeship' propounded by Mahatma Gandhi and this was later adopted by corporate leaders such as GD Birla and Jamnalal Bajaj. These were initiatives pre-independence. Some of these CSR experiments have succeeded in the establishment of excellent institutions such as Indian Institute of Science, TIFR, TISS by the Tatas, BITS Pilani by Birla's, and the Jamnalal Bajaj Institute by Bajaj. GlaxoSmithline Consumer Healthcare works to support a large number of partnerships spread across the country with issues such as reducing of infant & maternal mortality, access to health care for tribal communities, breast cancer awareness for low income communities, school education for dropouts, etc. During Emergencies such as Tsunami and the recent Bihar floods it distributed material in kind such as Crocin, biscuits as well as donation of office infrastructure. It recognizes that NGOs and local partners are some of the best ways of quickly reaching the affected communities and has worked with a large number of respected organizations including Gandhian ones. The Reddy's "LABS" experiment has created thousands of new livelihoods and the Byrraju Fondation established by Satyam group has created rural jobs, rural BPO's in Bhimavaram, Godavari District in Andhra Pradesh, apart from the establishment of EMRI and HMRI. It makes drinking water available to families at

subsidized costs and has pioneered the concept of rural BPOs. It is an amazing sight to see young men and women cycle down to work in a serene rural environment rather than migrate in search of opportunities. The Eicher group has also transformed the primary education scenario in Harchandpur Block of Uttar Pradesh, without any publicity of any sort. The Mahindras have set up a foundation called Nanni Kali Trust, which is carrying out primary education work focusing on girl children in Udaipur, where the company has no factory. Mindtree closely works with Spastics Society of Karnataka having their logo itself designed by them, volunteering programs, etc. Kinetic Engineering's support to "Dreamland" an NGO in its formation and thereafter in its response to the farmers suicide is exemplary. Its outsourcing to leprosy affected communities has led to their empowerment. The Janaki Bajaj Gram Vikas Sansthan has worked extensively towards rural education and information in the villages of Maharashtra with clear cut exit strategies once basic indicators have been met.

In the traditional paradigm, most corporate bodies viewed CSR as the extension of a financial input for a humanitarian cause. However, the contemporary context is more complex. A company that undertakes activities aimed at communities (be they philanthropic, social investment or commercial initiatives) but does not comply with ethical business practice cannot be termed socially responsible. Corporate Responsibility is increasingly becoming an important aspect of corporate behaviour. Corporate contribution to society, environment and business when guided by enlightened self-interest improves quality of life for all. Effective corporate responsibility requires a good level of commitment from the entire organisation and especially the top management who can ensure that not only is CSR practiced but also that it is practiced well. Godrej Industries Ltd, one of the largest industrial groups in India, has not only integrated conservation of natural resources in its business operations but has also diversified into renewable to minimize its carbon footprint. The company's windmills have brought down carbon emissions, earning it carbon credits. A recent Green Business Survey released by Financial Express and Emergent Ventures India (FE-EVI Survey 2008) revealed that senior managements have realized various risks related to climate change and are putting pressure on their companies to manage climate change risks. Financial companies (67%) acknowledge this risk before others and put pressure on borrowers to come up with mitigation plans.

To create synergy, leaders from corporates, international agencies and governments should come together to assess the contribution businesses have made, can make. And like Nelson Mandela once said, "Without question, businesses must respond for its own good, and what is good for them is invariably good for the community."

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A STUDY ON THE BENEFITS & CHALLENGES OF GREEN MARKETING IN INDIA

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ABSTRACT

The concept of green marketing is about highlighting a product or service's environmental benefits and illustrating how brands are changing their processes and practices to be more environmentally aware. In the modern era of globalization, it has become a challenge to keep the customers as well as Consumers in fold and even keep our natural environment safe and that is the biggest need of the time. Consumers are also aware of the environmental issues like; global warming and the impact of environmental pollution. Green marketing is a phenomenon which has developed Particular important in the modern market and has emerged as an important concept in India as in other parts of the developing and developed world, and is seen as an important strategy of facilitating sustainable development. In this research paper, main emphasis has been made of concept, and challenges of green marketing. It explores the main issues in adoption of green marketing practices. The paper describes the current Scenario of Indian market and explores the challenges and opportunities businesses have with green marketing. Why companies are adopting it and future of green marketing and concludes that green marketing is something that will continuously grow in both practice and demand.

Keywords: *Environmental pollution, Green Marketing, Globalization, Global Warming, Sustainable Development. Eco-Friendly products, Green brands & Green products*

INTRODUCTION

Green marketing came into existence in Europe in the 1980s have seen many products in the 1980s very harmful for the environment & society as a whole. After proper studies they have created new products called "Green Product" i.e less cause for the environment.

The term Green Marketing is the buzz word used in industry which is used to describe business activities which attempt to reduce the negative effect of the products/services offered by the company to make it environmentally friendly. For a company to be successful in implementing green marketing strategy, it should not forget attitude of consumers towards green marketing. Company is focusing on consumer's demand for

green marketing products & services. Keeping this thing in mind this paper is an attempt to understand awareness of consumers' towards green marketing and green branding along with exploring the concept of green marketing.

Green marketing is concerned with the development of green impact of a product or services. In this competitive era all companies are trying to make that kind of products or services which are eco friendly. Global warming is one of the impact of non green products which are not good for environment. United Nation have already given instruction to all countries for producing only environment friendly products for the protection of our mother i.e earth companies who are producing various products for daily usages but not good for an environment.

Green marketing involves developing and promoting products and services that satisfy customers want and need for Quality, Performance, Affordable Pricing and Convenience without having a detrimental input on the environment.

OBJECTIVES OF THE STUDY

1. To study the basic concepts of green marketing.
2. To identify the challenges of green marketing implementation in the present scenario.

RESEARCH METHODOLOGY

The study is based on secondary data & exploratory research design is used for this research. The data is collected from Journals, magazines, websites books & publications related to the topic under study.

REVIEW OF LITERATURE

Prothero, A. (1998) introduces several papers discussed in the July 1998 issue of 'Journal of Marketing Management' focusing on green marketing. This includes; a citation of the need to review existing literature on green marketing, an empirical study of United States and Australian marketing managers, a description of what a green alliance look like in practice in Great Britain, ecotourism and definitions of green marketing.

Oyewole, P. (2001). In his paper presents a conceptual link among green marketing, environmental justice, and industrial ecology. It argues for greater awareness of environmental justice in the practice for green marketing. A research agenda is finally suggested to determine consumers' awareness of environmental justice, and their willingness to bear the costs associated with it.

Prothero, A. & Fitchett, J.A. (2000) argue that greater ecological enlightenment can be secured through capitalism by using the characteristics of commodity culture to further progress environmental goals. Marketing not only has the potential to contribute to the establishment of more sustainable forms of society but, as a principle agent in the operation and proliferation of commodity discourse, also has a considerable responsibility to do so.

Kilbourne, W.E. (1998) discusses the failure of green marketing to move beyond the limitations of the prevailing paradigm. The author identifies areas that must be examined for their effect in the marketing/environment relationship, namely economic, political and technological dimensions of the cultural frame of reference.

Green Marketing

Green marketing alternative names such as sustain-able marketing, environmental marketing, green advertising, eco marketing, organic marketing, all of which point to similar concepts. Green marketing is marketing activities to capture more market share by educating consumers about choosing environment friendly products. Consumers are more aware about green marketing products to protect global warming. They are buying only that kind of products which are easily disposable in the environment. **Best example** during the Maharashtra ganapati Festival people are buying only eco-friendly ganaesha idol for worship.

According to Pride and Ferrel (1993), green marketing refers to the organization's efforts at designing, promoting, pricing and distributing products that will not harm the environment.

A Product may be considered - green if it:-

1. Manufactured in environmentally way
2. Use renewal material
3. Conserve water & energy
4. Use own ecofriendly bag, rather than a plastic carrier provided by shopkeepers
5. No harmful to the environment
6. Being manufactured in a sustainable fashion.

BENEFITS OF GREEN MARKETING

Today's consumers are very conscious about the environment and are also becoming socially responsible for the benefit of ecofriendly environment. Therefore, more companies are responsible to consumers' aspirations for environmentally less damaging or neutral products. Some of the advantages of green marketing are,

- It ensures sustained long-term growth along with profitability.
- It saves money in the long run, though initially the cost is more.
- It helps companies market their products and services keeping the environment aspects in mind.
- It helps in accessing the new markets and enjoying competitive advantage .

Green marketing is having positive & important impact on earth. Government of India have consulted environmental expert on how to control all industries for producing low grade products. Customers & consumers have been watching with their naked eyes to all companies products. They bought only environmental friendly products for uses. Awareness about green marketing is one of most happening activities taking place in our

country. The Best example is solar energy installation for personal & commercial uses. Government of India has given 75% subsidy to all industry who have applied for commercial uses. University Grant Commission independent body NAAC have given weightage to solar energy installation in educational premises.

Impact of green manufacturing have seen in many countries, production cost minimum, environment friendly, good for the health, no hazardous impact on earth, global warming etc. Awards have been awarded to many companies who are producing products on government guideline.

Consumers and companies have changed their behavior to protect environment for the development of forest and other life changing elements. Excess consumption, climate change, burning forest etc are many issues which are giving challenge to all companies to produce only those kind of products which have no hazardous impact on environment.

EXAMPLE 1:

Best Green IT Project: State Bank of India: Green IT@SBI

By using eco and power friendly equipment in its 10,000 new ATMs, the banking giant has not only saved power costs and earned carbon credits, but also set the right example for others to follow. SBI is also entered into green service known as “Green Channel Counter”. SBI is providing many services like; paperless banking, no deposit slip, no withdrawal form, no checks, no money transactions form all these transaction are done through SBI shopping & ATM cards. State Bank of India turns to wind energy to reduce emissions: The State Bank of India became the first Indian bank to harness wind energy through a 15- megawatt wind farm developed by Suzlon Energy. The wind farm located in Coimbatore uses 10 Suzlon wind turbines, each with a capacity of 1.5 MW. The wind farm is spread across three states – Tamil Nadu, with 4.5 MW of wind capacity; Maharashtra, with 9 MW; and Gujarat, with 1.5MW. The wind project is the first step in the State Bank of India's green banking program dedicated to the reduction of its carbon footprint and promotion of energy efficient processes, especially among the bank's clients.

EXAMPLE 2:

Starbucks

As you already know, Starbucks is a coffee shop that have go international, Starbucks always brings something else that can attract customers, such his campaign this time I think this unique, the theme is encourage consumers to do planting, painting and sweep the streets for street. As you already know, Starbucks is a coffee shop that have go international, Starbucks always brings something else that can attract customers, such his campaign this time I think this unique, the theme is encourage consumers to do planting, painting and sweep the streets for street.

EXAMPLE 3:

Coca-Cola

The soft drink manufacturer's campaign to "Live Positively," was born out of a desire to make changes throughout the world through sustainability. Coca-Cola's goal by 2020 is three-fold:

1. To empower female entrepreneurs
2. To help conserve water worldwide
3. To help encourage a more healthful lifestyle with better choices and more exercise

Part of the campaign was to introduce its PlantBottle packaging, which uses materials recycled partly from plants to reduce the company's footprint and conserve resources.

EXAMPLE 4:**GOING GREEN-TATA'S NEW MANTRA**

Tata Motors is setting up an eco-friendly showroom using natural building material for its flooring and energy efficient lights. However, the projects us at the preliminary stage.

EXAMPLE: 5 The Indian Hotel Companies, which runs the Taj Chain is in the process of creating eco room which will have energy efficient mini bars, organic bed linen and napkins made from recycled paper. For illumination rooms will have CFLs or LEDs.

Green Marketing Challenges

Though the awareness about the need to buy green and environment friendly products growing in India yet there are various challenges facing the country to actually realize and apply the green marketing concept successfully. Indian consumer are price sensitive, their purchasing power of any products are not based on quality it is based on quantity. Green products are high priced because of that they are not able to buy green products. Indian consumers are price sensitive. They are not willing to buy those products that are good for environment. Indian consumer think that companies are selling green products for gaining maximum profit without any kind of inspection by any government agency how we can trust that product. They have changed marketing strategy for miss selling of existing products. It is imperative here to explain the concept of Green washing. Green washing is the term used when producers, manufacturers or marketers make false environment friendly claims for their product and deliberately mislead their consumers by incorrectly endorsing and promoting its environmental benefits. This again makes consumer averse of buying green products as they are not able to differentiate between the real and the fake claims made by the producers in respects of the products marketed as environment friendly.

Methods to Overcome the Challenges

Various challenges being faced in the Indian markets for the adoption of Green Products. In accordance to the Indian buying habits and requirements there is a need to develop such strategies which promote green products and help to protect the environment. In this

part the author tries to find out ways to overcome the challenges faced in the area of Green Marketing.

1. Cost Effective Products

One of the major characteristics that can be attributed to the Indian consumers is that they are priced responsive. Indian consumers always intend to buy good quality product at a reasonable price. They are not willing to pay extra amount for a product having no evidence or differentiable worth. Resultantly, the manufacturers should produce green products by using best possible resources, keeping in mind the cost effectiveness of the product. The reduced costs can thus be passed on to the consumers. This strategy would encourage consumers to go green in their buying and the environmental needs are also met, simultaneously. Consumers get good quality products at cheaper prices, the environment gets protected and the manufacturers also earn more profit due to surge in demand of eco-friendly goods at a lower price.

2. Improving Environment Standard Adherence

There are various international standards on the environment and environmental management systems. One of the most reputed and trustworthy standards in the area of environment management are ISO 14000. ISO 14001 examines the process of producing the product and is not restricted only to the analysis of the final product produced. It helps organizations to produce goods in an environment friendly way. However, in India there is no rigid or strict adoption of environment standards and controls. Bureau of Indian Standards is the National Standards Body of India that has developed various standards, product certifications, eco mark labeling, quality management certification, lab testing etc to ensure production of environment friendly goods. Another statutory body, the Central Pollution Control Board (Ministry of Environment & Forests) Government of India, also develops environment standards like National Ambient Air Quality Standard, Industry Specific Standard, Noise Standard, Vehicular exhausts etc. Though standards on environment exist in India but its observance in the right manner is a big question.

3. Quantification Of Environmental Benefits

Another characteristic or behavioral aspect of Indian consumers is that they better understand the environmental benefits when it is quantified in monetary terms. Conversion of environmental benefits in terms of savings and monetary gains help supplement the purchase of green products. Here it is relevant to quote the example of Star Rating Program. 'Bureau of Energy Efficiency' was established under the Energy Conservation Act, 2001. It was formed to develop projects that encourage energy efficient appliances that contribute towards energy conservation. It also developed energy standards and labeling systems. (Bureau of Energy Efficiency) Initially when Manufacturers started promoting their products with the energy

efficient labels, the consumers considered it to be a mere façade, only to fulfil government's requirement rather than a better quality product with more savings. It was then taken up by the Jago Grahak Jago and other voluntary consumer organisations to compute the amount of savings proportionate to the star ratings.

CONCLUSION

Now this is the right time to select —Green Marketing|| globally. It will come with drastic change in the world of business if all nations will make strict roles because green marketing is essential to save world from pollution. From the business point of view because a clever marketer is one who not only convinces the consumer, but also involves the consumer in marketing his product. Green marketing should not be considered as just one more approach to marketing, but has to be pursued with much greater vigor, as it has an environmental and social dimension to it. With the threat of global warming looming large, it is extremely important that green marketing becomes the norm rather than an exception or just a fad. Recycling of paper, metals, plastics, etc., in a safe and environmentally harmless manner should become much more systematized and universal. It has to become the general norm to use energy-efficient lamps and other electrical goods.

Marketers also have the responsibility to make the consumers understand the need for and benefits of green products as compared to non-green ones. In green marketing, consumers are willing to pay more to maintain a cleaner and greener environment. Green marketing assumes even more importance and relevance in developing countries like India.

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ANALYTICAL STUDY OF FDI IN INDIA'S DEFENCE SECTOR**Mr. Jay Kanani**

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ABSTRACT

Foreign direct investment (FDI) is now more liberal including investment in defence, retail, infrastructure, insurance, and communication and progress has been made to progress the regulatory environment to make doing business in India easier. India can attract much more foreign investments than it has done in the past. FDI in the defence sector can provide substantive economic rewards and transfer of advanced sensitive technology. This also can result in net improvements in employment at the aggregate level. The present study has focused on the trends of FDI Flow in India. The study based on secondary data which have been collected through different articles and reports from different government bodies.

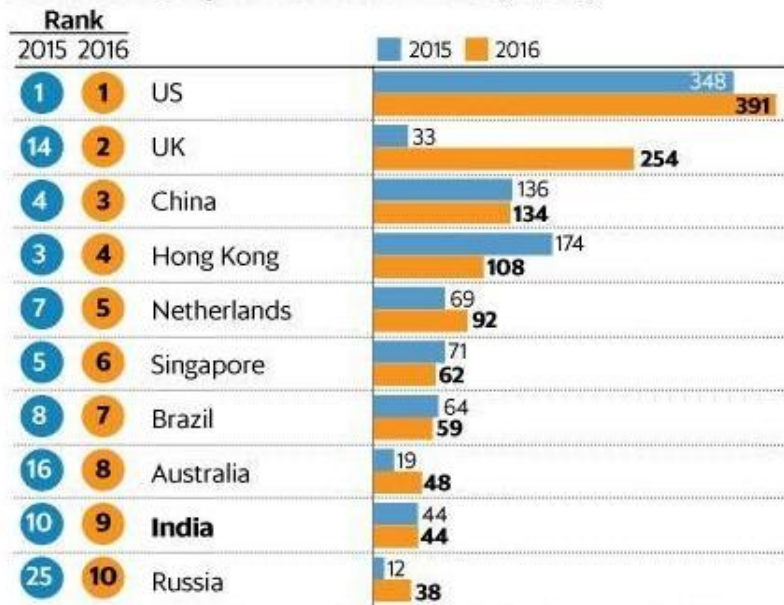
Keywords: Foreign direct investment, Technology, India

INTRODUCTION

Foreign Direct Investment (FDI) is a type of investment in to an enterprises in a country by another enterprises located in another country by buying a company in the target country or by expanding operations of an existing business in that country. In the era of globalization FDI takes vital part in the development of both developing and developed countries. At this point, it is recalled that there are two routes by which India gets foreign direct investments (FDI). Through the Automatic route, FDI can first be allowed without prior approval by Government or Reserve Bank of India. Secondly, through Government. India has replaced China as top destination for foreign direct investment by attracting \$63 billion worth FDI projects. A more liberal FDI policy is currently under consideration to attract FDI in defence sector, Foreign Direct Investment (FDI) policy in defence sector was last reviewed vide Press Note No. 5(2016 Series) on 24th June, 2016. As per the extant FDI policy, foreign investment up to 49% is permitted under the automatic route, foreign investment beyond 49% and up to 100% is permitted through Government approval, wherever it is likely to result in access to modern technology or for other reasons to be recorded. FDI in defence sector is subject to Industrial Licence under the Industries (Development & Regulation) Act, 1951. From July 2016 to January 2017.

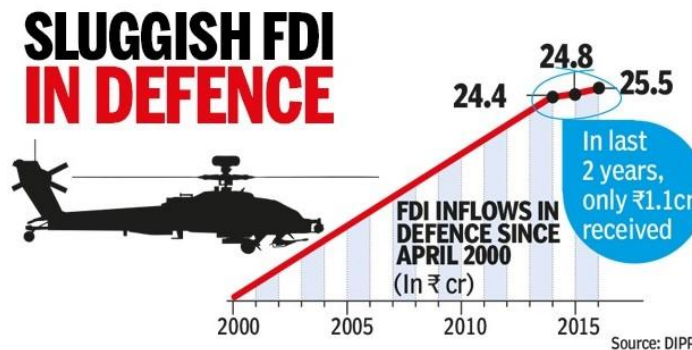
India improved its ranking by one notch to 9th position as one of the highest recipients of foreign direct investment (FDI) in 2016, at a time global FDI flows fell.

FDI inflows, top 10 host economies (in \$ bn)



(Source: livemint.com)

Foreign direct investment of a mere Rs 1.1 crore in the defence sector over the last two years has prompted the government to swing into action and prod ministries such as defence and home to quickly address concerns flagged by private sector manufacturers.



WHAT NEEDS TO BE DONE

<ul style="list-style-type: none"> ➤ Only a small fraction of 'make projects' for local design & development offered to private players ➤ Speed up issue of 	<ul style="list-style-type: none"> small arms licence for local production of guns, etc ➤ Allow access to test facilities since setting them up is expensive ➤ Push global 	<ul style="list-style-type: none"> players to manufacture locally in cases where tests have been completed ➤ Ease rules for meeting offset norms
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(Source: timesofindia.com)

Policy Initiatives & Investments

Government has modified the defence FDI policy by increasing the sectorial limits for FDI. Sectorial cap has been increased to 100%, but investment beyond 49% need government approval that comes with modern technology (FDI Policy amendment, July 2016). This means that investment up to 49% is made through automatic route. Licence applications will be considered and licences given by the DIPP, Ministry of Commerce and Industry, in consultation with Ministry of Defence and Ministry of External Affairs. Similarly, foreign investment in the sector is subject to security clearance and guidelines of the Ministry of Defence. The requirement of single largest Indian ownership of 51% of equity removed. The investee company should be self-sufficient in areas of product design and development. The amendment state that “The investee/joint venture company along with manufacturing facility, should also have maintenance and life cycle support facility of the product being manufactured in India.” As it is clearly demonstrated by the following recapitulative table, regarding to the previous 2014 reform, the salient added value with the new one is the clause that allowed FDI above 49% in case of transfer of the art technology which is now done.

FDI CAPITAL	2014 REFORMS	2016 REFORMS
Up to 49%...	FDI up to 49% is permissible under the automatic route without obtaining the prior approval of Government of India (GoI).	No change.
Beyond 49%...	FDI beyond 49% is permissible after obtaining the prior approval of GoI, where FDI is likely to result in access to modern and “state of art” technology in the country....	FDI beyond 49% is permissible after obtaining the prior approval of GoI, where FDI is likely to result in access to modern technology in the country or for other reasons to be recorded. The condition of “state of art” technology has been done away with.

OBJECTIVES:

The research paper covers the following objectives:

- To study the trends of FDI Flow in India
- To analyse the Indian defence sector.
- To understand the need for FDI in defence sector.
- To understand the effects of allowing FDI into the defence sector.
- To study the impact of ‘Make in India’ campaign in defence sector

MAKE IN INDIA CAMPAIGN

India attracted a little under \$1 billion in foreign direct investment (FDI) in the defence sector through the Prime Minister Narendra Modi's 'Make-in-India' push over the last three years. FDI inflows in defence, an industry that Modi has promised will tap into foreign investment to boost local manufacturing and wean India off its costly importing of arms and weapons. Foreign investment and, perhaps more crucially, transfer of technology have been two major themes the Modi government has grappled with over the last two years as India looks to reduce its dependence on foreign weapons contractors. On 1st June 2017, Prime Minister Narendra Modi was invited Russian companies to partner Indian firms in setting up manufacturing facilities to make high-tech defence equipment in India. Modi said, "I invite Russian companies to join Indian companies in setting up manufacturing base taking advantage of the new policy," "I invite Russian companies to join Indian companies in setting up manufacturing base taking advantage of the new policy"

The arrival of Reliance

The Russian government is providing a major boost to the Indian government's 'Make in India' programme by choosing Reliance Defence & Aerospace (RDA) for a joint venture enterprise to build 197 units of the Kamov 226T helicopters in India. Under the agreement signed between Reliance Helicopters, Russian Helicopters and RosoboronExport, the official agency for defence exports of the Russian defence ministry, Reliance Helicopters will be the lead integrator for a licensed production arrangement with transfer of technology from Russia. According to the newspaper's sources, the Reliance Group will have a majority 51% stake in the joint venture, while the remaining 49% will be held by the Russian government. The order to manufacture the almost 200 helicopters is valued at close to \$1 billion. This is among the largest deals under the "Make in India" programme. The Pipavav Defence Shipyards, also a part of the Anil Ambani – led Reliance Group, was selected by Zvyozdochka Shipyard of Russia to modernise 24 EKM 877 submarines in India.

Reasons to invest in India

- India's current requirements on defence are catered largely by imports. The opening of the defence sector for private sector participation will help foreign original equipment manufacturers to enter into strategic partnerships with Indian companies and leverage the domestic markets as well as aim at global markets. Besides helping in building domestic capabilities, this will also bolster exports in the long term.
- Favourable government policy which promotes self-reliance, indigenisation, technology up gradation and achieving economies of scale including development of capabilities for exports in the defence sector.
- The country's extensive modernisation plans with an increased focus on homeland security and India's growing attractiveness as a defence sourcing hub.

Statistics of India's defence sector

- India has the third largest armed forces in the world
- India is one of the largest importers of conventional defence equipment and spends about 31.1% of its total defence budget on capital acquisitions
- About 60% of its defence requirements are met through imports.
- The allocation for Defence in the Union Budget 2016-17 is approximate USD 34.53 billion.

Foreign investors

- Boeing India (USA)
- Airbus (France)
- Rafael Advanced Defense Systems Ltd. (Israel)
- BAE India Systems (UK)
- Pilatus (Switzerland)
- Lockheed Martin (USA)
- Israel Aerospace Industries (Israel)
- Raytheon (USA)
- Dassault Aviation SA (France)

CHALLENGES AGAINST FDI IN DEFENCE SECTOR

Presently, Indian defence exports mainly consist of personal defensive equipment, offshore patrol vessels, and spares for radars and helicopters, making it difficult to establish a design about target countries or the type of exports thus inhibiting the crafting of a viable export strategy. The gap in approaching the possible buyers thus remains a challenge and hindrance in meeting the target of USD 2 billion exports.

India's inability to meet its own defence needs through two flagship plans main battle tank Arjun and light combat aircraft Tejas are examples where the Indian defence research organisations have gone through several production delays and cost-overruns. That is drawing wider concerns over the challenges that the Indian defence industry has been going through in terms of being efficient, productive and more capable in research and development (R&D) of advanced weapons system and defence technology. The targets that have been set over the years have not been achieved, and that raises questions about the ability of India's defence industry to produce weapons system and defence technology to meet the requirements of the services of the Armed Forces.

Other challenges prevail as well, but they are more central in nature. India is not high up on the charts as a defence manufacturer. The proven military platforms that are 'Made in India', such as the Sukhoi30 fighter or the T90 tank, are licensed productions with Intellectual Property Rights (IPR) held by foreign defence firms. India cannot export these. Even in the case of the Brahmos missile, which has been jointly built by India and Russia, the approval of the Brahmosboard is required for its export. That leaves India

only with the indigenous Indian military platforms for export; the Akash missile, in which Vietnam and Thailand have shown interest in the past, is one such platform. However for indigenous military platform to become attractive to a foreign buyer, it will have to be tested and inducted into the Indian armed forces, and its operational performance displayed. The artillery guns being produced now, whether the Dhanush howitzer or Advanced Towed Artillery Gun System, will thus be available for export only a few years down the line.

Also, the military platforms in service in India are not to be exported to Indian neighbours. Of course the software codes for export platforms are different from the ones in use by Indian armed forces, this is to prevent the possibility of the leak of sensitive information about critical equipment.

However, one of the biggest challenges for defence exports remains the political leadership. To sell 36 Rafael fighters to India, the French defence minister made more than a dozen visits to India. Every American official visiting New Delhi reminds Indian officials of their interest in selling the F-16 or F-18 fighters, as does every German official about their keenness to build submarines in India. Although India is considering the proposal to manufacture the F-16 fighter jets given that the manufacturing base will be in India, it appears unlikely that Indian defence authorities would be able to provide the required escalation to exports. The need of the hour is to increase the budget allocation for defence R&D and utilise the manpower in its defence laboratories to promote research for advances in defence equipment, hardware, and technology. These practical steps would ensure that India meets the demands of the time, and is in continued possession of cutting-edge defence technology as a result of indigenous production by its defence industry.

CONSLUSION

Indeed, as the monetary stakes increase, as India turns its defence focus inward, this type of cut-throat competitiveness will be on the rise. The productiveness hopes that this will not only cut India's import bill, but also the corrupt, bureaucratic and biased nature of the defence sector itself. Threats from neighbour countries like, China and Pakistan leave India with no other option but to augment its defence capabilities to secure its national security interests. India's pace of defence modernisation. India would reach its goal of self-reliance only if it agrees more private players in India to contribute in the defence sector, and the true probable of the Indian minds are utilised.

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BATTLING WATER CRISIS IN INDIA**CMA Dr. S. K. Jha**

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ABSTRACT

Water is needed in almost every sphere of human activity. The amount of water in the world is finite. Water has become the biggest problem of the 21st century. Global consumption of fresh water increased six fold from 1990 to 1995, at a rate greater than twice the rate of population growth. If the present trend continued, two out of every three people on earth will have to live in water stressed condition by the year 2025. About 25 per cent of the world's population does not have access to safe drinking water, and 40 per cent does not have sufficient water for adequate living and hygiene. More than 2.2 million people die each year from diseases related to contaminated drinking water and poor living conditions, faced with water scarcity. Water scarcity has become a universal problem. The current status of water security in India is alarming. The Government has taken several initiatives. We need to focus on the issue of water quality too. Many solutions are being proposed to solve the problem, but no one solution will solve our water scarcity global problem. An integrated approach to tackle the situation of crisis is needed. Against this background, a modest attempt has been made in this paper to present current dynamics of water resource management in India. Further, several measures to cope with water scarcity have been suggested.

Keywords: *Indigenous Technical Knowledge, Poor Water Quality, National Water Mission, National Water Policy, Water Crisis.*

INTRODUCTION

The life of mankind and almost all the flora and fauna on the earth depends on the availability of fresh water resources. About 70 per cent of the earth's surface is covered by water. It could mean that there is more than enough water on the earth. But we rarely consider that about 97.5 per cent of the total water is saline. Only about 2.5 per cent is "Fresh Water" i.e. not saline and can be directly consumed by us and most of the land organisms. Further, out of the total fresh water on earth around about 68.9 per cent is in the glaciers and about 30.8 per cent is ground water. Only about 0.3 per cent is in rivers, lakes, ponds, streams and few other sources where we can access easily. Certainly, this quantity, about 0.007 per cent, is too small. This water is readily available for about 7.3 billion people and for other land organisms. Living organisms always need water. Certain organisms have more than 95 % water. Human body has about 60% water. These levels

cannot vary much although water is regularly lost. That is why organisms require regular water replenishment.

Apart from direct consumption, water is required by us for producing food, for dilution and treatment of wastes, and to maintain health of the environment. Both industry and Agriculture too need water. For example, 800 to 4000 lts are needed for producing one kg of wheat; 2000 to 8700. lts for one kg of cotton; about 100 lts for one apple; about 2400 lts for one average sized hamburger. Thus agriculture and related activities consume huge quantities of fresh water. Still there is large scale wastage of food all over the world. Another issue is that water intensive crops like rice, cotton, sugarcane etc. are regularly cultivated in water deficient areas. This explains why during the last century water use has grown at more than double the rate of population growth. Estimates indicate that during the last 50 years world-wide water withdrawal has grown three times.

Presently almost 1/3rd of the total earth's population is not able to get sufficient water for drinking requirements. By the middle of the current century 2/3rd of the world could face water scarcity. United Nations confirms that by 2025, about 1.8 billion people will live in water scarcity areas and two-thirds of earth's population will live in water-stressed regions due to overuse, increased activities, and also due to climate change. Climate change and consequent rise in earth's temperature will lead rains becoming uncertain and water evaporation faster.

People living in the developing countries are the worst sufferers. They have to compromise not only by way of quantity but also by way of quality. Most of the water sources are polluted and contaminated. Providing safe water is costly.

WATER CRISIS: A UNIVERSAL PROBLEM

The United Nation predicts that by 2025, two thirds of the world population will experience water shortage, affecting lives and livelihoods of 1.8 billion people and by 2050, 7 billion people in 60 countries may have to cope with water scarcity.

Water scarcity already affects every continent and four of every ten people in the world. The situation getting worse due to population growth, urbanization and the increase in domestic and industrial water use. Water scarcity forces people to rely on unsafe sources of drinking water. Poor water quality can increase the risk of diseases including cholera, typhoid fever and other gastrointestinal viruses, and dysentery.

As per the estimates of the **United Nations World Water Development Report 2015**, half of the global ground water resource is being used by India, Pakistan, Bangladesh, China and Nepal. And remaining globe uses the balance half portion of ground water.

The following table shows the global distribution of the fresh water.

Table-1: Global Distribution of Fresh Water

S. No.	Water Source	Quantity of water (in cubic km)
1.	Water in ice form	24,000,000
2.	Water in ponds, lakes and reservoirs	2,80,000
3.	Water in streams and rivers	1,200
4.	Water present as soil moisture	85,000
5.	Ground water	60,000,000
	Total	84,366,200

Source: UNO Report (2000)

Agriculture is the largest user of the world's freshwater resources, consuming 70 per cent. Industry uses a further 20 per cent and municipalities account for the remaining ten per cent. As the world's population rises and consumes more food, industries and urban development expand, and the emerging bio fuel crops trade also demands a share of freshwater resources, water scarcity is becoming an important issue. An assessment of water management in agriculture was conducted in 2007 by **the International Water Management Institute** in Sri Lanka to see if the world had sufficient water to provide food for its growing population. It assessed the current availability of water for agriculture on a global scale and mapped out locations suffering from water scarcity. It found that a fifth of the world's people, more than 1.2 billion, live in areas of physical water scarcity, where there is not enough water to meet all demands. A further 1.6 billion people live in areas experiencing economic water scarcity, where the lacks of investment in water or insufficient human capacity make it impossible for authorities to satisfy the demand for water. The report found that it would be possible to produce the food required in future, but that continuation of today's food production and environmental trends would lead to crisis in many parts of the world. To avoid a global water crisis, farmers will have to strive to increase productivity to meet growing demands for food, while industry and cities find ways to use water more efficiently.

Despite unprecedented progress, 768 million people still drew water from an unimproved source. Eighty-three per cent of the population without access to an improved drinking water source (636 million) live in rural areas. Furthermore, concerns about the quality and safety of many improved drinking water sources persist. As a result, the number of people without access to safe drinking water may be two to three times higher than official estimates.

Most people around the world aspire to piped drinking water supplies on their premises. Yet 38 per cent of the 6.2 billion people globally using an improved drinking water source do not enjoy the convenience and associated health and economic benefits of piped drinking water at home. Instead, they spend valuable time and energy queuing

up at public water points and carrying heavy loads of water home, often meeting only minimal drinking water needs. The most affected are the poorest and most marginalized people in society— many of whom, especially in urban areas, pay high prices for small amounts of often poor quality water. It is encouraging to note that the share of people relying on untreated surface water as their main drinking water source dropped from 6 per cent in 1990 to 3 per cent in 2011. Still, over 180 million people rely on rivers, streams, ponds or lakes to meet their daily drinking water needs. Access to drinking water for the rural poor, along with water quality and safety remain serious concerns (**The Millennium Development Goals Report 2013**).

THE ISSUE OF VIRTUAL WATER

Like air, water is everywhere. Like air, some of it is invisible. Water is embedded inside everything that we make every time that we use. The clothes which look nice and dry took a lot of water to grow the cotton from which the cloth is made and then a lot of water in all the factory processes that turned, the cotton into cloth, dyed and printed it, and remember we are very proud that we are a leading exporter of textiles. But with that, we are also transporting millions of liters of our water, ironically from where it is scarce, because cotton is often grown in Vidarbha and other water scarce regions (**Nilekani, 2012**). Similarly, each liter of milk we consume contains, according to the research of IWMI, 3000 liters of water. Naturally so, when you stop to think about it. The cow needs food, which needs water to grow and the cow herself drinks 20-30 liters of water a day. And then, since we no longer get our milk directly from the cow, as our grandparents used to, we have to add more hidden water because of all the water embedded in the energy intensive process of making the plastic bags and the tetrapaks the milk comes in. Ironically, because milk comes from the arid regions of Rajasthan and Gujarat, where the livestock economy flourishes, this unseen water is going from water scarce regions to water rich ones. Water used to be thought of as mainly a local resource, but globalization has changed all that. And this has a lot of interesting policy implications. For example, when India imports one tonne of wheat instead of producing it domestically, it is saving itself 1300 cubic meters of real, local water. John Anthony Allan of King's College explained this concept of embedded 'virtual' water. It has become a very important concept in the international debate on water. It has also helped people to understand their real *water footprint*, which measures the amount of water consumed by people on an average in the day, not only directly, but also virtually. It is said that in Asia, people on an average consume about 1400 liters of water each day whereas people in Europe and North America consume about 4000 liters of total water each day (**Nilekani, 2012**).

THE CHALLENGE OF WATER SECURITY IN INDIA

Water is one of the most precious natural resources, without which it is impossible to sustain life. India has 4% of water resources of the world, while it has to support 16% of

world population and 15% of livestock. The annual precipitation including snowfall, which is the main source of water in the country, is estimated to be of the order of 4000 Billion Cubic Metres (BCM). The estimated precipitation during the monsoon season (June to September) is of the order of 3000 BCM. The effect of global warming on hydrological cycle could result in further intensification of temporal and spatial variations in precipitation, snowmelt and water availability. The resources potential of the country which occurs as natural run off in the rivers is about 1869 BCM, considering both surface and ground water as one system.

The water sources in India include the vast oceans surrounding the Indian peninsula—Indian Ocean, Bay of Bengal and Arabian Sea, the inland rivers – both the Himalayan rivers and the rivers in the south, groundwater and rain water available in plenty through the abundant monsoons in India.

- India has 16 per cent of the world's population and 4 per cent of its fresh water resources.
- Estimates indicate that surface and ground water availability is around 1,869 Billion Cubic Metres (BCM). Of this, 40 per cent is not available for use due to geological and topographical reasons.
- Around 4,000 BCM of fresh water is available due to precipitation in the form of rain and snow, most of which returns to the seas via rivers.
- 92 per cent groundwater extracted is used in the agricultural sector, 5 and 3 per cent, respectively, for industrial and domestic sectors.
- 89 per cent of surface water use is for agricultural sector and 2 per cent and 9 percent respectively are used by the industrial and domestic sectors.

Table-2: Annual Current and Expected Requirement of Water in India (in BCM)

Different uses of water	1990	2000	2010	2025	2050
Domestic	32	42	56	73	102
Irrigation	437	541	688	910	1072
Industry	-	8	12	23	63
Energy	-	2	5	15	130
Others	33	41	52	72	80
Total	502	634	813	1093	1447

BCM: billion cubic metres

Source: Compendium of Agricultural Statistics, 2002, MoSPI

Table-2 shows the annual current and expected requirement of water in India. For India the issue of water crisis has immense importance. We need to tackle the challenge of water security. Accordingly, the on-going water crisis in India must take care of issues like

- Over – exploitation of ground water,
- Lack of conservation,
- Recurrent drought,
- Unsustainable systems & investment,
- Excessive use of fertilizers,
- Animal and Poultry wastes,
- Ignorance of Indigenous Technical Knowledge etc.

According to the report “Charting our Water Future” by the 2030 **International Water Resource Group (IWRG)** released in 2009, in India the low agricultural water productivity and efficiency, combined with aging supply infrastructure, would make severe supply-demand gaps likely in many basins with currently planned crop choices. India’s aggregate water demand is expected to double from the current level of about 700 billion cubic metres to 1498 billion cubic metres by 2030. With an estimated supply of about 744 billion cubic metres by then, the water gap is estimated to be 50 per cent. This gap would be driven by a rapid increase in demand for water for agriculture, coupled with a limited water supply and storage infrastructure. One key uncertain factor that may affect the size of this gap is climate change. Its most direct effect is likely to be an accelerated melting of the Himalayan glaciers upon which several of India’s river systems depend, particularly the western rivers such as the Indu, which relies on snowmelt for approximately 45 per cent of its flow.

Five crore people living in over one lakh habitations in villages in our country do not have access to safe drinking water even today. According to official figures twenty two per cent rural families have to walk for at least half a kilometre or more to fetch water (mostly it is the women who have to bear the burden). The percentage of such families is the maximum in Manipur, Tripura, Odisha, Meghalaya, Jharkhand and Madhya Pradesh. Fifteen per cent of households in villages depend on uncovered wells and other unimproved sources like rivers, springs, ponds for drinking water. Also eighty five per cent of all drinking water resources in villages are based on underground sources of water and in many of these areas water is contaminated. Only 30.80 per cent of the rural population has access to tap water. In fact there are only four states which have been able to bring fifty per cent or more of the rural areas under piped water supply. Many of the states are yet to fully comply with the Supreme Court order on supply of potable water in government schools. The latest available data shows that less than the 44 per cent government schools in villages have drinking water facility (**Brara, 2013**).

India could face a massive 50% water deficit by 2030, the biggest globally, says the recent report of **the Water Resources Group (WRG)**. The study finds that water demand would add up to nearly 1.5 trillion cubic metres then, more than double the 740 billion cubic metres today, driven by the demands of the growing domestic population, a

large proportion of which is moving towards middle-class lifestyles. According to a study by **Centre for Science and Environment's Green Rating Project (2009)**, the fresh water consumption will be more than triple in the next two decades and reach 18,075 million cubic metres in 2020-31. By 2030, the six sectors power, steel, cement, aluminium, fertilizer and paper, each of which are engines of India's future economic growth, and also the largest bulk emitters of greenhouse gases will be withdrawing more than 55,000 million cubic metre of freshwater. Currently, the daily water withdrawal by industries amounts to a billion peoples' water requirement. This will have social and environmental implications.

GOVERNMENT INITIATIVES

Ministry of Water Resources, Government of India is responsible for development, conservation and management of water as a national resource; overall national perspective of water planning and coordination in relation to diverse uses of water, general policy, technical assistance, research and development, training and matters relating to irrigation and multipurpose projects, ground water management, use of surface and ground water, command area development, flood management including drainage, flood-proofing, water logging, sea erosion and dam safety. The Ministry has also been allocated the subject of regulation and development of inter-State rivers, implementation of awards of Tribunals, water quality assessment, bilateral and external assistance and cooperation programmes in the field of water resources and matters relating to rivers common to India and the neighbouring countries.

The Government of India has formed various water management systems and authorities in India. These include Central Water Commission, Central Ground Water Board, National Water Development Agency, National Projects Construction Corporation Ltd., etc. for efficient water resources management. The policies thus formulated include Irrigation Management Policy, National Policy Guidelines to allocate water resources like rivers flowing through multiple states National Commission for Integrated Water Resources Development Plan, Water Information Bill, River Basin Organization policy, and many more. Various water reservoir projects were also taken up by the Ministry of Water Resources like construction and management of dams on various rivers.

Central Ground Water Authority

Central Ground Water Authority has been constituted under Section 3(3) of the Environment (Protection) Act, 1986 to regulate and control development and management of ground water resources in the country.

The Authority has been conferred with the following powers:

1. Exercise of powers under section 5 of the Environment (Protection) Act, 1986 for issuing directions and taking such measures in respect of all the matters referred to in sub-section (2) of section 3 of the said Act.
2. To resort to penal provisions contained in sections 15 to 21 of the said Act.
3. To regulate and control, management and development of ground water in the country and to issue necessary regulatory directions for the purpose.
4. Exercise of powers under section 4 of the Environment (Protection) Act, 1986 for the appointment of officers.

Regulatory measures undertaken include

- The Central Ground Water Authority is regulating withdrawal of ground water by industries / projects in 839 Over-exploited and 226 Critical Assessment Units.
- CGWA has notified 43 critical / overexploited areas in parts of NCT Delhi, Haryana, Punjab, Andhra Pradesh, Rajasthan, MP, Gujarat, West Bengal, Uttar Pradesh and Diu for control and regulation of development of ground water resources. For enforcement of the regulatory measures in these areas, concerned Deputy Commissioners / District Magistrates have been directed under Section 5 of Environment (Protection) Act, 1986 to regulate ground water development in these notified areas.

Ground Water Legislation

The States of Andhra Pradesh, Goa Tamil Nadu, Kerala, West Bengal, Himachal Pradesh, Bihar and Union Territories of Lakshadweep, Chandigarh, Dadra & Nagar Haveli and Puducherry have enacted and implemented ground water legislation. 18 States / UTs are at various stages of enactment of legislation.

Central Water Commission with its Headquarters in New Delhi is a premier Technical Organization in the country in the field of Water Resources since 1945. The Commission is entrusted with the general responsibility of initiative, coordination and furthering, in consultation with the state Governments concerned, schemes for control, conservation and utilization of water resources throughout the country for the purpose of Flood Control Irrigation, Drinking Water Supply and Power Development. Central Water Commission is headed by the Chairman with status of an Ex-Officio Secretary to the Government of India. The Commission has three Technical Wings, namely:

- Designs and Research wing
- Water Planning and Projects wing
- River Management Wing
- Each wing is headed by a Member with the status of an Ex-Officio Additional Secretary to the Government of India. The Activities of the wings are carried out by 18 functional units at the headquarters, each headed by a Chief engineer. The National Water Academy, Pune headed by a Chief Engineer is also a part of the

Commission. Besides this, the Commission also has 13 Regional Organizations, each headed by a Chief Engineer.

The Activities of CWC may be summarized as follows:

- Flood Forecasting and Assistance to State Governments in Flood Management;
- Collection and Analysis of Hydrological Data;
- Techno-Economic Appraisal of Projects;
- Monitoring of Projects and Projects receiving Central Assistance;
- Design of Projects;
- Surveys, Investigations and Preparation of DPRs;
- Studies on Environmental and Socio-Economic Issues;
- Studies Related to Irrigation Planning and Water Management;
- Basin Planning and Management;
- National Water Resources Assessment;
- Assistance in Resolution of Inter-State Water Disputes;
- Construction Equipment Planning;
- Studies on Dam Safety;
- Research and Development;
- Standardization of Engineering Practices;
- Operation of Reservoirs;
- Training and Capacity Building;
- International Cooperation in Water Sector.

Central Ground Water Board (CGWB), under the Ministry of Water Resources, is a multi-disciplinary scientific organization with a mandate to: “Develop and disseminate technologies, monitor and implement national policies for the scientific and sustainable development and management of India’s Ground Water Resources, including their exploration, assessment, conservation, augmentation, protection from pollution and distribution, based on principles of economic and ecological efficiency and equity.” The Board is headed by the Chairman and has four wings, namely: (i) Sustainable Management & Liaison (ii) Survey, Assessment & Monitoring (iii) Exploratory Drilling & Materials Management and (iv) Technology Transfer & Water Quality.

The ***Central Ground Water Authority*** is functioning under the administrative control of the Ministry of Water Resources with its Headquarters in Delhi. The Authority is headed by the Chairman and 14 other members from different Ministries/Departments/Organizations/institutions of Government of India including all the 4 Members of CGWB.

The Authority performs the following functions:

1. Exercise of powers under Section 5 of the Environment (Protection) Act, 1986 for issuing directions and taking such measures in respect of all the matters referred to in sub-section (2) of Section (3) of the said Act.
2. To resort to penal provisions contained in Sections 15 to 21 of the said Act.
3. To regulate and control, management and development of ground water in the country and to issue necessary regulatory directions for the purpose.
4. Exercise of powers under Section 4 of the Environment (Protection) Act, 1986 for the appointment of officers.

National Water Development Agency

National Water Development Agency (NWDA) was established in July, 1982 as a registered Society under the Societies Registration Act, 1860 under the Ministry of Water Resources to study the feasibility of the Peninsular Component of National Perspective Plan. The NWDA is fully funded by Government of India through grants-in-aid. Subsequently in 1990-91, NWDA Society resolved to take up the studies of Himalayan Component also. Further, on 28th June, 2006, NWDA Society approved modifications in the functions of NWDA to include preparation of DPRs of link projects and pre-feasibility/feasibility reports of intra-State links as proposed by states. Accordingly, MoWR vide resolution dated 30.11.2006 has modified the functions of NWDA Society. Further, MoWR vide resolution dated 19th May, 2011 modified the functions of NWDA Society. Further, MoWR vide resolution dated 19th May, 2011 modified the functions of NWDA to prepare DPR of intra-State links also and same has been published in the gazette notification of Government of India dated 11th June, 2011. The agency functions with the following main objectives:

- To carry out detailed surveys and investigations of possible reservoir sites and inter-connecting links in order to establish feasibility of the proposals of Peninsular Rivers Development and Himalayan Rivers Development Components forming part of the National Perspective for Water Resources Development prepared by the then Ministry of Irrigation (now Ministry of Water Resources) and Central Water Commission.
- To carry out detailed surveys about the quantum of water in various Peninsular river systems and Himalayan river systems which can be transferred to other basins/States after meeting the reasonable needs of the basin/states in the foreseeable future.
- To prepare feasibility report of the various components of the scheme relating to Peninsular rivers development and Himalayan rivers development.
- To Prepare detailed project report of river link proposals under National Perspective Plan for Water Resources Development after concurrence of the concerned states.

- To prepare pre-feasibility/feasibility/detailed project reports of the intra-state links as may be proposed by the states. The concurrence of the concerned co-basin states for such proposals may be obtained before taking up their feasibility Reports (FRs)/DPRs.
- To do all such other things the society may consider necessary, incidental, supplementary or conducive to the attainment of above objectives.

National Water Policy

The first National Water Policy (NWP) was adopted by the National Water Resources Council under the Chairmanship of Hon'ble Prime Minister during its 2nd meeting held on 9th September, 1987. This policy guided the formulation of policies and programmes for water resources development and its management. Thereafter, new challenges emerged in the water resources sector, which necessitated review of the National Water Policy. Accordingly, the revised National Water Policy-2002 was adopted by the National Water Resources Council in its 5th meeting held on 1st April 2002. The National Water Policy-2002 provides that "National Water Policy may be revised periodically as and when the need arises". The National Water Board, which was constituted to review the progress achieved in implementation of the National Water Policy and to report the progress to the National Water Resources Council from time to time, in its 10th meeting held on 18th September, 2009 recommended review of National Water Policy-2002. The National Action plan on Climate Change (NAPCC) and the National Water Mission Documents also stipulate review of National Water Policy. Accordingly, the Ministry of Water Resources undertook review of National Water Policy, 2002 to ensure sustainable and equitable development taking into consideration the likely impact due to climate change.

National Water Mission

The Government of India launched National Action Plan on Climate Change (NAPCC) on 30th June, 2008, which *inter-alia*, envisages the approach to be adopted to meet the challenges of impact of climate change through eight National Missions, namely: National Solar Mission, National Mission for Enhanced Energy Efficiency, National Mission on Sustainable Habitat, National Water Mission, National Mission for Sustaining the Himalayan Ecosystem, National Mission for a Green India, National Mission for Sustainable Agriculture, and National Mission on Strategic Knowledge for Climate Change.

Ministry of Water Resource is the nodal Ministry for National Water Mission with the main objective of "conservation of water, minimizing wastage and ensuring its

more equitable distribution both across and within States through integrated water resources development and management.”

Water resources schemes and projects are multi-disciplinary in nature and are implemented by several departments and agencies of State Governments and various ministries/departments of Central Government. Therefore, Ministry of Water Resources (MoWR) constituted six Sub-Committees to examine all related aspects in the field of:

- Policy and Institutional Framework;
- Surface Water Management;
- Ground Water Management;
- Domestic and Industrial Water Management;
- Efficient Use of Water for Various Purposes; and
- Basin Level Planning and Management.

India’s demand for water is growing even as it stretches its supplies. Water infrastructure is crumbling, averting the government from being able to supply drinking water to its citizens. Pollution is rampant by unfettered economic growth, poor waste management laws and practices. Although many analysts believe that demand will outstrip supply in India is mainly a manmade problem; therefore if India makes significant changes in the way it thinks about water and manages its resources soon, it could ward off, or at least mollify, the impending crisis.

Apparently, India needs to make water supply a national priority the way it has made food security and economic growth priorities in the past. India’s need for a comprehensive management program is severe because of its rapidly depleting water supply, environmental problems, and growing population. If this continues India will see a sharp decrease in agricultural production, which will negate all of the previous efforts at food security. The water crisis will have a big effect on India’s industrial sector, possibly rotting many industries. India has the power to avoid this dark future if people take action immediately: start conserving water, begin to harvest rainwater, treat human, agricultural, and industrial waste effectively, and regulate how much water can be drawn out of the ground.

Government has made a Strategic Plan for providing drinking water supply in rural areas of the Country. Under the Strategic Plan for rural drinking water supply for the period 2011-2022, covering the two Five Year Plan periods, the interim goal till 2017 is to cover 50% of all rural households with piped water supply, and 35% of rural households with household tap connections. By 2022, the goal is to cover 90% of rural households with piped water supply and with 80% having household tap connections.

Water Quality Improvement is Necessiated

In India, as a result of development, the demand for water is increasing both in urban and rural areas. Water quantity is not the only yardstick for scarcity. Quality also

has a bearing on the volume available for use. All of India's 14 major river systems are badly polluted. The pollution adversely affects the environment, threatens public health and reduces the flow of water available for human use. India's potable water quality is so poor that the country was ranked 120th out of 122 countries in a 2003 UN report. Thus, access to water, and protection against water-related risks, are crucial to human well-being. The country has more than 3.5 million hand pumps and over 100,000 piped water supply schemes have been installed under the Rural Water Supply Schemes. However, majority of the schemes remain non-functional. Access to quality water supply is an important ingredient of quality of life, and water scarcity is a capability deprivation. While the capability approach is generally recognised, there is, however, to date not much evidence of policymakers adhering to this approach. The United Nations has recognized access to water as a basic human right, stating that water is a social and cultural good, not merely an economic commodity. Today, due to increasing consumption patterns, water is becoming scarce and this scarcity is an emerging threat to the global population.

The water quality monitoring results obtained over a decade indicates that the organic and bacterial contamination continue to be critical in water bodies. This is mainly due to discharge of domestic wastewater mostly in untreated form from the urban centres of the country. The municipal corporations at large are not able to treat increasing load of municipal sewage flowing into water bodies without treatment. Secondly the receiving water bodies also do not have adequate water for dilution. Therefore, the oxygen demand and bacterial pollution is increasing day by day. This is mainly responsible for water borne diseases. The issue of water quality affects agriculture as well as human wellbeing. Water quality improvement is necessitated and measures need to be taken to address the issue properly.

INDIGENOUS TECHNICAL KNOWLEDGE MAY BE HELPFUL

A blend of indigenous knowledge of old and experienced persons, some of the beliefs and traditional practices and modern and efficient water management practices may be helpful in modern times too.

It has been a practice since ages, conserving the rain water in tanks, ponds and wells and the water, constructing rocky structures across water flows, ploughing across the solpe and dividing the field into small plots bunded four sides. Water used for bathing in the ponds of Mahananadi, a temple town near by Nandyal, Kurnool dist. A.P. is used for irrigating nearby cropped field if Banana and other crops (**Kumaracharyulu, 2007**). It has been a practice for the fast many years. In the olden days, when electric motors were not in vogue, two persons used to irrigate the field by taking out water with the help of iron baskets tied with pores on either side. This is called 'Chata neeru'.

Water conversation is made through Watersheds; Farm ponds; Making feeder channels to channelize rain water in to ponds; Construction of minor, medium and major irrigation projects; Desilting in ponds, watersheds and irrigation projects to improve the water storage capacity.

Indigenous water purification technologies can improve the drinking water quality of smaller villages as well as larger cities. It uses the Pressure Driven Membrane Processes. These are suitable for all capacity units e.g. they are adaptable from household level unit or community level unit to large scale unit. Water purification technologies make use of the nuclear energy and solar energy also.

Traditional water harvesting may not be sufficient for today's needs in all places. In many areas, the traditional systems have been irretrievable destroyed. As such, a balanced mix of the traditional along with the large and modern water infrastructure is needed. But the first priority should be on localized traditional systems which the community understands and is able to manage from its own resources both in term of labour and finance.

THE WAY FORWARD

There is an urgent need to ensure sustainable development of the water resources and its efficient management. We need to take up necessary measures for optimal utilization of the available water resources. The way forward in this regard would need to take care of the following:

- Artificial recharge to ground water has a very important role to play in our endeavour to augment the ground water resources in aquifer systems to tackle the challenge of ground water level depletion and associated environmental and socio-economic impacts. There is an urgent need to upscale the efforts for ground water recharge augmentation and to take it up as a national mission.
- Policy makers should focus on the importance of managing demand and reducing water loss along with increasing supply of water by optimizing the use of natural resources.
- Special emphasis must be laid on sustainability and profitability within the water management schemes. Also safe drinking water supply is another area where the Government needs to emphasize more.
- In view of the increasing problem of water quality and resultant health hazards, it is necessary to institutionalise water quality monitoring and surveillance systems.
- The prevailing scenario in which water consumption is increasing and the ground water table is fast depleting brings forth the need for reviving old Rainwater Harvesting structures like Tanka, Jhalara, Khadin etc. Modern materials and technology can be used to give a facelift to old Rainwater Harvesting structures.

- In our country we have been using traditional knowledge to conserve water in pounds and covered wells. Communities should be promoted to create as well as revive such structures in their locality.
- We need to minimise water requirement at home too. The water requirement per man may be reduced to 42 litres / day (Drinking 2 litres, bathing 20 litres, washing clothes and toilets use 20 litres). This can be exercised till water situation in India get improved.
- Replacing worn out pipes and taps and closing the leakages in all the water pipes.
- Clean the cars and two wheelers with wetted cloth.
- Practicing irrigation to home garden in the evening hours rather than in the morning.
- Using shower for bath rather than water from the buckets.
- Using washing machine with full load once in a week.
- Reusing the used water for cloth washing to clean the houses and toilets.
- Reducing the flush out tank capacity from 10 litres to 5 litres in the toilets.
- When drawing water from pipes to containers, close the pipe when $\frac{3}{4}$ th container is filled up so as to avoid overflow.
- As the water crisis manifests itself in the form of depleting water tables and water related conflicts between states, it is high time that water use efficiency becomes a focal agenda in the irrigation management policy of India. The irrigation strategy of India needs a relook with a focus on sustainable use of water resources. The present level of efficiency of the irrigation system in India is relatively low and there is considerable scope for improvement.
- Urban Indians especially from the middle and upper class have developed a mind-set of flush and forget. The mind-set of equating sewage system and water using flush with hygiene has to be changed. Attitudes have to be constructed towards understanding the three key facts, namely, that water is precious and scanty; wastage should be managed as close to the source as possible and human excreta has a resource value, only then tangible progress could be made towards reducing water pollution, treatment cost and water borne diseases.
- Regulatory mechanisms by the State Governments are also necessary to check the blatant and unscientific use of water resource.
- The private sector as well as Non-Government Organizations should also be enlisted to improve water management in the country.
- We need to create spatial and non-spatial datasets related to hydrology and their kinking with various socio-economic data for planning and management of water resources projects in a holistic manner.

- We need local and distributed water resources infrastructure. All sections of the society have to join hands and contribute to address the challenges in the water sector – be in the Centre, the States, Panchayati Raj Institutions, Urban local bodies, industrial houses, or the civil society – so that the demand for water by different sectors can be adequately met.
- India is fast becoming a water stressed country and over and above everything else there is need to generate awareness about protecting drinking water sources from contamination, regular testing of drinking water sources, conserving rainwater in tanks and ponds, water recharge and water saving devices so that everyone in the country is able to get the basic facility of drinking water. ‘Village water Committees’ should be actively involved to generate awareness in rural areas.

CONCLUSION

About two third of the water withdrawn worldwide from rivers and groundwater is used for irrigated agriculture. The water resources planning cannot be confined to one sector but must keep into account the competing demands, i.e. if supplies run short for one purpose, this will react upon the other. Water quality suffers from the pollution; again with an interaction between sectors, domestic wastes the quality for agricultural use and vice versa.

New and perplexing water issues are creating worldwide demands for alternative and innovative water management solutions. As water is becoming scarce, it is becoming increasingly important to conserve the available water. A number of off-farm and on-farm measures need to be imposed to use water more efficiently. In some areas, changes in water policy and institutional arrangements, or structures may be required. Because water cannot be stretched further for agriculture, it is faced with the challenges to use water more beneficially and efficiently.

Still there is no loss to water as per hydrological cycle, its availability, is becoming scarce across the world including India. Water use must be minimised both in agriculture and also in home. There may be some environmental imbalance temporarily, but it will vanish in the long run. We need to work together and create a synergy effect to march towards a common goal – to tackle the water crisis in India. Let’s us strive to become a low water economy, a low water society, so that water in its natural form can continue to sustain us all!

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BIOTECHNOLOGY AND ENVIRONMENTAL SUSTAINABILITY TOWARDS A CLEANER AND GREENER PLANET- A REVIEW

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ABSTRACT

At the dawn of this 21st century, environmental concerns have received utmost attention from all segments of human society. The extreme abuse of nature and ruthless hunt for material happiness are the reasons for post-enlightenment destruction of the environment. Environmentally-concerned individuals call for immediate action to stop being greedy and act positively. Pollution as a result of oil exploration, industrial, agricultural activities and poor waste management system have been identified as major threats to our environment. The emergence and acceptance of the concept of sustainable development warrants that the scope of environmental biotechnology be enlarged to address issues like environmental monitoring, restoration of environmental quality, resource/residue/waste-recovery/utilization/treatment, and substitution of the non-renewable resource base with renewable resources. Considering the number of problems that define the field of Environmental biotechnology the role of some bioprocesses for the protection of environment based on the utilization of living organisms are discussed in this article. The main areas of environmental biotechnology including wastewater treatment, soil treatment and solid waste treatment, biotreatment of gases, environmental monitoring, cleaner technological production have been included. The contribution of environmental biotechnology to the progress of sustainable society is revealed in this chapter.

Keywords: *bioremediation; genetic engineering; transgenic, cleaner technology, Environment, Waste management*

INTRODUCTION

Sustainability is vital as we progress into the future. As limited natural resources are in decline and as we are faced with consequences of climate change, the preservation and sustainability of the environment is recognized globally at the highest levels of leadership to be an issue requiring critical attention. To ensure environmental sustainability, key areas of focus include the management and preservation of non-renewable and environmental resources, the management of waste, the prevention and treatment of

pollution, and the preservation of biodiversity. Biotechnology, by its nature, uses biological systems and its processes are potentially “greener” compared to many traditional technologies involving chemical processes. It has the potential to play a role in the above key focus areas and be an important tool to promote environmental sustain diseases and of the interventions required to deal with them. These products can deliver on two vital and inextricably linked goals - improved health and more sustainable growth and development.

The precarious activities of human beings bring undesirable changes in the environment. The environment is degrading due to overpopulation, industrialization, heavy metals, pesticide, antibiotics, and other hazardous chemicals from one or more sources. As a result, humanity has to ponder over the condition of the environment, which is getting worse day by day. The more efforts humanity puts forward to control nature, the more environmental pollution increases, and because of this the future is getting more and more insecure. So, environmental protection is the primary concern for the future of humanity.

There are vast scientific communities working towards the development of eco-technologies, which can improve environmental sustainability without hampering the development of society. Environmental sustainability defines how people should study and protect ecosystems, air quality, integrity and focus on the elements that place stress on the quality of the environment. The environmental protection agencies recognized that developing technology acts as a key to this sustainability and protecting the environment from damages that technological advances could potentially bring. Environmental Microbiology and Biotechnology has emerged as very important and promising disciplines in the last two decades. Biotechnology has shown a great promise in solving a plethora of environmental problems.

To attain sustainable development four main subdivisions of environmental biotechnology are used in different areas

- **Green Biotechnology:** which is considered the oldest use of biotechnology by humans and which deals with plants and their uses.
- **Red Biotechnology:** applied to create chemical compounds for medical use or to help the body in fighting diseases or illness.
- **White technology:** focuses on the use of biological organism’s ability.
- **Blue Biotechnology:** Aquatic use of biological technology

Biotechnology applications can reduce the use of fossil fuels, reduce greenhouse gas (GHG) emissions, allow more energy efficient production in industry, produce biodegradable products, manage waste and treat pollution. Biofuels are being developed as a more environmentally friendly, alternative energy resource to alleviate our dependency on limited fossil fuels. The production of biofuels is being refined to reduce

the input of fossil fuel in the manufacturing process to reduce its impact on the environment. Biofuels made from cellulose in wood, grasses and non-edible parts of plants can significantly reduce GHG emission in comparison to fossil fuels. Newer sources of biomass such as algae can be transformed into a variety of renewable fuels.

Agricultural (Green) Biotechnology and Genetically Modified (GM) Crops can reduce the impact of farming on the environment caused by the effects of fertilisers, pesticides, tilling (ploughing), and exhaustion of soils and loss of biodiversity. With the increase in food production to feed the growing population, the environment comes under more severe threat. Biotechnology allows farmers to produce more food on existing farmland and allows crops to be grown on marginal land. It allows farmers to use less water (drought-resistant crops), to use less pesticide (insect-resistant crops), and to plough less (herbicide-resistant crops) thereby reducing soil erosion, water pollution caused by runoff, and the use of fossil fuels, therefore reducing GHG emissions. GM crops can lead to greater farmland biodiversity and reduce pressure on fragile wildlife habitats. While biotechnology has potentially great benefit, some risks have also been identified. The risk of gene transfer from GM crops to wild populations is a concern, with the fear of “superweeds” being created. The threat of disturbing ecological systems has been identified as a risk, as has the evolution of “superbugs” in adaptation to pest-resistant crops. For these reasons, GM crops are under strict regulation in South Africa and internationally.

Industrial (White) Biotechnology: is reducing chemical pollution and GHG emissions in industry, making manufacturing processes “greener”. It is also producing new products that have less impact on the environment. Biological enzymes can make industrial processes more environmentally friendly. Bioplastic made from biomass can substitute petroleum-based plastics. They are biodegradable and reduce landfill waste. Bio-refineries can transform bio-based waste into valuable feedstock or other useful products, making it not only environmentally friendly but also economically viable. Biogas, a renewable fuel, can be harvested from organic waste from industry.

Bioremediation: Bioremediation refers to the use of biological systems to reduce pollution of air, soil or water, generally using microorganisms or plants. Bioremediation can be used either to treat an already polluted environment or to treat waste before it leaves a production facility. Great care must be taken through careful monitoring when introducing microorganisms into an environment to clean up pollution so that the natural ecological balance is not destroyed. The effects of GM organisms and some other applications of biotechnology on the environment are still unpredictable, and regulations to ensure safe applications are essential. Nevertheless, biotechnology, in applying the immense diversity in species and biological pathways on earth, can in principle be a very

powerful tool in creating environmentally friendlier alternatives to products and processes that presently pollute the environment.

All the above areas are further supported by other branches such as biochemical bioprocessing and biotechnology engineering, genetic engineering, protein engineering, metabolic engineering for the purpose of production and application of biotechnological products. With the rapid degradation of the environmental components as a result of unplanned urbanization and industrialization environmental biotechnology can be the best option to safeguard further degradation. With the development of advanced technologies it is now possible to treat waste and degrade pollutants assisted by living organisms or to develop products and processes that generate less waste and preserve the natural non-renewable resources of energy as result of improved treatment for solid waste and wastewater, bioremediation, ensuring health of the environment through biomonitoring, cleaner production, production of renewable energy and genetic engineering for environmental protection and control. By considering all the above facts, environmental biotechnology can be considered as a driving force for integrated environmental protection leading to sustainable development.

Applications of environmental biotechnology

The applications of Environmental biotechnology cover a wide range, all of which leading to protection and remediation of the environmental components. Some of the applications are discussed below

1. Environmental Clean-up by biotreatment/ Bioremediation
2. Soil Bioremediation
3. Solid waste Bio treatment
4. Bio treatment of gaseous stream
5. Biodegradation of refractory pollutants
6. Environmental Monitoring
7. Environmental biotechnology for pollution and prevention and cleaner production

Environmental clean-up by bio treatment/bioremediation- Bioremediation is defined by US Environmental protection agency as a managed or spontaneous practice in which microbiological processes are used to degrade or transform contaminants to less toxic or non toxic forms, there by remediating or eliminating environmental contaminants. During the process of bioremediation, four main processes can be considered as working on the environmental contaminants

- **Removal:** a process that physically removes the contaminants or contaminated medium from the site without the need for separation from the host medium
- **separation:** a process that removes the contaminants from the host medium
- **destruction/degradation:** process that chemically or biologically destroys or neutralizes the contaminants to produce less toxic compounds

- **contaminant immobilization:** a process that impedes or immobilizes the surface and subsurface migration of the contaminants.

A complete biodegradation results in detoxification by mineralizing pollutants to carbon dioxide, water and harmless inorganic salts. Thus biological treatment processes are commonly applied to contaminants that can be used by organisms as carbon or energy source. They can also be used for some refractory pollutants such as organics (petroleum products and other carbon-based chemicals), metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc). All forms of life can be considered as having potential function in environmental biotechnology. However microbes and certain plants are of interest even as normally present in their natural environment or by deliberate introduction. Some of these organisms present in the environment have the ability to degrade some of the most hazardous and recalcitrant chemicals since they are discovered in unfriendly environments where the needs for survival affect their structure and metabolic capability.

Factors influencing bioremediation/Bio treatment The process of bioremediation is influenced by various factors which can be discussed under two groups -the chemical nature of the contaminant and their physical state(concentration, aggregation state: solid, liquid, gaseous, environmental component in which it is present, oxido-reduction potential, presence of halogens, bonds type in the structure etc.) -environmental conditions: (temperature, pH, water/air/soil, characteristics, presence of toxic or inhibiting substance to the microorganism, source of energy, source of carbon, nitrogen, trace compounds.

Soil bioremediation: Soil treatment technologies use living organisms to degrade soil contaminants, either in situ (ie in place, in ground) or ex situ (i.e. in another place, above ground) and include biotreatment cells, soil piles and prepared treatment beds. During bioremediation, microbes utilize chemical contaminants in the soil as an energy source and, through oxidation-reduction reactions, metabolize the target contaminant into useable energy for microbes. By-products (metabolites) released back into the environment are typically in a less toxic form than the parent contaminants. For example, petroleum hydrocarbons can be degraded by microorganisms in the presence of oxygen through aerobic respiration. The hydrocarbon loses electrons and is oxidized while oxygen gains electrons and is reduced. The result is formation of carbon dioxide and water [3]. When oxygen is limited in supply or absent, as in saturated or anaerobic soils or lake sediment, anaerobic (without oxygen) respiration prevails. Generally, inorganic compounds such as nitrate, sulfate, ferric iron, manganese, or carbon dioxide serve as terminal electron acceptors to facilitate biodegradation. Generally, a contaminant is more easily and quickly degraded if it is a naturally occurring compound in the environment, or chemically similar to a naturally occurring compound, because

microorganisms capable of its biodegradation are more likely to have evolved. Petroleum hydrocarbons are naturally occurring chemicals; therefore, microorganisms which are capable of attenuating or degrading hydrocarbons exist in the environment. Development of biodegradation technologies of synthetic chemicals such DDT is dependent on outcomes of research that searches for natural or genetically improved strains of microorganisms to degrade such contaminants into less toxic forms. Microorganisms have limits of tolerance for particular environmental conditions, as well as optimal conditions for pinnacle performance. Factors that affect success and rate of microbial biodegradation are nutrient availability, moisture content, pH, and temperature of the soil matrix. Inorganic nutrients including, but not limited to, nitrogen, and phosphorus are necessary for microbial activity and cell growth [5]. All soil microorganisms require moisture for cell growth and function. Availability of water affects diffusion of water and soluble nutrients into and out of microorganism cells. Anaerobic respiration, which produces less energy for microorganisms (than aerobic respiration) and slows the rate of biodegradation, becomes the predominant process. Soil moisture content between 45 and 85 percent of the water-holding capacity (field capacity) of the soil or about 12 percent to 30 percent by weight is optimal for petroleum hydrocarbon degradation. Soil pH is important because most microbial species can survive only within a certain pH range. Furthermore, soil pH can affect availability of nutrients. Biodegradation of petroleum hydrocarbons is optimal at a pH 7 (neutral); the acceptable range is pH 6 – 8. Temperature influences rate of biodegradation by controlling rate of enzymatic reactions within microorganisms. Generally, speed of enzymatic reactions in the cell approximately doubles for each 10°C rise in temperature [3]. There is an upper limit to the temperature that microorganisms can withstand.

Bio treatment of gaseous streams:

In the waste gas stream treatments, biotechnology is applied to find green and low cost environmental processes. Following methods can be employed for the gas stream treatment:

1. **Bioscrubbing** Bioscrubbing consists of the absorption of a pollutant in an aqueous phase, which is then treated biologically in a second stage in a liquid phase bioreactor. The effluent leaving the bioreactor is then recirculated to the absorption column. This technology allows for good gas cleaning when the gaseous pollutants are highly water soluble. The main advantage of this technology are : (i) removal of reaction products by washing out, avoiding their possible inhibitory effects, (ii) easy control of the biological process due to control of the liquid medium composition and (iii) good adaptation capacity of the microbial biomass with reference to the composition of the gas to be cleaned.

2. **Trickling biofiltration** Waste gas treatment in trickling biofiltration involves using a biological filter continuously fed with a liquid medium and packed with a synthetic carrier on which a biofilter grows. The polluted gas passes through the carrier material, co- or counter-currently to the mobile liquid phase which ensures nutrient supply to the microorganisms. Fresh medium fed to the reactor may be mixed with drain water recirculated to the system. Carriers frequently used and reported in the literature include plastic or ceramic structured packings, activated carbon, or mixtures of different materials.
3. **Bio filtration** A biofilter consists of a filter-bed, traditionally composed of organic matter (peat, compost, sawdust, etc.), serving both as carrier for the active biomass and as nutrient source. While flowing through the filter-bed, contaminants present in the polluted air are degraded by the active biomass. One important characteristic of the process is the absence of a mobile liquid phase as a consequence of which biofilter are suitable to treat poorly water-soluble pollutants.

Environmental biotechnology in pollution detection and monitoring: Environmental monitoring deals with the assessment of environmental quality, essentially by measuring a set of selected parameters on regular basis. In general, two methods –physiochemical and biological are available for measuring and quantifying the extent of pollution. Biomarkers/Bioindicators More recently, Environmental monitoring programmes have, apart from chemical measurements in physical compartments, included the determination of contamination levels in biota, as well as the assessment of various response/parameters of biological/ecological system. Nowadays, temporal and special changes in selected biological systems and parameters can and are used to reflect changes in environmental quality/conditions through biomonitoring [7] A biomarker, or biological marker, is in general a substance used as an indicator of a biological state. It is a characteristic that is objectively measured and evaluated as an indicator of normal biological processes, pathogenic processes, or pharmacologic responses to a therapeutic intervention. It is used in many scientific fields. A bioindicator is an organism or biological response that reveals the presence of the pollutants by the occurrence of typical symptoms or measurable responses, and is therefore more qualitative. These organisms (or communities of organisms) deliver information on alterations in the environment or the quantity of environmental pollutants by changing in one of the following ways: physiologically, chemically or behaviourally. The information can be deduced through the study of: 1. Their content of certain elements or compounds 2. Their morphological or cellular structure 3. Metabolic-biochemical processes 4. Behavior, or 5. Population structure(s). The importance and relevance of biomonitoring, rather than man-made equipment, is justified by the statement: There is no better indicator of the status of a species or a system than a species or system itself. Biomarkers that have potential for

use in biomonitoring are: □ Molecular(gene expression, DNA integrity) □ Biochemical (enzymatic, specific proteins or indicator compounds) □ Histo-cytopathological (cytological, histopathological) □ Physiological □ Behavioral Biosensors for Environmental monitoring A biosensor is an analytical device for the detection of an analyte that combines a biological component with a physicochemical detector component.

Environmental biotechnology for pollution and prevention and cleaner production:

Role of biotechnology in integrated environmental protection approach Biotechnology is regarded as the motor for integrated environmental protection. Complementary to pollution control which struggles for the tail end of the processes and manages pollution once it has been generated, pollution prevention works to stop pollution at its source by applying a number of practices, such as:

- Using more efficient raw materials
- Substituting less harmful substance for hazardous material
- Eliminating toxic substances from production process
- Changing processes
- Others

Since biotechnology can contribute to the elimination of hazardous pollutant at their source before they enter the environment, industrial and environmental biotechnology uses biological processes to make industrially useful products in a more efficient, environmentally friendly way, cutting waste byproducts, air emissions, energy consumption and toxic chemicals in several industries. As biotechnological processes once setup are considered cheaper than traditional methods, changes in production process will not only contribute to environmental protection, but also help companies save money and continuously improve their public image. Process modification and product innovation The technique of modern molecular biology are applied the industry and environment to improve efficiency and diminish the environmental impact. Biodegradation, biotransformation and biocatalysis are the three processes that occur as a result of microbial metabolism. A manufacturer using microbial metabolism is said to conducting a biotransformation or to be using biocatalysis. Biotransformation involves modification of organic molecules into products of defined structure, in the presence of microbes, plants or animal cells or enzymes. Biotechnological processes generate operate under gentle conditions, use biodegradable raw materials and intermediates and water is usually the solvent. As a result of high enzymatic specificity, biological synthesis can lead to increased yield and less by-products, thus saving additional cost for further purification. Biotechnological processes can contribute to sustainability, provided they replace chemical production methods. Environmental biotechnology and eco-efficiency Environmental biotechnology has a great potential to be ecologically beneficial and at the

same time economically profitable in many areas. Environmental challenges increasingly affect the competitiveness, not only in terms of clean up and pollution –control costs but also in the marketplace. Eco-efficiency analysis showed that there is some potential for biobased materials and white biotechnology and that the greatest impact of white biotechnology may be in the fine chemicals segment, where up to 60% of the products may use biotechnology.

Concluding remarks - Environmental biotechnology challenges and prospects for sustainable development:

New environmental challenges continue to evolve and new technologies for environmental protection and control are currently under development. Also, new approaches continue to grow harnessing the potential of microorganism and plants as eco- efficient and robust clean up agents in a variety of practical situations such as

- Enzyme engineering for improved biodegradation
- Process engineering for enhanced biodegradation
- Re use of treated wastewater
- Biomembrane reactor technology
- Design wastewater treatment based on decentralized sanitation and reuse
- Implementation of anaerobic digestion to treat biowaste
- Biodevelopment of biowaste as an alternative and renewable energy resource
- Emerging and growing technological; application of soil remediation and cleanup of contaminated sites

Along with the wide group of technology with the potential to accomplish the objectives of sustainability, biotechnology continue to play an important role of food production, renewable raw material and energy, pollution prevention, bioremediation. Since biotechnology has proved to have a large potential to contribute to the prevention, detection and remediation of environmental pollution and degradation of waste, it is a sustainable way to develop clean processes and products, less harmful, with reduced environmental impact than their forerunners, and this role is illustrated with reference to clean technology options in the industrial, agro forestry, food, raw materials and minerals sector. An evaluation of the consequences, opportunities and challenges of modern biotechnology is important both for policy makers and industries for implementation of ways for sustainable development.

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CLIMATE CHANGE: ARE WE HEADING TOWARDS A RIGHT DIRECTION?

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ABSTRACT

In our lifetime we have witnessed some of the worst natural calamities. Warning of polar ice melt, tsunamis, hurricanes and snowstorms are scaringly frequent. Are these the vagaries of the planet or is this a response to human activities? This question has been extensively debated in the last few years, creating more questions- environment or industry? Planet or people? These are some uncomfortable yet justified questions whose straight answers are difficult to found. Yet on International forum a serious thought has been floated to make this earth livable and sustainable. This paper is an attempt to understand about climate change, its causes and consequences, and to provide some macro level measures to curb the situation to save the Blue Planet.

Keywords: *Climate Change, Global Warming, Green Tax, Kyoto Protocol, Paris Agreement,*

INTRODUCTION

Climate change is the contemporary, much debated and negotiated 'international policy' of the present times and amidst this topic, Paris Agreement, 2015 is the latest development. The recent debate on climate change is entered into troubled waters because of the recent stand taken by the President of America Donald Trump on Paris Agreement 2015, which is contrary to the stand taken by the former President Barak Obama. India is 62nd country who acted proactively and ratified the obligations of The Paris Agreement before coming of its enforcement. Globally the much applauded Paris Agreement also has a grey face. There are many unanswered questions on which experts and scholars need to ponder upon. This very agreement is silent about various issues like the reasons behind failures of Kyoto Protocol 1997, urgency to have a new agreement, human rights, and the roadmap of its success.

REVIEW OF LITERATURE

Contemporary world is very frequently exposed to the uncertain and unpredictable. Climate change is the root for all other ancillary enviro-health problems and has become a topic of grave concern for the present generation. The helplessness of man in its lack of ability to predict change in climate is well admitted and conferences are being organized at every nook and corner of the world, both at International and National level to

politically tackle this issue by way of creating stringent laws after analyzing the reasons for climate changes. These conferences trigger the cause of climate change, but only externally and not internally, i.e. man is only compelled to think but not react or act to avoid climate change. Climate Change needs both action and omission on the part of every human being on this Earth to come out of the bourgeois way of life. Recently, Amitav Ghosh has again re-started discourse on climate change through his work, which certainly work like an antidote for the cause and propel the necessary changes in the behaviour of the human beings so that they will not only understand the problem of Climate change but also work individually towards its cure to bring about a safe future. Though neither the work is strictly legal in nature, nor Ghosh is proposing any new legislation to curb climate change, but he certainly throws light on the horrors of climate change and the possibilities and increasing probabilities of highly improbable events taking place which were only a part of science fiction for the past generations but a hard core reality for the present generation and surely a deadly gift to the future generation. Dominic Roser (2013) argues that in our everyday lives, we encounter the topic of climate change at the gas station in the form of biofuel, at the supermarket when we read instructions about the carbon footprint of certain products, and when the travel agent asks us if we want to fly climate-neutral. And maybe we have also asked ourself when hiking in the Alps, what has happened to the glaciers. Similarly, in India, glaciers are vanishing at a rapid speed, the natural phenomenon like cloud burst, floods, earthquakes, etc. increased , even January 2017, is considered as warmest January of the century. Therefore, there is no avoiding of the issue that climate is changing.

NEED OF THE STUDY

Climate change has suddenly become the cause of concern for every nation. Be it a developed country, developing country or an underdeveloped country. But the onus of climate change is put on the shoulders of emerging economies like India and China. In this backdrop, there is a need to understand what climate change is and how it is going to affect the world?

OBJECTIVE OF THE STUDY

- a. To identify the causes of climate change.
- b. To suggest some macro level measures to handle the climate change.

RESEARCH METHODOLOGY

This paper is exploratory in nature. For this purpose, secondary data was collected through newspaper, magazines, books, journals, government reports and websites.

CLIMATE CHANGE: CAUSES AND CONSEQUENCES

Climate change is a ‘natural phenomenon’ and therefore it is essential for us to use mitigation, adaption and other techniques to tackle it, but, as it is generally said, ‘easy said and hard done’. It is proved by the extensive reports of the Intergovernmental Panel

on Climate Change (IPCC) that the present climate change is not natural and its speed is accelerated by the anthropogenic actors who had produced and used energy. And, therefore, present anthropogenic climate change poses a serious threat to the mother earth, which needs immediate attention and solutions. The major cause of climate change is the increase in the demand for the energy. The demand for energy has increased tremendously post industrialisation. Industrialisation led to the lopsided growth where fossil fuels were exploited to the maximum and energy was extracted in various forms, from the environment and utilised by the human beings for towards developmental purposes.

This simple fact of development of the human beings posed another problem that is in *stricto sensu*, it is the development of whom? Is it an inclusive development of mankind or the privilege of particular State(s) only? Developed States or in other words, the colonial countries who led to industrialisation and colonisation, have exploited the natural resources and developed their countries to a large extent. Energy is causal factor for both economic growth and emission of Green House Gases (GHGs). GHGs are responsible for the **global warming**, which further leads to **changes in sea levels** which are a direct and threat looming large to the Nations and States near the coastal areas. Global warming has a direct and enormous impact on the glaciers, which have already started melting at the rapid pace and also has effects on ice sheets, consequently leading to increase in sea levels. Climate change also leads to extreme weather events, and it affects the natural environment and food production. Human health and its security are also threatened by climate change to a considerable extent because climate change may lead to abrupt events such as heavy rain falls, floods, tsunami, avalanches, cloud burst etc. The change in weather conditions may also lead to change in land use which will certainly increase forced migration.

The question pertaining to climate change and its repercussions is now is extremely pertinent and urgent. When in 1970's, it was realised that environment of the earth is changing, the concern was shown only by the developed countries and therefore, an international initiative was taken to negotiate to mitigate the effects of climate change. Stockholm Declaration 1972 was the first such International Convention where the condition of the environment was discussed in detail. However, though late, the same initiative is now also being taken by the developing countries who in turn also suffer the climate change which may largely be due to the use of harmful chemicals by the developed countries and the resulting emissions.

CHRONOLOGICAL DEVELOPMENT OF INTERNATIONAL TREATIES AND AGREEMENT

Considering the effects of climate change, and after knowing that anthropogenic activities are responsible for the rapid change in the climate, suddenly, the entire world

was on the same table against the common cause. The international efforts started from 1972 Stockholm declaration, where for the first time, ever, the problem of environmental pollution was recognised.

Montreal Protocol: 1987

Montreal Protocol was the first agreement concluded to check the climate change, and it also called for the protection of stratosphere's ozone layer from industrial effluents such as Chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs). And later in 1988, United Nations Environmental Programme (UNEP) and World Meteorological Organizations (WMO) had established Intergovernmental Panel on Climate Change (IPCC). IPCC was established to work towards mitigation, and adaptation due to climate change. Later in 1992, Rio Earth Summit, United Nations Framework Convention on Climate Change (UNFCCC) treaty was ratified and "the treaty called for stabilization of GHG concentrations at a level that would prevent dangerous anthropogenic interference with the climate system but stopped short of setting quantitative targets for emissions and stabilized concentrations (Incropera, 2016). However, it did call for regular meetings of its adherents, termed the Conference of Parties (COP), to advance its agenda, and it was at the 1997 meeting in Kyoto, Japan, that specific goal was established."

Kyoto Protocol

For more than a decade, the Kyoto Protocol was the centrepiece of the International negotiations on climate change at world level. To check climate change, Kyoto calls for the reduction in GHG emissions to 95% of 1990 levels by the year 2012. It had exempted developing economies from the threshold limits. But, from here began the politics of climate change. The limits were not taken as it is from the developed countries and the politics was on to decrease the threshold limits of emissions, and also to include the developing economies in the Kyoto Protocol. Kyoto needs ratification by the industrialised countries which contribute 55% of the Carbon emissions collectively. In 1990, United States (21%), Russia (17%) and the European Union (15%) were the major contributors to carbon emissions in the Earth's atmosphere, and therefore, it was essential that they should agree on the common minimum programme to be followed to control the carbon emissions on Earth. Luckily, for Germany, inefficient industries were closed which were established in the erstwhile East Germany, and thereby reduced the carbon emissions, whereas, Russia because was facing one of the most severe economic downturns, carbon emissions were the least, and United Kingdom had just converted many of its coal-based power plants to natural gas, which had progressively contributed towards the Earth's atmosphere. And, because of the aforesaid causes, aforesaid countries are already near the threshold limit, and therefore, it was convenient for them to follow the limit of GHGs emissions fixed by the Kyoto. In Contrast, no such factors because were present in the US at that time and therefore, they were reluctant to ratify

the Kyoto. The United States though agreed to the 1990 GHGs emissions baseline, but had proposed to meet its target,

1. Firstly, by receiving credit for carbon sequestered in its vast forests and not through real reductions in emissions, and,
2. Secondly, by purchasing emission allowances from nations such as Russia, whose emissions were below those imposed by the Kyoto Protocol.

Nevertheless, it was in the interest of the U.S. to allow the trading of credits between the nations and as well as the benefits accrued from the sequestration of carbon by the net growth of a nation's forests. A sequestration provision would yield credits commensurate with carbon sinks provided by net conversion of CO₂ to biomass in a nation's forests. However, both amendments were roundly rejected, particularly by the Europeans, and the meeting concluded without the United States, Russia, and Japan as signatories.

Later, when the Kyoto Protocol (KP) was amended to include, a concession to allow an emissions-trading system made at a 2001 meeting of the Conference of Parties (COP), Japan joined the EU in ratifying the KP. The US categorically rejected the idea of joining KP. But, the US under the administration of Mr. Bush, had declared various self-goals to check carbon emissions in the US. The success of KP is not limited to the fact that there was no consensus but in the fact that first-time International Governments are on the same table to tackle the issue of climate change. According to Walter R. Tribett, "The goal of Kyoto was to minimise the adverse effects of climate change due to rising 116 levels of greenhouse gases (GHGs). The governing document focused on reducing emissions of carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆), known as the Kyoto basket of GHGs."

PARIS AGREEMENT, 2015

In November 2014, "Obama (US) –Xi (China) announcement was instrumental in the framing of the Paris Climate Agreement. The INDCs submitted by the US and China, both unconditional, build closely on the language of this bilateral plan. These nations emit more GHGs than any other: China bypassed the US to become the world's largest emitter of CO₂ during 2006. The importance of these two nations arriving at mutually agreeable language to combat global warming, prior to the Paris meeting, cannot be understated. To date, INDCs from 190 out of the 196 nations in the world have been submitted to UNFCCC. For the first time in history, there is a consensus among the world's nations that a collective effort is needed to combat global warming." Paris Agreement (PA) is very different from KP because of the following reasons.

- (i) **Firstly**, “the Paris Agreement has specific goals for limiting future global warming relative to the pre-industrial baseline. The Agreement seeks to reduce cumulative emission of GHGs such that,
- (a) The increase in global mean surface temperature (GMST) is “well below 2 °C”, and,
- (b) To “pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial”.
- (ii) **Secondly**, unlike KP, here, “individual nations were encouraged to submit, prior to the COP 21 meeting in Paris, there **Unilateral Intended Nationally Determined Contribution (INDC)** for the reduction of GHG emissions. There are two types of INDCs: unconditional (firm commitments) and conditional (commitments contingent on financial assistance and/or technology transfer). The INDCs from most participating nations in the developing world is conditional.
- (iii) **Thirdly**, The Green Climate Fund, established during COP 15, is recognised as one of the several means to facilitate the flow of resources needed to implement the conditional INDCs. The Paris INDCs consider the original Kyoto basket of GHGs (CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆) plus NF₃, which was added at the COP 17 meeting held in Durban (a group of seven UNFCCC basket of GHGs), South Africa during 2011.”
- (iv) **Fourthly**, The Paris Climate Agreement has a top-down, quantitative goal of limiting global warming from rising either 1.5 °C (target) or 2.0 °C (upper limit) above pre-industrial. The method of achieving the necessary reduction in GHG emissions is a bottom-up approach, conducted via unilateral INDCs. The Obama administration maintains the agreement is not a treaty and, as such, does not require Congressional approval.”

POSSIBLE MEASURES TO TACKLE CLIMATE CHANGE

There are many ways to handle the wicked problem of climate changes. These can be divided into three broad categories-, such as by mitigation, adaption and geoengineering.

Mitigation: Mitigation is a state where all the possibilities are explored to control the emissions of GHGs upto a permissible limit. Some measures available with Government are

1. **Cap-and-trade:** Government can fix caps on the maximum GHG emissions from the heavy industries, such as coal mines, oil refineries, power plants, etc. Initially, the cap is higher to allow adjustment and the cap will be maintained until carbon concentration level is reduced to a significant level.
2. **Carbon Tax:** The carbon tax is the other way, of tackling carbon emissions. Imposition of taxes on goods and services which are emitting carbon emissions helps in reducing the carbon footprints in the long run because the due tax will inflate the price of the goods and services.

3. Introduction of Legislation/Regulation: The third option is to go for the regulatory measures to control the GHG emission levels. For every industry which is emitting carbon emissions, the maximum limit was fixed for the emission of GHGs emissions subject to penalty. This system was successful to the extent, that it forced industries to adopt green technologies.

ADAPTATION

One way of controlling the impact of climate change is adaption which can be done by increasing the resilience of human. This will help in diminishing prospects for stabilizing GHG concentrations at acceptable low level.

Geoengineering : Geoengineering refers to large scale engineering endeavors designed to counteract the warming effects of GHG emissions. Following are some way outs:

1. Use of Improved Technology

Experts believe emissions can be reduced by increasing efficiencies while producing fuel and converting it into other forms of energy at all stages of the fuel's life cycle by using new and improved technology. Moreover by increasing process efficiencies the consumption of energy can also be reduced marginally which ultimately result into less carbon emission

2. Solar Radiation Management: Solar radiation management be an economical technology solution which poor countries can afford. However, till now Developed and developing countries have used this resource and they are able to conserve their fossil fuels and reduce their carbon emissions. But less developed countries should also focus towards this measure with collaborating with developed nations in their area of expertise.

CONCLUSION

The argument of the developing countries that developed countries are responsible for the increasing emissions of GHGs in the atmosphere is the biggest hurdle in the success of any agreement or treaty. The argument of the developing countries that developed countries are responsible for the increasing emissions of GHGs in the atmosphere, and therefore, they should bear the major cost of adaptation of above measures by the developing countries. On the contrary, developing countries are of the view that the developed countries are responsible for the increasing emissions of GHGs in the atmosphere, and therefore, they should bear the major cost of adaptation of above measures by the developing countries. And, therefore, in international forums, the negotiations on controlling carbon dioxide emissions are on from past three decades. Several steps are proposed and several steps are adopted by the both (developed and developing countries) and several other steps need serious discussion before adopting by the member nations. In the words of Hurrell and Kingsbury, "Can a fragmented and often highly conflictual political system made up of over 170 sovereign states and

numerous other actors achieve the high (and historically unprecedented) levels of cooperation and policy coordination needed to manage environmental problems on a global scale?" The green politics is the major hurdle towards achieving various goals to check climate change. Governance beyond the nation state can sometimes be a useful supplement especially when they avoid being captured by powerful interests and instead focus on problem amelioration. Yet even for this, it requires support and oversight from national governments .No strategy will work unless all the countries forget about their vested interest and think about the globe which is green in color and having no boundaries.

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DEEP DIVE ANALYSIS OF IPL TRAVELERS BEHAVIOUR AND TRAVEL PREMIUM LEAGUE SERVICES BASED ON CHENNAI CITY

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ABSTRACT:

The Online travels and hospitality industry has emerged as one of the key drivers of growth among the services sector in India. The online travel industry has grown significantly in the past few years and the online gross booking now constitutes 51% of the overall Indian travel market and expected to grow to 36% in 2020. Travelling is not restricted to just visiting different places and sight-seeing, it has evolved as a mean of exploring and experiencing varied forms of lifestyles and cultures. While the online segment is growing major portion of Indian customers prefer to research online and book with travel agencies offline. The conventional means of obtaining travel tickets and related travel arrangements are rapidly changing. These changes are primarily due to an availability of online travel sites such as makemytrip.com, yatra.com, goibibo, etc. that claim to provide an easier, less expensive alternative to traditional methods of getting travel arrangement. In this paper, efforts are taken to study traveler's behavior and their approaches towards premium league services offered by online travel brand such as Match Tickets, transport channel, travel app, accommodation, entertainment zone and bonanza contest during IPL Matches in India. This research paper also aims to understand traveler's attitude and trends in Chennai city towards online technology platforms and identify how they put their attitudes into action.

Keywords: *Travel Brands Ride, Toss Ka Raja Contest, Premium league services, online travel portals.*

INTRODUCTION

The Indian Premier League is a professional Twenty20 cricket league in India contested during April and May of every year by teams representing Indian cities. The Indian Premier League is a mega event as there Bollywood celebrities flaunting their moves and welcoming the fans of this fantastic festival of cricket. In this concern, the online travel portals offer and promote premium leagues services to the cricket fans during IPL Matches in India. According to data revealed by the Tourism Ministry of India, the

country's online travel and tourism market is poised to grow at a rate of 7.5 percent in 2015 and that the travel sector would contribute to Rs 8.22 trillion to India's GDP this year. The online travel sector comprising more than 50 percent of the total e-commerce industry in India, It is estimated to be in the range of \$ 11-16 billion. With evolution of travel portals, bookings of tickets for airline, hotel, car, bus etc. have all added up to the traveler's convenience while fulfilling their desire for hassle free bookings. Online travel portal are thus seen as a one stop shop and a hassle free virtual store for customized travel solution. Consumers are now curating their own experiences using online, mobile, and social media, interchangeably, along their non-linear paths to purchase. The financial package and personalized deals offered by online travel companies is helping the industry grow both in terms of value and volume. Some of the aspects that are driving growth in the segment are- tie-ups with hotels and lodges to provide a complete travel package and out-of-the-box solutions offered by new entrants. Apart from this, use of innovative technology –like mobile apps to help customers connect with the portal, has become a major differentiating factor when selecting long-term association with a travel company. Online travel agencies adopting new policies, technologies, innovation has altogether shaped a new face to the industry. The travel industry boom, evaluation of internet and the emergence of low cost carrier have been the key factors that have contributed to ride the e-commerce business in this sector. The Primary intention of the study is to explore the travelers feeling towards premium league services rendered by online travel portals and also help to know their experience, level of satisfaction and Purchase intention in future.

LITERATURE OF REVIEW

PhoCusWright (2011) commented that online travel bookings have captured a good percentage of market globally. In India only a handful of Indian travel websites have succeeded in attracting a significant share of India's heavy online traveler population. Air websites have the highest penetration of heavy online travelers, followed by the leading OTAs: MakeMyTrip, Yatra and Clear trip. The more the India's population accesses the internet, the share of online travel booking and shopping will continue to grow further.

Lindstrom & TT (2012) explained that OTAs provide the complete solution in making travel arrangements. For tourism suppliers, the Internet provides them the way for product distribution to potential travelers globally at any time. These suppliers can distantly control their servers to exhibit information on services/ products at an electronic speed. It also indicated that modern travelers demand more high quality travel services, products, information, and value for their money.

Nivedita Gangly Deepa Nair (2013) in her articles on "the Hindubusinesslines" reports that Goibibo.com has launched IPL special travel premium league that gives discounts on

domestic air tickets and match tickets. It also revealed that travel portal plan to extend the offers to hotels stay and sight seeing to the cricket fans.

Aneesh Phadnis (2015) in his articles on “the Business standard” stated that Makemytrip, the principal sponsor of Sunrises Hyderabad team has launched a special offer called “Toss Ka Raja Contest”. It also insight that Contest winners will get live on Television and get other goodies to all IPL Matches during the seasons.

NEED FOR THE STUDY

Online travelling is the newest addition to the travelling ecosystem in India. The advent and propagation of computers, coupled with the increasingly acceptable leveraging of the Internet has caused some major changes in the travel industry. Online travel portals offer all the travel solution to the travelers through internet. In today’s scenario, travelers are taking initiatives to search and plan their own trips during ipl matches according to their convenience and this has easily made possible by the use of online tourism service portals. This study helps us to understand travelers feeling and outlook towards online travel portals services during ipl matches in Chennai city. Thus the research study would be useful to online travel marketers to better develop appropriate strategies to enhance and promote e-booking to future travelers during ipl seasons while retaining existing travelers and also to researchers as well as academicians conducting research in this area in providing future direction.

STATEMENT OF THE PROBLEM

Travel is an inherently social activity, arranging a trip is a complex endeavor that often involves an intensely personal decision-making process. From the beginning, most travel sellers designed websites to support a shop-book sequence. This mimicked the approach, professional travel agents used on global distribution systems. The design was made to capitalize on low-hanging fruit – monetizing traffic by making bookings for travelers who already had specific dates and destinations in mind. The use of online travel portal is equally becoming popular in India. Mostly the young generation is using this source as their travel solution. Despite many studies conducted in terms of the traditional service by travel agents, relatively few studies have been done in the Internet market, and even less on the online travel service. This study focuses on how IPL fans use Internet as the channel to search travel information and to book travel services and analyses their behavior on premium league offers.

OBJECTIVE OF THE STUDY

- To analyse the attitude and behaviour traits of IPL Traveler’s from Chennai city exploiting the Premium league services offered by travel portals.
- To study the demographic profile of the traveler’s watching IPL matches through premium league services offered by travel brands.

- To find out the relationship between profile variables of the travelers and the variables related to premium league services.
- To identify the quality dimensions of online travel services from travelers point of view.
- To study the traveller's contentment level towards "Toss Ka Raja Contest" organised by travel portals during IPL seasons.
- To study the problems and concerns of travellers purchasing their trip online.

SCOPE OF THE STUDY

This study has been conducted among the IPL travelers from various region of Chennai city travelling to watch IPL matches in India during the April and May month and enjoy the benefits offered by travel premium league services. The study also enlighten the importance of Internet usage for information searching and product purchasing for online travel products among domestic and foreigners travelers during IPL seasons. .

RESEARCH METHODOLOGY

RESEARCH DESIGN

The present research design is descriptive and diagnostic in nature as it describes what is happening, why it happening and possible solution is for it via understanding and analyzing behavior of Travelers towards various aspects of travel premium league services.

SAMPLING DESIGN

Population

The population of the study consists of the different domestic and foreigner travelers like students, professional, employees and businessman watching IPL Matches from Chennai city. The sample size of the actual study consisted of 60 travelers watching IPL matches in various region of India and starting their flight journey from Chennai city.

Sampling Technique

The sampling technique used was non-probability sampling method is adopted in this study. It refers to the technique where the probability of each cases being selected from the total population is known. The sampling technique used was judgement sampling where sample units are selected from special group of the travelers watching IPL Matches.

Data Collection Method

The present study has employed both the primary and secondary data. Data was collected only through primary source. Primary data was collected through E-questionnaires. To approach the target population a text link of the questionnaire with the online travel portal booking confirmation mail is taken format's portal. It gives an opportunity to users who have booked their IPL Tickets through internet to participate in the survey by

clicking on the text link. To analyze the trends of online travel portal, secondary data has been collected from the websites, journal and reports.

DATA ANALYSIS

RELIABILITY TEST

Reliability Statistics

Cronbach's Alpha	N of Items
.981	25

Inference:

The Cronbach’s alpha coefficient for 25 items is 0.981 suggesting that the items have high level of internal consistency.

ONE WAY ANOVA ANALYSIS

Null hypothesis (H₀): There is no significant difference between the overall trip journey and age group of IPL travelers.

Alternate hypothesis (H₁): There is significant difference between the overall trip journey and age group of IPL travelers.

ANOVA

overall trip journey

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	32.467	2	16.234	82.744	.000
Within Groups	11.183	57	.196		
Total	43.650	59			

Inference:

Here p values is lesser than 0.05. So reject null hypothesis .There is difference between the overall trip journey and age group of IPL travelers

KRUSKAL-WALLIS TEST

Null hypothesis (H₀): There is no significant difference between the rating of Travel premium league services and the occupation of IPL travelers.

Alternate hypothesis (H₁): There is significant difference between the rating of Travel premium league services and the occupation of IPL travelers.

Ranks

	Occupation	N	Mean Rank
travel premium league services	Professional	9	19.00
	Businessman	4	49.00
	Students	28	19.00
	Foreigners	19	49.00
	Total	60	

Test Statistics^{a,b}

	travel premium league services
Chi-Square	59.000
df	3
Asymp. Sig.	.000

a. Kruskal Wallis Test

Inference:

Since $p\text{-value} = 0.000 \leq 0.05 = \alpha$, we reject the null hypothesis. At the $\alpha = 0.05$ level of significance, there exists enough evidence to conclude that there is a difference between the rating of Travel premium league services and the occupation of IPL traveler.

CHI SQUARE TEST

Null hypothesis (Ho): There is no association between the IPL traveler rating towards Toss Ka Raja Contest and their gender wise.

Alternate hypothesis (H₁): There is association between the IPL traveler rating towards Toss Ka Raja Contest and their gender wise.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	60.000 ^a	1	.000		
Continuity Correction ^b	55.844	1	.000		
Likelihood Ratio	79.881	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	59.000	1	.000		
N of Valid Cases	60				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.82.

Inference:

The Pearson chi square significant value is 0.000 which is less than 0.05. Hence Reject Null hypothesis. There is association difference between the IPL traveler rating towards Toss Ka Raja Contest and their gender wise.

KENDALL TAU-B CORRELATION COEFFICIENT

To study the relationship between travel premium league service and the income level of IPL Travelers.

Correlations

		Income	travel premium league services
Kendall's tau_b	Income	1.000	.626**
	Correlation Coefficient		
	Sig. (2-tailed)	.	.000
	N	60	60
	travel premium league services	.626**	1.000
	Correlation Coefficient		
	Sig. (2-tailed)	.000	.
	N	60	60

** . Correlation is significant at the 0.01 level (2-tailed).

Inference: The table represents the Kendall tau-b correlation coefficient r is 0.626 which implies there is a positive relationship between the travel premium league service and the income level of IPL Travelers.

FINDINGS

- The Cronbach’s alpha coefficient for 25 items is 0.981 suggesting that the items have high level of internal consistency.
- Using One Way Anova Analysis it is found that there is difference between the overall trip journey and age group of IPL travelers.
- Using kruskal Wallis test it is found that there is a difference between the rating of Travel premium league services and the occupation of IPL traveler.
- Using chi square Analysis it is found that the Pearson chi square significant value is 0.000 which is less than 0.05. Hence Reject Null hypothesis. There is association difference between IPL traveler rating towards Toss Ka Raja Contest and their gender.
- Using Kendall tau-b correlation coefficient Analysis it is found that the r is 0.626 which implies there is a positive relationship between the travel premium league service and the income level of IPL Travelers.

SUGGESTIONS

The suggestions and recommendations in order to make the Travel premium League services more effective as follows

- Online travel firms should encourage ‘browsers’ to become ‘travelers’, by planning the service according to customer needs.
- Online travel portals have to inculcate some more services to make it customer friendly, like document collection & delivery at traveler’s place, flexibility in package modification, refund process and providing updated on their home page.
- Online travel portals should improve m-commerce among travelers to download their mobile apps to encourage bookings through mobile phones.
- Online travel portals should improve trip advisors, travel blogs and social networking sites to build a brand name by encouraging travelers to share their personal travel experiences.

CONCLUSION

With the increasing role of ICT in this sector, an electronic tourism solution has emerged which is significantly transforming the tourism industry worldwide. Nowadays, travelers give priority to search for information related to tourism services on the Internet and many a times, they book and finalize their trip from travel agencies. Online travel portals offer all the travel solution to the consumers through internet. The use of online travel portal is equally becoming popular in India.

This research aims to report a descriptive study that the perceptions of travelers towards travel premium league services and online travel portals techniques during IPL match.. Hence, it can be concluded that due to technological revolution, limitation of time, increase in demand and high expectation of convenience factor amongst the travelers has boosted the business of online travel portals.

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ECONOMIC DEVELOPMENT VS CHEMICAL TRAGEDY: A SPECIFIC STUDY AMONG DEPRIVED ENDOSULPHAN AFFECTED PERSONS OF KASARAGOD DISTRICT, KERALA

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ABSTRACT

The Endosulphan issue of Kasaragod is the worst chemical tragedy that Kerala ever experienced. This poisoning caused serious health hazard to the people in the areas of application of this chemical pesticide. This caused rare and complicated health issues which include cancer, mental retardation, cerebral palsy and locomotors among deprived sections. The economic backwardness of Endosulphan victims and low health infrastructure in the areas demands further government attention. High medical expenses also created economic burden to these people. The proper identification of their needs and development of health care facilities in rural area along with effective distribution of social and economic security measures among affected persons and their families are very important. The exclusion in all economic packages and human development programmes should also be reduced.

Keywords: *Kasaragod; Enmakaje Panchayath; Chemical Tragedy; Economic Packages; Socio-economic status*

INTRODUCTION

It is globally accepted that economic growth and environmental quality does not go together. High economic growth and industrialization causes pollution of air, water, soil and degradation. There are several health and socio-economic issues to people. Economic growth, no doubt, generates positive impact in the field of income and employment. But in a society where there is high differences between rich and poor, the benefits of economic growth is mostly concentrated to high income class and the common people bears the cost of it. In most cases deprived people are the victims of various tragedies (Jeevakrishnan, 2014).

The Endosulphan tragedy in Kasaragod district of Kerala is the result of the decision making done by the Plantation Corporation of Kerala, a public sector entity who owns the cashew plantations. This was due to the aerial spraying of Endosulphan, a highly toxic organo chloride group of chemical pesticide to control insects, mites and tea-bugs

between the years 1976-2000 (Asha, et. al, 2012). The tragedy caused multiple health problems to the people of 14 panchayaths in the district. Different symptoms like, hyper activity, apnoea, salivation, loss of consciousness, diarrhoea, anaemia, nausea, vomiting, insomnia, blurred vision, cyanosis, tremor, dry mouth, headache, loss of memory, imbalance, lack of co-ordination, etc and chronic effects like loss of male reproduction system, delaying sexual maturity, infections with sex hormone synthesis, cancer, etc were observed among human beings and animals (Binu, et. al, 2012).

Since 2001, the aerial spraying was banned and the Supreme Court also banned Endosulphan. Lot off relief and remedial packages were introduced by the district panchayath, Government of Kerala and India for the victims. It includes pension schemes, special education, housing facilities, drinking water supply, rehabilitation, training and employment (Govt. of Kerala, 2011). But still, the socio-economic status of the affected persons is severe and problematic. In this context the socio-economic status of deprived Endosulphan affected persons is attempted in this study.

METHODOLOGY AND MATERIALS

The study used primary and secondary data. Primary data were collected from the houses of Endosulphan affected persons, field workers, local self-government members and authorities. Secondary data were obtained from various printed and electronic sources. Tools like Proportional Morbidity Ratio and Average Monthly Health Cost and Benefit Ratio were used for analysis. Proportional Morbidity Ratio is in percentage terms and is calculated by dividing the number of ill affected persons with total number of victims. The average monthly health cost and benefit ratio per individual is calculated by dividing monthly health benefit with health expenditure and if the result is greater than one economic package are sufficient to cover the health expenditure and have positive impact on the economic status of the victims. If it is less than one, economic packages are insufficient.

ANALYSIS AND DISCUSSION

Health issues due to Endosulphan spray: Endosulphan aerial spray in cashew plantations started since 1976 in the panchayaths of Badiyadka, Bellur, Muliyar, Karadka, Kallar, Ajanur, Kumbadaje, Kayyoor-Chemeni, Panathady, Enmakaje and Pullur-Periya in the Kasaragod district (Mohammed, et. al, 2015). Different health issues were first reported from Enmakaje Grama panchayath (Karunakaran, 2017). Later complex and rare health issues were reported. It includes cancer, cerebral palsy, locomotors disabilities, mental retardation, deaf and dump, vision problems, skin disorders and other anomalies (Table 1).

Detailed analysis in one panchayath in the district (Table 2) shows that 207 additional cases were reported between 2010 and 2014.

Table. 1. Health problems reported due to Endosulphan spray in the Kasaragod District.

Name of Panchayath	Health problems in number												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
Badiyadka	59	4	30	4	0	2	3	0	14	15	1	13	145
Bellur	24	4	36	16	9	15	2	2	7	25	7	13	160
Muliyar	42	6	23	7	5	17	1	19	11	9	11	15	166
Karadka	76	4	37	18	8	21	5	8	37	14	17	29	274
Kallar	88	4	32	4	31	18	13	19	34	21	36	102	402
Ajanur	74	3	15	6	17	15	2	10	14	10	23	59	248
Kayyoor-Chemeni	33	7	18	65	58	29	10	12	28	25	26	100	411
Panathady	113	0	36	11	30	4	8	30	35	15	17	52	351
Kumbadaje	54	1	25	22	9	7	1	27	9	14	6	26	201
Pullur-Periya	49	6	51	26	14	15	1	4	13	18	9	13	219
Enmakaje	56	23	61	35	12	10	1	6	28	11	9	7	259
Total	668	62	364	214	193	153	47	137	230	177	162	429	2836

Note: Health problems (1. Mental retardation, 2. Cerebral Palsy, 3. Locomotors Disabilities, 4. Multiple disabilities, 5. Other anomalies, 6. Mental illness, 7. Cancer, 8. Infertility, 9. Deaf and Dump, 10. Vision Problems, 11. Skin disorders, 12. Others).

Source: Govt. of Kerala (2010), Health department, Kasaragod district.

Table. 2. Endosulphan affected persons in Enmakaje Panchayath

Sl. No.	Disease category	2010	2014	No. of growth
1	Mental retardation	56	88	32
2	cancer	1	31	30
3	Cerebral Palsy	23	38	15
4	Locomotor disabilities	61	84	23
5	Multiple disabilities	35	57	22
6	other anomalies	12	23	11
7	Mental illness	10	21	11
8	Infertilities	6	18	12
9	Deaf and Dumb	28	31	3
10	Vision problem	11	19	8

11	skin disorders	9	16	7
12	Others	7	30	23
Total		259	466	207

Source: (1) Govt. of Kerala (2010), Health department, Kasaragod district and (2) Enmakaje Endosulphan field worker report, 2014.

From 466 persons, 60 affected persons (34 female and 26 male) were identified and analysed in detail. These persons were selected from different places of Enmakaje panchayath like Kattukukke, Padre, Perla and Vaninagar having many health problems like mental retardation, cancer, locomotors diseases, cerebral palsy, mental illness, deaf and dumb, skin disorders, vision problems and other multiple disabilities (Table 3).

Sl. No.	Category of Disease	Endosulphan affected persons	Proportional morbidity ratio (in percent)
1	Mental retardation	11	18.33
2	Cancer	8	13.33
3	Cerebral palsy	7	11.66
4	Locomotors disabilities	16	26.66
5	Multiple disabilities	5	8.33
6	Mental illness	4	6.66
7	Deaf and dumb	2	3.33
8	Vision problem	4	6.66
9	Skin disorders	3	5.00
Total		60	100.00
Source : Primary data			

From Table 3 it is evident that both mental retarded and locomotors cases combine 44 percent of total illness in the area studied. Table 4 shows the age wise composition of Endosulphan affected persons and it revealed that half of them fall in the category of age between 15 to 60 and are mainly working population and deprived sections, which badly affect the ability to work, earn, consume and save among them. The rare and complicated health issues among children and old age members significantly raise the health expenditure of these families.

Average Monthly Income of Families: It is identified that majority of the family members were construction workers of un-organized sectors, small scale agricultural labours, small village shop-keepers and auto drivers. More than 80 percent of families depend on these types of means for their livelihood (Table 5).

Table. 4. Age Wise Group of Endosulphan affected persons

Age group (in years)	Category of health problem									
	1	2	3	4	5	6	7	8	9	Total
0-15	7	0	3	2	0	3	2	0	0	17
15-30	0	2	2	0	0	0	3	1	0	8
30-60	3	5	6	2	2	1	0	1	2	22
above 60	1	1	5	0	0	0	2	3	1	13
Total	11	8	16	4	2	4	7	5	3	60

Note: Health problems (1. Mental retardation, 2. Cancer, 3. Locomotors disabilities, 4. Mental illness, 5. Deaf and dump, 6. Vision problems, 7. Cerebral palsy, 8. Multiple disabilities, 9. Skin disorders).

Source : Primary data

Health facilities for affected persons: Regarding the health facilities available in the area compared to the nature of diseases majority of the respondents pinpointed that the local health infrastructure is not enough to check the complex neurological disorders that cause cerebral palsy and locomotors and other Endosulphan caused illness.

Table. 5. Average monthly income of Endosulphan affected families

Sl. No.	Monthly income level (in Rs)	Percentage of families
1	Below 3500	23.00
2	3500 – 7000	32.00
3	7000 – 10000	27.00
4	Above 10000	18.00
Total		100.00

Source: Primary data

Distribution of social security assistance to the affected persons: The important social security measures and economic packages provided for uplifting the Endosulphan affected persons are:

The National Human Rights Commission Recommended Economic Assistance: This assistance includes: (i) Rs 5 lakh for completely bed ridden victims; (ii) Rs 3 lakh for mentally retarded; (iii) Rs 3 lakh for physically challenged; (iv) Rs 3 lakh for cancer victims and Table 6 shows its distribution status. From Table 6, it is evident that 16 victims are excluded from the economic package and 9 persons completely unaware of it.

Table. 6. The National Human Rights Commission recommended relief package to Endosulphan affected persons in the study area.

Category	Amount issued (in Rs)	Amount disbursed (in Rs)	No of beneficiaries
Completely bed Ridden	500000	150000	13
Mental retardation	300000	100000	9
Other physically challenged	300000	100000	17
Cancer patients	300000	100000	5

Persons aware, but not benefited from this economic package	-	-	7
Persons not aware about this economic package	-	-	9
Source: Primary data			

Monthly Pension Programme: Table 7 shows the rehabilitation package received as monthly pension under ‘Aswasakiran’ programme.

Table. 7. Endosulphan affected families receiving various pension benefits in the study area.		
Sl. No.	Type of pension programme	No. of beneficiaries
1	Monthly pensions (Rs. 2000) (Completely bed ridden cases)	17
2	Monthly pensions (Rs. 1000) (Include other physically challenged)	12
3	The relatives who benefits from Aswasakiran Pension programme (Rs. 700)	6
4	The relatives of bed ridden who do not receiving benefits from Aswasakiran programme	11
5	The victims who aware but not receiving benefits from pension programme	14
6	The victims who do not aware about pension programme	7
Source: Primary data		

Food Security: Food security of the affected community is relevant in the sense that there are a lot of bed ridden victims and low income families who are unable to maintain their nutritional security. All households under study are from low income families and the nature of illness prevents them to earn from employment. To realise it the government converted Above Poverty Line ration card holders into Below Poverty Line card holders to provide free food grains. 54 families in the study area are receiving it and the rest 6 are getting from other programmes of Public Distribution System.

Table. 8. Endosulphan affected families benefited from Thanal Housing Scheme in the study area.		
Sl. No.	Category	No Families
1	Families who applied and benefited from Thanal scheme	5
2	Families applied but not benefited	11
3	Families not aware about this programme (This includes families who benefited from Panchayath housing scheme)	44
Source: Primary data		

Infrastructural Development: The Kasaragod district panchayath organized a housing scheme named ‘Thanal’. The district panchayath decided to build 88 houses and 44 of

them completed and 22 are under construction. It is observed that the social security programme under housing scheme is not popularized in the study area. Many of them reported that they are unaware of it. The details regarding Thanal housing scheme is presented in Table 8.

Table. 9. Number of beneficiaries of scholarships and exclusion in Endosulphan affected families in the study area.

Sl. No.	Children from Endosulphan affected families who receives scholarship as educational benefit	Numbers
1	Total number of households surveyed	60
2	Total children (include direct victims and others from family)	71
3	Total children attending buds school	10
4	Total children not attending buds school	7
5	Other children of Endosulphan affected families deserved scholarship	54
6	Children received scholarship from primary or high school or higher secondary level	39
7	Total number of children who do not get any scholarship from this category (KRD social security mission)	15

Source: Primary data

Educational Benefits: In the study area, out of 17 Endosulphan affected children, 5 are completely bed ridden, 2 are mentally retarded and the rest 10 are attending buds school named 'Santhwanam'. The educational scholarships and its distributional status are given in Table 9 which shows that 15 deserved children are excluded from it.

Door to door medical care services: This include special cell for relief and rehabilitation of victims, home based health care for bed ridden and physiotherapy services (Table 10).

Table. 10. Door to door health services for the Endosulphan affected families in the study area.

Sl. No.	Category	No. of Victims
1	Mobile medical team visit to house monthly	14
2	Beneficiaries of home centred free Medicare	12
3	Person getting physiotherapy treatment	6
4	Persons have equipments for improvement of other organs	3
5	Victims having any of these door to door health service at once	8
6	Persons benefited from any of these health services	17

Source: Primary data

Cost-benefit analysis

The monthly health cost-benefit analysis of Endosulphan affected persons is presented in Table 11. Among the Endosulphan affected persons in the study area, 38 percent are excluded from receiving any monthly health benefit except pension amount. 27 percent are bearing the cost of health expenditure from their own personal disposable income. 32 percent are experiencing inadequate health benefit and their monthly health expenditure exceeds benefit. Only 18 victims are able to cover their monthly health expenditure by health benefit.

Table. 11. Average monthly health cost and benefit of Endosulphan affected families in the study area.				
Sl. No.	Type of illness	Average monthly health benefit (in Rs)	Average monthly health expenditure (in Rs)	Result
1	Mental retardation	1000	1500	0.66**
2	Deaf and dumb	1000	200	5*
3	Locomotors	1000	500	2*
4	Multiple disability	-	2000	***
5	Cancer	-	2500	***
6	Vision problems	-	-	****
7	Cerebral palsy	-	3500	***
8	Deaf and dumb	-	-	****
9	Mental retardation	1000	700	1.42*
10	Locomotors	-	1000	***
11	Mental Illness	1000	300	3.3*
12	Mental retardation	-	750	***
13	Cerebral palsy	1000	800	1.25*
14	Cancer	2000	4000	0.5**
15	Locomotors	-	-	****
16	Cancer	2700	2500	1.08*
17	Skin disorder	-	-	****
18	Locomotors	-	2000	***
19	Vision problem	-	-	****
20	Locomotors	1000	1500	0.66**
21	Skin disorder	1000	400	2.5*
22	Locomotors	1000	1400	0.71**
23	Mentally retarded	2700	3000	0.9**
24	Locomotors	-	500	***
25	Cancer	1000	3800	0.26**
26	Mental illness	-	400	***
27	Locomotors	-	-	****
28	Cerebral palsy	2000	3500	0.57**

29	Mentally retardation	2700	3000	0.9**
30	Multiple disability	2000	2500	0.8**
31	Locomotors	2000	1800	1.11*
32	Cancer	-	2500	***
33	Mental illness	-	500	***
34	Cerebral palsy	2700	2500	1.08*
35	Locomotors	1000	500	2*
36	Multiple disability	2000	2700	0.74**
37	Locomotors	2000	2500	0.5**
38	Mental retardation	1000	1800	0.55**
39	Vision problem	1000	200	5*
40	Locomotors	2700	2500	1.35*
41	Skin disorder	-	200	***
42	Mental retardation	1000	800	1.25*
43	Mental retardation	-	800	***
44	Multiple disability	1000	700	1.42*
45	Locomotors	1000	1200	0.83**
46	Cerebral palsy	-	1500	***
47	Locomotors	2000	2500	0.80**
48	Cancer	1000	3000	0.33**
49	Locomotors	-	1000	***
50	Multiple disability	-	2000	***
51	Mental retardation	1000	1200	0.83**
52	Vision problem	1000	200	5*
53	Cancer	-	-	****
54	Mental illness	1000	750	1.3*
55	Locomotors	2000	2500	0.8**
56	Mental retardation	1000	2000	0.50**
57	Cerebral palsy	2000	1800	1.11*
58	Cancer	2700	3000	0.9**
59	Cerebral palsy	2000	1800	1.1*
60	Mentally retardation	-	2000	***
Note: *- Benefit, **- Cost, ***- Cost only, ****- Currently no treatment.				
Source: Primary data				

The unavailability of adequate regular health benefit and increased health expenditure are the two problems identified from Table 11 and 12. This is particular in the case of chronic illness like cancer. This increased health cost and exclusion from attainment of health benefit is prominent in all diseases mentioned in Table 12 in connection with chemical aerial spray tragedy among deprived Endosulphan affected persons of Kasaragod district, Kerala.

CONCLUSION

From the analysis of the Endosulphan affected persons of Kasaragod district in general and Enmakaje panchayath in particular it is revealed that there is a need to develop health care facilities in rural area along with effective distribution of social and economic security measures among affected persons and their families. The exclusion which is present in all the economic packages and human development programmes should also be reduced.

Table. 12. Average monthly health finance of Endosulphan affected persons in the study area based on morbidity.

Sl. No.	Category of disease	No of victims who have no health benefit	No of victims who bears more health cost	No of victims who bears more health benefit	Currently no treatment cases	Total
1	Mental retardation	3	6	2	0	11
2	Cancer	2	4	1	1	8
3	Locomotors	4	5	5	2	16
4	Multiple disability	2	2	1	0	5
5	Mental illness	2	0	2	0	4
6	Cerebral palsy	2	2	3	0	7
7	Deaf and dumb	0	0	1	1	2
8	Vision problem	0	0	2	2	4
9	Skin disorder	1	0	1	1	3
	Total	16	19	18	7	60

Source: Primary data

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ECOTOURISM: A STEP TOWARDS SUSTAINABLE TOURISM**Ms. Lyseth M. D'souza**

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ABSTRACT

Ecotourism is a mode of tourism that emphasizes the careful selection of recreation sites, nature loving cultivation and respect for local residents' life and culture. Ecotourism also called nature-based tourism is fast gaining the attention of developed and developing countries as a potential means to conserve natural resources and support sustainable economic progress. It is intended as a low-impact and often small scale alternative to standard commercial (mass) tourism. In the words of Black and Crabtree (2007), ecotourism is "a force within the industry that, in its very essence, aims to minimise tourism's negative impacts whilst maximising tourism's positive impacts".

India offers a very rich diversity of culture, landscape, food, rich spiritual dimensions combined with wellness opportunities through Yoga and outstanding spa options and is home to some ancient traditions and religions making it an attractive destination for a life time experience. The vast variety of flora and fauna, geographical diversity, 30 World Heritage Sites and 25 biogeographic zones in various states, encouraged the growth and popularity of ecotourism in India. Ecotourism is an instigator of change which will build new relationships between people and environment, and between people with different lifestyles. Thus, ecotourism may be viewed as an intervention in the tourism industry as an attempt to modify its mode of operation for reasons not entirely commercial but with motives like spirit of enquiry, search for knowledge, peace, escapism, social, sustainability and respect for nature.

Keywords: *Ecotourism, tourism, sustainable tourism*

SIGNIFICANCE AND GROWTH OF TOURISM

According to the World Tourism Organization, tourism is limited to holiday activities comprising of various elements such as attractions, activities, services and infrastructures, which build up the total appeal of the natural and man-made characteristics of the place. Tourism is known as a service industry, or the recreation industry or the industry of experience (Barlow & Maul, 2000) where people travel for recreation, leisure, religious, family or business purposes.

Tourism is an important source of income for many countries. Its importance was recognized in the Manila Declaration on World Tourism of 1980 as "an activity essential

to the life of nations because of its direct effects on the social, cultural, educational, and economic sectors of national societies and on their international relations". Hospitality and tourism sector accounts for more than a third of the total global services trade and is the world's number one employer. In 2015 the total contribution of Travel & Tourism to employment, including jobs indirectly was 20.1% of the total employment and by 2027, it is anticipated to support over 380 million jobs (World Travel and Tourism Council). For six consecutive years, the Travel & Tourism sector has outperformed the global economy. In 2016 Travel & Tourism's direct contribution to GDP grew by 3.1%, faster than the global economy which grew at 2.5%. Travel & Tourism is the largest and fastest-growing sector with more than 1000 million people travelling every year. According to United Nations World Tourism Organization's (UNWTO) long term forecast "Tourism Towards 2030", international tourist arrivals worldwide are expected to increase by 3.3% a year between 2010 and 2030 and is expected to reach 1.8 billion by 2030 with arrivals in emerging destinations (+4.4% a year) projected to increase at twice the rate of those in advanced economies (+2.2% a year).

Travel and Tourism is the third largest foreign exchange earner for India. In 2015, the total contribution by travel and tourism sector was US\$ 136.3 billion and is expected to increase to US\$ 275.2 billion in 2025 as per the press releases of DIPP (*Department Of Industrial Policy & Promotion*), Ministry of Commerce and Industry. According to the National Council for Applied Economic Research, tourism contributes as much as 6.77% to India's total Gross Domestic Product through direct and indirect impact which is very close to the much touted Information Technology-Business Process Outsourcing industry, which contributes around 7.5% to the economy according to industry body NASSCOM (The National Association of Software and Services Companies). This indicates the importance of tourism to the economic growth and regional development of India. India was ranked 11th among 184 countries in terms of travel and tourism's total contribution to GDP in 2015. According to WTTC's India Benchmarking Report 2015, every \$1 million in travel and tourism spending in India generates \$1.3 million in GDP.

SHIFT TO ECOTOURISM

In today's world with our hectic life style, tourism is gaining more and more importance not only for a break from our everyday jog-trot life, but also for the conservancy and development of the countryside too. On one side there is a growing awareness and need the world over, to protect and safe guard the ecology and environment and on the other side there is a transformation of consumers who want brands to engage with them and add value to their lives, which has given rise to a new mode of tourism, which combines ecological conservation, environmental education, and cultural experiences. Ecotourism

is a mode of tourism that emphasizes the careful selection of recreation sites, nature loving cultivation and respect for local residents' life and culture.

India offers a very rich diversity of culture, landscape, food, rich spiritual dimensions combined with wellness opportunities through Yoga and outstanding spa options and is home to some ancient traditions and religions making it an attractive destination for a life time experience. The vast variety of flora and fauna, geographical diversity, 30 World Heritage Sites and 25 biogeographic zones in various states, encouraged the growth and popularity of ecotourism in India. Ecotourism also called nature-based tourism is fast gaining the attention of developed and developing countries as a potential means to conserve natural resources and support sustainable economic progress.

LITERATURE REVIEW

The International Ecotourism Society defines ecotourism as "responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education". Hetzer (1965) proposed that traditional tourism be replaced with "ecological tourism" and identified four core principles of ecotourism, namely, minimizing the environmental impact, respecting and minimizing the impact on local culture, maximizing the economic benefits for local residents, and maximizing tourist satisfaction while according to Olson (2012), ecotourism emphasizes on experience and education. Ecotourism definitions differ but all agree that it aims to change real world operations in the tourism industry with a focus on social improvement and economic activity; and protection of wildlife and ecosystems. It usually involves travel to destinations where flora, fauna, and cultural heritage are the primary attractions. It is intended as a low-impact and often small scale alternative to standard commercial (mass) tourism. In the words of Black and Crabtree (2007), ecotourism is "a force within the industry that, in its very essence, aims to minimise tourism's negative impacts whilst maximising tourism's positive impacts". Social goals such as the alleviation of poverty, the involvement of local communities and the preservation of pride in traditional cultures are also referred to repeatedly, sometimes within ecotourism itself and sometimes as community tourism, community ecotourism or responsible tourism (Spenceley,2008b).

According to Lin (2007), the Tourism Bureau in Taiwan is promoting the ecotourism policies that focus on "local, ecological, and diversified tourism" so as to reduce the environmental impact of recreational activities, encourage local residents to participate, and conserve natural and cultural resources experientially. Several studies have been carried out covering ecotourism issues; Buckley (2009) studied the outcomes ecotourism has accomplished with regard to environmental issues, Jaafar & Maideen(2012), examined ecotourism-related products and activities and studied the economic sustainability of chalets on four Malaysian islands, Chaminuka et al (2012) investigated the ecotourism potential of rural communities near the Kruger National Park in South

Africa and Olson (2012) explored two unique ecotourism projects in the Sierra de Manantlán Biosphere Reserve in west central Mexico by using anthropological methods. Ceballos-Lascurain(1983) predicted that, conserving the northern Yucatan wetland, an American flamingo habitat would attract tourists for bird watching, thereby stimulating local economic activities and promoting ecotourism. Gibson *et al.* (2003) while studying about Kenyan cities pointed out that, the practices of ecotourism to an urban environment is relatively a new concept. Follows & Jobber, (2000) conducted a study assessing the attitudes and norms to predict environmentally friendly behaviour since ecologically oriented consumers are willing to pay a higher price, when they have the assurance that they are purchasing environmentally friendly products (Minton & Rose, 1997). According to a report in 2000 by the World Tourism Organization, understanding tourists' expectations and feelings, demands, and experiences and providing high-quality services that meet their expectations and needs is crucial to maintain the advantage ecotourism has on the tourism market (Parasuraman et al, 1988). Most of the countries are shifting their attention not only to sustainable ecotourism, but are focusing on increasing the competitiveness of ecotourism through experiential marketing.

The promotion of ecotourism and development of experiential ecotourism lead to a culture and knowledge-based experience economy in Taiwan (Lin, 2007). So also in Malaysia, the government focused on promoting specific destinations and products, one among them being ecotourism on account of its rich flora and fauna: lakes, mangroves, limestone caves, mountains, wildlife, waterfalls, islands etc. and has successfully promoted ecotourism in costal based areas too.

MEASURES TO PROMOTE ECOTOURISM IN INDIA

The Ministry of Tourism, Government of India, way back in 1998 recognizing its role in promoting Sustainable Tourism, extensively deliberated with the industry and other stakeholders to formulate the wide-ranging “Ecotourism in India – Policy and Guidelines”. It covered issues like the definition of ecotourism, ecotourism resources of India, policy and planning, environmental pledge and operational guidelines for government, developers, operators and suppliers; visitors, destination population / host community, and NGOs/scientific & research institutions.

Inspired by the environmental planning and development strategies of the United Nations and World Tourism Organization, The Ecotourism Society of India (ESOI) was established in 2008 at the demand of the tourism ministry as a non-profit organization to promote environmentally responsible and sustainable practices in tourism.

A memorandum of understanding (MoU) has been signed between the Union Tourism Ministry and ESOI to develop policy guidelines, code of conduct, ethical practices for sustainable tourism, spread awareness and educate tourism service providers as well as local government officials on the need to ensure sustainable tourism practices.

In July 2010 the Ministry of Tourism, Government of India, convened a National Workshop on Sustainable Tourism Criteria for India and based on the recommendations a sub-committee chaired by the Joint Secretary (Tourism), Government of India, and comprising expert stakeholders was constituted in 2010 for defining Sustainable Tourism Criteria for India (STCI) and indicators.

The tourism sector's capability as a sustainable and inclusive development driver, especially for livelihoods, was renewed with the 10th Five Year Plan, the National Tourism Policy, the global Incredible India campaign and the Millennium Development Goals. The Planning Commission, in the Approach Paper to the 12th Five Year Plan, mentioned that Tourism and Hospitality Sector has a key role to play in promoting faster, sustainable and more inclusive economic growth.

According to industry experts at the Worldwide Hospitality and tourism Themes (WHATT), sustainable tourism is to be placed at the center of development so that rural tourism and culture can thrive and a proper balance can be maintained between development and preservation of the natural environment. To achieve this the Ministry of Tourism sanctioned US\$ 142 million to States and Union Territories for developing and promoting tourism destinations, Fairs and Festivals, Natural and Rural Tourism during FY 2014-15. Consultants were appointed by the Government of India to carry out feasibility studies of various projects like theme parks, infrastructure projects and entertainment related projects which are intended to attract and boost tourism in the country so as to create memorable experiences as we are at present in the experience economy. Private players are encouraged to participate in these projects along with the government under the PPP mode. For example the Government of Goa has invited private players under the PPP mode to invest in projects like the ropeway across the Mandovi river, an Oceanarium at Miramar Beach and a golf course at Tiracole.

One of the primary functions of the Government is to enhance Sustainable Tourism and to create an environment that enables or influences the private sector to operate more sustainably, and influence patterns of visitor flows and behaviour so as to optimize the impact of tourism. Positive intervention by the Government, is thus necessary, going beyond providing an enabling environment. As per the 12th Five Year Plan investments in the tourism sector were expected to be US\$ 12.4 billion of which, private investments were likely to total US\$ 9.2 billion.

In addition to the above The Department of Tourism along with the Education Department has endeavored to instill in the minds of the young feelings of sustainability by incorporating topics in the school and college curricula. There are topics on sustainable tourism too and Training of Trainers for Sustainable Tourism through institutional arrangements has been carried out.

Recognizing the importance of tourism in general, the Government of India launched a number of branding and marketing initiatives such as Incredible India! , Athiti Devo Bhava , M visa, Tourist Visa on Arrival, five-year tax holiday for 2, 3 and 4 star category hotels located around UNESCO World Heritage sites (except Delhi and Mumbai) and 100 % FDI through the automatic route to provide a focused impetus to growth. In the last two years, the Ministry of Tourism has undertaken several initiatives to provide a further boost to the sector such as launch of new schemes like Swadesh Darshan and PRASAD revamping of existing schemes such as Hunar se Rozgar tak, extending e-Tourist Visas to more countries, developing a Mobile Application for Tourists, introducing an Incredible India Tourist Helpline, and undertaking various skill development initiatives such as setting up of Indian Culinary Institute, approval of new Institutes of Hotel Management.

CONCLUSION

Ecotourism emphasizes the careful selection of recreation sites, nature-loving cultivation, respect for local residents' life and culture, and the sharing of benefits with local residents. It promotes sustainable use of biodiversity, provides jobs to local populations, respects local culture, focuses on socially responsible travel, personal growth, environmental sustainability and informed consent and participation of local communities in the management of ecotourism enterprises.

In short, ecotourism stresses not only on service quality but on experience and education, thereby enabling consumers to enjoy the positive emotions through recreational experiences. India has taken a lead in this field. Tourism experiences across the country now provide quality time visits for participatory settings, where the takeaway includes the enduring way of life, art, culture and heritage that are community-owned, culturally expressive and environmentally sustainable. India has always been a land dedicated to worship of nature, conservation of ethics, customs, traditions, beliefs; coupled with rich cultural and natural heritage. Advancement in transportation and information technology has given an impetus to eco tourism as tourists are able to explore more and more remote areas and experience and interact with nature and locals without any or least damage to the eco systems by focusing on sustainability, experiencing a sense of education, fun and being one with nature and thereby fighting against the ill effects of urbanization and commercialization.

Ecotourism is an instigator of change which will build new relationships between people and environment, and between people with different lifestyles. Ecotourism may be viewed as an intervention in the tourism industry as an attempt to modify its mode of operation for reasons not entirely commercial but with motives like spirit of enquiry, search for knowledge, peace, escapism, social, sustainability and respect for nature. Hence the ecotourism industry should strengthen the experience environment by creating

diverse ecotourism experiences through experiential marketing by staging and providing unique facilities and related services along with different kinds of leisure facilities so as to reinforce and promote the tourists' recognition and behavior intentions for ecotourism as was done successfully in Taiwan.

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ELECTRIC AND HYBRID VEHICLES: ROAD TO SUSTAINABILITY IN AUTOMOBILE SECTOR

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ABSTRACT

Automobile industry is one of the most important economic sectors around the world today; it is rightly been called as “the industry of industries” by Peter Drucker. It is the most versatile industry and one can always hear about something or the other happening in the technical and commercial front of the sector. The automobile industry is constantly evolving and adapting to consumer demands; automakers are striving to fulfil the three basic requirements of the customers today i.e. efficiency, security and affordability.

However one cannot overlook the negative contribution of the sector to the environment. Vehicular pollution is one of the biggest contributors to the global warming and other health related issues. The main pollutants emitted from the automobiles are hydrocarbons, lead/benzene, carbon monoxide, Sulphur dioxide, nitrogen dioxide and particulate matter.

The automobile industry not only includes production but the ancillary industries and designing, marketing and selling of the automobiles. All inclusive, the sector is the biggest source of pollution to the environment. Thus it is relevant to generate ideas for sustainability in the sector and study the feasibility of the same. The automobile sector like many other sectors is gradually but promptly shifting its focus to one of the most essential topic of “sustainability”.

The following research paper focusses on one of the emerging areas of sustainability in the automotive sector i.e., the evolution, growth and future prospects of electric and hybrid vehicles segment. The progress in the EV segment is fast and positive with certain points of discussion like sustainability of power generation for fueling the EVs.

Keywords: *electric, battery, efficiency, sustainability*

The key to control negative impact of climate change lies in improved technology. We need to find new ways to produce and use energy, meet our food needs, transport ourselves, and heat and cool our homes that will allow us to cut back on oil, gas, coal, nitrogen-based fertilizer, and other sources of the climate-changing greenhouse gases. Sustainability in automobile sector is the call of the hour and more and more companies are consciously getting involved in ensuring their contribution to the same. One of the biggest contributors to the sustainability is introduction of electric and hybrid cars which are gradually replacing the conventional combustion engines.

An electric car is an automobile that is propelled by one or more electric motors, using electrical energy stored in rechargeable batteries or another energy storage device. They are around three times as efficient as cars with an internal combustion engine.

With their immense potential for increasing the country's energy security, economic vitality, and quality of life, plug-in electric vehicles (PEVs) including plug-in hybrid electric and all-electric vehicles will play a key role in the country's transportation future. In fact, transitioning to a mix of plug-in electric and low-carbon fuels and electricity could reduce greenhouse gas emissions by more than 80 percent and petroleum use almost entirely.

By 2030, nearly 40% of all new cars hitting the country's roads will be electric vehicles; this prediction is in line with the government's vision to turn India into a 100% electric vehicle nation by 2030. India unveiled 'National Electric Mobility Mission Plan (NEMMP) 2020' in 2013 to address the issues of National energy security, vehicular pollution and growth of domestic manufacturing capabilities.

EVOLUTION OF ELECTRIC CAR

It's hard to pinpoint the invention of the electric car to one inventor or country. Instead it was a series of breakthroughs from the battery to the electric motor in the 1800s that led to the first electric vehicle on the road.

In the early part of the century, innovators in Hungary, the Netherlands and the United States including a blacksmith from Vermont began toying with the concept of a battery-powered vehicle and created some of the first small-scale electric cars. And while Robert Anderson, a British inventor, developed the first crude electric carriage around this same time, it wasn't until the second half of the 19th century that French and English inventors built some of the first practical electric cars. In the U.S. the first successful electric car made its debut around 1890, William Morrison, a chemist who lived in Des Moines, Iowa. His six-passenger vehicle capable of a top speed of 14 miles per hour was little more than an electrified wagon, but it helped spark interest in electric vehicles. Over the next few years, electric vehicles from different automakers began popping up across the U.S. New York City even had a fleet of more than 60 electric taxis. By 1900, electric cars were at their heyday, accounting for around a third of all vehicles on the road. During the next 10 years, they continued to show strong sales.

While all the starts and stops of the electric vehicle industry in the second half of the 20th century helped show the world the promise of the technology, the true revival of the electric vehicle didn't happen until around the start of the 21st century. Depending on whom you ask, it was one of two events that sparked the interest we see today in electric vehicles.

INTRODUCTION OF HYBRID VEHICLES AND TESLA MOTORS

The first turning point many have suggested was the introduction of the first hybrid car - Toyota Prius. Released in Japan in 1997, the Prius became the world's first mass-produced hybrid electric vehicle. In 2000, the Prius was released worldwide, and it became an instant success with celebrities, helping to raise the profile of the car. To make the Prius a reality, Toyota used a nickel metal hydride battery -- a technology that was supported by the Energy Department's research. Since then, rising gasoline prices and growing concern about carbon pollution have helped make the Prius the best-selling hybrid worldwide during the past decade.

(Historical footnote: Before the Prius could be introduced in the U.S., Honda released the Insight hybrid in 1999, making it the first hybrid sold in the U.S. since the early 1900s.)

The other event that helped reshape electric vehicles was the announcement in 2006 that a small Silicon Valley startup, Tesla Motors, would start producing a luxury electric sports car that could go more than 200 miles on a single charge. In 2010, Tesla received at \$465 million loan from the Department of Energy's Loan Programs Office -- a loan that Tesla repaid a full nine years early -- to establish a manufacturing facility in California. In the short time since then, Tesla has won world-wide acclaim for its cars and has become the largest auto industry employer in California.

Tesla's announcement and subsequent success spurred many big automakers to accelerate work on their own electric vehicles. In late 2010, the Chevy Volt and the Nissan LEAF were released in the U.S. market. The first commercially available plug-in hybrid, the Volt has a gasoline engine that supplements its electric drive once the battery is depleted, allowing consumers to drive on electric for most trips and gasoline to extend the vehicle's range. In comparison, the LEAF is an all-electric vehicle (often called a battery-electric vehicle, an electric vehicle or just an EV for short), meaning it is only powered by an electric motor.

TYPES OF ELECTRIC VEHICLES

There are three types of electric vehicles, and while each has advantages and disadvantages, they all save on fuel and emit fewer greenhouse gases than vehicles that burn fuel only. They also all recharge their batteries through regenerative braking. In this process, the vehicle's electric motor assists in slowing the vehicle and recovers some of the energy normally converted to heat by the brakes.

Three Types of Electric Vehicles:

1. **BEV** - Battery Electric Vehicle
2. **PHEV and HEVs** – (Plug-In) Hybrid Electric Vehicle
3. **FCEV** – Fuel-cell Electric Vehicle
Battery Electric Vehicle (BEV)

A BEV runs entirely on a battery and electric drive train, without an internal combustion engine. It is powered by electricity from an external source, usually the public power grid. This electricity is stored in onboard batteries that turn the vehicle's wheels using one or more electric motors. The initial purchase price is significantly higher than similar gas-powered vehicles though lot of money can be saved on fuel and maintenance costs.

Plug-in Hybrid Electric Vehicle (PHEV)

A PHEV runs mostly on a battery that is recharged by plugging into the power grid. It is also equipped with an internal combustion engine, running on gasoline or diesel fuel, that can recharge the battery and/or to replace the electric drive train when the battery is low and more power is required. The original purchase price is comparable to similar vehicles operating on internal combustion alone. PHEVs have an advantage over BEVs because consumers are already comfortable with petrol or diesel-fueled vehicles. Since PHEV batteries are smaller than BEV batteries, charging time is less.

Hybrid Electric Vehicle (HEV)

An HEV has two complementary drive systems - a gasoline engine and fuel tank, and an electric motor, battery and controls. The engine and the motor can simultaneously turn the transmission, which powers the wheels. Where the HEV differs from the above two types of electric vehicles (BEV and PHEV) is that HEVs cannot be recharged from the power grid. Their energy comes entirely from gasoline and regenerative braking. The original purchase price is comparable to similar vehicles operating on internal combustion alone. HEVs have an advantage over BEVs because consumers are already comfortable with gas- or diesel-fueled vehicles.

ELECTRIC VEHICLES MOTOR TYPES:

AC Motors

Virtually all of the EV's and hybrids in the market use AC motors. Alternating-Current motors are better for continuous power (hills). Starting power is slower, but the motor can run at high RPMs without overheating. Because they can run at high RPMs they do not require a transmission. They can also move a heavier vehicle.

AC motors are best suited to the regenerative braking systems featured in both EVs and hybrids. Regenerative braking, which returns braking power to the battery, combined with superior efficiency make for better fuel economy. Generally speaking, AC motors run more smoothly and can be precisely controlled. For these reasons, production model electric cars and hybrids use AC motors.

AC motors are more expensive than DC Motors and so are the battery packs. They are also more complicated to control. Because battery output is DC, they require a converter which takes up a lot of space.

DC Motors

DC motors are more affordable and easier to control. They also have greater initial torque and higher peak power, so they are popular with racers. A major disadvantage of DC motors is a tendency to overheat. They also become very large and heavy according to their power output.

AC conversion kits are now available and will become more popular for conversions. However, there are a wide variety of DC motor designs which may improve for EV application.

Electric vehicle battery types

Three types of batteries are found in electric cars:

Lead-acid batteries

- Oldest type of rechargeable battery.
- Cheap to produce and compatible with existing electronics.
- Messy, toxic and prone to explosion.

Lithium ion batteries [Li-ion]

- High energy-to-mass ratio (which means less weight per unit of stored energy).
- They retain their stored energy when not in use but lose capacity with age.
- Considered to have the most potential for mass-market EVs but the most advanced models are too expensive.
- Li-ion batteries are toxic and require special handling to recycle.

Nickel metal hydride [NiMH]

- Good energy-to-mass ratio (a.k.a. energy density).
- Non-toxic which makes for easy recycling.
- The major disadvantage to nickel metal hydride batteries is that they don't hold a charge very well when they aren't being used.

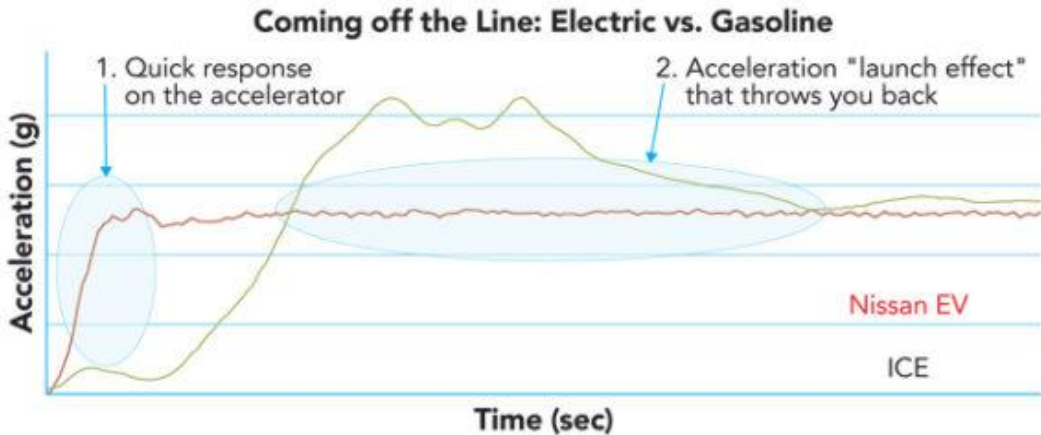
Batteries are the greatest obstacle to the proliferation of EVs. Electric cars require a lot of batteries which must be installed in an array and housed in a battery pack. These batteries are heavy (the Tesla Roadster's battery pack weighs 1,000 lbs) and take up a lot of cubic centimeters. Then there is the simple fact that batteries run out of power and must be recharged. However, if the gas stations are replaced with charging stations there's going to be a parking problem because batteries take a long time to recharge.

The problems with battery technology explain why there is so much excitement around fuel cells. Compared to batteries, fuel cells will be smaller, much lighter and instantly rechargeable.

ADVANTAGES OF AN ELECTRIC CAR

- 1. Electric vehicles are inherently more efficient at turning energy into miles driven:**

Most people do not realize this, but electric drivetrains are *much* more efficient than internal combustion engine (ICE) drivetrains (about 75% vs 25%, in fact). ICE drivetrains are inefficient for many reasons, including heat losses and inertial losses of various kinds, but ICE's are also thermodynamic systems with efficiencies limited by the heat cycle they operate under. Engineers have done amazing work in improving the efficiency of gas-powered cars, but they are up against fundamental limits. In contrast, a Nissan Leaf or a Chevy Volt can go about 40 miles on 11 Kilowatt-hours (KWH) of electricity, the energy equivalent of a third of a gallon of gasoline.



2. Electric vehicles are greener than gasoline-powered cars:

EVs emit no tailpipe pollutants, although the power plant producing the electricity may emit them. Electricity from nuclear, hydro, solar, or wind-powered plants causes no air pollutants.

Research has shown that most of a vehicle's carbon production comes during operation rather than production, and electric vehicles that consume only a third as much energy in operation are inherently greener no matter what fuel is used to generate the electricity they use. And electric vehicles powered by electricity from hydro, solar, wind, or nuclear sources produce no carbon in operation.

3. Electric vehicles can be powered by electricity produced from multiple energy sources:

Electricity can come from wind, solar, hydro, nuclear, biofuel, and fossil fuel sources including natural gas, oil, and coal. So electric vehicles have the potential to support economy and reduce our dependence on imported oil.

4. Popularity:

EV's are growing in popularity. With popularity comes all new types of cars being put on the market that are each unique, providing you with a wealth of choices moving forward.

5. Safe to Drive:

Electric cars undergo same crash-test procedures as other fuel powered cars. In case an accident occurs, one can expect airbags to open up and electricity supply to cut from battery. This can prevent you and other passengers in the car from serious injuries.

6. Cost Effective:

Earlier, owing an electric car would cost a bomb. But with more technological advancements, both cost and maintenance have gone down. The mass production of batteries and available tax incentives has further brought down the cost, thus, making it much more cost effective.

7. Low Maintenance:

Electric cars run on electrically powered engines and hence there is no need to lubricate the engines. Other expensive engine work is a thing of past. Therefore, the maintenance cost of these cars has come down. You don't need to send it to service station often as you do a normal gasoline powered car.

8. Reduced Noise Pollution:

Electric cars put curb on noise pollution as they are much quieter. Electric motors are capable of providing smooth drive with higher acceleration over longer distances.

DISADVANTAGES OF AN ELECTRIC CAR**1. Recharge Points:**

Electric fueling stations are still in the development stages. Not a lot of places you go to on a daily basis will have electric fueling stations for your vehicle, meaning that if you're on a long trip and run out of a charge, you may be stuck where you are.

2. Electricity isn't Free:

Electric cars can also be a hassle on your energy bill if you're not considering the options carefully. If you haven't done your research into the electric car you want to purchase, then you may be making an unwise investment. Sometimes electric cars require a huge charge in order to function properly – which may reflect poorly on your electricity bill each month.

3. Short Driving Range and Speed:

Range is typically limited to 60 to 120 miles on a full charge although a few models can go 200 to 300 miles. Electric cars are limited by range and speed. You just can't use them for long journeys as of now, although it is improved in Tesla Model X & S

4. Longer Recharge Time:

While it takes couple of minutes to fuel your gasoline powered car, an electric car take about 4-6 hours to get fully charged. Therefore, you need dedicated power stations as the time taken to recharge them is quite long. Even a "fast charge" to 80% capacity can take 30 min.

5. Silence as Disadvantage:

Silence can be a bit disadvantage as people like to hear noise if they are coming from a shorter distance. An electric car is however silent and can lead to accidents in some cases.

6. Normally 2 Seaters:

Most of the electric cars available today are small and 2 seated only. They are not meant for entire family and a third person can make journey for other two passengers bit uncomfortable. Here again Tesla Model X & S has improvised and seating capacity is increased to up to 7 passengers.

7. Battery Replacement:

Depending on the type and usage of battery, batteries of almost all electric cars are required to be changed every 3-10 years. The large battery packs are expensive and may need to be replaced one or more times. Battery packs are heavy and take up considerable space.

8. Not Suitable for Cities Facing Shortage of Power:

As electric cars need power to charge up, cities already facing acute power shortage are not suitable for electric cars. The consumption of more power would hamper their daily power needs.

9. Some governments do not provide money saving initiatives in order to encourage you to buy an electric car.

10. Some base models of electric cars are still very expensive because of how new they are and the technology it took to develop them.

EVOLUTION AND GROWTH OF EV IN INDIA

The stock of the plug-in electric cars in the country climbed from 530 units in 2009 to over 3,100 in 2013, and as of December 2015, there were over 6,000 plug-in electric cars registered in India, consisting of 4,350 all-electric cars and 1,660 plug-in hybrids. Sales of electric vehicles in India grew by 37.5% to 22,000 units in the year ended 31 March 2016, according to industry lobby group Society of Manufacturers of Electric Vehicles (SMEV).

The Mahindra Reva e2o electric car was introduced in India in March 2013. It operates on lithium ion battery with 100 km range for 4 hours of charging. In addition to this, there are several other companies involved in making electric bikes like Hero and Ampere.

In 2016, a new car, the Mahindra e-Verito, was launched by Mahindra introducing the sedan class electric vehicle at a cost of 9 to 10 lakh Indian rupees ex showroom.

NEMMP 2020 target: 2W - 5 million vehicles, 3W - 30,000, 4W - 1 million vehicles, LCV - 50,000, Buses - 30,000 = Total 6 to 7 million vehicles

List of electric vehicle manufacturers in India/ manufacturers of electric vehicles:**Fully electric cars:**

- Mahindra e2oPlus
- Mahindra e-Verito.

Hybrid Cars

- Toyota Prius, Price Range: Rs. 38.10 lakh - Rs. 39.80 lakh
- Toyota Camry Hybrid
- BMW i8
- Mahindra Scorpio Micro Hybrid
- Maruti Suzuki Ciaz Diesel SHVS
- Maruti Suzuki Ertiga Diesel SHVS

Motorcycles and Scooters

- Tunwal E Vehicles private limited
- LOHIA AUTO INDUSTRIES
- Heroelectric
- BPG
- Bsa motors
- TVS
- EKO
- Okinawa Autotech Pvt. Ltd.

Bicycles

- Hulikkal Electro India Pvt Ltd
- Ampere Vehicles
- BSA Motors
- EBike India
- Electrotherm

Buses

Electric Buses in Bangalore by BMTTC

India's first electric bus was launched in Bangalore in 2014.

Ashok Leyland

Tata Motors has launched its pure electric bus 'Starbus Electric 9m' and hybrid 'StarBus Electric 12m' in Jan 2017 at indicative price range of Rs.1.6 crores & Rs.2 crores

Mini pickup trucks

- Mahindra
- Tata Motors, Ace Electric in 2016
- Ashok Leyland, Dost Electric pickup truck

Heavy duty trucks, semi-trailer and tractor trucks

There are no known cases of manufacturing and use of electric heavy duty trucks, semi-trailers or tractor trucks in India.

Rickshaws

Electric auto rickshaw in Siliguri

A Motor Vehicles (Amendment) Bill was passed by the Parliament in 2015, which established battery-powered e-rickshaws as a valid form of commercial transport in India.^[19] With their small size and small turning radius, E-rickshaw is already a popular mode of transport in Delhi-NCR, particularly in small lanes and congested areas.

Railways

Indian Railways has a long history of electric locomotives. Metro, Delhi, & Chennai Suburban Railway powered by electricity, is the latest and most successful public transport system in India.

LIMITATIONS OF ELECTRIC VEHICLES IN INDIA:**1. Infrastructural issues:**

India lacks charging stations which are necessary for EV industry to grow. According to Central Electricity Authority, India is still facing a deficit of 1.6 per cent in power production. The problem is even more acute in tier-2 cities and remote parts of the country. This further limits the market for EVs in India. According to ministry of power, there has been 19.18 percent growth in power generation in the country in fiscal 2016.

2. Initial cost:

Current EVs sell at higher prices compared to the conventional petrol and diesel vehicles. This is in itself a big challenge for the industry, especially in a price-sensitive market like India. One of the ways this can be tackled is by granting subsidies to lower down the production cost of EVs and boost the sector.

3. Limited options:

The variety of electric vehicles is still limited. The options further narrow down when you look for EV options keeping a budget in mind.

4. Limitations of EVs:

With top speed of 70 miles per hour, electric vehicles are a poor bet for highway driving. Further, a complete battery recharge takes up to eight hours.

Although EVs are classified as green cars, but disposing of large lithium batteries, fitted inside the cars, can be an environmental hazard.

5. Awareness:

The major impediment to the growth of EV industry in India is the lack of awareness towards electric vehicles in India.

GOVERNMENT OF INDIA INITIATIVES TO PROMOTE ELECTRIC VEHICLES: Government of India has notified FAME India Scheme [Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India] for implementation with

effect from 1st April 2015, with the objective to support hybrid/electric vehicles market development and Manufacturing eco-system. The scheme has 4 focus areas i.e. Technology development, Demand Creation, Pilot Projects and Charging Infrastructure. The phase-I of the scheme is being implemented for a period of 2 years i.e. FY 2015-16 and FY 2016-17 commencing from 1st April 2015.

The FAME India Scheme is aimed at incentivizing all vehicle segments i.e. 2 Wheeler, 3 Wheeler Auto, Passenger 4 Wheeler Vehicle, Light Commercial Vehicles and Buses. The scheme covers Hybrid & Electric technologies like Mild Hybrid, Strong Hybrid, and Plug in Hybrid & Battery Electric Vehicles.

During the Financial Year 2015-16, an amount of Rs. 75 Crore was allocated for this scheme, which was almost fully utilized. In the current financial year 2016-17, Rs. 91 Crore (approx.) has already been utilized out of the budget allocation of Rs. 122.90 Crore. FAME got an allocation of Rs 175 crore for FY-18

Under this scheme, about 99000 hybrid/electric vehicles (xEVs) have been given direct support by way of demand incentives since the launch on 1st April 2015. Department has also approved pilot projects, charging infrastructure projects and technological development projects aggregating to nearly Rs. 155 Crores.

UPCOMING ELECTRIC VEHICLE POLICY BY DECEMBER

The government will be ready with its electric vehicle policy by December covering both light and heavy vehicles like cars and buses. Many Indian firms are showing interest in investing in electric vehicles and supporting infrastructure. The Orange City, Nagpur has become India's first city to have electric mass mobility system. It will soon have a fleet of 200 electric vehicles including taxis, buses, e-rickshaw and auto rickshaws, all of which will be fully owned by cab aggregator Ola.

The government's electric vehicle push has been gaining momentum in recent months. Government think tank NITI Aayog released a report recommending fiscal incentives to electric vehicle manufacturers and discouraging privately-owned petrol- and diesel-fueled vehicles. NITI Aayog, along with Colorado-based Rocky Mountain Institute, in the report suggested setting up "a manufacturer consortium for batteries, common components, and platforms to develop battery cell technologies and packs and to procure common components for Indian original equipment manufacturers." The report said that adoption of electric and shared vehicles could help country save \$60 billion in diesel and petrol along with cutting down as much as 1 gigatonne (GT) of carbon emissions by 2030.

CONCLUSION

The future of automobile industry driven towards electric vehicles looks very bright. As mentioned earlier the areas of prime importance of the customers these days is efficiency, security and affordability and for that electric vehicle is the appropriate answer. The USP

of the vehicle is alternate fuel (battery) and negligible amount of emissions. It's hard to tell where the future will take electric vehicles, but it's clear they hold a lot of potential for creating a more sustainable future. Many automakers are trying their hand in the attractive segment and coming up with their models in the segment with better efficiency. Government too realizing the benefits attached is encouraging the R&D in the sector. EVs currently represent a relatively small proportion of total vehicles on the road and are perhaps viewed as being relatively boring and underpowered. However, with the advent of new models like the stunning Tesla 3, which is due to be unveiled at the end of July and the amazing BMW i8, which is due to be unveiled in 2018, EVs are now turning heads and demand is set to increase exponentially. We are indeed on the verge of an EV motoring revolution. However, a solid framework and incentive package needs to be in place to woo present and new manufacturers to invest in sub Rs 1 million hybrid/ electric car productions where larger volumes can be expected.

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ENVIRONMENTAL IMPACTS OF SYNTHETIC PESTICIDES AND DEPLOYMENT OF BIO-PESTICIDES TOWARDS SUSTAINABLE DEVELOPMENT

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ABSTRACT

Water in its natural form occurs rarely in nature and is commonly found to contain wide variety of constituents. Growing urbanization, changing food habits, exploding population, are just some of the contributing factors responsible for increase in demand of food commodities leading to the more use of pesticides and fertilizers. Water quality is a growing concern throughout the developing world. Drinking water sources are under increasing threat from Pesticides contamination, with far-reaching consequences for the health of children and for the economic and social development of communities and nations. The present paper has detailed out the aspects of water contamination with pesticides, its regulation and method for removal of pollutants for sustainable development. The paper also focuses on the alternative use of Bio-pesticides.

Keywords : *Pesticides, bio-pesticides, guideline values for drinking water, Consumption of Pesticides, Sustainable Development*

INTRODUCTION

Most of us depend on surface water to fulfill our needs, but groundwater in renewable and non-renewable aquifers directly supplies drinking water to about 1.5 billion people. Freshwater systems provide goods and services valued at trillions of dollars per year, but their ability to maintain high quality and quantity is strained. Increased demands from industrial production and agriculture are the primary causes. Agriculture alone uses roughly 70% of all the water humans withdraw and is one of the heaviest polluters. Forests and grasslands filter and purify water, but in many of these ecosystems a significant amount of their original vegetative cover, essential for water filtration, has already been lost.

Humans withdraw about 4,000 cubic kilometers (km³) of water per year from global freshwater sources. Scientists estimate that the amount of runoff (the renewable supply of water that flows through rivers after evaporation and percolation) totals between 39,500 and 42,700 km³ per year. But only about 9,000 km³ is readily available to use; another 3,500 km³ is stored in reservoirs. Many rivers, lakes, and aquifers are so polluted, that

they are unfit for drinking, further reducing the amount of available water for humans and other species. Worldwide the quality of freshwater systems has worsened due to large urban existence of industrial areas and intensive agriculture practices. In the developing world, water-borne diseases from faecal contamination of surface waters continue to be a major cause of sickness and death. In agriculture the use of fertilizers and pesticides is causing the nitrate and pesticides pollution in surface and groundwater.

CONSUMPTION AND PRODUCTION OF PESTICIDES IN INDIA

Although the mechanical, biological and environment methods of pest control are extremely useful, the role of chemicals in pest control is of great concern to environmental scientist. Some of the chemicals, used as pesticides have a high acute toxicity to a wide range of animals, including man, others while not so acutely toxic, are very resistant to degradation in the environment and may accumulate in man and other animals. Pesticide industry has started in India in 1952 with the setting up of a plant at Rishra near Calcutta for HCH. It was followed by the setting up of two more units in the public sector by Hindustan Insecticides Ltd. for manufacturing DDT. Indian pesticide industry produces 81,803 Metric Tonnes of pesticides annually, and is the largest in Asia and ranks twelfth in the world.

The use of pesticides was initiated just to reduce the pest attack and control diseases on the crops, for increasing the crop yield. However, indiscriminate and excessive application of synthetic pesticides has damaged not only the environment and agriculture but also has entered into food chain thereby affecting human health and development. The application of pesticides in India has increased as much as 30 times over fifty years from merely 2350 tonnes to around 60,000 tonnes per year between 1959 and 2000 (Fig 1 and 2). In India the total production of pesticides was 81,803 tonnes in the year 2001-2002, which includes consumption of 40% organochlorines, 30% organophosphates, 15% carbamates, 10% synthetic pyrethroids and the remaining 5% others (Fig 3). Organochlorine group of pesticides is the most persisting among the chemicals in use. Although there are alternatives to the organochlorine group but due to no appropriate and alternative framework on usage of these chemicals, the magnitude of pesticides problem would go further and there is need to generate detailed literature on the environment and health dimensions for this aspect. Growing urbanization, changing food habits, exploding population, are just some of the contributing factors responsible for increase in demand of food commodities leading to the more use of pesticides and fertilizers. 186 pesticides are registered for use in India under section 9(3) of Insecticides Act, 1968 (National Centre for Integrated Pest Management). About 13.8 million people living in Delhi receive drinking water from surface water sources. Surface water is vulnerable to contamination by pesticides because they may receive run-off directly from agricultural fields, urban areas and often from areas that typically receive pesticide applications. In

order to adequately compute exposure levels of the general population to pesticides, it is necessary to obtain the information on pesticides concentrations in drinking water. Fig 4 indicates the levels of Organochlorine pesticides in urban water sources in India.

The pesticide characteristics of most concern for water quality monitoring, water treatment, resource management and associated health risks are toxicity, extent of usage, solubility in water, persistence in the environment, potential for biomagnification and the sensitive method of detection. Each of these aspects are required to be studied before evaluating their impact on environment. Any suggestion for the alternative to existing water treatment practices due to pesticides contamination and guideline values with respect to drinking water supplies is subject to these issues. In the present paper the endeavours are deployed for studying the extent of pesticide contamination in water supplies and their related health impacts in Indian context. The presence of these pesticides beyond certain limits are cause of concern for the human beings. The table below gives the WHO guideline values for pesticides in drinking water.

Table 1. : WHO guideline values for chemicals of health significance in drinking water pesticides (WHO, 2011)

Pesticides	Guideline Values	Remarks
<i>Alachlor</i>	20 ^a	
Aldicarb	10	
Aldrin/dieldrin	0.03	
Atrazine and its chloro-s-triazine metabolites	100	
Carbofuran	7	
<i>Chlordane</i>	0.2	
<i>Chlorotoluron</i>	30	
<i>Chlorpyrifos</i>	30	
<i>DDT and its metabolites</i>	1	
1,2-dibromo-3-chloropropane	1 ^b	For excess risk of 10 ⁻⁵
2,4-D	30	
1,2-dichloropropene	20(P)	
1,3-dichloropropene	20 ^b	For excess risk of 10 ⁻⁵
Endrin	0.6	
Isoproturon	9	
Lindane	2	
MCPA	2	
Methoxychlor	20	

Metolachlor	10	
Molinate	6	
Pendimethalin	20	
Simazine	2	
Trifluralin	20	
Chlorophenoxy herbicides other than 2,4-D and MCPA		
2,4-DB	90	
Dichlorprop	100	
Fenoprop	9	
Mecoprop	10	
2,4,5-T	9	

^a(P) — Provisional guideline value.

^b For substances that are considered to be carcinogenic

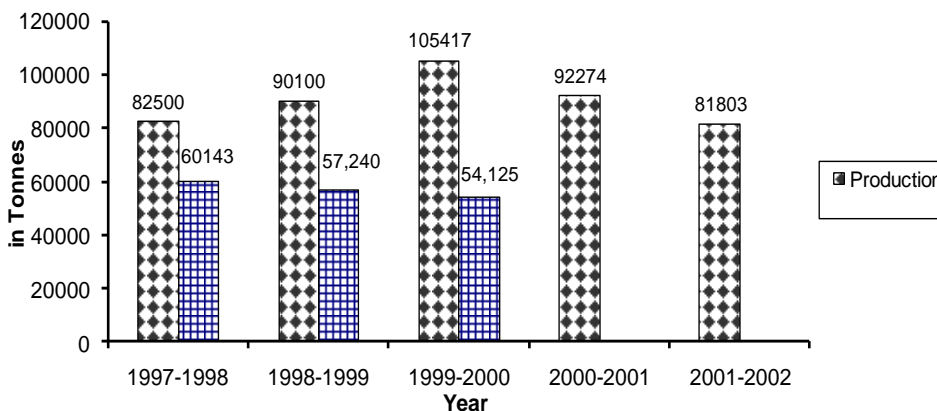


Fig 1: Annual Production and Consumption of Pesticides in India

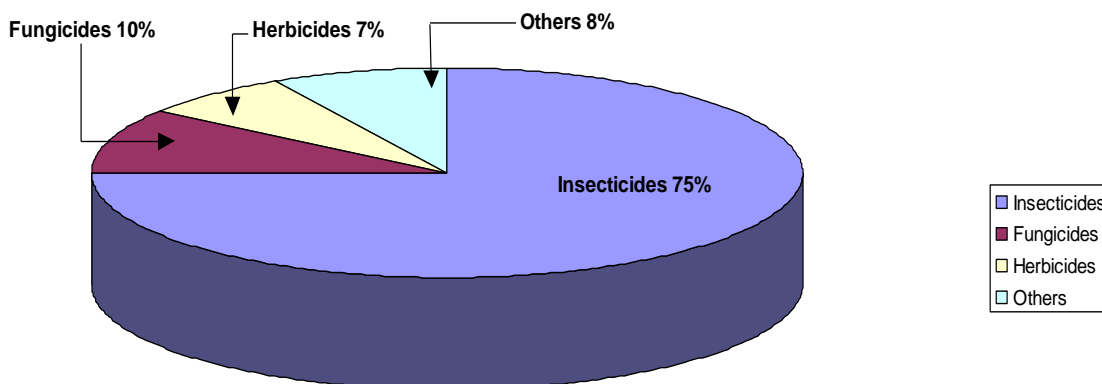


Fig 2: Consumption Pattern of Pesticides in India

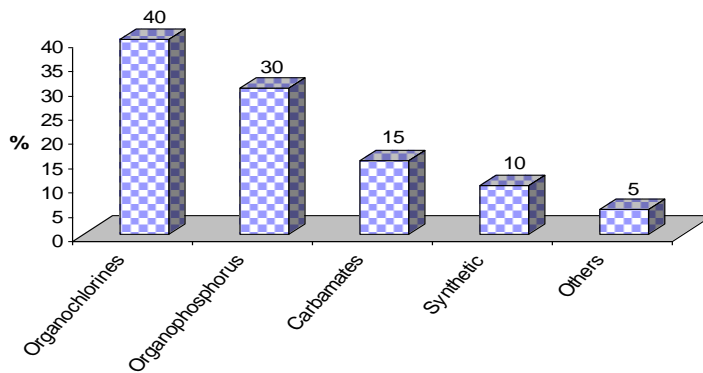


Fig 3: Consumption Pattern of Insecticides in India

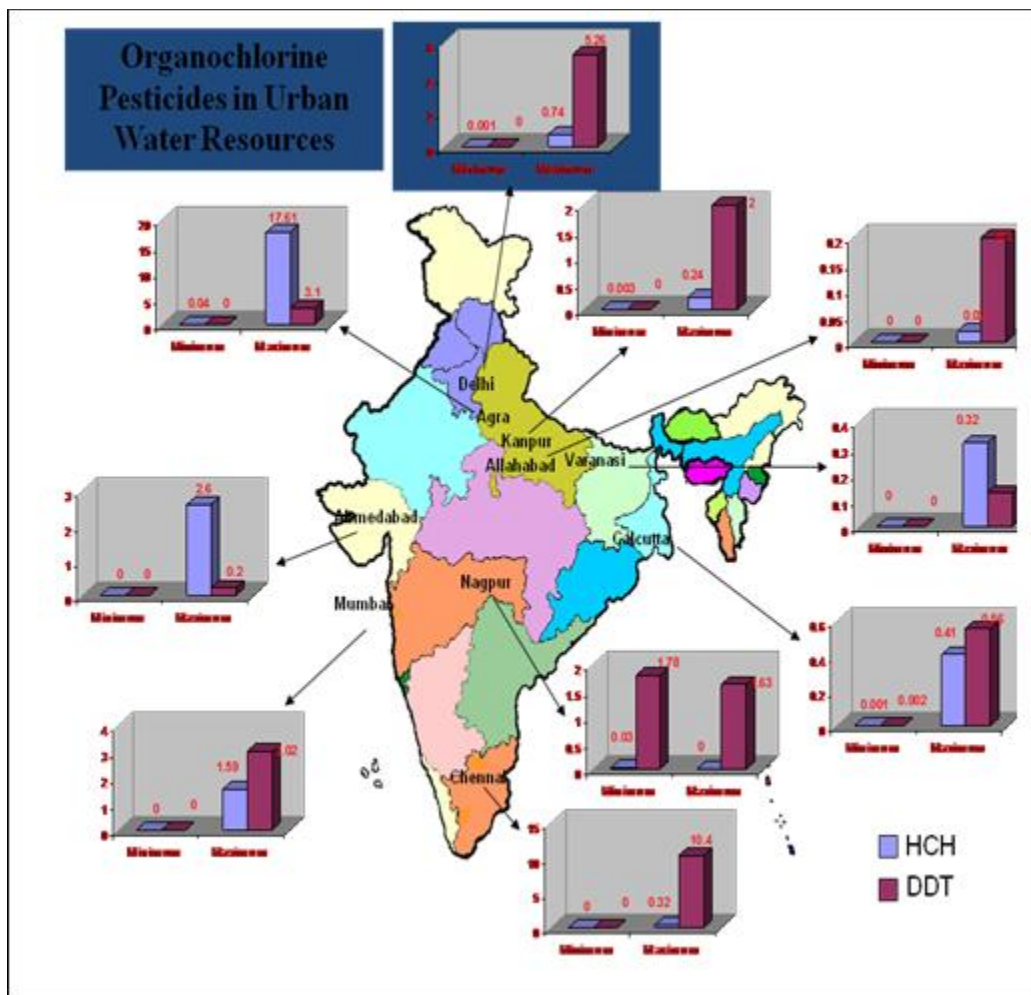


Fig 4. Organochlorine Pesticides in Urban Water Sources

Table 2 : Insecticides Registered under Insecticides Act, 1968 in India

Sl. No.	Name of Insecticide	Sl. No.	Name of Insecticide
1	Acephate	73	Iprodione
2	Alachlor	74	Isoproturon
3	Aldicarb	75	Kitazin
4	Allethrin	76	Lime Sulphur
5	Alphanaphthyl Acetic Acid	77	Lindane(Gamma BHC)
6	Aluminium Phosphide	78	Malathion
7	Anilophos	79	Maleic Hydrazide(MH)
8	Atrazine	80	Mancozeb
9	Alphacypermethrin	81	Menazon
10	Aureofungin	82	Metaldehyde
11	Barium Carbonate	83	Methabenzthiazuron
12	Benzene Hexachloride(BHC)	84	Methoxy Ethyl Mercury Chloride(MEMC)
13	Benthiocarb(Thiobencarb)	85	Methyl Bromide
14	Benomyl	86	Methyl Bromide + Ethylenedibromide(1:1 & 3:1)
15	Bitertanol	87	Methyl Chlorphenoxy Acetic Acid(MCPA)
16	Bromadiolone	88	Metalaxyl
17	Butachlor	89	Metoxuron
18	Calcium Cyanide	90	Methomyl
19	Captafol	91	Metribuzin
20	Captan	92	Metolachlor
21	Cartap Hydrochloride	93	Monocrotophos
22	Carbaryl	94	Mono Sodium Methane Arsonate (MSMA)
23	Carbendazim	95	Myclobutanil
24	Carbofuran	96	Methyl Parathion
25	Carboxin	97	Nickel Chloride
26	Chlorbenzilate	98	Nicotine Sulphate**
27	Chlorfenvinphos	99	Oxadiazon
28	Chlormequat Chloride(CCC)	100	Oxyacboxin
29	Chlorothalonil	101	Oxydemeton-Methyl

30	Chlorpyrifos	102	Oxyflourfen
31	Copper Oxychloride	124	Para Dichlorobenzene
32	Copper Sulphate	125	Paris Green(Copper Acetoarsenite)
33	Coumachlor	126	Paraquat Dichloride
34	Coumatetralyl	127	Pendimethalin
35	Cuprous Oxide	128	Permethrin
36	Cypermethrin	129	Phenthoate
Sl. No.	Name of Insecticide		Name of Insecticide
37	Cyfluthrin	130	Phenyl Mercury Acetate (PMA)**
38	Dalapon	131	Phorate
39	Decamethrin/Deltamethrin	132	Phosalone
40	Dichlorodiphenyltrichloroethane(DDT)	133	Phosphamidon
41	Dichloropropane And Dichloropropenes Mixture (DD Mixture)	134	Pirimiphos-Methyl
42	Dichlorovos (DDVP)	135	Profenophos
43	Dicofol	136	Propanil
44	Diflubenzuron	137	Propetamphos
45	Dimethoate	138	Propoxur
46	Dinocap	139	Pyrethrum
47	Dioxathion	140	Quinnalphos
48	Diuron	141	Sevido(4:Carbaryl and Gamma HCH)
49	Dodine	142	Simazine
50	Diazinon	143	Sirmate
51	Dieldrin	144	Sodium Cyanide
52	2,4-Dichlorophenoxy Acetic Acid(2,4-D,Sodium Amine and Ester Salts)	145	Streptomycin
53	Ethylene Dibromide	146	Sulphur
54	Edifenphos-Carbon Tetrachloride Mixture(EDCT Mixture 3:1)	147	Temephos

55	Endosulphan	148	Trichloro Acetic Acid(TCA)
56	Ethofenprox/Etofenprox	149	Triallate
57	Ethepon	150	Trichlorphon
58	Ethylene Dibromide(EDB)	151	Tricyclazole
59	Ethyl Mercury Chloride	152	Tridemorph
60	Ethion	153	Trifluralin
61	Fenitrothion	154	Thiometon
62	Fenarimol	155	Thiram
63	Fenobucarb(EPMC)	156	Thiophanate Methyl
64	Fenthion	157	Triazophos
65	Fenvalerate	158	Triadimefon
66	Ferbam	159	Warfarin
67	Fluchloralin	160	Zinc Phosphide
68	Fluvalinate	161	Zineb
69	Formothion	162	Ziram
70	Fosetyl-AI	163	Hexaconazole
71	Gibberellic Acid	164	Pretilachlor
72	Glyphosate	165	Propiconazole

**** for export only**

HEALTH EFFECTS OF PESTICIDES

The uncontrolled use of organic chemicals over the past 50 years has led to the contamination of many of our hydrologic systems. Pesticide contamination of ground water is an issue of national importance because ground water is used for drinking purposes by about 50% of the population. The increasing awareness among public for pesticide contamination in drinking water led to the development of method to assess their presence and their removal. The health effects associated with the pesticides found in the water are different and depends upon the exposure whether it is acute or chronic (Table 3). Acute exposure causes diarrhea, nausea, vomiting, abdominal pain, profuse salivation and sweating, blurred vision, skin and eye irritation, upper respiratory tract distress, edema of the lungs, acute gastro-intestinal distress, headache, dizziness, drowsiness and seizure. The effects of long-term exposure to low levels are much harder to define. However, growth depressions in laboratory animal, liver and lung cancer in human as well as other types of cancer, genetic mutation and fetal deformities have been associated with the chronic exposure. The detection depends on the duration of exposure to the chemical, and how quickly the compound is metabolized and excreted from the body.

Table 3 : Brief Symptoms of Pesticide Poisoning

Category	System Affected	Common Symptoms
Respiratory	Nose, trachea, lungs	Irritation, tight chest, coughing, choking
Gastrointestinal	Stomach, intestine	Nausea, vomiting, diarrhoea
Renal	Kidney	Back pain, urinating more or less than usual
Neurological	Brain, spinal cord	Headache, dizziness, confusion, behavior, depression, coma, convulsions
Hematological	Blood	Anemia (tiredness, weakness)
Dermatological	Skin, eyes	Rashes, itching, redness, swelling
Reproductive	Ovaries, testis, fetus	Infertility, miscarriage

PESTICIDES IN POTABLE WATER : DEVELOPMENT OF A REMOVAL PROCESS

Attention has been focused on ways of preventing pesticides contamination into the water, and to determine what levels of pesticides are acceptable in water supplies. The guidelines have been proposed by BIS for drinking water, their aims is to keep pesticides at levels below for those that are considered to cause any health effects in humans. These are derived based on laboratory data using methods, depending on whether or not the compound causes cancer or other toxic effects.

Based on the laboratory scale study, a process was worked out for the removal of specific group of pesticides in water (Thacker N.P. et al., 2002). The study involved evaluating efficacy of granular activated carbon (GAC) for removal of commonly encountered organochlorine pesticides from potable water. The optimal doses of GAC in Continuously Stirred Tank Reactor (CSTR) and Fixed Bed Reactor (FBR) systems have been found to be 0.9 and 0.6 gL⁻¹ respectively at 5-12 µgL⁻¹ levels of α -HCH, p,p'-DDT, and p,p'-DDE present in potable water. A design package has been developed for a continuous type pesticide removal treatment unit, which would serve a small community (population of 1000). Assuming water consumption of 40 lpcd, the capital cost and recurring cost/month in deploying a unit consisting of activated carbon bed has been worked out. A refill type pesticide removal unit attachable to the consumer's tap has also been developed. The system filled with GAC will be suitable for removal of α -HCH,

DDT and DDE at concentrations levels below $5.0 \mu\text{gL}^{-1}$. The unit is capable of treating two cubic meters of water with 60-90 percent removal of pesticides, 99 percent reduction in TOC and 100 percent removal of faecal coliforms.

PESTICIDES EFFECTIVENESS AND PERSISTENCE

In the last few decades, there has been an increasing global concern on the toxicological consequences of chemical pesticides. The severity of pesticide pollution in aquatic system depends on the characteristics of the particular chemical used as pesticides e.g: synthetic and naturally occurring pesticides. Many of the synthetic pesticides are persistent and leave considerable residue in the soil or the atmosphere and from there they are readily transferred into the aquatic systems. An alternative to the synthetic pesticides are bio-pesticides. Bio-pesticides are biodegradable but because of its short persistence, its effectiveness is limited. Pesticides have entered the natural food chains contaminating all strata of the ecosystem. Humans, being on the top of the food chain, are most vulnerable to health risks as the intake of pesticides is several-fold higher through the process of bio-magnification in the food chain. Over reliance on synthetic pesticides is the root cause of the problem of environmental contamination in India. Although the average pesticide use of 0.57 kg/hectare in India is low compared to the 2.5 to 3.0 kg/hectare used in USA and Europe. Indians show the highest level of DDT in their bodies. This is due to the non-judicious use and over-use of pesticides. The data from International Development Research Centre, Canada shows that every year about 10,000 people die and another 40,000 suffer from various effects of pesticide poisoning in developing countries. India accounts for one third of pesticide poisoning cases in the third world. Farm workers are the worst affected. Cases of blindness, cancer, premature delivery, abortions, diseases of the liver and nervous systems have been identified in Andhra Pradesh and Maharashtra. The alarming rise of pesticide poisoning is attributed to increasing number of toxic chemicals and their large scale use. Thus there is a need to find suitable alternative for these synthetic pesticides. Studies have shown that eco-friendly Neem -based bio-pesticides are the best alternatives to synthetic pesticides.

BIO-PESTICIDES

Rotenone, nicotine, pyrethrum and neem are examples of biopesticides. Just because the materials are natural, however, doesn't mean they are always less toxic than the synthetics. Nicotine sulfate has been used since the turn of the century and is the most hazardous bio-pesticide available to home gardeners. Highly toxic to humans and other warm blooded animals, nicotine sulfate is rapidly absorbed through the skin. It is six times more toxic than diazinon, a widely available synthetic insecticide sold for control of many of the same pests. Substituting crude neem extracts for expensive chemical

controls saves both money and lives. The neem tree, a plant used cosmetically and medicinally by many cultures for centuries, now appears to offer an environmentally safe alternative to synthetic pesticides as well. Neem is non-toxic to animals or people. Areas sprayed with neem are not poisonous areas. Neem is also a natural, biodegradable product. Several chemicals have been isolated from neem extract, including azadirachtin, nimbin, salannin, epoxyazadiradione, and deacetylsalannin. Azadirachtin, $C_{35}H_{44}O_{16}$, is the most useful from an agricultural standpoint.

Neem is native to India and significantly contributes to the forest cover of the northern areas. All parts of this plant show an array of negative effects on insects including ovipositor deterrent, anti-feedant, and other inhibitory activities (Veitch et al, 2007; Sanderson 2007). More than 100 compounds have been isolated from various parts of the neem tree 345 and most of the active principles (Limnoids) belong to the group of tetranortriterpinoids especially 'Azadirachtin' and its analogs. Farmers have traditionally used various components of the neem tree such as oil extracted from the seed, neem cake, (the residue left after pressing the oil) and the leaves as well as the wood. Farmers in India use neem cake as an organic manure and soil amendment. It is believed to enhance the efficiency of nitrogen fertilizers by reducing the rate of nitrification and to inhibit soil pests including nematodes, fungi, and insects (Gupta, 1993). Neem leaves and small twigs are also used as mulch and green manure. Neem leaves and neem oil have also been used traditionally to protect stored grains and legumes. Neem leaves are mixed with the grain in storage or the grain is stored in jute bags treated with neem oil or other neem extracts. These methods can protect food and seed stores from insect pests for several months. Another traditional agricultural practice involves the production of "neem tea." The seeds are dried, crushed and soaked in water overnight to produce a liquid pesticide that can be applied directly to crops.

Azadirachtin

Azadirachtin is structurally similar to insect hormones called ecdysones, which are steroids that interfere with molting (the periodic shedding and secretion of a new exoskeleton) and metamorphosis. This mode of action is different from that of most pesticides available in the market, which act by interfering with the insect's central nervous system. Additionally, azadirachtin has been found to deter insects from feeding on plant material, thus qualifying it as an antifeedant.

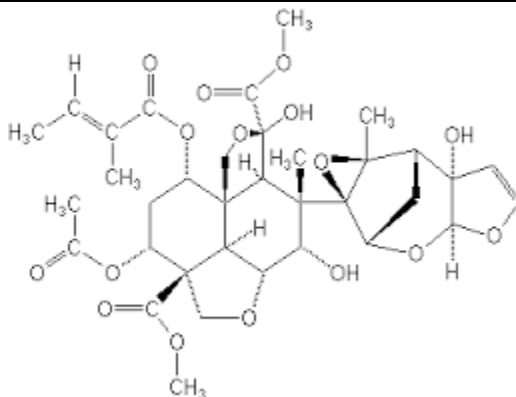


Fig. Structure of Azadirachtin

Initially found to be active as a feeding inhibitor towards the desert locust (*Schistocerca gregaria*), (Butterworth and Morgan, 1968) it is now known to affect over 200 species of insects, by acting mainly as an antifeedant and growth disruptor, and as such it possesses considerable toxicity toward insects LD₅₀ (*S. littoralis*): 15 µg/g. Azadirachtin fulfills many of the criteria needed for a good insecticide. Azadirachtin is biodegradable (it degrades within 100 hours when exposed to light and water) and shows very low toxicity to mammals (the LD₅₀ in rats is > 3,540 mg/kg making it practically non-toxic).

NEEM OIL AS AN FUNGICIDES

Neem provides plants and animals with protection from many types of fungi (Murthy and Sirsi, 1958b); (Bhowmick, 1982); (Schmutterer and Ascher, 1987). In several tests, spraying neem oil on plants prevented the outbreak of powdery mildew better than popular commercial products. It seems to work best as a preventive rather than a cure once the fungus has become established. Neem leaf extracts have also been proven effective against one of the world's most dangerous substances: aflatoxin (Bhatnagar and Zeringue, 1993). Produced by the *Aspergillus flavus* species of mold, aflatoxin is common to grains and nuts (like wheat and peanuts). Only 5 ppb (parts per billion) are allowed in food products sold in the U.S. due to its highly carcinogenic nature. Neem leaf extracts sprayed on the grain inhibited the mold from producing the aflatoxins, a finding which could help ensure safer foods and a larger food supply.

CONCLUSION

Though biopesticides are the alternatives for synthetic pesticides, synthetic pesticides are used on a larger scale. The plethora of knowledge on water pollution and regulations for drinking water will bring environmental awareness among the consumers and the institutions who are regulating the water treatment plants and supplies. Each and every pesticide for which the quality standards are set are required to be controlled because of

their potential danger to the health and well being of the community. There is a need of expansion of existing chemical testing facility in the water quality laboratory to cover all the health related constituents. The water quality laboratory attached with the water treatment facility, public health institutions and at other related food processing and beverage industries in the country are required to be strengthened in this respect. Gadgets attachable to the domestic supply and technology for the large scale water treatment plants should be developed, made available for the existing aspects of water contaminants

A nodal centre should be set up and entrusted with planning and implementing research on environmental protection from pesticides. Pesticide registration should be made very stringent. The pesticide industry, which is the main polluter, should be taxed or should pay for developing decontamination techniques. Monitoring of pesticides in food commodities and drinking water should be done regularly. Tolerance limit for pesticides should be re-evaluated and made lower in comparison with the existing ones. Studies on the health effects of pesticides as well as epidemiological studies should be conducted to further minimize the intake of pesticide. Integrated pest control measures, organic farming and use of biopesticides eg. neem should be promoted and subsidies and markets should be created. A national programme to create mass awareness on synthetic and bio-pesticides, to monitor pesticide residues and to assess their environmental impact, need to be launched and sustained.

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GREEN ECONOMY: A SUSTAINABLE TOOL FOR ACHIEVING SUSTAINABLE DEVELOPMENT IN INDIA

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ABSTRACT

India is the seventh largest country by area, the second most populous country with over 1.2 billion people. It is one of the fastest growing major economies. But today, there are many environmental problems and issues in India. Therefore, there is the need for using alternative model of development known as green economy. Green Economy is a development strategy which harmonises both economic development and ecological sustainability. Adopting the multi-dimensional Green concept is going to have ripple effects on employment, trade, agriculture, domestic industries, business pattern, which, accordingly, require extensive fiscal reforms, vigilance on changing international trade relations and trade patterns, skill development, indigenous research and development for resource efficiency, political stewardship, public awareness, etc. Judicious inclusion of sustainability factor into the ongoing economic decisions for boosting infrastructure and manufacturing can set things rolling for putting the Indian economy on the Green Economy path.

Keywords: *Green economy, ecological sustainability, economic development, climate change*

INTRODUCTION

Sustainability of economic growth in a finite resource environment has long been questioned and acknowledged as a complex issue. Complexity arises because of potential nonlinearities in the relationships among economic and ecological variables. Rate of depletion of resources over the years becomes faster than the regeneration and thereafter the economy runs the risk of lesser resources, raising the cost of extraction and pushing the economy towards its limits to growth. Such severe resource depletion and ultimate resource exhaustion consequently lead to economic contraction or sustained economic depression. The slow feedback from decline in non-renewable natural resources to the production of goods in the economy hides the perils of unsustainable economic practice. Therefore, proactive economic policies maintaining a sustainable stock of resources are needed and Green economy comes into the picture.

Green Economy is defined as one that results in improved human well-being and social equity, while significantly reducing environmental risk and ecological scarcities. On the

other hand, green economy implies that a substantial part of the economy is earned from the green industry which entails the production and marketing of floriculture and environmental horticulture crops. It includes greenhouse and field grown flowers and foliage plants, landscape plants, bulbs and turf grass production. The green economy is an economy that pursues growth while also promoting sustainable development through efficient use of resources. It implies an increasing use of agricultural practices that will increase farm productivity and income. A green economy can be thought of as an alternate vision for growth and development; one that can generate growth and improvement in people's lives in ways consistent with sustainable development. Critically the green economy is more than merely "greening" economic sectors; it is a means of achieving sustainable development imperatives of; improving human well-being, securing better healthcare system, education and job security increasing social equity; ending persistent poverty and ensuring social, economic and financial inclusion educating environmental risks; addressing climate changes, ocean acidification, the release of hazardous chemicals and pollutants; and reducing ecological scarcities, securing access to fresh water, natural resources and improving soil fertility.

It is based on a set of transformative actions - ambitious and far reaching. The transition to a Green Economy in the context of sustainable development must be underpinned by an ethical framework of shared values and principles that extend beyond the traditional technology-based economic system. The new concept of Green Economy is neither to replace the holistic and inclusive idea of Sustainable Development, nor can it be considered independent of that guiding principle, rather the Green Economy needs to be understood as a means to the end of achieving the goals and principles that have been set out within the concept of Sustainable Development.

OBJECTIVES OF THE PAPER

The major objectives of the present research study are as follows.

1. To study the issues relating to the green economy;
2. To study the extent of a green economy achieved by the India;
3. To give suggestions for attaining green economy in India

RESEARCH PROBLEM

In a green economy, growth in income and employment should be driven by public and private investments, that reduce carbon emissions and pollution, enhance energy and resource efficiency and prevent the loss of biodiversity and ecosystem services. The green economy approach is an effort to focus sustainable development and poverty reduction effort on transforming economic activities and economies.

India can make green growth a reality by putting in place strategies to reduce environmental degradation at the minimal cost of 0.02% to 0.04% of average annual GDP growth rate. According to a New World Bank Report, 2013, this will allow India to

maintain a high pace of economic growth without jeopardizing future environmental sustainability. The annual cost of environmental degradation in India, amounts to about Rs. 3.75 trillion (\$ 80 billion) equivalent to 5.7% of GDP. It focuses on particle pollution from the burning of fossil fuels, which has serious health consequences amounting to up to 3% of India's GDP along with losses due to lack of access to clean water supply, sanitation and hygiene and natural resource depletion. Further a significant portion of diseases caused by poor water supply, sanitation and hygiene is borne by children under 5. Above 23% of child mortality in the country could be attributed to environmental degradation. Green growth is measurable and important as India is a hotspot of unique biodiversity and ecosystems. The present study tries to examine the state consisting of nature and extent of the green economy with reference to India through empirical analysis by using appropriate indicators of green economy.

RESEARCH METHODOLOGY

The present work depends on the secondary data provided by World Bank, India statistical reports, books, magazines etc. This study considers the appropriate indicators of environment, human well-being and social equity relating to a green economy of India. This research study highlights three principal areas of a green economy and their indicators and the key challenges to developing a framework for metrics for a green economy.

Indicators of Economic Transformation

A green economy is first and foremost about transforming the way economies grow currently. Growth is typically generated from investments in high emission, heavily polluting, waste generating, resource intensive and ecosystem damaging activities. A green economy requires investment to shift towards low carbon, clean energy, waste minimizing, resource efficient and ecosystem enhancing activities. The key indicators of economic transformation, therefore, include the shift in investment over time, the consequent growth of environment friendly or environmentally enhancing goods and services and related jobs.

Indicators of Resource Efficiency

Principal indicators of this area include those on the use of materials, energy, water, land, changes to ecosystems, generation of waste and emissions of hazardous substances related to economic activities.

Indicators of Progress and Well-being

A green economy can contribute to societal progress and human well-being in two ways is, Firstly, by redirecting investments towards green goods and services and secondly by redirecting investments towards the strengthening of human and social capital. Some of the indicators of progress and well-being area include the extent to which basic human needs are fulfilled, the level of education achieved, health status of the population.

Issues on Green Economy

Generally, developing economies like India should be concerned that despite its good intentions as a policy instrument for sustainable development and poverty reduction; the “green economy” concept may be misused or taken out of context. There is growing concern about green economy in the country on account of the burgeoning population with rising poverty and increasing risk of food insecurity and environmental degradation. However, its promotion may give rise to unhelpful or negative developments and these must be avoided. Some of the concerns are

One dimensional approach in which the “green economy” is defined or operationalised in a one dimensional manner and promoted in a purely “environmental” manner (without considering fully the development and equity dimensions of sustainable development) and without consideration of the international dimension, especially its negative effects on developing countries. Thus, there is the concern that if the green economy concept gains prominence, while the sustainable development concept recedes, there may be a loss of the use of the holistic sustainable development approach,

“One size fits all” approach in which all countries are treated in the same manner. This would lead to failures either for environment, development or both. The levels and stages of development of countries must be fully considered, and the priorities and conditions of developing countries taken into account. India as a developing country continues to support the view that the principle of common but differentiated responsibility should be respected and operationalised. Thus in considering various principles, policies and targets of green economy, adequate flexibilities and special treatment should be provided for developing countries, such as exemptions, allowance for more lenient obligations and the provision of finance, technology and capacity building.

Environmental standards constitute another area of risk to green economy concept as developing countries are concerned that the adoption of environmental standards for products may mean that if they are unable to meet the standards, they face the prospect of losing their exports. Unless developing countries are provided with resources and technology for upgrading their environmental technology and standards, they will continue to be penalized. Developing countries need to be fully involved in negotiating and setting international environmental standards and be assisted to comply with them so as to make the green economy concept acceptable.

The treatment of subsidies is also another area of concern. Many developing countries are concerned that some developed countries have been providing their companies with major subsidies for the research and development (R&D) of environmentally sound technologies. This puts developing countries at a disadvantage, especially since they lack the financial resources to match the developed countries’ subsidies. Given this unfair imbalance in subsidies, the developing countries and their firms would be in an even

worse competitive situation if they have to lower their tariffs on environmental products. Overall, there is a major concern that the “green economy” may be used as new conditionality on developing countries for aids, loans and debt relief. This may pressurize affected developing countries to take on one dimensional environmental measures rather than sustainable development policies that take economic and social development and equity goals into account. There is also the believe that the “green economy” concept has the potential to drive sustainable development, but that in order for it to be meaningful and relevant to developing economies that are faced with the challenge of overcoming poverty, the concept must be guided by and enshrined with a number of principles.

ENVIRONMENTAL ISSUES IN INDIA

The environmental issues in India become more serious every day like that lack of environmental education, falling fertility of agricultural land, declining water level in earth, mass deforestation, land degradation, excess use of fertilizers and chemical in food production and river contamination and pollution. a true about India, ours whopping 65 percent of the land is degraded in some way like nature or size and the infinite government policies do little to curb the damage. In reality, there is no shortage at all of government legislation protecting the environment and other resources but sorry to say that it is never enforced due to flagrant abuse of power, corruption, lack of resources, lengthy process of policy preparation and its implementation. We discussed here, some essential burning issues exist in Indian economy and whether or environment.

First, Drought is very dangerous calamity stood in front of India because most of area covered by natural calamity of drought due to inadequate or lack of access to vital fresh water resources to common people of country. Furthermore Indian economy in large scale depends on agriculture and allied sector. Therefore, economy is directly influenced by impact of drought. Similarly, our 67 per cent agriculture land directly depends on rainfall or monsoon. Consequently, one of the most important proverbs has applied to Indian agriculture, “Indian Agriculture is gamble on monsoon”.

Second, Deforestation is one of the important issue exist in India in the form of over-grazing, indiscriminate falling of forest tree and over exploitation of land resources. The devastating effects of deforestation in India take account of soil, water and wind erosions, estimated to cost over 16,400 crores every year. Deforestation and over-grazing have been causing tremendous land erosion and landslides. On an average India is losing about 6,000 million ton of top soil annually due to water erosion in the absence of trees.

Third point concern to air quality, due to the bad air quality. Air pollution is the fifth leading cause of death in India after high blood pressure, indoor air pollution, tobacco smoking and poor nutrition, with about 620,000 premature deaths occurring from air

pollution-related diseases. Like China, India faces an unprecedented public health crisis due to air pollution.

DATA ANALYSIS

Indicators of resource Efficiency

- In India the renewable electricity generation status has been good, even their compound growth rate was at positive 7 per cent and averagely generated 124 Billion Kilowatt Hours. The renewable electricity generation compared with growing population then we come over the growth of renewable electricity is higher than growth of Indian Population therefore; per capita electricity has been showing a continuous increase. It increased from 77 Khr in 2000 to 140 Khr in 2015 due to technological and industrial development in India. Averagely, 108 Khr per capita renewable energy has increased. But only at 5 per cent compound growth rate is found in respect to per capita renewable electricity generation in India.

In conclusion, performance of renewable electricity generation of India has been improving year by year. For that, we should hard work for increasing share of renewable energy in total electricity generation in India.

- In the Modernization, energy plays most important role in inclusive and sustainable development of around the world of humans. Energy concept prepared or framed from various sources of primary energy like Coal, petroleum, and natural gas are fossil fuels, and also non-renewable resources. Under the principal area of resource efficiency; these primary natural resources should be used perfectly or fully without waste of any part of respective source of energy. Today these energy resources have been depleting fast to meet the requirements of industry and transportation. That means, we may come over the conclusion of those countries has been using higher natural resources of energy, those gone on top of economic, social and cultural development. Vice-versa those countries has used less energy compared to developed countries like USA, Australia, Norway etc. realized less development and achieved low growth. Therefore, conventional sources of energy cannot be neglected, it is imperative to develop programmes in the area of renewable sources, as they not only help conserve scarce conventional sources of energy but contribute immensely to a forestation, improvement of the environment, employment generation, upgradation of health and hygiene, social and women's welfare, provision of water for agriculture and drinking, and bio-fertilizer production.
- In 2000, annual per capita energy use was 438kg, then after the 2001 gradually rate of per capita energy use has been growing up to present year 2016. In the present, availability of energy is 679Kg per capita. Conclusion of this description is that compound growth of annual availability of energy in India during the study period is at positive 3 per cent and average availability of energy in India is 543 Kg per capita.

Variation is also normally seen at 16 per cent (C.V) during study period. Ultimately, per capita energy has been steadily rising at 3% CGR. This is very positive thing for developing India to acquire sustainability in economic development and growth.

- Agriculture has been backbone of Indian Economy because before the independence period and after the two decades of independence, share of agriculture sector in total GDP was above 60 percent. Similarly, share of agriculture in total merchandise exports also essential for improving the balance of trade. Therefore, this study is important for critical analysis of role agriculture in not only merchandise exports but also economic and social development. Beside, agriculture is purely pollution free and hazardless occupation. Resulting, it has been giving important contribution in attaining green growth and green economy objectives. In respect to India, since long period; India has been exporting agricultural raw material to European countries.
- Here, we analyze the performance of agriculture sector, in 2000, out of total 1.26 percent share was in total merchandise export. But excepting some years, in 2010-11, 2013-14 & 2015-16 share of agriculture raw material export in total export has risen.

INDICATORS OF PROGRESS AND WELL-BEING

- Healthy and Long life can be obtained through green and sustainable development of around the respective area of human society. For example, people of Norway, Australia and Netherland have long life comparative to India. Therefore, we may come over to conclusion of getting the long life to citizen of respective country is best indicator of physical development of green economy. In 2000, life expectancy was 62 years of Indian people then it has been gradually increased up to 67 in 2015-16.
- Total Health Expenditure (Private + Public)
Physical and Mental oriented Labour's work efficiency ultimately depend on their body fitness and good health because if, labours neither physically fit nor healthy for work, result will show that not only micro level but also macro level production would decline. Moreover, many researches has demonstrated that more significant relationship between labour health and industrial production level, income level, standard of living of labour of respective firm and concluding, overall growth has been depending on health condition of respective firm, industry, or country. Therefore, study of health or expenditure on them; should be important for accounting the green performance of respective area.

In 2000, government had expended at 4.31 percent share of total expenditure. But this percentage share slowly declined up to 2006 and speedily declination of expenditure on health, in 2015-16, government spent only 3.67 percentage share on Indian health service out of total expenditure.

CONCLUSIONS

The thorough discussion of some indicators from their principal area of green economy with reference to India reveals that some indicators show positive trend useful for green economy except the indicator health. This adequately proves that India had adopted the strategy of green economy; hence it is endeavoring in that direction. But there is urgent need to improve the health sector and its positive results. The necessary provision for health in government budget with honesty and rigorous in spending and implementation will help us a lot.

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GREEN MARKETING IN INDIA: MAKING A FRESH START**Ms. Pooja Darda**

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ABSTRACT

Green Marketing is the path toward making things and benefits and lifting them to satisfy the customers who lean toward aftereffects of good quality, execution and convenience at direct cost, which meanwhile don't inconveniently influence nature. It incorporates a wide scope of exercises like item adjustment, changing the creation procedure, altered publicizing, change in bundling and so forth went for decreasing the impeding effect of items and their utilization and transfer on the earth. Organizations everywhere throughout the world are endeavoring to diminish the effect of items and administrations on the atmosphere and other natural parameters. It concentrates on offering items and administrations in view of their natural advantages. The Companies have begun all the more ecofriendly benefits for the buyers alongside numerous condition benefits

Hence this paper includes the thoughts related to Green Marketing, why Green is basic, why associations dispatch Green Products, who are stressed over nature can be influenced and reinforce their gaining decisions. The paper researches the challenges and openings associations have with green advertising. The paper additionally portray the motivation behind why organizations are receiving it and infers that green advertising is something that will consistently develop in both practice and request The paper introduces a theoretical system of Green Marketing in India. It clarifies the different open doors and obstructions for green advertising.

Keywords: *Green Marketing, Globalization, Sustainability, Green Product, Recyclable, Environmentally safe, Eco Friendly, Environmental Marketing, Green promoting*

INTRODUCTION

As indicated by the American Marketing Association, green advertising is the promoting of items that are dared to be ecologically protected. In this manner green showcasing joins an expansive scope of exercises, including item alteration, changes to the creation procedure, bundling changes, and additionally adjusting promoting. Green advertising alludes to the way toward offering items as well as administrations in light of their natural advantages. Such an item or administration might be naturally amicable in itself or delivered in an ecologically cordial way. The green improvement has been expanding rapidly on the planet. As to this buyers are accepting obligation and doing the right

things. Consumer mindfulness and inspiration keep on driving change in the commercial center, strikingly through the presentation of all the more ecofriendly items

OBJECTIVES OF THE STUDY

1. To examination the essential ideas and thoughts behind green showcasing
2. To examination the significance of green advertising.
3. To distinguish the difficulties related with various parts of green advertising in the present situation
4. To talk about the requirement for Green showcasing in India from alternate points of view.

EVOLUTION OF GREEN MARKETING

The term Green Marketing came in the late 1980s and mid-1990s, began in Europe in the mid-1980s when certain things were seen to be ruinous to nature and Society generally. In this manner new sorts of items were made, called "Green item" that would make less mischief the earth. The reasons for the common advancement can be taken after back to different parts of the world all through history. Green showcasing was given predominance after the procedures of the principal workshop on Ecological promoting held in Austin, Texas (US), in 1975. The workshop discharged the primary book on green showcasing entitled "Environmental Marketing". Several books on green promoting started to be distributed from that point. The turning points for wave of green showcasing came as distributed books, both of which were called Green Marketing. They were by Ken Peattie (1992) in the United Kingdom and by Jacquelyn Ottman (1993) in the United States of America. As indicated by Peattie (2001), the development of green showcasing can be isolated into three stages; First stage was named as "Natural" green advertising, to help tackle the Environment issues through cures.

Second stage was "Natural" Green Marketing with concentrate on clean innovation that included outlining of creative new items, when deal with contamination and waste issues. Third stage was "Reasonable" where it ends up plainly basic for organizations to deliver condition well disposed items as the mindfulness for such items in on the ascent as clients are requesting Eco-accommodating items and advancements. It became a force to be reckoned with in the late 1990s and mid 2000

WHAT IS GREEN MARKETING

"The all-encompassing administration process in charge of distinguishing, suspecting and fulfilling the necessities of clients and society, in a beneficial and maintainable way (Peattie, 1995)". Green advertising comprises of all exercises intended to create and encourage any trades expected to fulfill human needs or needs, to such an extent that the fulfillment of these requirements and needs happens, with insignificant hindering effect on the indigenous habitat. It is sorry to learn, a larger piece of individuals trust that green showcasing alludes exclusively to the Advancement or publicizing of items with

ecological attributes. Terms like Phosphate Free, Recyclable, Refillable, Ozone Friendly, and Environmentally Friendly are a portion of the things shoppers frequently connect with green promoting. While these terms are green advertising claims, by and large green showcasing is a considerably more extensive. Idea, one that can be connected to purchaser products, mechanical merchandise and even administrations.

OBJECTIVE OF GREEN MARKETING

- Dispose of the idea of waste.
- Reinvent the idea of product.
- Influence costs to reflect genuine and ecological expenses.
- Make environmentalism productive.
- Bringing out product modifications.
- Changing in production processes
- Packaging changes.
- Modifying advertising

GREEN MARKETING MIX FOR COMPANIES

GREEN PRODUCT

Green items are "those that utilization recyclable materials, insignificant wastage, and lessen the utilization of water, spare vitality, have negligible bundling, and transmit less lethal substances." characterized by Nimse8

Basically communicated, these things should benefit the earth and not hurt it .In looking at the supportability of an item. Items with earth dependable bundling. McDonalds, for example, changed their bundling from polystyrene clamshells to paper.

Green Products save water, essentialness and money and in addition constrain the ominous effect on condition. For example, Air Jordan shoes made by Nike as it has diminished the usage of ruinous glue bonds fundamentally. Nike has promoted this variety of shoes by underscoring that it has diminished wastage and used condition very much arranged materials.

The desirable products are the ones having one of the following characteristics:-

- Items produced using reused products, e.g., reused paper. For example, Quik N Tuff lodging materials produced using reused broccoli boxes.
- Products that can be reused
- Products which spare water, vitality or oil and which have less damage to environment.
- Products with environmental friendly packaging, e.g., McDonald's packaging with degradable paper. McDonalds, for example, changed their packaging from polystyrene clamshells to paper
- Products are organic in nature

- A service that rents or loans products – such as toy libraries.
- Certified items, which meet or surpass ecologically mindful criteria.
- Whatever the item or administration, it is fundamental to guarantee that items meet or surpass the quality

GREEN PRICING

Cost is an essential piece of the green marketing mix . Green Pricing considers the overall public, planet and advantage in such a way it ensure the productivity what's all the more, less or no hazardous to the earth Green thing offerings are all around on the superb side of the esteeming continuum. This circumstance can be credited to the higher valued crude materials being utilized as a part of the item or higher work costs being caused in the fabricate of the item. This makes a value hole between winning items and those that are maintainable, which is frequently alluded to as the 'Green evaluating hole'. What is essential to incite customers to buy and use greener things is – to show to them a couple of preferences which can be gotten from their usage – like they can save money by using imperativeness compelling lighting or by driving a mutt or electric auto they can save their fuel charge, sparing cash on their influence charge by using sunlight based fueled controlled machines, et cetera—which will go far in lessening this hole. Earth mindful items, in any case, are frequently more affordable when item life cycle costs are contemplated.

GREEN PLACE

Green Place includes exercises identified with dealing with company's request chain by observing and enhancing natural execution. Associations have begun putting their exertion incorporating working with their channel accomplices to get reusable or expendable crude material so as to hone Green Marketing Mix – Place.

GREEN PROMOTION

Green Promotion are powerful devices to advance items, administrations, thoughts and associations' endeavors to indicate concern and their drives to secure and safeguard the earth

It is similarly an instrument used by the associations to share and enlighten the part that the associations moreover particularly influence with the overall issues, parallel with awareness appeared by the social requests.

Keen green advertisers will have the capacity to strengthen natural believability by utilizing feasible showcasing and specialized apparatuses and practices. For instance, many organizations in the monetary business are giving electronic explanations by email, e-marketing is quickly supplanting more customary promoting techniques, and pieces of literature can be delivered utilizing reused materials and productive procedures, for example, waterless printing.

In any case, they should tread painstakingly while embracing different green advancement strategies as though any false claims are influenced it to can have antagonistic impact for the association. Lately, Nike made a novel endeavor by making a 100% reused TV notice as a major aspect of their "Better World" battle utilizing film from prior.

WHAT ARE GREEN COMPANIES?

Firms adding to assurance of condition through Biodiversity, making condition agreeable things, conservation of imperativeness, water and trademark resources, climate security, support of schools, lanes, parks, giving help to upliftment of the nation section and the underprivileged, and whatnot so forward.

The Common Characteristics of Green Companies are :-

- Use combustible gas for evaporator fuel.
- Recycle biodegradable waste.
- Minimum use of plastic material; use recyclable packaging materials.
- Use biomass and sun powered controlled radiation as wellsprings of feasible power source.
- Generate control from hydroelectric plants.
- Reduce lethal emanations.

UTILIZATION OF GREEN MARKETING BY CORPORATE

There are different strategies for the associations to be green. They can be green themselves in three ways: esteem expansion forms (firm level), administration frameworks (firm level) as well as items (item level). There are various cases of firms who have strived to end up noticeably more earth mindful serving to better fulfill their purchaser needs. Besides, their exercises likewise help them to enhance their incomes and benefits in different ways.

Numerous associations are grasping green for getting business area shot of green promoting a couple of cases

FAB INDIA

Fab India is an Indian mold mark with its stores the whole way across the country. This brand is famous for advancing handloom and handmade items. This brand is into form attire, beauty care products and furniture's. They have been fabricating the items in total ecofriendly way and they claim of utilizing the fixings with no hurtful chemicals. The bundling is likewise ecofriendly and they dishearten utilization of polythene for bundling.

PATANJALI

Patanjali is advanced by a man who is face of characteristic and sound practices. Swami Baba Ramdev who began Patanjali gladly claims of creating ecofriendly and safe items.

TATA GROUP OF COMPANIES

TATA Group is another pioneer in advancing green showcasing in the Indian markets. TATA Group under their lead produces items which are ecofriendly and receives green methods for showcasing its image. The Tata Group organizations, for example, Tata Steel, TataMotors, Tata Chemicals and Tata Consultancy Services contribute positive outcomes to the earth. TATA Steelsaid it is at present taking a shot at more than 17 CDM i.e.Clean Development component activities to checkharmful outflow with Ernst and Young and these projects are at different phases of endorsement at United Nations Framework Convention on Climate Change.

TATA Motors is setting up an eco-accommodating showroom utilizing characteristic building material for its deck and vitality productive lights. The Indian Hotels Company, which runs the Taj chain, is making Eco rooms which will have vitality productive scaled down bars, natural bed cloth produced using reused paper. What's more, with regards to brightening, the rooms will have CFLs or LEDs

LG INDIA

LG India is one of the underlying propagators of Green items in India, they have various electronic contraptions those are eco well-disposed in nature. They infrequently utilize incandescent lamp or mercury and lead in the assembling procedure. The items do hurt the earth and furthermore utilizes 40% less power.

HCL

HCL is likewise receiving the green procedure. It has as of late propelled HCL ME Notebooks which are ecofriendly in nature. These journals don't utilize any polyvinyl chloride or some other unsafe chemicals in assembling. It has likewise got a five star rating from the Bureau of vitality effectiveness.

HAIER

Haier in its new green activity has been concentrating on eco marking .They have propelled Eco life arrangement. Their items are likewise vitality proficient and safe to nature.

SAMSUNG INDIA

They are taking a great deal of significant endeavors in the way of advancing and honing green advertising in the India. Their eco well-disposed items like LED TV, Airconditioners does not utilize any destructive chemicals like mercury and lead. Their items additionally claim to consume 40% less power.

SAIL

SAIL is one of biggest maker of steel in India . SAIL is likewise occupied with green exercises. SAIL in different urban communities Rourkela and Bhillai has set up green crematoriums that fills in as a swap for burial service fires that discharges so much smoke and uses oxygen .

INDUSIND BANK

IndusInd Bank is one of the primary bank to present green practices. They disheartened the utilization of papers in the branches and their ATM's and begun sending electronic messages and sends. These practices has helped in sparing the earth and furthermore diminished deforestation. Numerous different banks like ICICI,SBI ,Axis and so on are likewise following these practices. Indusland Bank introduced the nation's first sun oriented fueled ATM and along these lines achieved an eco-sagacious change in the Indian managing an account part

INDIAN RAILWAYS. :- Recently IRCTC has enabled its clients to convey PNR no. of their E-Tickets on their tablet and mobiles. Clients don't have to convey the printed variant of their ticket any longer.

No Polythene convey sacks for nothing: - Forest and Environmental Ministry of India has requested to retail outlets like BigBazar,More,Central,D-Mart and so forth that they could give polythene convey packs to clients just if clients are prepared for pay for it.

STATE BANK OF INDIA: Green IT Project: - By utilizing eco and power agreeable hardware in its 10,000 new ATMs, the managing an account monster has not just spared control costs and earned carbon credits, yet additionally set the correct case for others to take after. SBI is additionally gone into green administration known as "Green Channel Counter". SBI is giving many administrations like; paper less managing an account, no store slip, no withdrawal shape, no checks, no cash exchanges frame all these exchange are done through SBI shopping and ATM cards. State BANK OF INDIA swings to twist vitality to diminish emanations. The breeze venture is the initial phase in the State Bank of India's green saving money program committed to the decrease of its carbon impression and advancement of vitality proficient procedures, particularly among the bank's customers.

NEROLAC:- Kansai Nerolac has dealt with expelling perilous overwhelming metals from their paints. The unsafe substantial metals like lead, mercury, chromium, arsenic and antimony can effectsly affect people. Lead in paints particularly postures peril to human wellbeing where it can make harm Central Nervous System, kidney and conceptive framework. Kids are more inclined to lead harming prompting lower insight levels and memory misfortune.

WIPRO:- Wipro Infotech was India's initially organization to dispatch condition well-disposed PC peripherals. For the Indian market, Wipro has propelled another scope of desktops and tablets called Wipro Greenware. These items are RoHS (Restriction of Hazardous Substances) agreeable consequently diminishing e-squander in nature.

ITC LIMITED-ITC has been 'Carbon Positive' three years consecutively (putting away double the measure of CO₂ than the Company transmits) and 'Water Positive' six years in succession (making three times more Rainwater Harvesting potential than ITC's net

utilization). ITC is near 100% strong waste reusing. ITC's Social and Farm Forestry activity has greened more than 80,000 hectares making an expected 35 million man days of work among the impeded. ITC's Sustainable Community Development activities incorporate ladies strengthening, supplementary instruction, and coordinated creature farming software engineers. It additionally gives E-choupal offices ITC fortified their responsibility regarding green advancements by presenting „ozone-treated natural chlorine free“ fading innovation without precedent for India. The outcome is a whole new scope of best green items and arrangements: the earth benevolent multi-reason paper that is less contaminating than its conventional partner. ITC's Bhadrachalam paper unit has put resources into a Rs. 500 crore on innovation that influences the unit chlorine to free

OIL AND NATURAL GAS COMPANY (ONGC)- India's biggest oil maker, ONGC, is good to go to lead the rundown of best 10 green Indian organizations with vitality productive, green crematoriums that will soon supplant the customary wooden fire the nation over. ONGC's Mokshada Green Cremation activity will spare 60 to 70% of wood and a fourth of the consuming time per incineration.

HERO HONDA MOTORS-Hero Honda is one of the biggest bike makers in India and a similarly dependable best green firm in India.

MCDONALD-McDonald's supplanted its shellfish shell bundling with waxed paper on account of expanded purchaser concern identifying with polystyrene generation and Ozone consumption. McDonald's eatery's napkins, sacks are made of reused paper.

COCA-COLA-The Coca Cola Company is one of the biggest overall drink retailers, producers, and advertisers of different non-mixed refreshments. They keep up an extensive concentrate on the ecological effect of their items and utilize diverse procedures and activities with a specific end goal to lessen squander and support the earth. Coca-Cola pumped syrup straightforwardly from tank rather than plastic which spared 68 million pound/year

SURF EXEL - New Surf Exel (Do Bucket Paani... Ab Rozana Hai Bachana) that produces lesser foam yet is as powerful as some time recently, along these lines lessening water utilization.

NTPC - Badarpur Thermal Power station of NTPC in Delhi is conceiving approaches to use coal-powder that has been a noteworthy wellspring of air and water contamination. Barauni refinery of IOC is made strides for confining air and water toxins. Presentation of CNG in all open transport frameworks to check contamination in Delhi

HEWLETT-PACKARD-The Hewlett-Packard Company reported plans to convey vitality effective items and administrations and foundation vitality productive working practices in its offices around the world.

WALT DISNEY - Walt Disney World, have founded ecologically dependable conduct in their procedures and frameworks

XEROX - Xerox presented an "astounding" reused printer paper trying to fulfill the requests of firms for less ecologically unsafe items.

BODY SHOP - The U.K.- based Body Shop makes and offers characteristic fixing based beauty care products in recyclable pressing.

PROCTOR AND GAMBLE - Proctor and Gamble has presented refills for its cleaners and cleansers in Europe that comes in disposable packs.

KIRLOSKAR COPELAND LIMITED (KLC)- Kirloskar Copeland Limited (KLC) cases to have as of late presented the eco-accommodating R404A gas compressor.

ECO-FRIENDLY RICKSHAWS BEFORE CWG-Chief Minister Shiela Dikshit propelled on Tuesday a battery-operated rickshaw, "E-rick", supported by a cell administrations supplier, to advance eco-accommodating transportation in the city ahead of the Commonwealth Gam

GREEN MARKETING: IDEAS FOR GREENING YOUR BUSINESS

- Energize exchange sorts of driving - As it is said that " little advances prompt enormous changes " ,working a green business is valuable for the earth and helpful for business' primary worry in light of the fact that by preserving resources , decreasing waste and accepting the Go Green Mantra can lessen costs and give your business a greener picture in this engaged world. We look at certain easy to-execute musings to be biologically tried and true by decreasing the carbon impressions and work a green business.
- Companies can encourage their specialists to use open transport or auto pool by offering them motivators for the same and setting up "mate frameworks ".
- Green headway - Companies can use web based systems administration publicizing and email exhibiting (paperless displaying) to talk with the customers and propel their things.
- Diminish paper utilize
- Shop Green =Companies should ask specialists to impart by messages and read email messages onscreen to check whether it's imperative to print them or not.
- Using twofold sided reports at whatever point conceivable.
- Using reused paper and reuse scrap that the associations by and large dispose of.
- Companies should get IT things that play out a couple of limits as opposed to one. They should purchase essentialness capable electronic things that are less complex to regulate, use less power and costs less when appeared differently in relation to many single-reason electronic things.
- Support investigate for green items

- Encourage their laborers to consider new considerations for green things by compensating their proposition.
- Companies should begin with a vitality review and break down the measure of vitality they are utilizing and at what cost. At that point an examination of their vitality needs ought to be done and correlations ought to be made with that of similar organizations in the business
- Switch to vitality proficient lighting, for example, LEDs and CFLs and kill machines when not being used.
- Grow office plants to reduce CO2 outpourings and use them as normal channels.
- Making delegates and customers earth aware
- Educate them about the activities that can be unfavorable to the earth and asking for that they grasp a greener lifestyle at home too.
- Companies ought to use reusable sacks over plastic or paper packs.
- Retailers can similarly help change the inclinations for their customers by progressing reusable texture or canvas packs.
- Encourage workers to utilize reusable sacks and jugs
- Green Marketing: Ideas for Greening your business
- Support trade sorts of driving
- As it is said that " little walks provoke enormous changes" , working a green business is valuable for the earth and in addition helpful for business' essential worry in light of the fact that by monitoring resources , lessening waste and accepting the Go Green Mantra can diminish costs and give your business a greener picture in this engaged world.
- We discuss certain easy to-execute musings to be naturally tried and true by reducing the carbon footprints and work a green business.
- Companies can ask their delegates to use open transport or auto pool by offering them motivating forces for the same and setting up "buddy systems".
- Green headway
- Companies can use web based systems administration publicizing and email exhibiting (paperless advancing) to talk with the customers and propel their things.
- Decrease paper utilize
- Shop Green
- Companies should encourage specialists to communicate by messages and read email messages onscreen to check whether it's imperative to print them or not.
- Using twofold sided chronicles at whatever point possible.
- Using reused paper and reuse scrap that the associations by and large dispose of.

- Companies should get IT things that play out a couple of limits instead of one. They should purchase essentialness compelling electronic things that are less requesting to direct, use less power and costs less when appeared differently in relation to many single-reason electronic things.
- Support investigate for green products
- Vitality assurance
- Encourage their delegates to consider new contemplations for green things by compensating their proposals.
- Companies should start with an imperativeness survey and explore the measure of essentialness they are using and at what cost.
- Then an examination of their imperativeness needs should be done and connections should be made with that of similar associations in the business.
- Switch to imperativeness capable lighting, for instance, LEDs and CFLs and execute machines when not being utilized.
- Grow office plants to diminish CO2 radiations and use them as customary channels.
- Making agents and customers naturally conscious
- Educate them about the activities that can be detrimental to nature and asking for that they get a greener lifestyle at home as well.
- Decrease and Recycle
- Companies ought to use reusable sacks over plastic or paper packs.
- Retailers can in like manner help change the inclinations for their customers by progressing reusable material or canvas sacks.
- Encourage laborers to use reusable sacks and containers.

CONCLUSION

The Research paper derives that green advertising thought is grabbing centrality in a making country like India a similar number of associations have taken green exercises and consider imaginative green things. Corporate accomplishment has essentially ended up being associated with nature.

With the danger of an unnatural climate change representing a potential risk, it is important that green publicizing transforms into the standard rather than an uncommon case or just a fever. Reusing of paper, metals, plastics, et cetera. In a safe and environmentally harmless route should wind up recognizably fundamentally more systematized and comprehensive. Publicists in like manner have the commitment to impact the customers to understand the necessity for and favorable circumstances of green things when appeared differently in relation to non-green ones. In green displaying, customers will pay more to keep up a cleaner and greener condition. Finally, buyers, current buyers and suppliers need to pressurize results for confine the negative effects on

nature neighborly. Green advancing expect fundamentally more criticalness and congruity in making countries like India.

Green Marketing in India is still in its most punctual stages and a significant measure of research is to be done on green publicizing to explore its greatest limit. Sponsors need to fathom the implications of green displaying.

Publicists moreover have the commitment to make the accomplices careful about the need and the advantages of green things. Affiliations are as of now careful with the path that without grasping green in the focal point of their strategy they can't make due in the present centered time. Indian FMCG associations are moreover grasping green to hold their photo in the market Most of the associations are advancing towards green promoting because of possible results for regard expansion, weight from authorities, cost reducing as time goes on and potential high ground to the organizations.

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GST: ITS IMPLICATIONS ON NATIONAL AGRICULTURAL MARKET

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ABSTRACT

India is a unique experiment in federal governance with the challenge for ensuring efficient economic development without compromising independence of states. Good and Services Tax (GST) was envisaged to have a simple harmonized tax structure with operational ease leading to a single unified market at national level for goods and services while ensuring that there is no negative revenue impact on the states. On a similar vein, the central sector scheme on National Agricultural Market has been launched to ensure efficiency in agricultural marketing. The underlying principle in both the initiatives is to have a national market facilitating trade and transparency.

GOODS AND SERVICES TAX (GST)

Goods and Services Tax proposes to introduce a single tax on supply of goods and services or both, by amalgamating all the central indirect taxes (excise duty, countervailing duty and service tax) and state indirect taxes (VAT, luxury tax, entry tax, octroi, etc). GST seems to be more comprehensive, compliable, simple, harmonized and development oriented tax system. The GST, unlike the present system, will allow the supplier at each stage to set-off the taxes paid at previous levels in the supply chain. It is essentially a tax on value added at each stage. The final consumer will thus bear only the GST charged by the last dealer in the supply chain, with set-off benefits at all the previous stages (GOI).

BENEFITS OF GST

The uniformity in tax rates and procedures across the country will lead to various benefits for the economy and the consumers. 1. Unified market - the amalgamation of various taxes into one will simplify the procedure and help in evolution of a common market at national level 2. Increase in tax revenue is projected due to better compliance and broader tax base 3. Increase in exports due to cost effective production 4. The burden of tax on goods is expected to fall under GST leading to benefits to the consumers 5. The GDP is predicted to grow in the range of 0.9 – 1.7 percent annually

WHY IT TOOK SO LONG?

The states fear to lose their power to impose and collect taxes and loss of revenue. The extended period of negotiations and deliberations helped in putting the apprehensions of states to rest on loss of revenue and losing fiscal independence. The establishment of national agricultural market involving participation of various states is likely to face similar problems of consensus building among states on various aspects dealing with revenue and related apprehensions. The lesson learnt in reaching at consensus for implementation of GST could ease the implementation of National Agricultural Market. As the GST is being introduced with the objective of having a unified tax structure for goods and services, this is likely to facilitate and strengthen the Scheme on National Agricultural Market (NAM) aimed at an integrated system of market of agriculture produce at the national level, allowing free flow of agricultural commodities across states.

NATIONAL AGRICULTURAL MARKET (NAM)

A Central Sector Scheme for promotion of National Agricultural Market has been introduced by the Ministry. The scheme envisages networking of selected markets to a common electronic platform to be developed by the Central Government. The identified regulated markets across the country will be integrated with the common e-platform to provide farmers and traders with access to opportunities for purchase/ sale of agri commodities at optimal prices in a transparent manner across the country. The commodities brought in the market linked to the National Market will be traded on the basis of their assessment/grade specification electronically. In an ideal situation this implies that a traders/buyer anywhere in the country will be able to bid for this commodity. The settlement of payments will be made electronically by integrating financial institutions with the Market. The concept has the potential of eventually developing into a comprehensive model facilitating integration of markets, functionalities and services like warehousing, banking, insurance, finance, promotion, etc. The market will lead to enhanced regional cooperation. The common market is expected to have an advantage over existing markets in terms of transparency, competition, efficiency, market information, risk, price signal, etc due to operation on e-portal, participation of large number of traders and integration of various services. It is a paradigm shift in the existing structure of agricultural marketing requiring business re-engineering.

CONDITION FOR IMPLEMENTATION OF NAM

The concept though does not propose to change the basic state supported marketing structure but calls for their integration to the national marketing system. The speedy implementation of the scheme will require political will, availability of infrastructure,

participation of private sector and willingness of stakeholders to participate. The implementation of the concept will be particularly challenged by a few legal restrictions.

APMC ACT

The agricultural produce markets in different states are regulated by APMC Acts of their respective states. Each state is having different provisions under its Act. The provisions defined under these Acts create legal barriers to the inter-state trade and physical movement of goods viz (a) Taxation Related Barriers (variation in rates, applicability of VAT, levy of market fee at multiple point, etc.); (b) Physical Barriers (Essential Commodities Act, Check Posts, APMC Regulations, etc.); and (c) Statutory Barriers relating to licensing and registration of traders, commission agents. The Government of India circulated a Model Act in 2003 to all the States/UTs to bring uniformity in the regulation, management and operation of agricultural marketing in different states but with limited success as suggested by the status of reforms and participation of private sector in various states. Some of the provisions identified for the implementation of a National Agricultural Market are unified license, single point levy and e-trading. Joining NAM would necessitate amending the different legal or regulatory framework that controls the agricultural trade in different states to harmonize and facilitate movement of goods and to reduce conflicts, inefficiencies, redundancies in supply chain and encourage transparency.

ESSENTIAL COMMODITY ACT, 1955 (EC ACT)

The list of commodities covered under the EC Act has been reduced from 54 to 7 at present. However, in order to contain the inflationary pressure on prices of essential commodities, the Government has been imposing stock limits on paddy, rice, pulses, sugar, edible oils and edible oil seeds, etc as and when required to contain the inflationary pressure. The ad-hoc approach on imposition of control on stock limits and movement of produce goes against the spirit of reforms and hinders investment and free trade in the country.

TAXATION

The taxes applicable on agricultural trade in addition to the market fee also vary from state to state. The degree of market distortions on account of variation in the levy of market taxes/cess applicable on different commodities in different states are presented in Table-1 below.

Table 1. Degree of Market Distortions

Sr. No.	Name of the State	Sales Tax	Taxes (as percent of MSP)	Remarks
1	Andhra Pradesh	All Commodities (except Maize, Jowar, Ragi, Bajra, Coarse grains) 4 %		
2	Bihar		3.0	
3	Assam	All commodities (except rice, wheat, pulm, f&v, fish, gur, atta, maida etc.)-4-8 %		*Not collected as markets are not in operation
4	Chattisgarh		2.2	
5	Delhi	F & V- nil Oilseeds-3 % Methi-7 %		
6	Gujarat	1.Spices --3%, 2.Aniseed-- 2%, 3.Cotton --4%, 4. Isabgol--2 %, 5. Cummin-2%, 6. Ajwain--2 %	0.8	Other agricultural commodities exempted from Sales tax Octroi - 0.2 to 4%
7	Goa	1.Betelnut -2% 2.Cashewnut - 2% Coconut, F&V, Cattle & Milk exempted from Sales Tax		Entry Fee Cattle - Rs.10/head Vehicle- Rs.10/truck
8	Jharkhand		1.0	
9	Haryana	F&V - nil, Food grains--4 % Pulses--4 %, Oilseeds--4 %	11.5	
10	Himachal Pradesh		5.0	
11	Karnataka	1.Foodgrains-nil 2.Pulses -2% 3.Oilseeds-4%		Market fee exempted for Industrial & Export Purchases.

Sr. No.	Name of the State	Sales Tax	Taxes (as percent of MSP)	Remarks
12	Kerala	Rs. 4 to 8 %		There is no market regulation and hence no prescribed charges.
13	Madhya Pradesh	NA	9.2	Development cess from traders only - 1 to 5%.
14	Maharashtra	All agricultural commodities are exempted from Sales Tax	3.8	Entry fee - Rs.10/truck.
15	Punjab		14.5	
16	Rajasthan	F & V--nil, Foodgrains--4 % Pulses & Oilseeds--2% Coarse grains--nil	3.6	Surcharge on Sales Tax -15 %
17	Tripura	Nil (for all agricultural commodities)		Entry fee Rs1/head
18	Uttar Pradesh	Foodgrains-4 % Pulses-2 % Oilseeds & Others- 4 %	16.71	
19	Uttarakhand		7.5	
20	West Bengal	NA	2.5	Purchase Tax Jute -4 %

NATIONAL AGRICULTURAL MARKET IN THE LIGHT OF GST

In order to achieve National Market in agriculture, there is need for harmonization in the provisions of APMC Act, EC Act and WDR Act. The implementation of GST is

expected to facilitate the implementation of National Agricultural Market on account of subsuming all kinds of taxes/cess on marketing of agricultural produce as well as it would ease interstate movement of agricultural commodities which would improve marketing efficiency, facilitate development of virtual markets through warehouses and reduce overhead marketing cost.

Agricultural commodities are perishable in nature in varying degrees therefore trade is influenced by the time required for transportation. The Economist (Nov 8, 2014) reports that long distance trucks in India are parked for 60 per cent of the time during transportation. The simple uniform tax regime is expected to improve the transportation time, and curtail wastage of precious food.

The present system many times, makes it difficult to implement tax support provided by the center for an agri-commodity due to heterogeneous policies adopted by the different states. The implementation of GST is expected to bring uniformity across states and center which would make tax support policy of a particular commodity effective.

The ease of availing tax credit under GST regime is expected to boost inter-state trade leading to achieving the objectives of National Agricultural Market.

The implications of GST on agricultural marketing needs further examination due to its features like business size. Even if the food is within the scope of GST, such sales would largely remain exempt due to small business registration threshold. Also, given the exemption of food from central Value Added Tax and 4 per cent Value Added Tax on food item, the GST under a single rate would lead to a doubling of tax burden on food. There is need for more clarity on exemptions available under CGST and SGST.

Some of the States are imposing Purchase Tax and Development Cess on sale of agricultural produce in the markets. For example, Maharashtra, earns more than 13,000 crore annually from octroi. Gujarat, on the other hand, earns about 5,000 crore from the CST. Agrarian states such as Punjab and Haryana earn more than 2,000 crore from purchase tax. Therefore, on account of subsuming this Tax/Cess in to GST may adversely affect the income of States. Therefore, it would be necessary to compensate such states in the beginning of introduction of GST.

The terms of trade can also be expected to improve in favour of agriculture vis-avis manufactured goods. The prices of agricultural goods would increase between 0.61 percent and 1.18 percent whereas the overall prices of all manufacturing sector would decline between 1.22 percent and 2.53 percent. Consequently, the terms of trade will move in favour of agriculture between 1.9 percent and 3.8 percent (GOI, 2012-13).

The increased agricultural prices are expected to improve terms of trade but at the retail level. There is need for an efficient agricultural marketing system ensuring the proportionate increase in the prices at the producers' level as well. The national

agricultural market which coincides with the proposed reforms in taxation through GST may help in developing a system ensuring balanced distribution of the value created.

Presently small scale of operations and low level of processing in agriculture may be one of the reasons limiting agricultural commodities to avail benefits of GST unlike manufactured goods. NAM is expected to help scale size of business and attract big players making the agricultural marketing reach a level to start availing benefits offered by GST.

GST is predicted to reduce incidence of suppressed sales since billing and payment of tax would be necessary for availing set-off of taxes at each stage. The same principle would apply to transactions between traders in agricultural commodities where there is substantial amount of suppressed sale.

CONCLUSION

The implementation of GST is inevitably linked to successful implementation of NAM as it aims at unified tax structure of goods and services which would eventually include agricultural produce. The National Agricultural Market envisages smooth flow of goods across states leading to competitive and transparent prices with likelihood of increased share to the farmer in the value created in agricultural commodities. The learnings from the GST experience may also help in resolving various bottlenecks to be encountered in evolving a unified common agricultural market.

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DEFENDING EXPORT BIASED AND MANUFACTURING LED GROWTH

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ABSTRACT

Inclusive Economic can be understood with a simple game where every economic agent/participant has equal access for participation and benefit from the economic growth story of a nation. One can imagine it somewhat extremal to the concept of upper privileged layer of the economic pyramid and a straitjacket but sluggish solution to income disparity, a case that is prevalent in developing nations like India. Economic growth can also be understood as employment for all that helps in reducing poverty potentially and rampantly.

The inclusive growth approach takes a longer-term perspective as the focus is on productive employment rather than on direct income redistribution, as a means of increasing incomes for excluded groups.

HOW'S INDIA APPROACHING IT

Discussing about India, what we may call as the most promising of incidents in the economic history of India till date is the most celebrated but forceful *Economic Liberalization* in the year 1991 due to the Balance of Payment crisis and partially due to other factors including the absence of a coherent budget in recent years, a spiraling deficit, rising inflation and India's purchase of oil at \$30 a barrel, about \$10 higher than today's price, during the Persian Gulf war.

Let's start a short discussion about the year 1991 and further what did happen and did not happen after the liberalization, instead of talking so much about the devastated British India. Because what we can do best is to look forward.

Initiated by the then prime minister Mr. Narasimha Rao and the finance minister Manmohan Singh, India entered the global markets, though forcefully but with a vision that changed the global economic map and gave India a propeller to fly high as a mega economic super power.

India never defaulted since independence 44 years ago. India's foreign debt climbed to about \$72 billion, making it the world's third largest debtor after Brazil and Mexico. In 1980, its foreign debt was \$20.5 billion. At the moment India had only \$1.1 billion in its hard-currency reserves, enough only for two weeks of imports. A nation which found immense pride historically on self-reliance was open for all now.

The significant weakness of the Indian economy is the continued dependence of some 60 per cent of the workforce on low-productivity agriculture and allied occupations for employment and living. The efforts made since Independence have led to only a small decline in the percentage of the population dependent on agriculture.

Now if we talk a bit about Heckscher-Ohlin theorem which states that a country export goods which use relatively a greater proportion of its abundant and cheap factor. While same country import goods whose production requires the intensive use of the nation's relatively scarce and expensive factor. Taking it up for the case of India and China where a huge pool of labor force exists, China has very well succeeded in absorbing its employable workforce in manufacturing, but India has only been able to do it till the premises of services export, IT by large. Rest can be seen and compared through the various parameters one wants to.

The availability of labor and manufacturing wages can be considered a factor to examine manufacturing in India. China and India represent the two largest national populations in the world. India's labor force amounted to about 502 million people in 2014, while China's was approaching 802 million

When it comes to manufacturing wages, India has some of the lowest in the world. The average manufacturing labor cost in India in 2014 was just \$0.92 per hour, as opposed to \$3.52 per hour in China. India's relatively low cost of labor is one of the strongest incentives for setting up a plant here. Now, we can think about the hurdles that undo the benefits of the eye-catching facts above. We can keep it simple at a few things - Ease of doing business, labor laws and skill development.

Going back again and trying to put forward the idea of trade biased growth, it's necessary to bring about some facts. The size of the economy can often give the first impression of the might of a country. GDP gives the total worth of the goods and services produced in a country in one particular year. India's GDP stood at INR 5,86,212 crore in 1991. About 25 years later, it stands at INR 1,35,76,086 crore, up 2216 percent. In dollar terms, India's GDP crossed the \$2 trillion mark in 2015-16. Currently, the country is ranked ninth in the world in terms of nominal GDP. India is probably to become the second largest world economy by the year 2050.

The expansion of India's exports of services between 1990 and 2013 has been nothing short of spectacular, putting India on a par with the world's high-income economies in terms of service-product sophistication and as a share of total exports. This has created unique opportunities for continued growth. By contrast, when it comes to exports of manufactured goods, India has lagged behind its emerging-markets peers, both in quality and as a percentage of the total export basket, leaving substantial room for improvement. Before 1991, foreign investment was negligible. The first year of reform saw a total foreign investment of only \$74 million. However, investments have steadily risen since

then, except for occasional blips between 1997 and 2000 and 2008 and 2012 – owing to the global economic slowdown. As of 31 March 2016, the country has received total FDI of \$371 billion, since 1991. The year 2008 recorded the highest FDI inflow of \$43.40 billion. The biggest spurt in inflow was between 2005 and 2006 – 175.54%. As of March 2016, India has attracted \$10.55 billion worth of FDI. In 2015, India received \$63 billion (nearly INR 4.19 lakh crore) and replaced China as the top FDI destination, according to *The Financial Times*.

Per capita income is the average income of every citizen arrived at by dividing the GDP by the country's population. Though purely a statistical exercise which may not necessarily show the true picture of a country's development, nevertheless the data makes for an interesting read. Between 1991 and 2016, per capita income rose from INR 6,270 to INR 93,293. This is a whopping 1388 percent jump. However, there's nothing to be euphoric about the number. As RBI governor Raghuram Rajan says, with this number we are nowhere near ending poverty. "We are still a \$1,500 per capita economy. All the way from \$1,500 per capita to \$50,000, which is where Singapore is, there is a lot of things to do. We are still a relatively poor economy and to wipe the tear from every eye, one would at least want to be middle-income around \$6,000-7,000 which, if reasonably distributed, will have dealt with extreme poverty. And that is two decades worth of work to be even moderately satisfied," he said in a recent interview to *The Times of India*.

The post-reform period shows the gradual decline in the agriculture sector's contribution to the Indian economy. India's traditional occupation, agriculture now contributes only about 15% to the GDP, down from 29 percent in 1991. The services sector has taken the lead role in propelling the economy at the global stage. The IT sector has been the torchbearer of the service sector in India. Currently, it contributes around 53 percent to the national economy. In the meanwhile, the industrial sector has undergone marginal growth in the last 25 years. What we need is skill development, technology transfer, labor reforms, ease of doing business and a more logical and far sighted *Make in India*.

THE RECENT PARADIGM SHIFTS

With the aggressive policies by the current Modi Government be it Make in India and the other specific effort on skill development and tax reforms (such as GST) and Jan Dhan Yojna, there is a positive disturbance in the stagnant loath economic structure which was merely surviving up-till now.

Since we need money to fund our growth and development policies, we also need some sustainable mega source of wealth generation for the nation. With the new fleet of schemes that focus on providing a standard lifestyle to the people of the country, which is one of the parameters one can establish about inclusive growth such as Ujjwala – providing subsidized LPG for all the unprivileged household, new scheme that pledges electricity for all named 'Saubhagya' that also provide subsidy on equipment like

transformers, meters and wires. Also, the skill India Program, it all needs heavy fund since it caters to a large mass of the nation.

Good and Service Tax has been a breakthrough as it would increase the tax base, lower the tax rate in future, increase the consumer surplus, eradicate tax evasion and colliding effects of taxation and will prove easy accounting as well. This will not only be luring and easing the foreign player to invest in India but also provide a potentially larger pool of fund for the nation to invest in all-round development areas. Again, GST will also increase transparency and help in reducing income disparity too. The goods and services tax (GST) can boost India's GDP growth by up to 4.2% as lower taxes on manufactured goods will bump up output and make products cheaper, a US Federal Reserve paper stated. GST, it said, will reduce inefficiencies in the production process while eliminating the compounding effect of different central and state levies. In the International Finance Discussion Paper (IFDP), the US Fed researchers said GST is an 'inclusive policy' that is also expected to bring down overall domestic and international trade barriers. "GST is expected to raise overall Indian welfare and is projected to be an inclusive policy in that it would be welfare improving for all Indian states,"

The International Monetary Fund (IMF) had earlier this year said GST could help raise India's medium-term GDP growth to over 8% and create a single national market for enhancing efficiency of movement of goods and services. Even the World Bank has said a smooth implementation of GST could prove to be a significant push to economic activity as growth could pick up to 7.2% in 2017-18 and further to 7.5% in 2018-19.

The Fed note also said GST is expected to reduce overall domestic and international trade barriers, which in turn boosts welfare because consumers have access to cheaper products. GST will raise welfare for all states and is thus estimated to be an "inclusive" policy. However, the note cautioned that if the aggregate GST rate is assumed at 20%, then there will be lesser positive impact of 3.1% on GDP.

Some of the recent development are also very igniting, the Indian electronic manufacturers and assemblers, who were solely dependent on import from China, are shifting their strategies of procurement due to high costs. Instead of importing from China, Indian firms forayed in establishing their own manufacturing operations in India. Havells, Godrej, Micromax, Bosch (auto part maker) have all started exploring manufacturing operations in India.

Also, Foxcon is the contract manufacturer for Apple and is the world's largest contract manufacturing company in electronic industry. Foxcon has decided to invest US \$ 5 billion in India. If Apple expands in India, it may lure other tech giants in India and China is likely to face more transfer of supply chains in India, the Chinese daily apprehended.

Today, there is a spurt in domestic production. It meets 45 percent of the mobile demand in the country. India produced 100 million mobile phones in 2015, against 64 million mobile phones in 2014- triggering a growth by eighty percent within a year. Import from China plunged by over 25 percent during the past two years

THE WAY AHEAD

Now, domestic demand is naturally sluggish in a slowing economy. But the world market represents unlimited demand. If only India gets competitive, exports will boom, and so will investment, bank lending and GDP

Exports need to grow at 26.5 per cent annually for the next five years for India to reach a “respectable” 5 per cent share in world trade from the existing 1.7 per cent it has been stuck at since 2011, according to the second part of the Economic Survey for 2016-17.

This could be achieved only through reforms in trade policy by diversifying exports, rationalizing tariffs and developing world class export infrastructure. Making a case for lowering average applied tariffs, the Survey stated that there is scope for reduction by selectively bringing down tariffs across many lines, while retaining higher tariffs for sensitive and important items.

To increase exports, the Survey made a case for a demand based export basket diversification rather than a mere supply based strategy. It also stressed that world class export infrastructure and logistics, especially port-related, need to be developed on a war-footing.

What also matters is productivity, the cost of doing business, export logistics and red tape, and the cost of credit. India has failed to match up to competitors in all these respects. The government’s attempt to make business easier has not worked well, according to a recent research paper of Niti Aayog. India has high real interest rates, high land costs (after the land acquisition law) and uses high rail freight rates (that hit exports) to massively subsidize passenger traffic

Reforms are needed in all these areas. A quick remedy will be for the RBI to depreciate the rupee and cut interest rates but that has inflationary effects. But for sustained 7-8% GDP growth, productivity must rise faster in India than among competitors, making exports dynamic. Domestic demand alone cannot ensure more than 5-6% growth on a sustained basis

Labor reforms essentially mean taking steps in increasing production, productivity, and employment opportunities in the economy in such a manner that the interests of the workers are not compromised. “Essentially, it means skill development, retraining, redeployment, updating knowledge base of workers-teachers, promotion of leadership qualities, etc. Labour reforms also include labour law reforms”. Labour laws are concerned with the trade union rights of the workers, industrial relations and job security and policies relating to wages, bonus and other incentive schemes

India's labour laws for the workers in the organized sector give workers permanent employment, of course, after a probation period ranging from 6 months to 2 years. Job security in India is so rigid that workers of large private sector employing over 100 workers cannot be fired without government's permission.

This really tells on the efficiency of the workers leading to low productivity in the manufacturing industry. Even the owners of sick industries are not permitted to downsize the establishments or to close them down. In view of this, one finds the tendency of Indian firms to employ casual or contract workers who are not protected by the country's labour laws.

Hence for the purpose of Inclusive growth of the nation there needs to be a bias towards export based growth. We need huge fund on long term basis for the purpose of inclusive and sustainable growth and development of a mega complex nation such as India which manufacturing can guarantee. But to attract manufacturing we need capacity building. Labor laws and labor reforms needs to be at place with adequate flexibility for the employer, infrastructure, skilled youth and ease of doing business needs to be impressive as soon as possible to utilize the untapped avenue in the time to come.

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**INDIAN HEALTH EXPENDITURE AND INTERSTATE VARIATION IN
TECHNICAL EFFICIENCY OF HEALTH OUTCOMES – A STOCHASTIC
FRONTIER ANALYSIS**

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ABSTRACT

The two main challenges that the Indian health sector is facing are: compared with global level extremely low expenditure on health, leading to relatively poor health outcomes and the huge differences of health outcomes across different States. In India, only 4% of GDP is devoted to the health sector, the contribution of the Government expenditure is 1.1% of the GDP and the major portion of the health expenditure is in the form of out of pocket (OOP) expenditure. This huge OOP expenditure fuels the growth of private health care industry in India. The private health care industry in India is valued at \$40 billion and is projected to grow to \$ 280 billion by 2020. Low expenditure on health is one of the main factors responsible for poor health outcomes in India. The IMR in India is 41.81 and it is ranked 174 among 224 countries. Besides relatively poor health outcomes at the international level huge differences are observed across different regions within India. On the one hand Kerala having IMR 12 is far ahead from Madhya Pradesh where IMR is 54. Similarly percentage of women receiving full antenatal care in Tamil Nadu is 45 and in Bihar it is only 3.

INTRODUCTION

Human capital as a main source of economic growth and development is of recent past. The dominance of physical capital over the human capital as a determinant of economic growth was overshadowed by the rapid progress of the countries like Japan, Germany and of late China. The spectacular growth of these countries made human resource development a burning topic in academic and policy discussions. In economics health is regarded as a merit good because it has huge externalities which are not taken into consideration if it is left to the market forces of demand and supply. So, to attain the better health outcomes government has to come forward to ensure universally accessible and affordable healthcare.

Current Health Scenario in India: India has achieved a lot of success in improving the health outcomes particularly in the last 25 years. The Maternal Mortality Ratio (MMR) reduced from 560 in 1990 to 174 in 2015. The under-5 mortality rate (U5MR) declined

from 126 in 1990 to 48 in 2015. Polio has been completely eradicated. The life expectancy has increased from 58.3 years in 1990 to 69 in 2015. Deaths due to tuberculosis among HIV-negative people (per 100000 population) reduced from 39 in 1990 to 19 in 2012. Deaths due to Malaria (per 100000 population) reduced from 3.5 in 1990 to 2.3 in 2012. But still India has the worst health indicators in comparison to the major and emerging economies of the world. These comparatively poor health outcomes are given in Table 1.

Table 1: Health Outcomes of Selected Developed and Developing Countries, 2015.

Country	U5 mortality deaths	MMR	Life Expectancy
Afghanistan	94000	396	60.5
Bangladesh	119000	176	71.8
Brazil	52000	44	75.0
China	182000	27	76.1
Germany	3000	6	81.0
India	1201000	174	68.3
Japan	3000	5	83.7
Norway	0	5	81.8
USA	25000	14	79.3

Source WHO, 2015.

From Table 1 it is clear that India stands at the lowest ebb amongst the major and emerging economies of the world, when it comes to the health outcomes. Even to reach to the level of next worst performer in the group i.e Bangladesh, India has to reduce the U5MR by 11 points and improve the life expectancy by 4 years. The past experience shows that to eliminate this difference in these variables India will take at least half a decade.

Health Sector Spending in India: The relatively poor health outcomes in India are because of so many causes but the leading cause is the negligence of the health sector. This negligence is evident from the extremely low expenditure on the health. As a percentage of GDP, India spends only 4% on health sector. Out of this, the contribution of Government is only 1.1%. Total Health Expenditure (THE) per Capita in Int.\$ (Purchasing Power Parity) in India is 215, the average of the same for the rest four BRICS nations is 1202 i.e on an average six times more than that of India. The health expenditure of India is very low when compared with the other major and emerging

countries of the world. Table 2 summarises the average health expenditure of a group of countries from 2004-13.

Table 2: Health Expenditure of Selected Developed and Developing Countries from 2004-13.

Country	THEXP as % of GDP	GHEXP as % of GDP	PHEXP as % of GDP	THEXP INT \$	GHEXP as % of THEXP	PHEXP as % of THEXP	OOPHE as % of THEXP	OOP as % of PHEXP
Australia	8.9	6.0	2.9	3615.6	67.5	32.5	18.4	56.6
Bangladesh	3.4	1.2	2.2	68.7	34.5	65.5	60.8	92.8
Brazil	8.9	4.0	4.9	1163.0	44.8	55.2	32.4	58.6
China	4.9	2.5	2.4	409.7	50.1	49.9	40.2	80.2
Germany	11.1	8.5	2.6	4147.1	76.6	23.4	13.3	56.7
India	4.0	1.1	2.9	166.4	28.2	71.8	62.8	87.4
Japan	9.2	7.5	1.7	3091.5	81.5	18.5	15.1	81.3
Norway	9.1	7.7	1.4	5350.0	84.5	15.5	14.7	95.2
Russia	6.3	3.5	2.8	1224.1	56.2	43.8	38.9	88.3
Sri Lanka	3.5	1.6	1.9	245.0	44.6	55.4	45.5	82.1
UK	8.9	7.4	1.6	3134.0	82.6	17.4	9.3	53.5
USA	16.4	7.6	8.8	8021.0	46.2	53.8	12.4	23.1

THEXP = Total Health Expenditure

GHEXP = Government Health Expenditure

PHEXP = Private Health Expenditure

OOPHE = Out of Pocket Health Expenditure.

Source: WHO, 2013.

From Table 2 it is clear that Government Health Expenditure (GHEXP) as percentage of GDP is lowest for India (1.1), as percentage of Total Health Expenditure the contribution of Government is 28.2, lowest in this group of countries. Low contribution from the Government means that the private expenditure on health is maximum (71.8%) in India. From this huge private expenditure in India, Out of Pocket (OOP) expenditure on health as a percentage of Total Health Expenditure (THEXP) is highest (62.8). The consequence of this huge OOP expenditure is that each year about 30 million people are pushed below the poverty line only because of it. From Table 1 and 2 it is clear that the contribution of the Government in health spending is more than private spending in countries like Japan, Norway, UK and Germany. These countries have the best health outcomes compared to

the countries where the private contribution to health spending is more like USA, India and Brazil. The inference which could be drawn from the above is that those countries which have accepted health as a merit good and ensured its provision mainly through public sources possess the best health outcomes.

The meagre contribution by the Government gave rise to rapidly expanding private health care services in India. The private health care industry in India was valued at \$40 billion in 2010 is projected to grow to \$ 280 billion by 2020. The current growth rate of this industry, at 14% is projected to be 21% in the next decade. Given the fact that in India still 20% of the population lives below poverty line, rapid privatization of the health sector means that these people will be left out from availing the health services. Since the private healthcare is costly in India as is revealed by NSSO 71st Round (2014). As per this survey in rural India the average expenditure for childbirth in Private healthcare facility is ₹14778 and in public health facility it is ₹1587. Similarly in urban areas the average expenditure for childbirth in Private healthcare facility is ₹20328 and in public health facility it is ₹2117. This shows that private healthcare costs 10 times more than the public health facilities. Today private sector in India accounts nearly 80% of outpatient care and about 60% of inpatient care. In the private healthcare as much as 40% is provided by informal unqualified providers. As much as 72% of all private health care enterprises are own-account-enterprises (OAEs), which are household run businesses providing health services. In terms of comparative efficiency, public sector is value for money as it accounts for less than 30 % of total expenditure, but provides for about 20% of outpatient care and 40% of in-patient care. This same expenditure also pays almost 100% of preventive and promotive care (NSSO 60th Round)

To achieve the universal health coverage, India has to increase the public health expenditure. The classic examples of developing countries where universal health coverage was achieved by focusing more on public provision are Thailand and Brazil. With almost the same expenditure on health (3.2 % of the GDP) Thailand has achieved universal health coverage. The contribution from the public health spending in Thailand is 77.7% which explains its success in universal health coverage.

EFFICIENCY OF HEALTH OUTCOMES ACROSS INDIAN STATES

The health outcomes of India are not only poor at the international level, huge diversity is observed particularly in maternal and child health outcomes at the interstate level. On the one hand States like Kerala, Tamil Nadu and Maharashtra where health outcomes are at par with the developed countries. The IMR of these States is 12, 21 and 25 respectively (2012). On the other extreme of this scale are the States like Madhya Pradesh, Uttar Pradesh and Odhisa with IMR of 56, 53 and 53 respectively (2012).

For relative comparison of performance of health sector across different Indian States and to arrive at the relative efficiency of these States; the outcome indicator of IMR and

its main determinants like per capita income (PCY), percentage of institutional deliveries, female literacy rate, percentage of women with complete ante natal clinics (ANC) and percentage of households with access to sanitation are used. The selection of the determinants is guided by the fact that these determinants are significantly correlated with the IMR. The correlation coefficient between IMR and percentage of institutional deliveries -0.57 and between IMR and female literacy it is -0.71. The choice of IMR as a dependent variable is because of the Availability of data on this indicator and its association with the other health outcomes like maternal mortality rate (MMR) and child mortality rate (CMR). To compare the relative efficiency of different States the Stochastic Frontier Analysis (SFA) was used. The stochastic frontier production model is composed of error structure with a two-sided symmetric term and a one-sided component. The one sided component reflects inefficiency, while the two sided error captures the random effects outside the control of the production unit. This technique is used to calculate the relative efficiency of different decision making units. In this the best performing unit serves as a benchmark or a frontier. The efficiency of the other units is judged relative to the frontier. The model used for this analysis is given below:

$$OI_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + v_i - u_i$$

Since the objective of every state is to reduce the IMR so for the current analysis the inverse of IMR has been chosen as the outcome variable. X's are the factors contributing to the outcome indicators; X1 is per capita income (PCY), X2 is percentage of pregnant women who received complete antenatal clinics (ANC), X3 is female literacy (LIT) and X4 is percentage of institutional deliveries (INSTDEL). All these independent variables have significant backing of literature in their support. β' s are the respective coefficients, v_i is the random error term accounting the unexplained portion of the variation and u_i is the random variables accounting for the technical inefficiency in production. The efficiency scores of Indian States based on the 2012 data are given below:

Results

The results obtained from frontier 4.1 are given following Tables.

Table 3a: MLE Estimates of Coefficients

	Coefficient	Standard-error	T-ratio
β_0	-0.444	0.1000000	-0.44430864
β_1	0.998	0.1000000	1.99876906
β_2	0.177	0.1000000	2.17758100
β_3	0.913	0.1000000	1.91312247
β_4	0.117	0.1000000	2.11729437

Table 3b: Statewise IMR its Selected Determinants and relative efficiency in India 2012

State	IMR	PCY	ANC	LIT	INSTDEL	Eff est.
Andhra Pradesh	41	38556	85.4	51.54	93.14	0.906
Arunachal Pradesh	33	35527	35.5	52.04	95.02	0.884
Assam	55	21741	39.3	63.03	83.03	0.901
Bihar	43	13149	17.0	49.0	75.97	0.798
Chhattisgarh	47	27163	54.2	55.06	61.59	0.882
Delhi	25	106677	75.1	73.1	94.27	0.943
Goa	10	129397	94.9	81.63	99.66	0.966
Gujarat	38	56634	67.5	61.36	95.10	0.921
Haryana	42	61716	59.2	60.02	83.58	0.914
Himachal Pradesh	36	49203	62.6	74.62	75.50	0.932
J&K	39	28790	73.5	51.64	87.52	0.898
Jharkhand	38	25265	35.9	48.91	71.00	0.842
Karnataka	32	41492	79.5	59.71	98.08	0.923
Kerala	12	52808	93.6	90.81	99.79	0.962
Madhya Pradesh	56	23272	40.7	52.43	85.22	0.870
Maharashtra	25	61276	75.1	68.54	96.33	0.937
Manipur	10	22169	68.6	68.89	76.14	0.950
Meghalaya	49	34232	54.0	68.37	51.13	0.912
Mizoram	35	37921	59.3	79.81	86.35	0.936
Nagaland	18	46340	32.7	71.51	73.02	0.934
Odisha	53	24542	61.8	60.74	86.91	0.907
Punjab	28	46325	74.8	65.74	82.77	0.929
Rajasthan	49	29612	41.2	45.8	92.28	0.845
Sikkim	24	73704	70.1	72.45	88.62	0.940
Tamilnadu	21	57093	95.9	65.05	99.83	0.940
Tripura	28	39608	60.0	79.49	86.25	0.939
Uttar Pradesh	53	18014	26.6	53.65	62.67	0.843
Uttarakhand	34	52606	44.9	66.18	71.65	0.918
West Bengal	32	32164	62.0	65.51	73.32	0.920

CONCLUSION

From the results it is clear that PCY and female literacy are most important determinants of IMR in Indian States with coefficients of 0.99 and 0.91 respectively. The coefficients of complete ANC and institutional deliveries are 0.17 and 0.11 respectively. With regard to the efficiency of the States Kerala and Goa are the best States with their efficiency score of .97 and hence serve as frontier. The efficiency scores of worst performing States are Bihar (0.79), Madhya Pradesh (0.84), J&K (.89), Jharkhand (0.87) and Uttar Pradesh (0.84).

This difference in the health outcomes across different regions is because of the difference in the determinants of these health outcomes. The main determinants of maternal and child health outcomes are sanitation and access to safe drinking water, poverty, nutritional level of expecting mothers, antenatal care, institutional deliveries, female literacy. Even today huge difference is seen across different States. Households having access to safe drinking water in Telangana is 98.2% and in Madhya Pradesh it is 84.7% (NFHS 4, 2015-16). Households having access to improved sanitation in Telangana is 77.6% and in Bihar it is 25.2%. Female literacy rate which encompasses so many dimensions is an important determinant of IMR and MMR. There is significant variation in female literacy across different States Poor nutrition and poor antenatal care are the main determinants of IMR and MMR. It ranges from 50% in Bihar to 91% in Kerala. Per capita income which reflects the standard of living varies from thirteen thousand in Bihar to one lakh twenty nine thousand in Goa. Similarly percentage of women who receive full Antenatal Care (ANC) ranges from 3.3 in Bihar and 45 in Tamil Nadu. Percentage of women who have low Body Mass Index (BMI) ranges from 30.4 in Bihar and 14.6 in Tamil Nadu. In order to improve the overall health scenario in the poor performing States the investments in social sectors needed to be enhanced because in the developing regions these investments have more forward and backward linkages.

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MICROFINANCE: KEY TO SUSTAINABLE SOCIO-ECONOMIC DEVELOPMENT

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ABSTRACT

Liberalization, Privatization, Globalisation Free Economy, Digital Economy are the features of today's business world. Microfinance is now a buzzword in international aid circles. It is mooted the panacea for sustainable development in very poor countries, and has been successfully implemented. Poverty alleviation is one of the primary goals of developing countries and international assistance agencies. The eradication of poverty and the promotion of sustainable development represent two of the most important challenges facing the world in the 21st century. Under sustainable development all human beings will have the opportunity to satisfy their basic needs in an appropriate way, to enjoy equal access to resources, to have a say in the social and economic development process as it affects them, and to participate in political decision making. The present research paper focuses on micro finance and how micro finance is key for sustainable socio-economic developments.

Keywords: *Microfinance, Microcredit, Grameen Bank, Sustainable Development, Socio-Economic Development etc.*

INTRODUCTION

Micro finance means providing poor families with very small loans to help them engage in productive activities or grow their tiny business. Now microfinance has come to include a broader range of services such as microcredit, savings and micro-insurance etc. The focus of microfinance has not been only on providing small credit, but to integrate it with other developmental activities. Today, microfinance is very much in the agenda of public policy and it has been increasingly used as a vehicle for reaching the otherwise unreachable poor in the country.

Microfinance is not just a tool for poverty eradication but also for individual development, growth in entrepreneurial activities in the economically backward areas. Over the last few years the microfinance services have been changing people's lives and revitalizing communities. The microfinance is a vehicle to reach SC/ST/OBC. The horizon is seen and can be touched upon to bring the neglected and oppressed poor rural people into the lit zones.

Rural finance is a matter of great concern in an agrarian economy like India where 70 percent of the population depends upon agriculture for their livelihood. Moreover, 40 percent of our GDP is contributed by rural sector. Economic development of our country can be achieved only with the upliftment of the village folk consisting of poor households, artisans, agricultural labour, farmers etc. Finance being the life line of every commercial venture, availability of adequate funds at reasonable terms is a must to ensure speedy economic development in the rural areas. The Commercial banks, Cooperative Banks and Regional Rural Banks play a significant role in financing different segments of rural sector. But these rural credit institutions find themselves in a moribund state today. This is largely attributed to financial sector reforms introduced in 1990's as a part of liberalization and globalization of Indian economy.

CONCEPTUAL BACKGROUND

Microfinance is a tool for individual development. Microcredit is a system of providing credit to those people who cannot borrow money from the usual formal sources of credit because they are too poor and have no collateral. They are usually women, and if they borrow from traditional moneylenders, are exploited and then become part of the continuing cycle of poverty. Microfinance however includes both a savings and a credit component. These schemes may be introduced by NGOs, Governments or local community groups or finance businesses. When introduced by governments, such as the Vietnam Bank for Agriculture and the Vietnam Bank for the Poor, or by finance organisations such as the Credit Unions in Thailand, they generally focus solely on provision of, and repayment of, loans. Local community groups may commence with savings first or design some method of pooling resources before loaning money.

Grameen Bank. In 1983, Professor Muhammed Yunus established the Grameen Bank of Bangladesh for the purpose of poverty alleviation. Assumption of the Grameen Model is that the rural poor just need access to credit to be able to climb out of poverty. Groups of five people meet at Centre meetings each week where they make loan repayments, undergo training and recite and discuss the 16 Decisions, "The 16 Decisions" are sometimes altered slightly in other countries because of different social and cultural influences. Nevertheless, all GBR (Grameen Bank Replicas) members are expected to know and adhere to these Decisions. Gow, Moore, Hoeksma and Wood reported on eight key features that practitioners determined are essential for the Grameen Model to have any chance of success, These are: the importance of the basic group; compulsory savings; regular repayments; realistic interest rates; weekly meetings; intensive staff training; openness and transparency of transactions; and constant performance monitoring.

Microfinance, according to Otero is "the provision of financial services to low-income poor and very poor self-employed people". These financial services according to Ledgerwood generally include savings and credit but can also include other financial

services such as insurance and payment services. Schreiner and Colombet define microfinance as “the attempt to improve access to small deposits and small loans for poor households neglected by banks.” Therefore, microfinance involves the provision of financial services such as savings, loans and insurance to poor people living in both urban and rural settings who are unable to obtain such services from the formal financial sector.

SIGNIFICANCE OF THE RESEARCH STUDY

In India access to credit remains a significant challenge for poor / low income household who live in remote regions and have hardly any asset and are viewed by formal institutions as being "unprofitable". This has a potential for microfinance institutions to explore. Thus; microfinance institutions have made the informal sector more advantageous and welcoming for the poor and low income people. In spite of their fact that India today has an extensive banking infrastructure, the importance of micro finance lies in the fact that the formal / institutional banking sector has not lived up to its social responsibility of meeting the financial needs of the poor.

The credit requirement of the poor in India has been estimated to the around Rs. 50,000 crore per annum. Against this requirement the credit outstanding of the poor with the formal banking sector is stated to be Rs. 5000 crore or ten percent of total demand. Around 87 percent marginal farmers/landless laborers / poor do not access credit from the formal banking sector. Most of the benefits have gone to relatively better off people. It is therefore; as the banking sector is not able to meet the entire credit needs of the poor, it is necessary to encourage the growth of microfinance institutions for substantial scaling up of the microfinance to prevent exploitation of the poor from dominating money lenders in the rural credit sector and to magnifying the scope of employment opportunities and poverty eradication through micro finance creation. To meet out this lacuna, the microfinance institutions have merged as key providers of financial services for the poor. The microfinance which includes the small credit, micro saving and micro-insurance is gradually emerging as one of the most effective strategies to alleviate poverty. It effectively generates employment and sustains the income of the rural households by giving them often opportunity of work. More efforts are needed to promote and strengthen microfinance to optimize them way against poverty because there is a crying need for timely and adequate availability of funds for rural finance for improving the income of the poor.

The microfinance institutions in the rural credit sector have made the access to rural credit convenient through a particular subset of financial services which provide small loans to very poor families, most often without any collateral. The loan can be for consumption, production activities or for small business. This enables the rural people to raise their income level and living standards. Microfinance helps the rural people to avail

and create economic growth opportunities. The access to credit as well as extending other financial products and services to these people of low income group below poverty line includes women, small and marginal families, artisans, agricultural laborers and share croppers. It also gives them access to micro-insurance through which sudden expenses relating to serious illness or loss of asset can be recovered. The facts reveal that interest rates charged by informal money lenders are hidden than those charged by microfinance institutions, hence, there is an overwhelming demand from all corners to protect the rural people from these extorters and play a vital role by MFIs as vehicle to reach poor. Realising the importance of microcredit in the development process, the government and RBI have taken various steps in this regard and have encouraged financial institutions to make timely and adequate finance available to poor. to access to institutional credit to poor sections of society, microfinance is one of the most sustainable and effective tool.

OBJECTIVES OF THE RESEARCH STUDY

Microfinance is a provision of thrift, credit and other financial services and products of very small amounts to the poor in rural, semi-urban areas, for enabling them to raise their income levels and improve living standards.

Without economic improvement of the poor villagers it would not be possible to sustain the development activities.

The main objectives of the proposed research study are as under :

1. To highlight the meaning and concept of micro finance.
2. To study the development of microfinance services in India.
3. To study microfinance and credit lending models for effective development of micro finance.
4. To examine and analyse the impact of microfinance on the socio-economic development of rural people of India.
5. To examine and analyse various issues and challenges related to microfinance in rural areas of India.
6. To detect out the problems in the way of promoting micro financing in India.
7. To give some concrete suggestions, this may help microfinance institutions to make an overall improvement in microfinance services in the rural areas of Indian economy to accelerate the socio-economic upliftment of rural people.

HYPOTHESIS OF THE RESEARCH STUDY

The main hypothesis of the present research study is as under :

1. There is scope for substantially improving the quality and efficiency of service delivery by the organizations providing micro finance services.
2. It is assumed that the government performs as a facilitator rather than of a regulator.
3. It is assumed that the poor people are more honest and sincere in repayment of microcredit in comparison of other urban / metro and large borrowers.

RESEARCH METHODOLOGY

The present research study mostly based is on the secondary data and where available the data will be collected from the primary sources through administering a structured questionnaire and by making personal contacts with the respective authorities. Their views are incorporated where ever required to make the study more informative, effective and meaningful.

The secondary data is collected from various issues of RBI publications, annual reports of the banks and microfinance institutions, related books, journals and magazines and from the office records of regional and district offices. The data is also collected from various websites.

AN INTERNATIONAL SUCCESS STORY : GRAMEEN BANK

Dr. Yunus established Grameen Bank in 1983 in Bangladesh, with the goal of assisting the disadvantaged by providing deposit and microcredit services for individual customers and groups. The bank promotes the concept of savings, which reduces the reliance on outside funds. It also offers microcredit through group loans, which not only abolishes the need for collateral but also reduces costs. To date, the bank has experienced a high savings rate and an excellent recovery rate for loans. In only a decade, the unit has developed from an experimental organization into a financial institution that has branches throughout Bangladesh.

Grameen Bank's recovery rate of 90 percent (with 94 percent of its loans made to women) is high compared with that of the Bangladesh National Bank, which only recovers 25 percent of its loans. Grameen Bank's innovative design, open door loan policy, commitment to gender equality, and its poverty alleviation potential has attracted interest from governments and international assistance agencies throughout the world. The Grameen Bank model is now being used as a reference in planning microcredit programs in other countries.

MICROFINANCE & ITS IMPACT IN DEVELOPMENT

Microfinance has a very important role to play in development according to proponents of microfinance. UNCDF states that studies have shown that microfinance plays three key roles in development. It helps very poor households meet basic needs and protects against risks, is associated with improvements in household economic welfare, helps to empower women by supporting women's economic participation and so promotes gender equity. Otero illustrates the various ways in which "microfinance, at its core combats poverty⁸". She states that microfinance creates access to productive capital for the poor, which together with human capital, addressed through education and training, and social capital, achieved through local organisation building, enables people to move out of poverty. By providing material capital to a poor person, their sense of dignity is

strengthened and this can help to empower the person to participate in the economy and society.

The aim of microfinance according to Otero is not just about providing capital to the poor to combat poverty on an individual level, it also has a role at an institutional level. It seeks to create institutions that deliver financial services to the poor, who are continuously ignored by the formal banking sector. Littlefield and Rosenberg state that the poor are generally excluded from the financial services sector of the economy so MFIs have emerged to address this market failure. By addressing this gap in the market in a financially sustainable manner, an MFI can become part of the formal financial system of a country and so can access capital markets to fund their lending portfolios, allowing them to dramatically increase the number of poor people they can reach. There is a need for all involved in microfinance and development to ascertain what exactly has been the impact of microfinance in combating poverty.

SUCCESS FACTORS

Essentials for Success : some of the successes factors are -

1. A three-to five-year Business Plan toward Institutional Financial Self-sufficiency
2. Skilled financial, as well as field managers
3. Increasing levels of institutional efficiency to current industry standards
4. Interest rated fees to clients that are appropriate to cover all costs and to attract savings
5. A computerised management information system that produces financial statements of international standard
6. An effective staff productivity incentive scheme.

The study by Goodwin-Green also identified a number of key success factors for microfinance in commercial banks.

1. Create a small, specialised bank or a separate microfinance unit within a large commercial bank
2. Treat savings as equally important as lending
3. Charge interest rates to cover all the costs of the lending products
4. Ensure excellent management information systems and portfolio management
5. Recruit staff from outside the bank and/or give staff specialist training, and
6. Find a champion or visionary who will see the program through to success.

Professor Yunus has observed that many poverty-focused programs throughout the third world have failed because the benefits were taken up by the “not so poor”. Repayment of loans is the largest problem faced by lending institutions, with success measured by high repayment levels and misuse of loans (such as spending the loan on personal consumption, education or payment of previous debts) is one of the reasons for those

repayment problems. Repayment is necessary for the lending organisation to be self-reliant and to ensure the continuity of loans.

One of the key ingredients in a sustainable MFI is the training of the managers, staff and field workers and the loan recipients who are commencing or increasing the output of their small businesses or farming produce. They reports that one of the problems at the grass roots levels is that the project cadres lack the skills to meet requirements of project complicated monitoring and management systems. Training is needed, not just at the beginning of a program, but throughout the life of the program. Managers of even the most financially successful programs still ask for assistance in motivating the women in the programs to make their repayments and to improve their income generating skills. Training is considered to be an essential component of the success of microfinance schemes and the CARD bank has become a Centre of Excellence with respect to training at all levels. Similarly, the AIM in Malaysia has produced a simple training mLmud with a promotional video, which is very helpful in explaining what AIM does. CASHPOR provide consultants and trainers who travel across the world and train managers 'and assist the program managers in problem solving the many issues that arise in financial and mcmagement areas.

CONCLUSION

Micro finance is a tool for sustainable socio-economic development. The complexity of the Grameen Bank and other such schemes needs to be reduced in order to lessen the expense associated with such schemes, and their long term viability can be ensured by linking the project early with existing credit unions or rural banks. There is some evidence to suggest that the community benefits economically, educationally and socially from the presence of MFIs.

Therefore, there is a greater need for Micro Finance Institutions to carefully design services that meet the needs of the poor and this can only be done when Micro Finance Institutions understand their needs and the context within which the poor are working. If Micro Finance Institutions are to meet their overall development objectives then they need to ensure financial sustainability and outreach of financial services designed to meet the needs of those most in need of such services.

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PERCEIVED RISK & TRUST IN ONLINE SHOPPING AMONG YOUTH IN NAGPUR AND PUNE CITIES

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ABSTRACT

The final purchase decision is the outcome of interplay between perceived risk & trust in online shopping as well as traditional shopping for different products. An attempt has been made in this paper to study the interplay between the perceived risk and trust among youth belongs to Nagpur and Pune. Filled structured questionnaire were received from 312 shoppers. T Test has been used to analyze the data. There was no difference found in case of perceived risk and trust between online shoppers of Nagpur and Pune.

INTRODUCTION

Perceived risk & Consumer buying process

Generally, perceived risk is conceptualized as a typical influence that is addressed during the early stages of the consumer buying process (e.g., (Rich, 1964); (Staelin, 1994). The consumer buying process is often described as a five-stage linear process- R. D. Blackwell, 2001: stage one -- need recognition, stage two -- information search, stage three -- alternatives evaluation, stage four -- purchase decision, and stage five -- post-purchase behavior.

In the need recognition stage, consumers first perceive risk when they recognize the need for a product or service. In the presence of uncomfortable levels of perceived risk, consumers apply risk reduction strategies during the second and third stages, such as reliance on personal recommendations-Cunningham, 1967; seeking additional information about a product or service-Rich, 1964; a preference for national brands and the security of warranties-Bettman, 1973; Rich, 1964; Staelin, 1994. It is generally assumed that these practices are sufficient for mitigating risk, and risk is seldom studied beyond the information search stage- Dr. Lawrence F. Cunningham, 2004.

PERCEIVED RISK: CONCEPT

While making a purchase decision and immediately after having made a purchase, consumers experience a state of uneasiness and tension. The purchase process results in a state of anxiety and tension with respect to the negative consequences that could result from product usage. This state known as “perceived risk”; it refers to a feeling of uncertainty that arises within an individual when he fails to predict the consequences of product choice, usage and resultant experience. This feeling arises because the consumer

cannot judge with certainty the consequences of their purchase decision. The circumstance that led to such a state is lack of information, newness of the product/service offering, complexity of the offering, high price, etc.(Sahney, 2012)

The notion of perceived risk was originally introduced by Bauer (1960, 67) as a psychological, subjective construct to explicate phenomena's such as information seeking and brand loyalty. Perceived risk is the nature and amount of uncertainty or consequences experienced by the consumer in contemplating a particular purchase decision (Rich, 1964). Perceived risk is the consumer's perception of the uncertainty and concomitant adverse consequences of buying a product or service (Dowling and Staelin, 1994). Consumer behavior involves risk in the sense that any action of a consumer will produce consequences that he or she views with some degree of uncertainty(Linda C. Ueltschy, 2004). Michel Laroche (2004) takes perceived risk as the uncertainty and consequences of the decision. Perceived risk is defined as "the amount that would be lost if the consequences of an act were not favorable, and the individual's subjective feeling of certainty that the consequences will be unfavorable (Adobor, 2005). Staelin (1994) had defined the Perceived risk as "the consumer's perception of the uncertainty and concomitant adverse consequences of buying a product or service. In the psychology literature, perceived risk has been described as consisting of a set of possibly interrelated components: financial, performance, physical, psychological, social, and time and convenience, yielding a separate measure of overall perceived risk. (Linda C. Ueltschy, 2004). There is not much literature available which differentiate perceived risk and online perceived risk but A M Hassan defined online perceived risk as "the expectations of any loss or any negative consequences as a result of online shopping".

PERCEIVED RISK: TRADITIONAL AND ONLINE SHOPPING

The majority of research on perceived risk is focused on traditional purchasing situations. If a purchase is perceived as risky, consumers will employ strategies to reduce the perceived risk until it is below their level of acceptance risk, or if they are unable to do so, withdraw from the purchase (Staelin, 1994). Within this context, risk is distinguished between inherent and handled risk (Bettman, 1973). The former refers to the risk before and the latter to the risk after the consumer has applied risk –reduction strategies. Thus, inherent risk is a determinant of risk, whereas handled risk is the result thereof. In a physical store, consumers can see, smell, touch, taste and evaluate quality of a specific product. In online shopping all this is absent. So, it becomes very difficult for consumer to judge a product without inspection. In case of apparel shopping, there may be problem related to fiber content, fit and color as their inability to inspect or try on the garment physically (Stoel, 2005).

However, online shopping¹ is much different than shopping in stores. Internet shopping technologies are essentially self-service technologies that offer the benefits of round-the-clock convenience, ubiquitous availability, time and money savings, and a reduction in the anxiety caused by judgmental service representatives (Bitner, 2000). There are disadvantages too of online shopping as per Dr. Cunningham (2004) such as system complications, computer phobia, and loss of pleasure and social interaction.

In case of traditional shopping there is only one component of perceived risks and that is about the vendor but in case of online shopping there are two components of perceived risks-one, is about the vendor and second is about the computer & internet system. The actual purchase is done after reducing the amount of perceived risk in both the components; hence the amount of perceived risk is more in case of online shopping as compared to traditional shopping.

PERCEIVED RISK AND PURCHASING BEHAVIOR

Internet is an open environment. As a result, online applications or technology is exposed to security threats such as worms, crackers, viruses, spoofing and password sniffing, theft of funds, breaches of personal privacy and attacks by hackers (H. P. Lu, 2005). Consequently personal security may be threatened when people use online applications. Intangible nature of online environment also adds to perceived risk. Intangibility is defined as “lack of physical evidence and the degree to which a product or service cannot provide a clear concrete image” (M. Laroche, 2003). Consumers are thought to have “an inherent predisposition to avoid risk in purchasing situations” (Pavlou, 2003). Perceived risk influences every stage of the consumer decision-making process (Mitchell, 1992). It is theorized that when perceived risk falls below an individual’s acceptance value, it has little effect on intended behavior and is essentially ignored (Greatorex& Mitchell 1993). On the other hand, an extremely high level of perceived risk can cause a consumer to postpone or avoid a purchase entirely. Consumer decision making process due to perceived risk will depend on how frequently he visits and exposure to the online shopping cite. The extent of the exposure depends on the importance or magnitude of the goal, the seriousness of the penalty for not attaining the goal, and the amount of means committed to achieving the goal (Rich, 1964, Staelin 1994 & Dr. Cunningham 2004).

TYPES OF PERCEIVED RISK IN CONTEXT OF ONLINE SHOPPING

Sr. No.	Risks	Researchers&Years
1	financial,	Kaplan (1974), Szybillo and Jacoby (1993), Michel Laroche (2004)
2	performance,	Kaplan (1974), Fatma A. Mohamed (2011), Szybillo and Jacoby (1993), Michel Laroche (2004)

¹ Internet shopping, e shopping and online shopping all are used interchanging in literature

3	physical,	Kaplan (1974), Szybillo and Jacoby (1993), Michel Laroche (2004)
4	social,	Kaplan (1974), Fatma A. Mohamed (2011), Szybillo and Jacoby (1993), Michel Laroche (2004)
5	convenience/ time	Kaplan (1974), Roselius 1971, Fatma A. Mohamed (2011), Michel Laroche (2004)
6	psychological,	Kaplan (1974), Szybillo and Jacoby (1993), Mitchell and Greatorex (1993), Fatma A. Mohamed (2011), Michel Laroche (2004)
7	source credibility	Kaplan (1974), McKorkle (1990), Fatma A. Mohamed (2011)
8	privacy	Kaplan (1974)

According to different researchers description of Perceived Risk are as follows- Financial Risk, Performance Risk, Physical Risk, Psychological Risk, Social Risk, Time Loss Risk, Source Risk, and Privacy Risk

TRUST

Trust is considered as an expression of confidence between the partners in an exchange or a relationship of some kind, a belief that no partner to the exchange will exploit the other's vulnerability, the willingness to rely on the other party (C. Y. Nicholson, 2001). Trust is a multidimensional concept that has been discovered to contain confidence, predictability, ability, competence, expertness, intentions or motives, benevolence, business sense and judgment, altruism, loyalty, integrity, congruence, consistency, fairness, character, openness of management, liking, respect, faith, acceptance and security (Svensson, 2001).

(Bromiley, 2005) define trust as an individual's belief or a common belief among a group of individuals that another individual or group (a) makes good faith efforts to behave in accordance with any commitments both explicit and implicit, (b) is honest in whatever negotiations preceded such commitments, and (c) does not take excessive advantage of another even when the opportunity is available. In the marketing field, trust is defined as psychological state comprising intention to accept vulnerability based on one's positive expectation of the intentions or behaviours of another (Deshmukh, 2000) or willingness to rely on an exchange partner (Ganeshan, 1994) .

TRUST IN ONLINE TRANSACTION

In context of online shopping, trust is defined as the belief that an Internet shopper has in an Internet merchant and is willing to engage in an Internet shopping transaction, even with the possibility of loss, based on the expectation that the merchant will engage in

generally acceptable practices, and will be able to deliver the promised products or services (K. H. Lim, 2006). Trust has been conceptualized as a set of beliefs about an Internet vendor in electronic commerce research (Bhattacharjee, 2002). Trust is significant in adoption of new technologies including the Web and e-commerce. Due to the inherent uncertainty created by the need to depend upon others in many types of commerce transactions and the resulting possibility of facing opportunistic behaviour or behaving in an unpredictable manner, trust becomes significant aspect in e-commerce (Straub, 2003).

INTERRELATION BETWEEN TRUST AND RISK

Trust and risk are closely interrelated (R. C. Mayer, 1995). Trust is vital factor under conditions of uncertainty and risk (Turban M. K., 2001). An interesting implication is the directionality of the causal relationship between trust and perceived risk is an interesting factor. The research suggests that the directionality of the causal relationship flows from trust to perceived risk. Trust also acts indirectly on intention to transact through the mediating effect of perceived risk, on which it has a direct effect. The customers could be attracted or promoted to do their first online purchasing rather than just surfing the Internet, they would tend to have a higher e-trust level. Further, with a higher e-trust level, these customers will be more willing to purchase and spend more money online. (Chuan Pang, 2007). In an electronic store, perceived size and perceived reputation were found to determine trust which impacted the attitude, risk perception and which in turn influenced the willingness to buy in an electronic store (S. L. Jarvenpaa, 2000)

Lack of trust on online shopping has been conceived as the basic barrier to the adoption of online shopping. Same would be one of the major handicaps for further development and growth of B2C e-commerce. Intensity of risk perception has resulted in a parallel line of research – to develop a construct which can be used by the marketers to overcome the perceived risk is ‘online trust’. Various studies have taken place to understand the nature of online trust and its element.

EMPIRICAL EVIDENCES

The importance of internet has been increased significantly and now it plays vital role in the growth of selling as well as buying products. Despite the phenomenal growth of the Internet over the past few years, the vast potential of conducting business over the Internet remains largely untapped. An attempt has been made in this paper to understand the role of perceived risk and trust in online buying behaviour of youth in Pune and Nagpur. Primary data on predefined parameters like frequency of shopping online, amount spend on online transaction, mode of payment; willingness to share the personal and financial information etc is collected from the youth of Pune and Nagpur with the help of a structured questionnaire. Information about age, gender, income, marital status,

education etc is also collected as all these also have impact on online shopping behaviour.

We take the hypothesis that there is no difference between the shoppers of Pune and Nagpur in terms of perceived risk & trust. Likert scale and T test has been used to check our hypothesis.

Characteristics	Categories	Pune	Nagpur	Total
City	Pune & Nagpur	267 (66)	140 (34)	407 (100)
Gender	Male	169 (42)	84 (21)	253 (62)
	Female	98 (24)	56 (14)	154 (38)
Age Group	18-25 years	149 (37)	51 (13)	200 (49)
	26-30 years	75 (18)	53 (13)	128 (31)
	31-35 years	43 (11)	36 (9)	79 (19)
Marital Status	Married	89 (22)	65 (16)	154 (38)
	Unmarried	178 (44)	75 (18)	253 (62)
Education	Above Post Graduate	15 (4)	19 (5)	34 (8)
	Post Graduate	178 (44)	80 (20)	258 (63)
	Graduate	47 (12)	31 (8)	78 (19)
	Professional	27 (7)	10 (2)	37 (9)
Occupation	Company employee	58 (14)	31 (8)	89 (22)
	Self employed	15 (4)	13 (3)	28 (7)
	Service holders	101 (25)	59 (14)	160 (39)
	Student	93 (23)	37 (9)	130 (32)
Monthly Income (in Rs.)	Less than 10000	92 (23)	41 (10)	133 (33)
	10001- 30000	89 (22)	60 (15)	149 (37)
	30001-50000	64 (16)	29 (7)	93 (23)
	50001 & above	22 (5)	10 (2)	32 (8)

The majority (66 percent) of respondents are from Pune. In case of gender, the major respondents are male (62 percent), the review of literature suggests that women have fear of technology as compared to males. Age wise, major respondents are from 18-25 years age group (49 percent), review of literature reveals that young age group are major constituents of buyers as compared to their other age group counterparts. In case of marital status, unmarried are more (62 percent), the unmarried spend more time with mobile as compared to the married ones, so the unmarried spend more on online shopping than married people. Education wise post graduate are major respondents (63 percent), educated people are more confident in online shopping, the less educated people find online shopping riskier, hence shop less. Occupation wise, service holders

are (39 percent), students have less money to shop, where as service holders may shop from their respective offices. Monthly income wise, 10k-30k are majority (37 percent), low income group are majorly having younger in age and hence shop more online.

OBJECTIVES:

1. To find out the level of perceived risk and compare it between the online shoppers of Pune & Nagpur
2. To find out the level of trust and compare it between the online shoppers of Pune & Nagpur

ANALYSIS OF PERCEIVED RISKS AND TRUST AMONG SHOPPERS

The level of perceived risk and trust of shoppers have been measured by the help of seven- point Likert scale. The shoppers’ responses (see attachment) were recorded on 1 to 7 point scale separately for questions related to Perceived risk (11 question) and Trust (10 question). Literature review suggests that Trust and perceived risk is a common phenomenon and it does not vary with place to place. The level of responses may be changing as per the local environment as well as demographic parameters. As table suggest that number of respondent from Pune and Nagpur is not same.

To conclude the discussion, two hypothesis have been framed and t statistics is used to test the same and results are shown in table no -----.

HYPOTHESIS

(a) H_0 : There is no difference in the level of perceived risk between the shoppers of Pune and Nagpur

H_1 : Otherwise

(b) H_0 : There is no difference in the level of Trust between the shoppers of Pune and Nagpur.

H_1 : Otherwise

T-test has been used to test Hypothesis 1 & 2, whether there are different perceptions with respect to perceive risk and trust.

Table: T-Test Results of Shoppers from Nagpur & Pune (Perceived Risk)

Null Hypothesis:		diff = mean(Nagpur) - mean(Pune)				Ho: diff = 0	
Qu es no	Mean values		Mean Difference	Equal Variance		Unequal Variance	
	Nagpur	Pune		Ha: diff != 0		Ha: diff != 0	
				Test value	Result	Test value	Result
1	4.52	4.8731	-0.35	Pr(T > t) = 0.0348	Rejected	Pr(T > t) = 0.0348	Rejected
2	3.40	3.8439	-0.43	Pr(T > t) = 0.0380	Rejected	Pr(T > t) = 0.0323	Rejected
3	4.26	4.3073	-0.04	Pr(T > t) = 0.8293	Not Rejected	Pr(T > t) = 0.8264	Not Rejected
4	3.96	3.9365	0.02	Pr(T > t) = 0.9040	Not Rejected	Pr(T > t) = 0.9051	Not Rejected

5	5.0754	5.0754	0.05108	$\Pr(T > t) = 0.8050$	Not Rejected	$\Pr(T > t) = 0.8062$	Not Rejected
6	4.7547	4.8536	-0.09894	$\Pr(T > t) = 0.6548$	Not Rejected	$\Pr(T > t) = 0.6466$	Not Rejected
7	6.0283	6.0243	0.00391	$\Pr(T > t) = 0.9793$	Not Rejected	$\Pr(T > t) = 0.9790$	Not Rejected
8	4.7169	4.8243	-0.1074	$\Pr(T > t) = 0.6244$	Not Rejected	$\Pr(T > t) = 0.6336$	Not Rejected
9	4.1509	4.4243	-0.2734	$\Pr(T > t) = 0.1656$	Not Rejected	$\Pr(T > t) = 0.1637$	Not Rejected
10	5.2169	5.2243	-0.0074	$\Pr(T > t) = 0.9690$	Not Rejected	$\Pr(T > t) = 0.9694$	Not Rejected
11	3.7264	3.7951	-0.0687	$\Pr(T > t) = 0.7464$	Not Rejected	$\Pr(T > t) = 0.7473$	Not Rejected

There is no change in the result of equal and unequal Variance. The null hypothesis is not rejected (Except question no. 1 and 2), so there is no difference between the shoppers of Nagpur and Pune in terms of perceived risk.

Table: T-Test Results of Shoppers from Nagpur & Pune (Trust)

Ques. No.	Mean values		Mean Difference	Ha: diff != 0		Ha: diff != 0	
	Nagpur	Pune		(two tail test)		(two tail test)	
				Test value	Result	Test value	Result
12	4.6226	4.7658	-0.1432	$\Pr(T > t) = 0.3482$	Not Rejected	$\Pr(T > t) = 0.3347$	Not Rejected
13	4.5566	4.7024	-0.14583	$\Pr(T > t) = 0.3763$	Not Rejected	$\Pr(T > t) = 0.3820$	Not Rejected
14	4.5	4.7902	-0.2902	$\Pr(T > t) = 0.1101$	Not Rejected	$\Pr(T > t) = 0.1119$	Not Rejected
15	4.6037	4.6487	-0.045	$\Pr(T > t) = 0.7809$	Not Rejected	$\Pr(T > t) = 0.7787$	Not Rejected
16	5	5.117	-0.117	$\Pr(T > t) = 0.4707$	Not Rejected	$\Pr(T > t) = 0.4945$	Not Rejected
17	5.4622	5.556	-0.09383	$\Pr(T > t) = 0.5493$	Not Rejected	$\Pr(T > t) = 0.5592$	Not Rejected
18	5.8207	5.9121	-0.0914	$\Pr(T > t) = 0.5333$	Not Rejected	$\Pr(T > t) = 0.5296$	Not Rejected
19	5.3301	5.1658	0.1643	$\Pr(T > t) = 0.3933$	Not Rejected	$\Pr(T > t) = 0.3705$	Not Rejected
20	5.1981	5.1121	0.0859	$\Pr(T > t) = 0.6168$	Not Rejected	$\Pr(T > t) = 0.6023$	Not Rejected
21	5.7641	5.839	-0.07487	$\Pr(T > t) = 0.6177$	Not Rejected	$\Pr(T > t) = 0.6211$	Not Rejected

There is no change in the result of equal and unequal Variance. The null hypothesis is not rejected, so there is no difference between the shoppers of Nagpur and Pune in terms of trust.

Table: Shoppers Likert Analysis

Qs	Cities	1	2	3	4	5	6	7	G Total
1	Nagpur	2 (0.64)	8 (2.56)	12 (3.85)	31 (9.94)	25 (8.01)	23 (7.37)	6 (1.92)	107 (34.29)
	Pune	3 (0.96)	8 (2.56)	27 (8.65)	33 (10.58)	57 (18.27)	57 (18.27)	20 (6.41)	205 (65.71)
	G Total	5 (1.60)	16 (5.13)	39 (12.50)	64 (20.51)	82 (26.28)	80 (25.64)	26 (8.33)	312 (100)
2	Nagpur	15 (4.81)	24 (7.69)	14 (4.49)	23 (7.37)	20 (6.41)	9 (2.88)	2 (0.64)	107 (34.29)
	Pune	29 (9.29)	27 (8.65)	3 (9.62)	37 (11.86)	38 (12.18)	31 (9.94)	13 (4.17)	205 (65.71)
	G Total	44 (14.10)	51 (16.35)	44 (14.10)	60 (19.23)	58 (18.59)	40 (12.82)	15 (4.81)	312 (100)
3	Nagpur	8 (2.56)	7 (2.24)	18 (5.77)	22 (7.05)	27 (8.65)	18 (5.77)	7 (2.24)	107 (34.29)
	Pune	17 (5.45)	18 (5.77)	24 (7.69)	46 (14.74)	46 (14.74)	34 (10.90)	20 (6.41)	205 (65.71)
	G Total	25 (8.01)	25 (8.01)	42 (13.46)	68 (21.79)	73 (23.40)	52 (16.67)	27 (8.65)	312 (100)
4	Nagpur	11 (3.53)	17 (5.45)	15 (4.81)	20 (6.41)	20 (6.41)	14 (4.49)	10 (3.21)	107 (34.29)
	Pune	24 (7.69)	27 (8.65)	28 (8.97)	40 (12.82)	45 (14.42)	27(8.65)	14 (4.49)	205 (65.71)
	G Total	35 (11.22)	44 (14.10)	43 (13.78)	60 (19.23)	65 (20.83)	41 (13.14)	24 (7.69)	312 (100)
5	Nagpur	5 (1.60)	6 (1.92)	5 (1.60)	26 (8.33)	15 (4.81)	19 (6.09)	31 (9.94)	107 (34.29)
	Pune	7 (2.24)	14 (4.49)	14 (4.49)	47 (15.06)	28 (8.97)	40 (12.82)	55 (17.63)	205 (65.71)
	G Total	12 (3.85)	20 (6.41)	19 (6.09)	73 (23.40)	43 (13.78)	59 (18.91)	86 (27.56)	312 (100)
6	Nagpur	5 (1.60)	9 (2.88)	13 (4.17)	15 4.81)	24 (7.69)	21 (6.37)	20 (6.41)	107 (34.29)
	Pune	13 (4.17)	24 (7.69)	12 (3.85)	24 7.69)	40 (12.82)	42 (13.46)	50 (16.03)	205 (65.71)
	G Total	18 (5.77)	33 0.58)	25 (8.01)	39 2.50)	64 (20.51)	63 20.19)	70 (22.44)	312 (100)
7	Nagpur	0 (0)	1 (0.32)	5 (1.60)	9 (2.88)	13 (4.17)	28 (8.97)	51 (16.35)	107 (34.29)
	Pune	1 (0.32)	4 (1.28)	4 (1.28)	20 (6.41)	24 (7.69)	50 (16.03)	102 (32.69)	205 (65.71)
	G Total	1 (0.32)	5 (1.60)	9 (2.88)	29 (9.29)	37 (11.68)	78 (25.00)	153(49.04)	312 (100)

8	Nagpur	7 (2.24)	13 (4.17)	13 (4.17)	9 (2.88)	14 (4.49)	31 (9.94)	20 (6.41)	107 (34.29)
	Pune	10 (3.21)	22 (7.05)	14 (4.49)	30 (9.62)	41 (13.14)	48 (15.38)	40 (12.82)	205 (65.71)
	G Total	17 (5.45)	35 (11.22)	27 (8.65)	39 (12.50)	55 (17.63)	79 (25.32)	60 (19.23)	312 (100)
9	Nagpur	7 (2.24)	12 (3.85)	14 (4.49)	31 (9.94)	19 (6.09)	16 (5.13)	8 (2.56)	107 (34.29)
	Pune	9 (2.88)	25 (8.01)	21 (6.73)	48 (15.38)	40 (12.82)	41 (13.14)	21 (6.73)	205 (65.71)
	G Total	16 (5.13)	37 (11.86)	35 (11.22)	79 (25.32)	59 (18.91)	57 (18.27)	29 (9.29)	312 (100)
10	Nagpur	3 (0.96)	5 (1.60)	7 (2.24)	22 (7.05)	14 (4.49)	27 (8.65)	29 (9.29)	107 (34.29)
	Pune	7 (2.24)	10 (3.21)	14 (4.49)	22 (7.05)	37 (11.86)	76 (24.36)	39 (12.50)	205 (65.71)
	G Total	10 (3.21)	15 (4.81)	21 (6.73)	44 (14.10)	51 (16.35)	103 (33.01)	68 (21.79)	312 (100)
11	Nagpur	15 (4.81)	15 (4.81)	18 (5.77)	22 (7.05)	16 (5.13)	15 (4.81)	6 (1.92)	107 (34.29)
	Pune	25 (8.01)	34 (10.90)	29 (9.29)	38 (12.18)	40 (12.82)	27 (8.65)	12 (3.85)	205 (65.71)
	G Total	40 (12.82)	49 (15.71)	47 (15.06)	60 (19.23)	56 (17.95)	42 (13.46)	18 (5.77)	312 (100)
Question related to trust									
1	Nagpur	1 (0.32)	4 (1.28)	10 (3.21)	37 (11.86)	26 (8.33)	26 (8.33)	3 (0.96)	107 (34.29)
	Pune	1 (0.32)	10 (3.21)	23 (7.37)	49 (15.71)	58 (18.59)	47 (15.06)	17 (5.45)	205 (65.71)
	G Total	2 (0.64)	14 (4.49)	33 (10.58)	86 (27.56)	84 (26.92)	73 (23.40)	20 (6.41)	312 (100)
2	Nagpur	1 (0.32)	6 (1.92)	19 (6.09)	28 (8.97)	21 (6.73)	24 (7.69)	8 (2.56)	107 (34.29)
	Pune	2 (0.64)	11 (3.53)	24 (7.69)	51 (16.35)	57 (18.27)	41 (13.14)	19 (6.09)	205 (65.71)
	G Total	3 (0.96)	17 (5.45)	43 (13.78)	79 (25.32)	78 (25.00)	65 (20.83)	27 (8.65)	312 (100)
3	Nagpur	5 (1.60)	8 (2.56)	8 (2.56)	32 (10.26)	25 (8.01)	20 (6.41)	9 (2.88)	107 (34.29)
	Pune	5 (1.60)	12 (3.85)	21 (6.73)	47 (15.06)	44 (14.10)	50 (16.03)	26 (8.33)	205 (65.71)
	G Total	10 (3.21)	20 (6.41)	29 (9.29)	79 (25.32)	69 (22.12)	70 (22.44)	35 (11.22)	312 (100)
4	Nagpur	1 (0.32)	6 (1.92)	13 (4.17)	30 (9.62)	29 (9.29)	21 (6.73)	7 (2.24)	107 (34.29)

	Pune	4 (1.28)	8 (2.56)	30 (9.62)	45 (14.42)	61 (19.55)	41 (13.14)	16 (5.13)	205 (65.71)
	G Total	5 (1.60)	14 (4.49)	43 (13.78)	75 (24.04)	90 (28.85)	62 (19.87)	23 (7.37)	312 (100)
5	Nagpur	1 (0.32)	6 (1.92)	10 (3.21)	25 (8.01)	18 (5.77)	28 (8.97)	19 (6.09)	107 (34.29)
	Pune	1 (0.32)	8 (2.56)	11 (3.53)	38 (12.18)	60 (19.23)	62 (19.87)	25 (8.01)	205 (65.71)
	G Total	2 (0.64)	14 (4.49)	21 (6.73)	63 (20.19)	78 (25.00)	90 (28.85)	44 (14.10)	312 (100)
6	Nagpur	1 (0.32)	4 (1.28)	5 (1.60)	12 (3.85)	25 (8.01)	34 (10.90)	26 (8.33)	107 (34.29)
	Pune	0 (0)	5 (1.60)	7 (2.24)	35 (11.22)	34 (10.90)	70 (22.44)	54 (17.31)	205 (65.71)
	G Total	1 (0.32)	9 (2.88)	12 (3.85)	47 (15.06)	59 (18.91)	104 (33.33)	80 (25.64)	312 (100)
7	Nagpur	0 (0)	2 (0.64)	2 (0.64)	14 (4.49)	16 (5.13)	36 (11.54)	37 (11.86)	107 (34.29)
	Pune	1 (0.32)	3 (0.96)	8 (2.56)	16 (5.13)	25 (8.01)	72 (23.08)	80 (25.64)	205 (65.71)
	G Total	1 (0.32)	5 (1.60)	10 (3.21)	30 (9.62)	41 (13.14)	108 (34.62)	117 (37.50)	312 (100)
8	Nagpur	1 (0.32)	6 (1.92)	5 (1.60)	15 (4.81)	22 (7.05)	35 (11.22)	23 (7.37)	107 (34.29)
	Pune	10 (3.21)	9 (2.88)	10 (3.21)	38 (12.18)	32 (10.26)	53 (16.99)	53 (16.99)	205 (65.71)
	G Total	11 (3.53)	15 (4.81)	15 (4.81)	53 (16.99)	54 (17.31)	88 (28.21)	76 (24.36)	312 (100)
9	Nagpur	0 (0)	5 (1.60)	4 (1.28)	24 (7.69)	24 (7.69)	33 (10.58)	17 (5.45)	107 (34.29)
	Pune	5 (1.60)	10 (3.21)	12 (3.85)	37 (11.86)	41 (13.14)	66 (21.15)	34 (10.90)	205 (65.71)
	G Total	5 (1.60)	15 (4.81)	16 (5.13)	61 (19.55)	65 (20.83)	99 (31.73)	51 (16.35)	312 (100)
10	Nagpur	1 (0.32)	2 (0.64)	2 (0.64)	13 (4.17)	18 (5.77)	35 (11.22)	36 (11.54)	107 (34.29)
	Pune	0 (0)	4 (1.28)	4 (1.28)	26 (8.33)	34 (10.90)	56 (17.95)	81 (25.96)	205 (65.71)
	G Total	1 (0.32)	6 (1.92)	6 (1.92)	39 (12.50)	52 (16.67)	91 (29.17)	117 (37.50)	312 (100)

CONCLUSIONS

According to review of literature there are eight varieties of perceived risks. While analyzing the impact of perceived risk in online shopper we asked questions on separate perceived risks while analysed the combined effect of theirs on the shoppers. The same

thing is with trusts also. The types of perceived risks may differ on the basis of types of shoppers, but in case of current study we did not find the difference in risks and trust between the shoppers of Nagpur and Pune. There is no difference between the shoppers of Nagpur and Pune in terms of perceived risk. There is no difference between the shoppers of Nagpur and Pune in terms of trust too.

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PUBLIC PRIVATE PARTNERSHIP FOR SUSTAINABLE PUBLIC SERVICES – CASE STUDY OF URBAN WATER SUPPLY SECTOR IN INDIA

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ABSTRACT

Urban water supply and sanitation is the responsibility of state governments whereas operation and maintenance of their services is seen by Urban Local Bodies (ULB) or the Public Health Engineering Departments. Essential services such as water supply, sanitation, sewerage, electricity etc. are a necessity for the growth of our cities, but unfortunately these services have never attained the kind of attention they should have. The cities are not fully geared up for upgrading the delivery of these services. Most of the cities use the traditional way of gradual expansion, age old tariffs that are economically unviable, bureaucratic organisational setup etc. The present system of supplying water to the population in urban areas in India is gradually changing face from the conventional department controlled Engineering, Procurement & Construction (EPC) contract to the latest model of delivery through Public – Private partnership (PPP). This paper discusses the use of PPP for delivery of urban water supply through a case study of Nagpur Municipal Corporation (NMC). This model is expected to bring about sustainability in the urban water supply scenario. The private player brings its technical and managerial expertise to improve the service delivery and upgrades the maintenance of the existing assets. The paper covers the investments outlay in water supply in India, the drawbacks in the traditional format of urban water supply and involvement of private firms along the value chain in the urban water supply.

Keywords: *Urban water supply, India, Public Private Partnership, Urban basic services, Private sector participation*

INTRODUCTION

Urban water supply and sanitation is the responsibility of state governments whereas operation and maintenance of services is seen by Urban Local Bodies (ULB) or the Public Health Engineering Departments. Under the 74th constitutional amendment, the responsibility of local essential service delivery has been assigned to the ULBs; but a

parallel delegation of powers to raise finances has not been done. Therefore, even today, the ULBs are dependent on state or central government funds for capital expenses and sometimes even the O & M expenses. The position paper prepared by the Department of Economic Affairs (DEA) in 2009 on water and sanitation says, “Large investments are needed to develop and upgrade water supply, treatment and distribution networks. The investment potential across various sub-sectors is expected to be around Rs 90 billion in 2010 and Rs 170 billion in 2015 with CAGR of 14% in water infrastructure investment’. According to a position paper of 2009 for this sector, the share of the Centre is set to drop sharply from 65% to 29%, the share of the states to increase from 33% to 67%. In absolute terms, the investment envisaged for the states is an increase of more than 400% from Rs.0.21 lakh crore to Rs. 0.96 lakh crore. The share of the private sector is also set to increase from 1.58% to 3.78%, providing an increased investment potential of 530% (from Rs. 1022 crore to Rs. 5421 crore) (DEA, 2009). This will be a huge challenge for both the State and Central Government to facilitate private sector investment in the sector.

EXISTING STRUGGLE IN URBAN WATER SUPPLY

As per the working paper of DEA 2009 (Vaidya, 2009) water supply is available for 2.9 hours per day across cities and towns. The non-revenue water that includes physical and revenue losses account for 40%-60% of total water supply. As per 54th round of National Sample Survey, 70% of urban households are being served by tap and 21% by Tube well or hand pump. 66% of urban households reported having their principal source of water within their premises while 32% had it within 0.2 Km. 41% had sole access to their principal source of drinking water and 59% were sharing a public source.

Poor coverage, irregular supplies, low pressure and poor quality are some of the most prominent features of water supply in the cities. As per the Report on Indian Urban Infrastructure and services prepared by High Power Executive committee head by I J Aluwallia (HPEC, 2011).

- Many large cities have to source water from far off places ranging from 50 to 200 km due to pollution of nearby sources. This increases the cost of raw water and possibility of leakage during transmission.
- Poor maintenance and inadequate replacement of existing assets and physical systems lead to technical losses in the distribution network. Errors in metering, unbilled water consumption and theft contribute to commercial losses and increase the non-revenue water.

Water Balance in a Typical Indian City

Water Produced (100%) 164 mld	Authorised Consumption (30%) 50 mld	Billed & Authorised Consumption (26%) 42 mld	Billed & Metered (4%) 6 mld	Revenue Water (26%) 42 mld	Collected (20%) 33 mld
			Billed & Un-metered (22%) 36 mld		
	Unaccounted for Water Losses (70%) 114 mld	Unbilled Authorised	Public Standpost (5%) 8 mld	Non-revenue Water (74%) 122 mld	
		Apparent Losses	Theft		
			Customer Meter Errors, Data Errors		
		Real Losses	Storage Leakage		
Transmission Main Leakage					
		Service Connection Leakage			

Note: mld stands for million litres per day
Source: ASCI (2010).

Figure 1 Water Balance in a typical Indian city

- The high commercial and physical losses compounded by unwillingness to increase user charges leads to a recovery of me 30%-35% of the O&M cost.

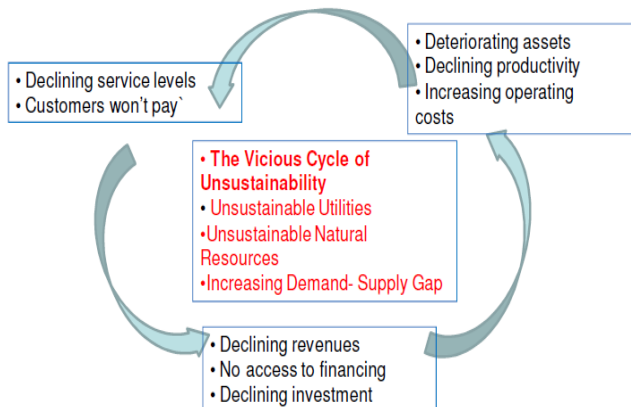


Figure 2 Vicious circle of unsustainability

- The burden of the poor quality of water delivery is borne by the poor. Lower-income groups without access to the public delivery have to rely on the market sources to get water at a higher price. Irregular water supply forces the poor people to forgo work as they have to stand in line to collect water when it arrives.
- Intermittent supply of water makes the pipeline vulnerable to corrosion and builds up germs

- Low water pressure forces people, who can afford to invest in pumps thereby increasing the electricity consumption, to buy storage tanks to store water
- Every time public water is supplied, peoples’ tendency to use fresh water results in wastage of water due to throwing of stored water.

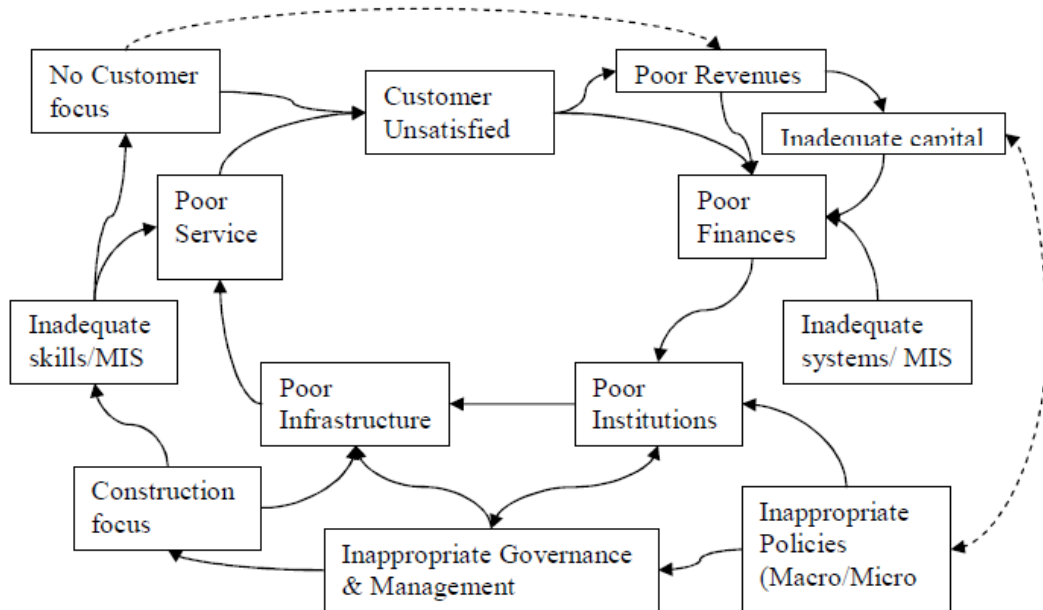


Figure 3 The vicious circle of Urban water sector

Source: World Bank (1999)

NEED FOR CHANGE IN URBAN WATER SECTOR MANAGEMENT

Cities are considered as the centres of economic development, investment flows, employment generation and trade & commerce. Therefore the pressure on the delivery of urban services is increasing from various sections of the society. The increasing difficulty in raising funds from the budgetary system of ULB is forcing the government to look at ‘off-budget’ financing strategies. Off-budget strategies, here, refer to the urban development financing strategies which do not directly impact on the budget of the pivotal urban management entity of a city, in the sense that they do not require additional utilization of local government revenue (Wegelin, 2005). In other words, such strategies are budgetary neutral, but seek to enhance the cost-effectiveness of resource utilization. There are two such strategies in particular: (a) multi-sector investment planning in urban development, and (b) public—private partnerships in urban infrastructure delivery. The first one rather refers to pooled investment planning of central and local government funds in the development of cities as is found in some of the countries. The latter is becoming much more important in the joint provision of the services, which are until now provided by the public body or government, and with which we are concerned here in the context of urban infrastructure services of local governments.

The public sector is sometimes not able to cope with the challenges it faces regarding water management. Public Private Partnerships (PPP's) are one of the possible solutions to this problem. PPP's are partnerships between the public and the private sector. Together, they develop projects which traditionally were the responsibility of the public sector. The aim is to give the responsibility of the project to the person most capable to manage it. PPPs in the water sector in India have recorded significant achievements—notably focusing on leveraging the efficiencies of the private sector rather than finance alone. PPPs are one of the options to improve water supply services, and are being preferred due to the perceived limitations of public sector reform (World Bank, 2014).

The alarming water crisis coupled with mega business opportunities hidden in the crisis has given rise to the increasing interest by the private players in the entire value chain [bulk water generation → treatment (desalination, waste water) → distribution of water → network rehabilitation] of the water supply sector.

PPP Option	Asset Ownership	Operation & Maintenance	Capital Investment	Commercial Risk	Duration
<i>Management Contract</i>	Public	Private	Public	Public	3-5 years
<i>Lease Contract</i>	Public	Private	Public	Shared	8-15 years
<i>Concession/ BOT</i>	Public	Private	Private	Private	25-30 years
<i>BOOT/BOO</i>	Public/ Private	Private	Private	Private	20-30 years

Figure 4 Appropriate Private Sector Participation model for different contracts

Source: Kumar. S and Prasad, C.J. (2004)

Some of the factors for increased interest of the private sector in urban water supply in India are (Venkatachalam, L, 2007):

1. Availability of public funding through schemes such as Jawaharlal Nehru National Urban Renewal Mission (JNNURM).
2. Improved mechanism to address water tariff concerns.
3. Increased attention to stakeholder support.
4. Strong project ownership by the Urban Local Body (ULB) with well drafted contractual terms highlighting realistic risk allocation.

PPP FOR PUBLIC NEEDS

Private sector's financing of projects in public domain results in the emergence of PPPs (Li & Akintoye, 2003). The 1990s has seen PPPs as the key tool of public policy across the world (Osborne, 2000). Since its emergence in 1997 in United Kingdom, PPP has been recognized as an effective way of delivering value for money in public infrastructure and services. In the USA, The National Council for PPP defines PPP "as a

contractual arrangement between a public sector agency and a for-profit private sector developer, whereby resources and risks are shared for the purpose of delivery of a public service or development of public infrastructure” (Li and Akintoye, 2003). In Canada, the Council for Public–Private Partnerships (2004) defines a PPP as a “cooperative venture between the public and private sectors, built on the expertise of each partner, which best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards”. While Standard & Poor defines PPP as any medium-to-long term relationship between the public and private sectors, involving the sharing of risks and rewards of multi-sector skills, expertise and finance to deliver desired policy outcomes (S&P, 2005). A significant characteristic of PPP is the allocation and sharing of risk among parties (Ke et al., 2010a, 2010b) and long term engagement to deliver public services. Unlike other procurement methods, the risks in PPP are identified and allocated to parties best able to manage and mitigate those (Li et al., 2005a).

CASE STUDY OF NAGPUR MUNICIPAL CORPORATION(NMC)

Nagpur is located in central India in the western State of Maharashtra. The city is home to 2.5 million people with approximately 850,000 (35 percent) living in slums. The Government of Maharashtra decentralized responsibilities for water supply services in early 2000s. The city took ownership of the entire water supply value chain and since 2002 has initiated a series of outsourcing contracts for supply of labour, small maintenance activities, and so forth. The city also built two water treatment plants on a partial financing cum operations basis. The water supply function enjoys a relatively higher level of autonomy as compared to other cities with similar institutional structures, and the city’s technical capacity is strong.

For many years NMC has been deliberating on the idea of outsourcing the operations of water supply to private players in view of difficulties in managing multiple fragmented contracts and reluctance of the staff to be deployed in water supply operations. After the success of the 24x7 pilot project at Dharampet zone covering 175,000 residents (10% of the total connections) achieving continuous water supply, the Corporation decided to scale up the initiative. The project includes operations and management of the existing distribution system (treatment plants and distribution networks) and rehabilitation of a significant part of the network including replacement of customer connections and meters. Sufficient raw water was made available which reduced the risk to the Operator.

NAGPUR WATER SUPPLY: Status before JNNURM

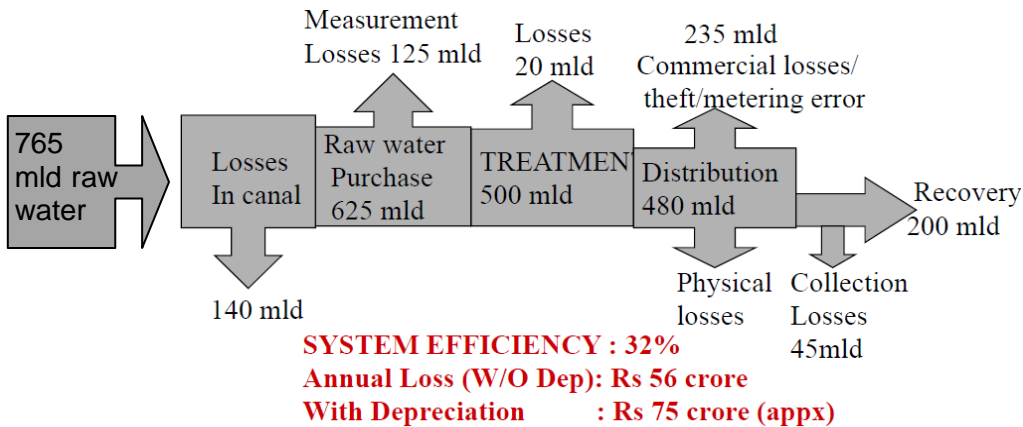


Figure 5

Source: Water Audit (2005), Nagpur Municipal Corporation

INSTITUTIONAL FRAMEWORK

To implement PPP, NMC formed a fully owned company Nagpur Environmental Services Limited (NSEL). NSEL will look after the water functions. Key elected representatives and executive of NMC shall constitute the board of NSEL. NSEL shall be responsible for contract supervision.

STAKEHOLDER SUPPORT

Since the project covered wider area and was complex, NMC held several meetings with citizens, editors / journalists, activists, NGOs and elected representatives to discuss the PPP model in detail, the technical, financial and social aspects of the project and explain the proposed benefits. The pilot 24x7 project at Dharampet zone also aided in building support for the project. Draft contract was made available on the Corporation’s website for review. The State government was supportive of the project and provided all the clearances to facilitate the process.

FUNDING

JNNURM provided grant to cover 70% of the project cost. Operator shall bring in remaining 30%. Future CAPEX shall be the responsibility of the Corporation. NMC would reimburse additional cost if the scope of rehabilitation increases in order to achieve the performance standards. NMC shall bear the cost of the raw water supply, electricity and staff retained.

BIDDING PROCESS

Administrative Staff College of India (ASCI) at the behest of NMC held stakeholder workshop with key policy makers to gain support for the bid process. In the two-stage International Competitive Bidding (ICB) process eleven bidders participated.

The first phase was based on experience and financial strength that saw three bidders - Veolia-Vishwaraj consortium, IVRCL-Aqualia, and Cascal-Nagarjuna Construction being pre-qualified. The second stage consisted of evaluation of the technical proposal, clarifications of queries alongwith the submission of financial bid. The award criteria was the lowest price per unit(m³) of water billed and collected by the operator. In 2010, the project was awarded to the consortium of Veolia – Vishwaraj.

CONTRACTUAL TERMS

Scope of Contract

The project tenure is 25 year with a provision of extension for further 25 years. The project included O&M of the existing distribution system and rehabilitation of significant part of the network including replacement of customer connections and meters. In the first five years the Operator is required to implement an initial performance improvement project under bill-of-quantities based contract. The operator’s performance obligation begins five years after takeover of the assets in November 2011. A separate works contract based on item rate covers the rehabilitation works.

Revenue model

The revenue collected by the operator shall be deposited in escrow account from where payments for electricity, raw water, operator fees etc. shall be made. Shortfall between collections and operator remuneration shall be covered by NMC’s budget. The operator is assured of minimum guaranteed revenue if the billing is below a threshold in the first five years. Liquidated damages are limited to 5% of the annual revenue. The revenue is revised every five years through rebasing (taking all costs & expenditure & revision of performance standards as determined by the Operator) and also subject to cost escalation and extraordinary rate adjustment. Operators’ financial risk is minimized to a great extent as the revenue exceeds four times the investment commitment by the operator in the first five years.

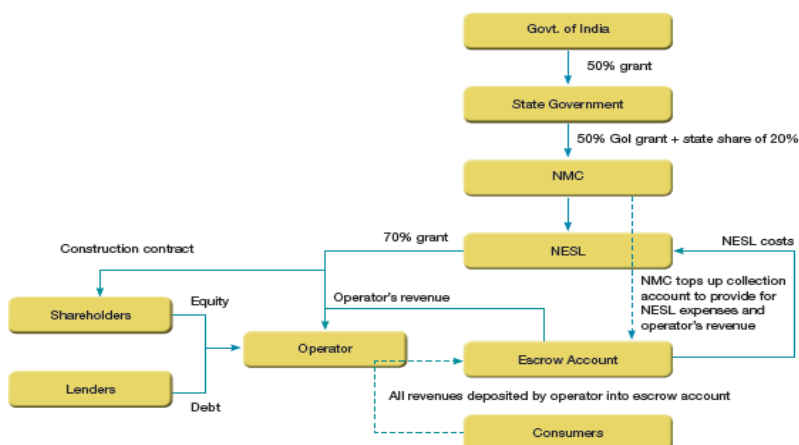


Figure 6 Nagpur PPP Flow of funds

Tariff

Prior to the bidding process NMC revised the water tariff to narrow the cost recovery gap. Tariff fixation is the responsibility of NMC.

Staffing

NMC employees have the option of joining the Operator or staying with NMC. If they decide to continue with NMC then they shall be redeployed in other functions.

Dispute resolution

Disputes shall first be resolved amicably, if not, then by arbitration at Nagpur under Indian Arbitration Act. Mumbai High court shall appoint a retired Supreme Court judge as the arbitrator.

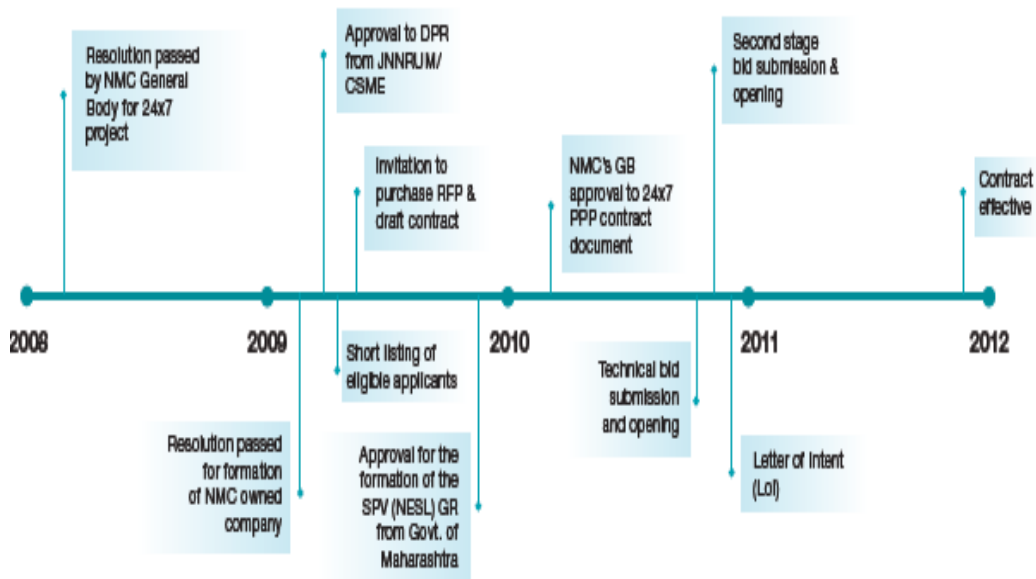


Figure 7 Nagpur PPP timeline

CONCLUSION

Poor inter-governmental coordination as well as lack of stakeholder participation in Urban sector projects has been affecting the progress of urban infrastructure. What is required is the participation of all the concerned parties and stakeholders' alongwith financing by concerned agencies. The above case is an example of 'partnership' rather than 'privatisation'. It involved a number of governance reforms, tariff restructuring, and the efficiency gains brought in by the private sector. Based on the above case study a set of guidelines are recommended for development and implementation of PPP in urban water supply;

1. To attract the private sector in urban basic services it is important for the Government to provide sound financial security.
2. For PPPs to succeed, it is important to have tender documentation with well-structured 'Requests for Proposals' and draft contracts ensuring a fair and balanced

relationship with clear and realistic risk allocation. Only then will serious contenders from the private sector come forth.

3. The legislative framework will have to be streamlined to ensure that PPPs are effectively implemented over the long run.
4. No PPP project for domestic water supply should be undertaken without complete safeguards and protection for the social objectives including water for all and the interests of the weaker sections.
5. A dedicated effort to gain support from various stakeholders is a must throughout the PPP process. Selection of a PPP project for a specific purpose should be done through participatory process with wide ranging community consultations and involvement. Also, consensus building among all stakeholders is important.
6. Appropriate revision of water tariff before the start of the PPP project will help to delink - the increase in water tariff and the involvement of private sector in the project.
7. PPP contract should have a provision to revise the revenue based on the cost adjustment to take into account the cost escalation because actual project condition can change from what was considered in the project planning and development stage.
8. PPP contract should have well defined service delivery and performance standards.
9. PPP is associated with staff retrenchment / downsizing. It is hence necessary to develop a strategy to engage the staff in other functions of the municipality. Besides, it is also necessary to change the attitude of the staff towards PPP projects.
10. Training, re-skilling and capacity building of the municipal staff at different levels are needed for smooth transaction.

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SHG-BANK LINKAGE PROGRAMME AND SUSTAINABLE LIVELIHOOD PROMOTION IN INDIA

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ABSTRACT

Inequality in our society exists since time immemorial. Extreme inequalities in a society lead to social unrest and have undesirable consequences and hence should be avoided. But a society can easily tolerate inequalities if those at the bottom are provided with subsistence and necessities of life. That is why the Planning Commission of India has been worried for reducing inequalities and hence poverty alleviation has been one of the objectives since its inception. In a recent move, Govt of India has moved to start NRLM to offer services to the poor to strengthen their livelihood in general and addressing their vulnerability affecting livelihood in particular. SHGs play a major role in poverty alleviation in rural India.

Ke words: *inequality, strengthen their livelihood, vulnerability, global phenomenon.*

INTRODUCTION

Inequality in our society exists since time immemorial. Extreme inequalities in a society lead to social unrest and have undesirable consequences and hence it should always be avoided. A noted economist Scitovsky (1963) has observed that as long as there are economic incentives to produce national product, it results in inequality. It is because human abilities are unequal. But a society can easily tolerate inequalities if those at the bottom are provided with subsistence and basic necessities of life (Panda, 2014).

Despite the tremendous growth in USA, there is great deal of inequality in the country. As cited in an example, it is noted that top one per cent of the households in USA take 22.5 per cent of the total income. Piketty also observes that a small group of wealthy rentiers, live lavishly while the rest continue to struggle to maintain their livelihood. Thus inequalities exist in almost all the societies. Hence efforts are being made to keep it within the limits, even if it cannot be stopped wholly.

Inequality is always associated with poverty and poverty is the consequence of the scarce livelihood support system. Because of adverse consequences of inequalities, Planning Commission of India has been worried for reducing the same and hence poverty alleviation has been incorporated as one of the broad objectives of planning in India since its inception. It is expected that the benefits of development will percolate at the root

level and will help in reducing inequitable distribution of national income. But after adoption of so many plans in the country also, it has not been possible to eradicate poverty completely for which some special self employment programmes like Integrated Rural Development Programme (IRDP) and Self Employment of Educated Unemployed Youth (SEEUY) as well as wage employment programmes like National Rural Employment Programme (NREP), Rural

Landless Employment Guarantee Programme (RLEGP) etc. have been implemented during late 1970s and early 1980s. Since 1999, IRD Programme has been stopped and Swarnajayanti Gramya Swarojgar Yojana (SGSY) has been implemented. Through all these measures attempts were made to transfer purchasing power to the poor so that the share of the poverty in the population of the nation will come down.

But in the words of Nobel Laureate, Amartya Sen (2000), Poverty is not insufficient income, but the absence of wide range of capabilities including security and ability to participate in economic and political systems of a nation. Thus extending livelihood support is more important than merely transfer of money for eradication of poverty and inequality.

Livelihood in a broad sense can be defined as the capabilities, assets and activities required for living. Mostly, the poor's who are marginalised are deprived of the ability to take advantage of the mainstream activities. To make them capable, there is necessity of strengthening sustainable livelihood opportunities. To enhance their livelihood and to participate in sustainable livelihood activities, there is a need to ensure their food security, remove economic vulnerability, enhanced incomes so as to have an access to basic entitlements. Finance plays an important role in ensuring all these to the poor. Self Help Group (SHG) approach provides an alternative to arrange finance through Micro Finance Institutions (MFIs). Most of the poors who are members of SHGs, actively engage in savings and credit besides other activities like income generation, national resources management, literacy, child care, nutrition etc.. Although the amount may be meagre, they get a chance to have control over capital. It gives them a boost to break the vicious circle of poverty within which they might be revolving as suggested by Ragnar Nurkse. NABARD through its Self Help Group- Bank Linkage Programme (SBLP) extended its full support to SHGs to enhance the livelihood support activities of its members. There is phenomenal growth of SHGs in India in recent years and expansion of SBLP has been reflected in reducing the poverty ratio of the nation. With this backdrop, an attempt has been made in this paper to analyse the performance of SHGs and SBL Programme and their level of success in generating livelihood support activities for the poors.

OBJECTIVES OF THE STUDY:

The present study has been undertaken with the following objectives:

1. To examine the trend in growth of SHGs in India.
2. To study the progress of SBLP in financing SHGs.
3. To analyse the impact of SHGs in livelihood promotion.

METHODOLOGY:

For the purpose of the present study, the data pertaining to the number of SHGs formed and the nos. Savings linked, the amount of loans disbursed and the amount of loans outstanding have been collected from the publications of NABARD, more particularly the various issues of the Progress of SBLP in India and the Reports on Status of Micro Finance in India. The data have been tabulated and analysed using various statistical tools.

RESULTS AND DISCUSSION:**Origin and Growth of SHGs in India**

The Self Help Group is a small group of 10- 20 members with a motive to combine the access to low cost financial services with a process of self management and development (Narang, 2012). It is a small group people coming together either voluntarily or persuasion among themselves to support each other, to extend help among themselves and to work together to bring changes in the common disadvantage found with each of them. It is a self-governed and informal association of usually socio-economically homogenous families.

SHG movement has become a global phenomenon. SHGs are growing at an unprecedented speed world-wide. About two per cent of Canadians belonged to SHGs in 1987(Gottlieb & Peters, 1991). Approximately 10 per cent of Israel's population were involved in SHGs (Ben-Ari & Azaira, 1995).Cancer SHGs were found to be prevalent in cities of China(MOK & Zhang, 2001).Even in USA, about 10 million were involved in SHG activities in 1996(Kessler et al, 1997). But the origin of SHGs dates back to the year 1975. SHGs originated at Bangladesh in 1975 by Nobel Laureate, Mohammed Yunus, who started women groups among the poors. It developed the habit of thrift and savings. Its success with the help of Bangladesh Grameen Bank led to similar organisations elsewhere. So also SHGs have been started in India and have been playing an important role in poverty alleviation and providing livelihood support. These are mostly engaged in saving and credit as well as other activities which can generate income and employment along with creation of output. Further, these are very effective in empowerment of women in undertaking required activities independently. Many NGOs are also involved in promotion of SHG movement in India. In recent years SHGs have become a very effective and relevant tool for organising poor and vulnerable and empowering them through promotion of income-generating activities (IGAs) to bring sustainable opportunities of regular income.

The SHG movement is associated with the micro credit which includes the credit for self employment, financial and other business services including savings and technical assistance. It is a novel approach of banking with poor with distinct advantages of high repayments of loans and low transaction cost. It started in India with the introduction of SHG-Bank Linkage Programme as pilot project in 1992 by NABARD. Its success story led the programme to be the most popular model of micro finance in India. It led to the significant growth of SHGs in India over the years.

The Growth of SHGs in India is presented in Table-1. It is found that the movement started with only 255 nos of SHGs through SBL Programme of NABARD in 1992-93. The number increased to 81780 in year 1999-2000 with the highest growth of 337.8 per cent over 1998-99. The no. of SHGs continues to increase over the years to reach the level of 13657102 with a cumulative progress of 7429500 SHGs with the bank linkages under SBL Programme in 2013-14. Of course there was a falling trend for the years from 2009-10 to 2011-12. Since then again there is an increasing trend in recent two years. The higher growth in years of late 1990s may be due to initial penetration of SHGs under the programme.

Table-1
Cumulative Progress of SHGs under SBL Programme in India

Year	No. of SHGs linked	Growth of SHGs over the preceding year (in %)	Cumulative progress of SHGs
1992-93	255	--	255
1995-96	2635	75.4	4757
1999-2000	81780	337.8	114775
2004-05	539365	49.0	1618456
2009-10	1586822	-1.41	6959250
2013-14	13657102	11.97	7429500

Source: Various issues of Status of Micro Finance, NABARD and Reports of SHG-Bank linkage Programmes in India, NABARD.

PROGRESS OF SBL PROGRAMME IN INDIA:

The SHG-Bank Linkage Programme led by NABARD has progressed tremendously. The data relating the amount of savings with the banks by SHGs, the amount of loans disbursed and the amount of loans outstanding against the SHGs from 2007-08 to 2013-14 have been presented in Table-2. It is observed that an amount of Rs.3785.39 crores have been saved by 50.10 lakh SHGs in 2007-08. The amount increased to the level of Rs.9897.41 crores by 74.30 lakh SHGs in India by 2013-14. Excepting the year 2011-12, in all other years there is rise in amount of savings generated by SHGs. The amount of

savings per SHG was Rs. 7555.67 in 2007-08. But it increased to a level of Rs.13320.87 per SHG in 2013-14.

Similarly in case of the performance in amount of loans disbursed, there is an increasing trend and the growth is significant as the disbursed amount increased from Rs.8849.26 crores to 12.28 lakh SHGs in 2007-08 to Rs.24017.36 crores to 13.66 lakh SHGs in 2013-14. Thus there is 271.4 per cent increase in amount of disbursement of loans over the period. It can be found that the amount of disbursement of loan per SHG was Rs. 72062.38 in 2007-08, which registered more than two fold increase to the level of Rs.175822.54 in 2013-14, shows the progress of the activities undertaken by the SHGs in India.

The outstanding loan against 36.26 lakhs of SHGs was Rs.16999.91 crores in year 2007-08. It reached the level of Rs.42927.53 crores in 2013-14 against 41.97 lakhs of SHGs. Thus it registered a growth to the extent of 252.52 per cent over the period with an increasing trend throughout. So also, the amount of outstanding loan per SHG was only Rs.46883.37 in 2007-08, which registered an increase to the level of Rs.102281.46 in 2013-14. Thus the performance regarding the savings generated by SHGs, amount of loan disbursed and the outstanding loans against during the period is found to be significant, which indicates the progress of SBL Programme sponsored by NABARD in India.

Due to sponsorship of SBLP by NABARD, the outreach of the programme has been extended to almost all the states. But the region-wise spread of the cumulative share of SHGs under the programme has been unequal. The southern region continues to have a larger share during the whole period. Of course, the magnitude is being reduced as it has come down from 73 per cent in 2000-01 to 58 per cent in 2004-05 and 50 per cent in 2013-14. Next to it comes the eastern region. Its share was 08 per cent in 2000-01, which increased to 17 per cent in 2004-05 and 20 per cent in 2013-14. It shows an increasing trend although at a lower rate. Among other regions, the share of western region was stagnant at 6 per cent during 2000-01 to 2004-05. But in the recent year of 2013-14 it has been doubled to 12 per cent. In northern region, there was a marginal rise in the share from 3 per cent in 2000-01 to 2004-05, but since then it remained stagnant. In north-eastern region, the share was very less i.e. less than 1 per cent in 2000-01. It has reached 4 per cent in 2013-14. In the central region, the share has taken a u-turn. The share was 9 per cent in 2000-01, which again reached the same level after a rise to a level of 9 per cent in 2004-05. Among all, it can be observed that the southern region maintains its position. It shows that in southern region, people have become aware of the advantages of the SHG-Bank linkage Programme. They have been trying to maintain the larger share in savings of SHGs as well as in the credit disbursement to SHGs under the programme.

The main cause of concern is that the regional disparity is looming large after two decades of inception of the programme by NABARD.

Table-2**Cumulative Progress of SBL Programme in India**

Year	Savings with Banks		Loans disbursed		Loans Outstanding	
	No. of SHGs (in lakhs)	Amount of Savings (in Crores)	No. of SHGs (in lakhs)	Amount disbursed (in Crores)	No. of SHGs (in lakhs)	Amount disbursed (in Crores)
2007-08	50.10	3785.39	12.28	8849.26	36.26	16999.91
2008-09	61.22	5545.62	16.09	12253.51	42.24	22679.84
2009-10	69.53	6198.71	15.87	14453.30	48.51	28038.28
2010-11	74.62	7016.30	11.96	14547.73	47.87	31221.17
2011-12	79.60	6551.41	11.48	16534.77	43.54	36340.00
2012-13	73.16	8217.25	12.20	20585.36	44.51	39375.30
2013-14	74.30	9897.41	13.66	24017.36	41.97	42927.53

Source: Various issues of Status of Micro Finance, NABARD, and Reports of SHG-Bank linkage Programmes in India, NABARD.

Table-3**Regional Spread of Cumulative Share of SHGs under SBLP in India**

Region	2000-01	2004-05	2013-14
Northern	03	05	05
North- Eastern	<1	02	04
Eastern	08	17	20
Central	09	12	09
Western	06	06	12
Southern	73	58	50
Total	100	100	100

Source: Various issues of Status of Micro Finance in India, NABARD.

CONCLUSIONS AND POLICY PRESCRIPTIONS

It is unequivocal to conclude that the growth of SHGs in India has been very significant. By the by, the cumulative share of the savings of SHGs in banks, the loans disbursed to SHGs and the outstanding loans against SHGs have been eye-catching. The progress of the SBL Programme by NABARD has been successful in bringing such achievements. SHG-Bank Linkage Programme was started with the objective of extending the outreach of banking the poor, who mainly comprises marginal farmers, landless labourers, artisans and craftsmen and others engaged in the small businesses such as vending and hawking. The main purpose of the programme is to empower the target groups with financial

assistance so that they can create their own livelihood support system. Hence it can be concluded that the programme has been successful in livelihood promotion in India. But everybody has to accept that the regional disparity that continues after two decades of the SBLP needs special attention. There is clear evidence that the spread of SHG movement in India has been more concentrated in southern states. Still, in recent years the spread in southern region has been declining leaving a share to other regions. But the process of shift to other regions also need a pro-active role of the state governments, involvement of the active and efficient NGOs in the states, awareness campaigns on benefits of SHG formation.

Another fact that is noticed is that about 80 to 90 per cent of SHGs are formed by women. Hence the SHG movement has actually contributed a lot in women empowerment. Still, in some cases, local politicians try to dominate them, which should be looked into. Once women are left free in taking decisions on their entrepreneurial actions and the required cooperation is extended, they can move ahead and will leave no stones unturned in achieving their goal. It calls for the steps that should be undertaken by Government to extend consultancy services to more particularly women SHGs and necessary security and political support when they come closer to compete with the local businessmen. Then only the their livelihood promotion will be effective and the level of poverty of the nation can come down.

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SMALL STEPS BIG IMPACT: STORIES OF YOUNG SMES**Dr. Pooja Goel**

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ABSTRACT

Some of the key sectors where SMEs have a significant environment impact include livestock farming, construction, metal finishing, waste treatment, food and drink industry, textile and leather manufacturing, etc. The main barriers to green growth and eco-innovation must be identified in order for SMEs and entrepreneurs to fully participate in the transition towards sustainable economic patterns. It's a good sign that we are able to recognize the hard trade-offs between economic growth and environmental improvements. Now the challenge before these SMEs and all the stakeholders of the SMEs is to figure out how fast and how far to go. With this theme, the present paper is an attempt to showcase some stories from across India which has well accepted the challenge and in spite of all the barriers they are able to outshine others.

KeyWords: *Green Products, Innovative Products, SMEs, Sustainability*

INTRODUCTION

In India, we are more worried about our generations to come. We want to give them a secure future. Be it a house, bank balance, running businesses (for some cases), culture, and values, we also have taken these from our older generations and want to pass onto our younger generation. In spite of all these, today's generation has an additional role to play in providing a clean and safe environment to the generations yet to come. In 1987, the World Commission on Economic Development (WCED, 1987) has come up with a report titled Our Common Future, in which the term sustainable development has been used widely. The meaning of sustainability is understood in the sense of meeting the present needs without compromising the needs of future generations. The WCED emphasized on simultaneous adoption of environmental, economic and social principles to pursue sustainable development.

Earlier responding to the environmental problems has always been a no-win proposition for managers but in this new world, both business and the environment can win (Walley & Whitehead 1994). Of lately, a new common wisdom has emerged that promises the ultimate reconciliation of environmental and economic concerns. But applying environmental criteria into corporate operations requires exploring new resource combinations and deploying existing resources in new ways (Hart, 1995; Lin and Ho, 2011). The use of new technical and administrative knowledge, the adoption of green

practices can be regarded as a catalyst for innovation, new market opportunity, and wealth creation (Clarke et al. 1994). Now the firms of all sizes are motivated to develop innovative ways to enhance their effectiveness, and to gain operational and market related benefits. In India companies like Tata group, Reliance, Mahindra and Mahindra, Infosys, Wipro and others have been proactive in their innovative green practices. These business houses have been quick to accept concepts like environmental management systems and waste minimization, etc. and have integrated environmental issues into all organizational activities. On the other hand SMEs have neither the resources nor the cash required for setting such practices within their operations (Bianchi & Noci 1996). Also, the SMEs are now exposed to the pressures from the competitive international environment. A strategy of continuous improvement and innovation is must for these SMEs to meet the challenges due to technological advances, global environmental concerns, changing needs and demands of the consumers.

REVIEW OF LITERATURE

Almost 80 percent of the global economic growth is contributed by the small and medium enterprise (SMEs) in all countries (Jutla et al. 2002). SMEs employ the largest percentage of the workforce and are contributing significantly for income generation opportunities. Indian SMEs have shown 4.5% stable growth in last five years and there are over 6000 products ranging from traditional to high-tech, which are being manufactured by the SMEs sector for domestic as well as international markets. To maintain the pace of the growth now SMEs are also taking the route of designing and developing new products, adopting smart approaches to manufacturing, implementing quick-to market distribution, purchasing cutting-edge communication and appropriate marketing strategies (Singh et al. 2010) . Nowadays adoption of green practices can be regarded as an innovation process. Green innovation adoption involves implementing new or modified processes, techniques and systems to reduce environmental harms (Weng & Ling 2011). Moreover, in recent scenario it has been seen that the consumer behavior is taking a shift towards the eco-friendly product which is also called green product (Saxena & Khandelwal 2008). This changing behavior of customers can be seen both as a challenge and opportunity as well by any organization. The key question for these small SMEs is how to integrate environmental decision making into business with profitable results? Corporate green sustainability strategy matrix (Hart, 2005) which offer numerous benefits such as cost savings, resulting from eco-efficiency, enhanced corporate image, improved relationships with local communities, access to new green markets and superior competitive advantage (Srivastava, 1995) may be the solution of this dilemma which every organization is having. However, some scholars argue that these benefits are relevant to larger companies only, not to SMEs (Noci and Verganti,

1999; Alberti et al., 2000). However some scholars argue that these benefits are not of much relevance for SMEs (Noci & Verganti, 1999)

Figure 1 Corporate Green Sustainability Strategy Mix

	Present	Future
Internal	<p>Approach: Pollution Prevention Minimize waste and emissions from operations</p> <p>Payoff: Cost & Risk Reduction</p>	<p>Approach: Clean Technology Develop the sustainable competences and disruptive innovation</p> <p>Payoff: Innovation & Repositioning</p>
External	<p>Approach: Product Stewardship Increase accountability and transparency</p> <p>Payoff: Reputation & Legitimacy</p>	<p>Approach: Sustainability Vision Create a shared roadmap for meeting unmet needs</p> <p>Payoff: Growth Trajectory</p>

Source: Adapted from Hart (2005, p.23)

NEED OF THE STUDY

SMEs face constraints on the grounds of finance, skill and knowledge deficit, marketing strategies. They are even unaware of many financially attractive opportunities for environmental improvements. Generally it is considered that these opportunities come with a hefty price tag and are technically complex. But there are some cases of these SMEs who have overcome these hurdles and acted upon the win-win opportunities. In this backdrop need is felt to highlight the efforts put in by SMEs in the first ‘P’ i.e. product of the marketing mix with special focus on sustainability.

OBJECTIVE OF THE STUDY

To study the sustainable product innovative strategies adopted by select SMEs operating in India.

RESEARCH METHODOLOGY

The present study is exploratory in nature and discuss in detail about some live examples of small business who have used innovative and sustainable strategy for their product development. For this purpose secondary data was collected through newspaper, magazines, books, journals, government reports and websites.

SUCCESS STORIES OF SMES PRODUCING SUSTAINABLE GREEN PRODUCTS

- a. **Saveglobe:** Saveglobe is a Bangalore based Indian small manufacturing company which offers bio-based as well as biodegradable product range. Its product range includes all kind of jute bags, injection mould applications such as cutlery, pens, bio degradable food packaging products like plates, bowls, trays, spoons, forks, knives, compartment or partition plates, biryani boxes etc. They also provide customized solution into food packaging, cloth bags, ecofriendly reusable dinnerware, jute bags, coconut coir pots and hangers. They also supply these economical products in major

places almost all big cities of India like Bangalore, Chennai, Hyderabad, Chandigarh, Lucknow, Pune etc. SaveGlobe export its products to different parts of the world to the countries like USA, Australia, Malaysia, Indonesia, Dubai, South Africa etc. This small enterprise runs on the premise which says, “Green is not just a color but it signifies sustainability and when we talk about bringing sustainability, it has to be a holistic approach, from the buildings we live into the products we use in our daily life’.

- b. CODE:** This small initiative taken by two young chaps (Vishal and Naman) offers a one-stop recycling solution for cigarette waste which operates in Delhi NCR Region. Cigarette waste is a huge environmental hazard. Cigarette filters are carcinogenic and can contaminate drinking water if disposed in our water bodies. Not only human beings but other species living on earth like fishes, birds, and animals can be in danger if they consume cigarette butts. The unique model adopted by this endeavor gives them an edge over other operating enterprise. They regularly collect waste from their customers in collection unit called VBins and recycle every component of the remaining cigarette and they also pay to the customers for collecting and handling over the cigarette waste to them.
- c. ReMaterials:** This Ahmedabad based set-up co-founded by Hasit Ganatra, an engineer graduate from University of Southern California provides modular roofing system for slum and village homes in the developing countries including India. Over a one billion people worldwide who live in slum and villages do not have safe, adequate roofing and rely on inferior quality and toxic metal and cement sheet roof. The panels which are the main component of the roofing system are manufactured customized from packaging and agriculture waste. ReMaterials has prototype solar cells integrated into Modroof panels. These solar cells are capable of powering LED lights and charge cell phones. Because of its modular design helps it in shipment, installation and replacement of individual panel. The panels can last for twenty years with minimal maintenance. This roof is also easy to install, stays cool, leak proof, fire proof, colorful, attractive and not very heavy on pocket too. However to solve the finance issue, arrangements have also been made to get this roof done through disbursement of loan. Recently they have been awarded with the “Parivartan” Award in the Alternative material category for developing affordable, durable and eco-friendly roof system.
- d. EnviGreen:** With a mission to make world plastic free, EnviGreen BioTech India Private limited produces India’s first 100% organic, biodegradable, eco-friendly bags which are substitute to plastics. They have good product depth like carrying bags, trash bags, bin liners, wrapping covers, laundry bags and many more. The company uses 12 ingredients including potato, tapioca, corn, natural starch, vegetable oil,

flower oil, banana etc. All raw materials are first converted into liquid form followed by a six-step procedure. The printing of the bags is also done by using natural and organic materials. Ashwath, the founder of EnviGreen claims that these eco-friendly bags are approximately 35 percent costlier than plastic bags but they are 50 % cheaper than cloth bags which are considered the alternative of plastic bags. The Karnataka State Pollution Control Board (KSPCB) has also approved these bags after conducting various tests and ensured that there was no plastic element was used in making these bags. The factory of manufacturing these organic bags is setup in Bangalore which produces 1000 metric tonnes of bags every month. Now they are also planning to empower farmers by sourcing their all raw material requirement which are required to make a bag from them.

- e. Saathi: Saathi is a social enterprise and manufacturing company that makes eco-friendly hygiene products. Founded in 2015, with a mission to create hygiene products that are good for the body, environment, and community, its four cofounders –graduates of MIT, Harvard and Nirma University, took a mission to create a fully eco-friendly, biodegradable sanitary napkins in India. Gujarat based Saathi team sat together and they conceived and developed a biodegradable sanitary napkin using locally banana fiber. Using standard pads containing plastic/chemicals causing health issues like irritation or rashes to the women is a serious concern. If we go by numbers, an average conventional sanitary pad contains 3-4 gm. of plastic and in 2016 only, there were 150,000 tons of sanitary pad waste in India. Since Saathi pad don't contain chemicals, they degrades 1200 times faster than the conventional plastic pads and also address the health issues. They are also contributing to the marginalized section of the society especially women, by gifting biodegradable pads on every purchase of Saathi pads.
- f. MobiTrash: MobiTrash Recycle Ventures Pvt. Ltd. is a start up service venture incubated by the promoters of Excel Industries Limited. It is India's first and most innovative solid waste management solution in Pune and Surat. Since garbage has no holidays and after throwing them irresponsibly people pretend that their garbage is not theirs. This start-up is following two- way approach. First ,they not only convert wet waste and green waste, right at the point of segregation into compost but also conducting demonstration in the premises of the residential complex or office complex to show how they can segregate waste properly. After providing training and subscribing for the service, a mobile van visits the premises everyday to collect the segregated waste. The mobile van is fitted with machines that take care of the initial process of composting and this can even be witnessed by anyone. Once the raw composting is done in the vehicle, the waste is taken to a large ground on the outskirts of the city where some specific area has been demarked by the municipality

to dump the processed waste. After some time when this dumped raw waste is cured, it is again carried by the mobile vans and delivered it to the customers who want it for their gardens. Their future plan is to deal with dry waste as well.

- g.** Chakr Innovation: The three Delhi based musketeers who are in their early -to- mid 20s, a team of skilled engineers and innovators wanted to be ensure that businesses should meet regulatory standards on pollutions. With this mission they started a business and developed a device that converts soot, especially the kind spewed by diesel generators or engines, to ink. Their company has also associated with central and state pollution control boards for improving air quality. Their client list include telecom companies such as Bharat Sanchar Nigam Ltd.(BSNL), Mahanagar Telephone Nigam Ltd (MTNL), and American Tower Corporation, all of whom largely dependent on diesel generator. Diesel gensets are considered to be significant pollutant and can be sealed any time. By placing device close to the exhaust of the diesel generator, it converts pollutants into useful ink. This ink is supplied to local ink manufacturers which can be used as printer ink. However in future this enterprise wants to play a significant role in reducing pollution in Delhi and come up with a technology to control industrial emissions.
- h.** BioUrja: There is a sudden inclination towards the solar energy which is the fastest growing alternate energy source right now, but the importance of indigenous biogas is nowhere less if talk about the small villages of India. BioUrja is a waste-to-energy company that has pioneered clean and low-cost technology for bio-waste management, and produces biogas and higher-methane-containing bioCNG (compressed natural gas) in the process, which can be used for cooking and power generation. The company provides complete solution starting from installation of equipment, its maintenance and odor management and remotely monitor operations via Internet of Things (IoT). BioUrja has differentiated itself from traditional biogas plants by replacing civil-engineering work with pre-fabricated instruments with very little installation work and using minimal space. Today company is providing its services to big business houses like ITC Hotels, Taj Hotels, Infosys etc. and also to other countries like Bangladesh where it is working on poultry waste.
- i.** Smart Joules:
How would you feel if somebody tells you that he is going to give you a cheque every month and that too without doing anything for him? This is the assurance which Delhi-based Arjun P. Gupta the CEO of Smart Joules gives to his clients. Smart joules is a company which deals in reducing energy consumption solutions. To achieve this, the company installs hardware and software to monitor electricity use and the systems automatically adjust operations to optimize energy consumption. The technology is based on three components- one is IoT-based, high performing, low –

cost hardware; second is a software platform to track energy consumption and set targets. Alarms etc; and the third is data from sensors, energy meters and machines used to get insights to better manage and operate the building. Smart Joules has roped in big clients including six large hospitals. Sant Parmanand Hospital, one of the clients of Smart Joule, multispecialty hospital having the capacity of 153 beds, has reduced its electricity bill by Rs. 1.5 core in approximately 2 years after opting for energy reduction solutions. Smart Joule has a vision of provide energy in the dark areas by saving energy who consume more energy.

CONCLUSION

These are some initiatives which have been taken by dedicated, young, focused and innovative young India. The list is not exhaustive. There are many more stories which may not be so big to get noticed but surely the spirit is not less anywhere. One thing is common which all these SMEs have that along with their innovative product or solution to save the environment, every enterprise has also have a big goal or mission. The efforts taken by these small enterprises are very positive and thoughtful. The individual environmental footprint of small enterprises may be low, but their aggregate impact can exceed that of large businesses in some respects. Similarly, consistent policy strategies should be identified and implemented to encourage SME investment in eco-innovation and sustainable practices in both manufacturing and services.

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SOCIAL ACCOUNTING FOR SUSTAINABLE SOCIAL DEVELOPMENT

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ABSTRACT

Social accounting may be defined as identification and recording of business activities regarding social responsibility. Business is a socio-economic activity and it draws its inputs from the society, hence its objective should be the welfare of the society. It should owe a responsibility towards solving many of the social problems. In the present age of growing technological, economic, cultural and social awareness, the accounting has to accomplish its social function. Social accounting is very important tool to measure the performance of any company in view of social responsibility. The act of social accounting leads to sustainable social development. This research paper attempts to disclose role of social accounting in sustainable social development.

Keywords: Social Accounting, Corporate Social Responsibility (CSR), Sustainability.

INTRODUCTION

Social responsibility concept is the one of the important concept of management. It is the duty of enterprise to do some social activities for completing their social responsibility.

Corporate social Responsibility is a concept which has become dominant in business reporting. Every organization has a policy for corporate social responsibility. In this regard one of the major enlargement areas within accounting in the last decades is social accounting for the society which has generated attention beyond the limits of accounting academics and professional accountants of developed countries. Changing environments and social parameters have compelled business enterprises to account and report information with regard to discharge of their social responsibilities. Social Accounting, also known as Social Responsibility Accounting, Socio-Economic Accounting, Social Reporting and Social Audit, aims to measure and inform the general public about the social welfare activities undertaken by the enterprise and their effects on the society. Social accounting is very important tool to measure the performance of any company in view of social responsibility.

DEFINITIONS OF SOCIAL ACCOUNTING

1. Social accounting is the process of communicating the social and environmental effects of organizations' economic actions to particular interest groups within society

and to society at large. As such, it involves extending the accountability of organizations (particularly corporations) beyond the traditional role of providing a financial account of capital, in particular, to shareholders. Such an extension is predicated upon the assumption that companies do have wider responsibilities beyond simply making money for their shareholders. Gray et al. (1987)

2. Social accounting is the process of selecting firm-level social variables, measures, and measurement procedures; systematically developing information useful for evaluating the firm's social performance; and communicating such information to concerned social groups, both within and outside the firm. Ramanathan (1976)

CHARACTERISTICS OF SOCIAL ACCOUNTING

1. Social accounting emphasizes on social costs as well as social benefits.
2. It is related to the use of social resources.
3. It emphasize on relationship between firm and society.
4. It is an expression of a company's social responsibilities.
5. It determines desirability of the firm in society.
6. It is application of accounting on social sciences.
7. It motivates business houses to adopt social welfare practices
8. It leads to sustainable development of an economy
9. It is not compulsory activity but voluntary act by enterprises

ROLE OF SOCIAL ACCOUNTING IN SUSTAINABLE SOCIAL DEVELOPMENT

1. Social accounting and society

Factories cause different types of pollution in society which is very harmful for it. Social accounting motivates companies to undertake activities for social wellbeing. Following are the important activities which are done by companies for getting good ranking under social accounting.

- a. Establishment of schools, colleges and charitable hospitals
- b. Reducing corporate carbon footprint
- c. Donating to or volunteering with charities
- d. Charitable giving, such as giving products to the needy
- e. Providing services to charitable causes
- f. Participating in environmental cleanups
- g. Changing corporate policies to develop greater efficiency and environmental savings
- h. Making investments that are socially and/or environmentally conscious

2. Effective utilization of natural resources

One of the objectives of making social accounting is to determine whether company is properly utilize their natural resources or not .Social accounting inspires companies for effective utilization of national resources.

3. Employees welfare

By treating employees fairly and ethically, companies demonstrate their corporate social responsibility. Company can help employees by providing the facility of education to children of employees, providing transport free of cost and also providing good working environment conditions.

4. Customers

As a part of social accounting companies provide goods to customers at lower rate and with high quality. Customers not only gets good quality of products at reasonable rate but also gets fair after sales services, truthful information about product or service.

5. Help to investors

Social accounting encourages companies to provide transparent accounting information to investors. It assures proper utilization of funds and fair return on the investment for the investors

6. Management

It assists management in formulating appropriate policies and programmes. Through social accounting, the management gets feedback on its policies aimed at the welfare of the society.

CONCLUSION

Social Accounting has become an integral part of good management in India and abroad. Most of the enterprises are making efforts to earn customer loyalty through community development schemes and good corporate governance. The ultimate goal of social accounting is measurement and reporting resources, costs and social benefits in the corporate world, genuine social accounting has been one of the first major stepping stones in improvements in corporate social responsibility. Social accounting encourages companies to undertake different functions which are essential for sustainable development. It is therefore necessary that managements at all level understand the scope and content of social accounting so that they can make value added contributions towards building the company's brand image and reputation.

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SUSTAINABILITY PRACTICES IN EDUCATION

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ABSTRACT

Education system of a nation has been shouldering the responsibility of socio-economic and environmental development of the nation by means of developing responsible citizens through certain good practices followed in education. The developments which are happening in the present era at global level have to sustain for the future generations also. This can be possible through sustainability practices in all the fields including education. Education sector being the centre of human resource development, experts believe that environment sustainability practices must start from this sector. Educational curriculum, right from school education to higher education has included environment study subject in the curriculum. Sustainability and sustainable development has become a global agenda in recent past and there has been deliberate and conscious efforts made towards this direction at global level. Experts, policy makers have been organizing global conferences to discuss and decide about the means measures to sustain the environment

Keywords: *Sustainability practices, education system, sustainable development, environment*

INTRODUCTION

Education has been a strong weapon to bring socio-economic transformations in the world since long time. The nations and the society who realized the importance and the hidden strength of education, used and implemented various practices in education so as to bring and build the modern society of today. The facilities and natural resources available today for the wellbeing of the human beings is the result of various practices followed in various sectors including education. Education system has invented and developed the products and services having capability of satisfying the needs of the society at the global level. Today's society is most developed and most sophisticated society in the history of human development. The process of development involved making use of various types of resources, mainly natural resources. The natural resources like air, water, land, environment, minerals etc are gifted by the nature and man can't create such resources. Man can only make use of these resources for developing some other resources like machineries, consumables, called man made resources, to bring development. Hence natural resources are the basic and fundamental resources without

which other resources can't be created. The modern world has been using the natural resources in such a way that the world has reached a stage of disaster and the coming generation will find their life will be miserable due lack of natural resources. There is a need of rethinking at the global level regarding the concept of sustainable development which means long lasting development. The researchers and intellectuals at global level have already taken initiative in creating awareness about the diastral situation of the present development and efforts are being made by some experts about sustainable development

Thus sustainability and sustainable development has become an important and most urgent concern of the modern society for the welfare of not only of future generation but also for present society. Sustainable development is the process of development which sustains for generations together. This involves use of natural resources in such a way that development takes place at the same time resources will also sustain i. e conservation of natural resources. Sustainability is basically to retain and sustainable development relates to make use of resources to meet the needs of the present without compromising the ability of future generation to meet their own needs in future. And to make this happen, sustainable development, experts believe, education sector is an important and result oriented instrument to create awareness among the people about adopting certain practices.

An effort is made in this article to study the practices introduced and followed in education system and in education institute to educate young generation about practices for sustainable development.

NEED OF THE STUDY:

Research reports on environment and sustainability of environment and expert opinions of the world reveal that the present generation has been creating disasters for the future generation to live happily. The way natural resources are being used and the rate at which environment is being deteriorated during last few decades has already created many problems like increasing global temperature, polluted air, scarcity of drinkable water, drought in many parts of the world, unknown diseases, and so on. There was urgent need to take certain steps for reducing the rate of environment deterioration. And the policy makers and researchers started organizing conferences for serious and conscious discussions on sustainability of the environment at global level for the welfare of all living beings including human being on the planet not for this but for coming generations also. Education institutes have to become centres to educate the young generation about sustainability of environment. The present paper is about knowing the reasons of education sector for not bringing expected awareness among young generation about sustainability of environment and to make some suggestions towards effective implementation of sustainability practices

SUSTAINABILITY PRACTICES IN EDUCATION

Development is a process or act of bringing certain changes, depending up on the changing environment, for the welfare of human beings. It is process of economic and social transformation based on the environment. Thus, development is concerned about bringing certain changes depending upon the changing environmental conditions to make human life happy. And change is continuous and never ending process and it involves use of natural and manmade resources. The resources required and used for development are limited hence are to be used carefully and cautiously so that it will continue for future generations to come and this is considered as sustainability. The concept of sustainability is ability to be sustained (supported) for our generation and future generation also. As per the ‘world commission on environment and development’, sustainability is “the process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional changes are all in harmony and enhance both current and future potential to meet human needs and aspiration”. Thus, it is the responsibility of present generation to make use of resources in such a way that the average quality of life this generation and future generation will be safe.

The nature and environment itself has developed a system which functions diverse and produce everything required for ecology to remain in balance. There is a cycle in the nature, the natural resources are generated (produced), used by the mankind to fulfill their needs and again regenerated, i. e. renewal of natural resources. Thus the cycle consists of three basic steps, generation, use and renewal. If this cycle is allowed to flow naturally with minimum and necessary interference by men, human life will be good so long as the natural cycle is going on. But man has been interfering in the ‘cycle of the nature and he knows only use of natural resources, step, but he can’t produce natural resources and renewal of natural resource is highly neglected by the user. This created a dangerous scenario at global level for not only human beings but also for all living creatures including plants on this planet. Therefore the experts and scientists at global level have been making research and concluded that certain measures need to be taken and certain practice be followed at the global level regarding use s and renewal of natural resources for sustainability of the planet.

HISTORY OF SUSTAINABILITY

The concept of sustainability and sustainable development is as old as human civilization but it was not so serious till last century due to various reasons like less population, limited needs of people, availability of ample quantity of natural resources and minimum wastage of natural resources. But 20th century realized the new concept that ‘there were environmental costs associated with material benefits that were now being enjoyed’. Which means, today we are using resources from the environment at free of cost or with lowest cost, but there will be a huge cost for the same resources in future when these

resources exhausted. Development in future will be impossible mainly due to non availability of natural resources from the environment.

An organized and systematic effort on sustainable development was emerged in 1992 at global level in the form of a conference. “United Nations Conference on Environment and Development” (UNCED 1992) held in 1992 in Rio de Janeiro. The conference was also known as “The Earth Summit”. The important message of The Earth Summit was ‘Transformation of Our Attitudes and Behaviour’. An attempt was made to draw up action plans and strategies for sustainable development. 100 heads of states and representatives from 178 national governments and few representatives from social organizations were present for the conference. It was agreed, sustainable development was the solution of environmental degradation based on Brundtland Commission Report of 1987. The commission investigated the human activities of last decade and concluded human activity was having severe and negative impacts on the planet and the pattern of growth and development would be unsustainable if they continued unchecked.

However, the concept of sustainable development received international recognition in 1972 at United National conference on “Human Environment” held in Stockholm. It was agreed in the summit both development and environment are separate issue. The U. N. government set up “the United Nations Environment Program” (UNEP) which today has been acting as catalyst in environmental protection at global level. The government representatives and non-governmental organizations in this Summit, identified Education as a fundamental to the achievement of sustainable development. But the progress was unsatisfactory and United Nation adopted a concept of Decade of Education for Sustainable Development with the goal to integrate the principles, values and practices of sustainable development into all aspects of education and learning.

The UN Earth Summit (1992) referred ‘Social development, Economic Development and Environmental Protection’ as three “Interdependent and mutually reinforcing Pillars” of sustainable development (by John Siraj-Blatchford). Hence there is a challenge of educators to develop educational system, curriculum and pedagogic practices that promote sustainable actions.

The World Summit on Sustainable Development (WSSD 2002) in Johannesburg recognized that education has major role to play in the realization of a vision of sustainability that links with economic well-being with respect for cultural diversity with earth and its resources. There is also general agreement that education for sustainable development (ESD) has to be an integral part of quality education for all as defined in the 2000 Dakar Framework for Action (by John Siraj-Blatchford).

EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD)

The outcome of The UN Earth Summit 1992 and The world Summit on Sustainable Development (WSSD 2002) was that, the scientists, experts and researchers at global

level realized that good and best practices for sustainable development be introduced from the schools so that the children and their parents can be made aware about environmental protection measures. And since then the concept of Education for Sustainable Development (ESD) was introduced in the schools.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) has been publishing book/s titled “Education for Sustainable Development, Good Practices in Early Childhood, Good Practices in Education for Sustainable Development: Teacher Education Institutions” since 2005 onwards. These books contain the results and outcomes of the projects and activities implemented by the stakeholders in various schools. The results of the projects showed some positive impact on the minds of school children about environmental protection. And hence study of environment has become a regular compulsory subject at school education and specialization subject at higher education.

United Nations Educational, Scientific and Cultural Organization identified in 2004 that ‘Higher education Institutes bear a profound, moral responsibility to increase the awareness, knowledge, skills and values need to create a just and sustainable future’. Higher education prepares most of the professionals who develop, lead, manage, work, teach in and influence society’s institution’. Thus higher education institutes have a critical and tangible role in developing the principles, qualities and awareness not only needed to perpetuate the sustainable development philosophy but in improve upon its delivery.

The Ministry of education, British Columbia developed a Sustainability Education framework in 2008 for K-12 level education system basically to promote, environmentally sustainable practices and learning opportunities for students that support healthy and natural environments for current and future generations. The framework included integration of practices using classrooms & school with examples of success stories from districts across to British Columbia

Sustainability Education framework 2008 of Ministry of Education, British Columbia consisted of three aspects, creating a sustainable classroom, creating a school-wide approach to sustainability and creating a district-wide approach to sustainability. Creating sustainable classroom involved teaching the concepts of environment and sustainability through curriculum. This included turning off lights and computers when not required, making full use of papers and other materials, recycling in the classrooms and encouraging waste free lunches. Creating school-wide sustainability was grouping of classes of the school to get commitment and participation from all parts of the school community, like students, teachers, administrative staff etc. And creating district-wide approach to sustainability was to creating groups of schools and providing networking

opportunities between schools and help to build a community of schools dedicated to sustainability.

SUSTAINABILITY PRACTICES IN EDUCATION IN INDIA

National Council for Educational Research and Training (NCERT), an autonomous organization of Indian government was formed to advise and assist the state and central governments regarding quality enhancement of school education. NCERT prepared a document in 2005 titled “Towards a Green School on Education for Sustainable Development” for elementary schools. The basic objective of the document was to include the contents of the book in curriculum for all round development of children through education. Another objective of the document was to create awareness about ‘Education for Sustainable Development’ (ESD) among different stakeholders in school education. It focuses on integration of school curriculum, teaching-learning practices and school environment for Education for Sustainable Development. The document says that, it is joint responsibility of all to involve in the entire school community to work together through participatory and collaborative approaches. It also helps all the stakeholders of school education to realize it does not require additional physical or human resources to understand the principles and practices of sustainable development. This document was the result of the book titled “The Decade of Education for Sustainable Development” (DESD) launched by the United Nation which aimed at integrating the principles, values and practices for nurturing sustainable development.

National Education Policy 1986 and program of action 1992 considered environmental education as priority area in the curriculum development programs, including schools at national level. Even the supreme court of India in 2002, made it obligatory to all the states and Union Territories to comply with them for implementation of environmental aspects through education. It has designed national curriculum framework which contained common core areas like constitutional obligations and other content essential to nurture national identity. The national curriculum includes subject areas which will promote values such as India’s common cultural heritage, democracy, secularism, equality of the sexes, protection of environment and removal social barriers. Based on it, the state governments started adopting strategies of infusion, integration and making environment study as a separate subject at all levels of education, from school level to post graduate level. Today almost all schools and state boards of secondary and higher secondary education have introduced environment studies as a spate subject or integrated with other subjects. Maharashtra State Secondary and Higher Secondary board of education has introduced environmental studies (EVS) as separate and compulsory subject at 10 + 2 level for commerce and arts course with a project work

A text book for “Environmental studies for undergraduate courses of all branches of Higher Education” has been published by the University Grants Commission (UGC) in

association with Bharati Vidyapeeth Institute of Environment Education and Research, Pune. Based on this book, almost all universities in India have introduced “environmental studies” as a separate subject in the curriculum at undergraduate level for Arts & commerce streams. The subject environmental study is made a compulsory subject for B. Com and B. A. courses of University of Mumbai. There certain universities like, Savitribai Phule Pune University has introduced a separate three years undergraduate program called, B. Sc. in environmental studies for the students of science stream. Environmental study has been a separate specialized subject at post graduate level and in research in all Universities in India. However, the nomenclature is different in different universities, like environmental sanitation, life & environmental science, forestry & environmental management, geography & environmental engineering etc.

PRESENT SCENARIO OF EDUCATION IN INDIA

Table I

School Education (2014-15)

Sr. No	Level of education	Students enrolled	No. of teachers involved	Total Number of people involved
1	Upper Primary (Class VI –VIII)	6,71,65,000	25,59,769	6,97,24,769
2	Secondary (class IX – X)	3,83,01,000	13,46,888	3,96,47,888
3	Higher Secondary (class XI-XII)	2,35,01,000	19,84,711	2,54,65,711
4	Total	12,89,67,000	58,91,368	13,48,58,368

Source: www.mhrd.gov.in/statist

Table II

Higher Education (2015-16)

Particulars	Number of people involved
Enrolment of Students in affiliated colleges	3,45, 84,781
Enrolment in Universities	66,89,196
Teachers involved in higher education	12,95,859
Total number of people involved in higher education	4, 25, 69,836

Source: www.aishe.gov.in

The tables I & II above indicate the number of students and teachers who are directly involved in education from school education to higher education in India. Table I indicates 12,89,67,000 students from standard VI to XII, age group 11 to 18 years were studying the subject environment subject as integrated and 58,91,368 teachers were involved in teaching a subject directly/indirectly related to environment. The number of students and teachers involved in higher education during the year 2015-16 were 4, 25, 69, 836 who have already studied about environment during their school education and many of them were studying the subject on environment in their curriculum of higher education. Thus more than 180 million populations (around 14% of the total population) was directly involved in education sector and if each one of them take sustainability practices as one the important activities, there can unprecedented improvement in sustainability of the environment. However there is very less visible positive impact of study of environment subject in the curriculum at school and higher education level. The probable reasons are:

REASONS OF LOW IMPACT OF STUDY OF ENVIRONMENT SUBJECT AT HIGHER EDUCATION

- **Less scope to make a career:** There is little awareness that one can make a career in the subject environment study as in the case of other subjects like mathematics, physics, accounts, finance, management etc. Thus study of environment as a subject in the curriculum is considered just to learn it and pass the examination to get a degree
- **Casual Approach:** ‘Sustainable development and protection of environment is not my responsibility, it is the responsibility of government’ is a common approach. Such casual approach of educated people has been showing very small positive impact on protection of environment and sustainability
- **Less Commitment:** There is some section of society which is considered as top level in the social structure. Political leaders, top level bureaucrats, national/international level players, people from film industry, business men etc happen to be role models. There is a tendency that common people are the followers of some of these people for various aspects. And there is lack of commitment from majority of top level people about environment and its sustainability. And majority of the followers of top level people are also least bothered about environment.
- **Lack of Recognition:** Very few people and organizations involved in the activities and projects on sustainable development and protection of environment and they have been doing well towards environment protection. However their efforts towards environmental protection are not recognized and appreciated to the level expected to make impact on other people of the society

SUGGESTIONS /RECOMMENDATIONS

Sustainability practices and sustainable development has become an emerging issue at the global level and each citizen has to think and act in that direction. Educational institutes happen to be the centres of human development and certain practices towards sustainability need to be followed by education sector so that at least certain percentage of new generation completing their education would realize the importance of sustainability and sustainable development

- **Teachers to become role models:** Teachers happen to be the role models for their students and the status of role model can be achieved only through adopting the philosophy of Walk the Talk. Teachers in their daily life have to follow certain practices which lead towards environmental protection and proper use of natural resources so that at least few students can adopt certain practices in their life towards sustainability of environment
- **Recognition:** The teachers and students who have been making conscious efforts and have been involved in the practices like optimum use of natural resources, using environment friendly materials in their daily life, taking initiatives in conservation of natural resources, be recognized and appreciated by the head of the educational institutes for the information of others. The students and teachers can follow certain practices like putting off electricity buttons of the classrooms when not being used, using natural light as much maximum as possible to, minimize use of electricity, optimum use of writing papers and use of electronic media where ever possible, reuse of half used note books, journals to avoid paper wastages, avoiding wastage of drinking water. Such practices should appreciated
- **Activity Based Learning:** Sustainability practices for environmental protection in educational institutes should be made activity based learning, like use of paper/cotton bags in the campuses, use of public transport system for daily travelling to educational institutes, if available, non-use of vehicles for short distance walk, say up to one kilo meter. Students should be given some projects and based on it they should be given academic benefits (marks or credits)
- **Awards for Sustainability practices:** A competitive environment can be created among intra-class/intra-department of the same educational institute and among inter-institutions of a specific region on adoption and following sustainability practices. The class/department of the educational institute and an educational institute practicing sustainability practices consistently should be given some award by head of the institutes or by the government organizations to motivate others to understand and to adopt the practices on sustainability. The level of competition on sustainability practices can be increased from institute level to group of institutes managed by the same trust, regional level and to state level

- **Creation of clubs/Forums:** Education institutions can form a group of few students and teacher with in the education institute which can be named as sustainability club or environment club or green house club. Such clubs like other clubs cultural club, sports club, literary club, of the institute can undertake certain projects on environment protection or sustainability during the academic year through which students can learn things on sustainability and can demonstrate for others. Education institute can provide the basic resources and infrastructure to such club for planning and implementing projects/activities on sustainability. The students of such clubs/forums can be some credit in their academic performance and the teacher can be given recognition in some form
- **Initiatives from the Top:** Top management of education institute, whether government or private management, should take initiatives towards sustainability practices. The practices may include development of infrastructure which supports use of natural light to the maximum extent, classrooms and other academic rooms should have maximum ventilation facility so that minimum use of electric light, rain water harvesting project to store rain water to use when required, installation of solar system to reduce electricity bill, activity on recycling of waste etc. Such initiatives by the top management will be an opportunity for the students and teachers to learn and realize the importance of sustainability
- **Eco-friendly Activities:** Internal stake holders of education institutes, particularly, students and staff, organize various types of cultural and traditional programs in the campus during the year. The programs vary from region to region of the country. Ganpati festival is celebrated in Maharashtra, the students under the supervision of teacher, should be guided to use only eco-friendly materials for the fest and avoid environment polluting materials like tharmacol, plastic etc. There should be guidelines how to celebrate holy festival with minimum use of water and avoid use of harm full colors.

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SUSTAINABLE ENTERPRISES FOR PROSPEROUS INDIA**Dr. Umesh S. Kollimath**Asst. Professor, AIMS, Pune
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ABSTRACT

In the light of 12th Five year plan, the planning mechanism has given thrust to three dimensions of India's Economic Development, viz., Sustainability, Inclusiveness, and Equity. This would mean that the economic activities taken up henceforth by Government/Public or Private Enterprises shall be tested for their merit on the parameters such as

- *The kind of resources being employed (whether in the long run interest of society and ecology)*
- *The procedures adopted in waste disposal and management*
- *The presence of recycling*
- *Low Carbon strategies*
- *Protective measures towards Land, Forests, and Water Resources*

The present paper attempts to identify existing Indian enterprises running their businesses on the above lines and the potential available for the budding entrepreneurs to start up such a sustainable enterprise.

Keywords: *Sustainable Enterprises, Economic Development, Inclusiveness, Equity, Resources.*

INTRODUCTION

It is worthwhile discussing a bit on the meaning and implication of the terms: Sustainability, Inclusiveness, and Equity in this paper.

SUSTAINABILITY

An exhaustive definition of business sustainability is; resiliency over time – businesses that can survive shocks because they are intimately connected to healthy economic, social and environmental systems. These businesses create economic value and contribute to healthy ecosystems and strong communities.

Business sustainability requires firms to adhere to the principles of sustainable development. According to the World Council for Economic Development (WCED), sustainable development is development that “meets the needs of the present without compromising the ability of future generations to meet their own needs.” So, for industrial development to be sustainable, it must address important issues at the macro

level, such as: economic efficiency (innovation, prosperity, and productivity), social equity (poverty, community, health and wellness, human rights) and environmental accountability (climate change, land use, biodiversity).

INCLUSIVENESS

“Inclusiveness is not necessary from a food security perspective. Literature shows that there is always a trade-off between efficiency and inclusiveness. On the whole there is still massive lack of inclusiveness of poor producers. Institutional and policy environments that ‘forces’ all businesses to adapt more inclusive businesses practices are the most important factors that contribute to greater inclusiveness.” Discussion at the latest of the IIED-Hivos ‘provocations’ in Brussels last week (22 June, 2013) suggests that the first step in assessing how ‘pro-poor’ business contributes to development and smallholder empowerment, is to understand what we mean by the word ‘inclusive’.

A Nicaraguan representative Mr. Mendez at an UN Research Institute for Social Development (UNRISD) hosted conference has claimed that an ‘inclusive business’ is a model where a business with a profit motive includes poor farmers in a fair way.

“Not all relationships between businesses and producers are inclusive,” he said. He shared a set of criteria for his understanding of inclusive business. For a start, it has a strong business focus. “It’s not philanthropy or self-promotion,” said Mendez . It is part of a company’s core business strategy and responds to a genuine market opportunity. “Trust (between companies and smallholders) is vital too”, said Mendez. As is capital investment — investment for technical assistance, improved productivity and access to credit. This type of business leads to empowerment by building the capacity of small-scale farmers to produce a better quality product at a better price. And from improving coffee in Nicaragua to boosting domestic maize production in Ecuador, he cited many examples of inclusive business in action.

The above situation is so much relevant to the Indian institutions and farming community too. Public/Private Companies, NGOs, Banks, Universities, and so on; All these institutions have a role to play bringing inclusiveness to themselves and the businesses alike. Moreover, in the process of being inclusive, they will be ensuring sustainability to themselves.

EQUITY

It is a common knowledge of business academicians that Equity is the ownership interest of investors in a business firm. Investors can own equity shares in a firm in the form of common stock or preferred stock. Equity ownership in the firm means that the original business owner no longer owns 100% of the firm but shares ownership with others. On a company's balance sheet, equity is represented by the following accounts: common stock, preferred stock, paid-in capital, and retained earnings. Equity can be calculated by subtracting total liabilities from total assets.

Further, Equity implies giving as much advantage, consideration, or latitude to one party as it is given to another. Along with economy, effectiveness, and efficiency, Equity is essential for ensuring that extent and costs of funds, goods and services are fairly divided among their recipients.

In the light of the above, we can test our claim that only those enterprises will sustain in the long run which are imbuing sustainable business practices, inclusive, and equitable. For that let us take examples from corporate, academic and social walks of life:

SUSTAINABLE CORPORATE COMPANIES

As C.K. Pralhad, M.R. Rangswamy, and Ram Nidumolu mention in one of the ‘Harvard Business Review’ article, “in the future, only companies that make sustainability a goal will achieve competitive advantage. That means rethinking business models as well as products, technologies, and processes.”

Following is the framework for organizations to establish sustainable existence. The framework is designed by Confederation of Indian Industry (CII):

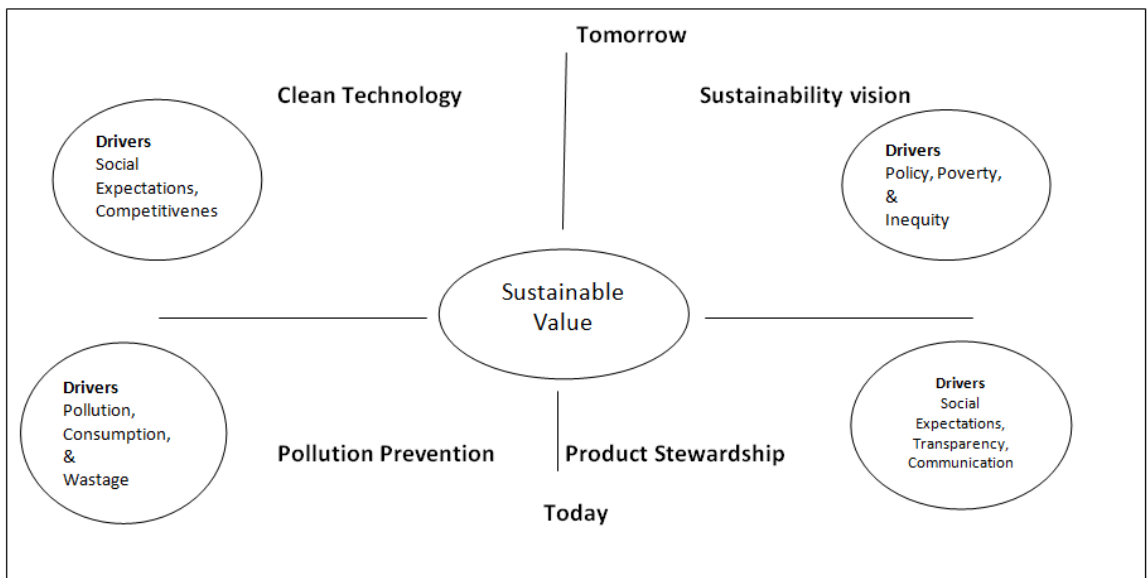


Fig: Sustainability Value Framework Source: CII

A recent report in a leading national daily claims that about 80 Indian companies are now doing sustainability reporting using the framework developed by the Global Reporting Initiative (GRI).

D K S Moorthy, director in Asia Society for Social Improvement and Sustainable Transformation (Assist), said the number was about just 34 a year ago, indicating that more and more companies were recognizing the value of such reporting. Wipro, Infosys, TCS, ITC are among those doing GRI-based sustainability reporting. GRI is a non-profit organization that works towards a sustainable global economy by

providing sustainability reporting guidance. GRI pioneered and developed a comprehensive sustainability reporting framework that is widely used around the world. The framework enables organizations to measure and report their economic, environmental, social and governance performance - the four areas that are seen to be key to sustainability.

INCLUSIVE BUSINESS MODEL, NEED OF THE HOUR

A research report by Mckinsey Global Institute has suggested that having the largest young population in the world, India needs to have more number of cities; the report estimates that about 70% of the new jobs can be created at thriving cities leading to 70% of the GDP generated in these cities. As a consequence there will be fourfold increase in per capita income across the nation by 2030.

The implication of the above research report to the policymakers, industrialists, and Universities is loud and clear- to create and nourish quality material and human resources. Understanding this pressing need, the institutions (commercial, educational, governmental, and social alike) will have to focus on being *inclusive*.

However, being inclusive means:

- to spread the phenomenon and dividend of economic growth across the nation,
- to take diverse range of castes/communities, languages, men/women in stride in this race of economic growth, and
- to ensure safety and security to children as well as old.

Somehow Indian corporate world has been contented with their philanthropy or odd CSR projects here and there! But the time has come the corporate companies demonstrated their willingness and capabilities to deliver more value at less cost in the area of agriculture, healthcare, education, energy, or financial services. It is heartening to note that many Indian Companies as well as Indian subsidiaries of MNCs have taken remarkable initiatives in this regard. Some such cases are mentioned below:

- Innovative public-private partnerships DuPont's India unit has forged with various state governments to increase the productivity and profitability of farmers and improve food availability by making resilient seeds available at affordable prices.
- PepsiCo India and the Punjab Agricultural University have co-developed a tractor-driven machine to systematically implement direct seeding of rice (DSR), an eco-friendly technique that can reduce water use in rice paddies by 30% and cut carbon emissions by 70%.
- Three innovative projects — MASARD (sanitary napkins production by/for poor women), Akshaya Kalpa (integrated organic dairy venture), and Aakar Asha (center for enabling physically disabled) are few examples of inclusive business models that our indigenous social entrepreneurs have developed in recent past.

- Young technocrats like Ms. Sandhya Shekar, CEO, IIT Madras Research Park, has successfully incubated profitable social enterprises such as DesiCrew, employing rural women as Business Process Outsourcing (BPO) workers. This endorses the fact that inclusive growth can happen even in the fields like I.T.

EQUITABLE BUSINESS PRACTICES FOR LONG RUN PROFITABILITY

India has the largest number of listed companies in the world, and the efficiency and wellbeing of the financial markets is critical for the economy in particular and the society as a whole. It is imperative to design and implement a dynamic mechanism of corporate governance, which protects the interests of relevant stakeholders without hindering the growth of enterprises.

CURRENT SCENARIO:

There have been several major corporate governance initiatives launched in India since the mid-1990s. The first was by the Confederation of Indian Industry (CII), India's largest industry and business association, which came up with the first voluntary code of corporate governance in 1998. The second was by the SEBI, now enshrined as Clause 49 of the listing agreement. The third was the Naresh Chandra Committee, which submitted its report in 2002. The fourth was again by SEBI — the Narayana Murthy Committee, which also submitted its report in 2002. Based on some of the recommendation of this committee, SEBI revised Clause 49 of the listing agreement in August 2003. Subsequently, SEBI withdrew the revised Clause 49 in December 2003, and currently, the original Clause 49 is in force.

The years to come shall bring a sea change in the way corporate governance takes place, ensuring equity in its true spirit. Following are the projected trends/events that may shape the corporate governance practices at Indian (indigenous as well as MNC) companies:

1. **Force of competition:** With the dismantling of licenses and controls, reduction of import tariffs and quotas, virtual elimination of public sector reservations, and a much more liberalized regime for foreign direct and portfolio investments, Indian companies are increasingly exposed to MNC competition since 1990s. While many companies will fall by the wayside, many more will earn greater profits than before in this game.
2. **Shuffling of Companies' positions:** Many companies and business groups that were consistently featured on the top till 1991 have been fallen to much lower positions. Simultaneously, new aggressive companies have clawed their way to the top. A contrasting performances of Ranbaxy and Dr. Reddy's Lab in pharmaceutical industry can be a relevant case in this context.
3. **Overall growth in Market capitalization:** In spite of fluctuations in stock prices, there has been a phenomenal growth in market capitalization in last two decades. Creating and distributing wealth has become a more popular maxim than ever before

— more so when the maxim is seen to be validated by growing market cap. The phenomenal growth in Reliance Group in a short span of time has well manifested this fact.

4. **Portfolio investors (Indian and foreign):** These investors have been seeking better corporate governance, more transparency and greater disclosure. The kind of influence they enjoy in the secondary market (accounting for about 50 % of the average daily volume of trade), has made them inevitable new genre of business stakeholders.
5. **Strong financial Press:** This accompanied by fast growth in financial literate population in urban India has compelling reasons to adopt fair and equitable corporate governance.
6. **Market Orientation in Banking & NBFIs sector:** Many of them have started converting some of their outstanding debt to equity, and setting up mergers and acquisition subsidiaries to sell their shares in under-performing companies to more dynamic entrepreneurs and managerial groups. This will intensify over time, especially with the advent of universal banking. The way Satyam closure was expedited is a classic case to endorse the above.
7. **Greater access to western (esp. U.S.) capital markets:** Indian corporations have learnt good corporate governance and internationally accepted standards of accounting and disclosure can help them to access the US capital markets. With Infosys making its highly successful Nasdaq issue in March 1998 and subsequent 10 more US depository issues has had two major beneficial effects. First, it has shown that good governance pays off, and allows companies to access the world's largest capital market. Second, it has demonstrated that good corporate governance and disclosures are not difficult to implement.

CONCLUSION

Thus, the author surmises on the basis of the above discussion that the willingness and ability of the institutions (commercial, educational, governmental, and social alike) to inculcate three fundamental virtues in their practices can only ensure their sustainability, and they are Sustainable products/services, Inclusive Business practices, and Equitable Corporate Governance.

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6. Dr. Prasad Kaipa, CEO Coach in Silicon Valley, and
7. Dr. Simone Ahuja, CEO and founder of Blood Orange Media.

THE STUDY OF GOVERNING BODIES FOR EFFECTIVE DISTRIBUTION OF AGRICULTURAL PRODUCTS IN INDIA

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ABSTRACT

With the advancement of science and technology in general and globalization of the world trade order in particular, Indian agriculture has undergone significant changes. As a result of introduction of hybrids and high yielding varieties coupled with judicious use of fertilizers, plant protection measures, scientific methods of crop cultivation and agricultural marketing reforms brought out which are significant landmarks in the history, development and transformation of India's agriculture. Agricultural marketing also has at its credit contribution offered for this and therefore assumes paramount importance and hence calls for its recognition.

Marketing in general and agricultural marketing in particular is systematized and multi faceted process involving human and inhuman elements known for their vital place and contribution in the process to be effective and fruitful.

MAHARASHTRA STATE AGRICULTURE MARKETING BOARD (MSAMB)

A marketing board is an organization created by many producers to try to market their product and increase consumption and thus prices. They most commonly exist to help sell farm products such as milk, eggs, beef or tripe and are funded by the farmers or processors of those crops or products. Marketing boards often also receive funding from governments as an agricultural subsidy. The leadership and strategies of the marketing boards are set through votes by the farmers.

Agricultural marketing is witnessing major changes world over, owing to liberalization of trade in agricultural commodities. To benefit farming community for the new global market access opportunities, the internal agricultural marketing system in the country needs to be integrated and strengthened. In this context, Government of India in the Ministry of Agriculture established The Maharashtra State Agricultural Marketing Board (MSAMB) on 23rd of March 1984. With increase in the production of agricultural produce in the state, more and more market committees were constituted. Due to this the government of Maharashtra felt the need for an apex organization to coordinate the working and functioning of the numerous APMCs in the state. Thus in the year 1984 the state agricultural marketing board was incorporated. MSAMB is having an important role

in developing and coordinating agricultural marketing system in the State of Maharashtra. The detail Address of the Head Office MSAMB is

Head Office, Pune

Maharashtra State Agricultural Marketing Board

Plot No: R-7, Market Yard

Gultekadi, Pune - 411037.

Phone No: 24528100/24522200

Fax: 91-20-24528299

E-mail:msamb@vsnl.com

Web Site: www.msamb.com

Post Box No-1407

MSAMB has its headquarters in Pune. The Board has 7 divisional offices at Pune, Nasik, Aurangabad, Latur, Amravati, Nagpur and Ratnagiri for proper co-ordination of the activities of all APMCs in the state.

OBJECTIVES OF MSAMB

The State Agricultural Marketing Board made specifically responsible for:

1. Setting up of a separate marketing extension cell in the Board to provide market-led extension services to farmers;
2. Promoting grading, standardization and quality certification of notified agricultural produce and for the purpose to set up a separate Agricultural Produce Marketing Standards Bureau.
3. Keeping necessary co-ordination in the working of market committees, to advise them to make improvements in their functioning, planning the development of market committees.
4. To maintain the market development fund.
5. To prepare plans and estimates of civil works undertaken by market committees.
6. Organizing seminars, workshops, exhibitions and training programs in subjects related to agricultural marketing, horticulture training centre.
7. Export of agricultural products, establishment of agricultural export zones,
8. Organizing grading-packing facility.

FUNCTIONS OF MSAMB

As per the provision of Maharashtra Agricultural Produce Marketing (Development & Regulation) Act, 1963 section 39(J), the Board shall perform the following functions and shall have power to do such things as may be necessary or expedient for carrying out these functions.

- To co-ordinate the functioning of the Market Committees including programs undertaken by such Market Committees for the development of markets and market areas.

- To undertake State level planning of the development of the agriculture produce markets.
- To maintain and administer the Agricultural Marketing Development Fund.
- To give advice to Market Committees in general or any Market Committee in particular with a view to ensuring improvement in the functioning thereof.
- To supervise and guide the Market Committees in the preparation of plans and estimates of construction program undertaken by them.
- To make necessary arrangements for propaganda and publicity on matters relating to marketing of agricultural produce.
- To grant subventions or loans to Market Committees for the purposes of this Act on such terms and conditions as it may determine.
- To arrange or organize seminars, workshops, exhibitions on subject relating to agricultural marketing & giving training to members and employees of marketing committee.
- To do such other things as may be of general interest relating to marketing of agricultural produce.
- To carry out any other function specifically entrusted to it by this Act.
- To carry out such other functions of like nature as may be entrusted to it by the State Government.
- Maharashtra State Agricultural Marketing Board (MSAMB) undertakes various activities for the benefit of individual farmers. Some of the activities like subsidy for onion storage structure, pledge loan scheme, facilitating issuance of Euro Gap certificate, promotion of exports, help the individual farmer financially.

The Maharashtra State Agricultural Marketing Board (MSAMB), Pune was established on 23rd, March 1984, under section 39A of Maharashtra Agricultural Produce Marketing (Development & Regulation) Act, 1963. MSAMB has done pioneering work in the field of Agricultural Marketing in the State and achieved success in various areas. MSAMB is having an important role in developing and coordinating agricultural marketing system in the State of Maharashtra.

BOARD OF DIRECTORS -

MSAMB is committed towards smooth and orderly development of agricultural marketing in the State. The Board of Directors takes all policy decisions in respect of this sphere of activity and such other important issues. The Board of Directors of the Maharashtra State Agricultural Marketing Board consists of the following members:

ORGANIZATIONAL STRUCTURE OF MSAMB –

MSAMB has its 160 employees comprising of general manger, deputy general manager, project consultant, managers, assistant managers, horticulture development officers, assistants, data entry operators etc.

The members of the board shall be appointed by the State Government from amongst the following categories of persons, namely:—

1. Chairman - Their shall be a Chairman of the state agricultural marketing board who will be -Minister in-charge agriculture/ agricultural marketing of the state Ex-officio Or Shall be elected by the Chairmen/ Members of agriculturists of Market Committees as prescribed.
2. Six to ten Members to be nominated from amongst the Chairmen of Market Committees or Six to ten agriculturist members elected by the members representing agriculturists or the chairmen amongst them as prescribed.
3. Other ex-officio members will be as follows:
 - a. Agriculture production commissioner/ Agriculture Commissioner
 - b. Secretary Agriculture Department/Secretary Cooperation and Marketing department or his nominee not below the rank of Deputy Secretary, in-charge agricultural marketing.
 - c. Agricultural marketing advisor to the govt. of India or his nominee.
 - d. Representative of the National Bank for agriculture and rural development not below the rank of Deputy General Manger.
 - e. Registrar of Co-operative Societies/ Commissioner for Cooperation.
 - f. Director/Managing Director of State Marketing Board.

The tenure of an official member of the board shall come to an end as soon as he ceases to hold the office by virtue of which he was nominated. In the event of supersession of the Market Committee from where the member/members have been nominated on the Board, the concerned member shall cease to a member on the Board.

AGRICULTURAL PRODUCE MARKETING COMMITTEE (APMC)

An agricultural produce market committee is a marketing board established by state governments of India. The Maharashtra State Agricultural Marketing Board runs 295 APMCs in Maharashtra. It runs on the APMC Act made by Government of India. Agricultural Markets in most parts of the Country are established and regulated under the State APMC Acts. The whole geographical area in the State is divided and declared as a market area wherein the markets are managed by the Market Committees constituted by the State Governments. Once a particular area is declared a market area and falls under the jurisdiction of a Market Committee, no person or agency is allowed freely to carry on wholesale marketing activities.

Role of Marketing Committees

The job of the market committees which the Marketing Board controls is basically, the manner in which any payment from the Market Fund is made, how its accounts are kept and audited or re-audited, its annual, revised or supplementary budget, estimates of income and expenditure made, and collection of annual contribution.

Objectives

It is the duty of the Market Committee to implement the provisions of the Maharashtra Agricultural Produce Marketing (Regulation) Act 1963, the rules and bye-laws made there under in the market area to provide such facilities for marketing of agricultural produce therein as the Director may from time to time, direct do such other acts as may be required in relation to the superintendence, direction and control of markets or for relating marketing of agricultural produce in any place in the market area and for purpose connected with the matters aforesaid, and for that purpose may exercise such powers and perform such duties and discharge such functions as may be provided by or under this Act.

The Act provides for establishment of Market Committees in the State. These Market Committees are engaged in development of market yards for the benefit of agriculturists and the buyers. Various agricultural produce commodities are regulated under the Act. At present there are 300 APMCs with main markets and 609 sub markets.

The APMC have been made specifically responsible for:

1. Ensuring complete transparency in pricing system and transactions taking place in market area;
2. Providing market-led extension services to farmers;
3. Ensuring payment for agricultural produce sold by farmers on the same day;
4. Promoting agricultural processing including activities for value addition in agricultural produce; and
5. Publicizing data on arrivals and rates of agricultural produce brought into the market area for sale.
6. Setup and promote public private partnership in the management of agricultural markets.

CONSTITUTION

Every market shall consist of:

- Agriculturists residing in the market area and being 21 years of age on the date specified from time to time by the Collector in this behalf.
- Traders and commission agents holding license to operate in the market area.
- Chairman of the co-operative society doing business of processing and marketing of agriculture produce in the market area.

Chairman of the Panchayat Samiti within the jurisdiction in which the market area is situated, President or Sarpanch of the local authority within the jurisdiction of which the principal market is situated. Deputy Registrar of Co-operative Society of the district, the Assistant Cotton Extn. Officer or where there is no such officer the district Agriculture Officer of the Department of Agriculture.

As per provision of section 37 (2) of the Act, every market committee has to pay an annual contribution to the Marketing Board, on the basis of their income. The Govt. of Maharashtra vide notification no. APM\1085\6568\621\11-c Dated - 04/04/1988 has specified the following rates of contribution.

As per the provision of section 37(2) of the Act, every APMC shall, out of market fund, pay within two months, from the date of expiry of previous year, to the Marketing Board the annual contribution as fixed by the Govt. as per the above notification. During 2011-12 as per income out of 300 APMCs, contribution of 291 APMCs) was fixed to Rs.26.46 crores.

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THE SUSTAINABLE DEVELOPMENT OF WATER RESOURCES

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ABSTRACT

The past century has seen enormous changes in the way society conducts the business of economic development, food production and trade. Concurrently, and especially in the later part of the century, there has been an explosion in the construction of large projects for water storage, irrigation and hydropower. Many developed and developing countries are feeling water crises already at present and the problem will become more serious in the 21st century as water is a renewal resource on which we all completely depend; it is nature's gift to human being. Sustainability entails a different way of thinking about the consequences and implications of development decisions. This is leading to a new commitment based on fundamental linkages between environmental protection and management, economic development, and the social well-being of people.

In India, one in five people living today do not have access to safe drinking water and by 2025 India's population will become 1.4 billion. At that time, the availability of fresh water will drop to 1,500 m³ per capita. Floods and droughts have always been features in Indian life and have produced some of the worst natural disasters in recorded history. This consensus includes both the new ways of thinking about water resource availability and quality as well as new ways of planning and managing human water use. This paper presents a framework that explores how planners might begin to define and set out specific goals for long term water planning based on principles of sustainable water resource management and future use for socio economic development.

Keyword: *climate change, freshwater, sustainable development, socio economic, water stress.*

INTRODUCTION

Earth is the blue planet with water as one of the most plentiful natural substances in its environment. Water permeates life on earth. Besides being an integral part of the ecosystem, water is a social and economic good. Water is essential as an enabler and sustainer both of life such as plants, animals and humans and of human civilization. There is more than 1.4 billion cubic kilometers (km³) of the stuff enough to give every man, woman and child more than 230 million cubic meters (m³) each if we were to divide it evenly (WCED, 1987).

However, water covers 71 percent of the earth's surface, of this, 97.5 percent is the salty water of the oceans and only 2.5 percent freshwater, most of which is locked in the polar ice caps. Less than 1 percent of the earth's freshwater are accessible in lakes, rivers, wetlands, and groundwater aquifers and atmosphere. That vial 1 percent of available freshwater is constantly in motion, either flowing in rivers, evaporating and moving around the globe as water vapor, falling from the sky as rain or snow or filtering slowly through the earth to emerge somewhere else (Falkenmark, 2003). Due to the water cycle, fresh water supply is continually replenished by precipitation, however there is still a limited amount necessitating management of this resource. It is the genesis and continuing source of all life on earth.

The limits of the world's freshwater resources have become all too apparent (Bhatia, Cesti and Winpenny, 1995). Water resources management is one of the most important challenges the world faces. It is difficult to think of a resource more essential to the health of human communities or their economies than water. The total volume of water conveyed annually by the world's rivers is about 43,000 km³, most of this occurs as floods. The low river flows (base flows) make up only about 19,000 km³, of this, about 12,500 km³ can be accessed and present levels of withdrawal account for about 4,000 km³ withdrawals are anticipated to reach 5,500 km³ per year by 2025. The demand for freshwater increased tenfold during the 20th century and this increasing trend will continue well into 21st century, twice the rate of population growth. The global population will expand from today's 6 billion to almost 8 billion in 2025. By this time, India's population will be 1.4 billion and the availability for the freshwater will drop to 1,500 m³ per capita (IWRA, 1991). Currently towards 35 percent of human water use is unsustainable, drawing on diminishing aquifers and reducing the flows of major rivers.

In the 21st century, the world continues its rapid globalization driven change to improve living conditions. Heedless of the need for a sustainable approach to development, the sustainability is the capacity to endure. Sustainable development is the development that meets the needs of the present without compromising the ability of future generation to meet their own needs.

USE OF WATER

The water is the base for household, municipality, industry, agricultural activity. The freshwater can be used for several purposes and necessitating management of water resource.

1. Water for production:

A major problem to be resolved by 2025 is producing enough food for the anticipated population of 8 billion people. Economic development and changes in food preferences will exert strong demand for additional production and more varied food products. Water is becoming the single most important constraint to increased food

production. The UN has estimated the potential area for new irrigation as 45 million hectares worldwide, which could provide up to 21 percent of the projected additional food need.

2. Water for Poverty Reduction:

One in five people living today in India do not have access to safe drinking water, and half the world's population does not have adequate sanitation. The poor not only prone to adverse impacts of unsafe drinking water and inadequate sanitation but ADB's survey also consistently show that the poor spend disproportionately more of their incomes on potable water than more privileged section of the community for whom piped water supplies are assured.

3. Water for basic Human Right:

As per the Dublin principle, freshwater is an input to which every human being has the right to claim an essential minimum amount of water which is necessary to sustain and meet basic sanitation need (Falkenmark, 2003). The human for survival requires minimum 5 liters of water, daily, whereas the daily requirement for sanitation, bathing, cooking and assuring for survival is about 50 liters per person. It is essential for water planning to secure basic human and environmental needs for water.

Why Be Concerned About Water Quantity and Quality?

Water Resource Availability	How Safe Is Our Water?	Water and World Security
Average U.S. household uses about 50 gal/person/day, nearly triple Europe's level and more than 7 times the rest of the world (ENS, 1999b).	In 1996, 263 million tons of Nitrogen and 18 million pounds of Phosphorus ran into the Chesapeake Bay (ENN, 1998).	Israelis and Palestinians have argued for years over how to share the Mountain Aquifer beneath the West Bank (Edie Summaries, 2000).
The World Health Organization says good health and cleanliness require a total daily supply of about 8 gal/person/day (Collier, 1999).	Fish advisories for risks to human health have become a standard practice of the 1980s and 1990s (ENN, 1999).	Pakistan and India in conflict for centuries over water in the Indus and Ganges Rivers, which both originate in Kashmir (Mustikhan, 1999).
Two-thirds of residential interior water used for toilet flushing (4 gal/flush) and bathing (15-50 gal/shower or bath) while a dishwasher	In 1986 a study statistically linked children with leukemia in Woburn, Massachusetts to contaminated drinking	While the Syrians press for an Israeli withdrawal from the Golan Heights, water, not land is the crucial issue between the two countries.

<p>uses 8-12 gal and a toploading clothes washer 40-55 gal (ENS, 1999b)</p>	<p>water affected by a nearby waste site (Montague, 1998).</p>	<p>The Golan Heights provides more than 12% of Israel's water requirements (Edie Summaries, 2000).</p>
<p>China is draining some of its rivers dry and now mining ancient aquifers that take thousands of years to recover (Brown, 1999).</p>	<p>Between 1976-1996, annual rates of harmful algae blooms — leading indicator of health risks for marine animals and people — increased from 74 to 329 (Barker, 1997).</p>	<p>The Mercosul countries of Brazil, Argentina, Uruguay, and Paraguay launched a project for preservation of the Guarani Aquifer that serves all four countries (Muggiati, 2003)</p>
<p>Africa's Lake Chad has shrunk from a surface area of 25,000 sq km in 1960 to only 2,000 sq km today (GreenBiz.com, 2003).</p>	<p>Aging infrastructure, source water pollution and outdated treatment technology increase human health risks in 19 US cities (ENS, 2003)</p>	<p>Canada and the U.S. signed a treaty approximately 10 years ago that states no water can be removed from the Great Lakes basin (ENS, 1999a).</p>
<p>Two of every 3 persons could live in water-stressed conditions by the year 2025 (GreenBiz.com, 2003)</p>		<p>Maryland is in control of Virginia's water destiny (IATP, 2003).</p>

(Source: R. Warren Flint, The Sustainable Development Of Water Resources, Universities Council On Water Resources Water Resources Update, Issue 127, Pages 48-59, January 2004)

FUTURE CHALLENGES AND HURDLES IN WATER RESOURCE MANAGEMENT

Water planners and developers have always worked from projections based on population growth, industrial and agricultural production and level of economics and social development to determine demand, and hence to formulate engineering solutions to provide the appropriate freshwater supply.

1. Water Stress:

Water stress begins when withdrawals of freshwater rise above the 10 percent of renewable resources. Medium to high stress translate as water use that exceeds 20 percent of available water supply (IWRA, 1991). Countries experiences have water stress when the ratio of water use to supply exceeds 40 percent. This pattern of freshwater use may not be sustainable, and water scarcity is likely to become the limiting factor to socio economic growth.

2. Shared Water:

The International as well as domestic conflicts over water is becoming more frequent as completion for available freshwater resources increasing. There are 215 rivers, about 300 groundwater basins and aquifers that are shared by several states and countries (Falkenmark, 2003). Asia has the lowest per capita availability of freshwater resources among the world's continents (Shah, Roy, Quershi & Wang, 2003).

3. Double edged sword: Flood & Draught:

Flood and Drought have always been featured of Indian life and have produced some of the worst natural disasters in the recorded history. Due to inappropriate land use and land management practices, uncoordinated and rapid growth of urbanization and loss of natural flood storage wetlands, floods are becoming more frequent. According to the Intergovernmental panel on climate change, the frequency of drought could rise by 50 percent in certain parts of the world by 2050 (IPCC, 2007).

4. Threats of Hydrocide:

Disposal of waste water, which is untreated in many parts of the world, has resulted in considerable negative impact on aquatic ecosystem. A rapid industrial growth in semiarid regions is particularly problematic because relatively large volumes of water are required, and the volume of effluents is correspondingly large. The world is threatened by a hydrocide, a circumstance in which the water accessible in rivers is no longer fit for use.

ACTING ON SUSTAINABLE DEVELOPMENT

Sustainable development can mean working to improve human's productive power without damaging or undermining society or the environment—that is, progressive socio-economic betterment without growing beyond ecological carrying capacity: achieving human well-being without exceeding the Earth's twin capacities for natural resource regeneration and waste absorption (Flint, 2003).

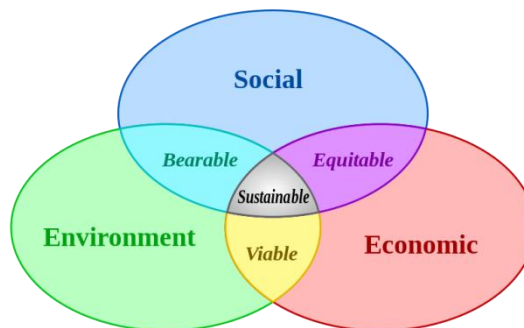


Figure 1: Sustainability Model

By acting under the principles of sustainable development, our economic desires/demands become accountable both to an ecological imperative to protect the

ecosphere and to a social equity imperative to create equal access to resources and minimize human suffering.

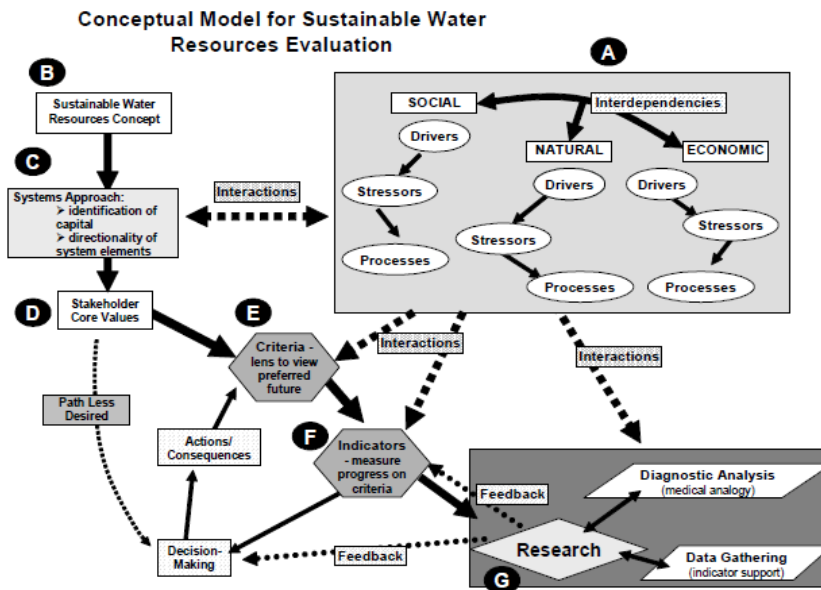


Figure 2: Conceptual Model for Sustainable Water Resource Evaluation

- A. Illustrates the systems approach.
- B. Shows the development of a conceptual view of sustainable water resources.
- C. Defines water resources “capital” and assesses directionality of issues.
- D. Elaborates the sustainability goals of stakeholders.
- E. Develops criteria to judge
- F. Water resource sustainability and
- G. Identifies indicators to measure sustainability.
- H. Demonstrates the research support required

As discussed, a number of severe problems unfolded, widespread river depletion emerged in the wake of the irrigation based Green Revolution. In addition the water pollution and large scale losses of biodiversity in aquatic ecosystem continues generating adverse effect on the water resources. Sustainability criteria must be added to the set of principles guiding water resources planning and management. Considerable effort has been invested in defining sustainability, finding ways to measure it and identifying the steps necessary to include it in the planning and management of complex water resource systems.

- Crops with low water requirement should be selected, and technology employed to determine the exact amount of water needed for different stages of crop growth.

- Provide clean and dependable freshwater close to the home can substantially reduce the efforts of woman's and their workload so the free up time they can engage themselves in economic activities to improve household income.
- Promote effective national water policies and action programmes to foster the efficient and sustainable use and conservation of water.
- Apply principles of inclusive and equitable water service delivery, support adoption of appropriate pricing policies to promote greater efficiency.
- Promote cooperation for beneficial use of shared water resources within and between countries.

CONCLUSION

Natural resources are naturally occurring substances that are considered valuable in their relatively unmodified form. The hope for future lies in doing for water productivity what the Green Revolution did for crop productivity, the blue revolution would dramatically improve the efficiency of freshwater use. The revolution should begin with public awareness and participation. The approach helps in creating policies, strategies, and incentives to establish integrated water resource management on the global basis for the upliftment of socio economic development. The culmination in the allocation of resources to effect the social, institutional and technological changes are necessary for efficient water allocation and use. Ultimately, the human progression is depending on large social movements which influence community choices, environment and economic activities. So let's all of us adopt the behaviours and practices to secure our future.

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TO INVESTIGATE THE RELATIONSHIP BETWEEN WORK ENVIRONMENT AND EMPLOYEE PERFORMANCE IN SANDVIK MANUFACTURING COMPANY IN PUNE

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ABSTRACT

This research aims to investigate the relationship between work environment and employee performance in the Sandvik Manufacturing Company in Pune. The work environment can implicate the social relation at workplace and also maintain the relationship between colleague, supervisor and the organization. It describes the neighboring circumstances in which employees are working together. A satisfied, happy and hardworking employee is biggest asset of any organization. Effective results & productivity for any organization is depend on the level of satisfaction of employees and work environment is one of the most important factor which influence the satisfaction & motivation level of employees. Efficient human resource management and maintain good work environment or culture effects not only the performance of employee & organization but also affects the growth & development of entire economy.

Keywords: *Work environment, work culture and employee performance*

INTRODUCTION

Work Environment

The term work environment is used to describe the surrounding conditions in which an employee operates. The work environment can be composed of physical conditions, such as office temperature or equipment such as personal computers.

The work environment can involve the social interactions at the workplace, including interactions with peers, subordinates, and managers. Generally, and within limits, employees are entitled to a work environment that is free from harassment. A hostile work environment exists when unwelcome sexual conduct interferes with an employee's job performance, or creates a hostile, intimidating, or offensive work environment.

The term work environment can also be associated with the physical condition of the building. Healthy work environments will be free from problems associated with sick building syndrome, which is often due to poor ventilation or off-gassing of chemicals used during construction. The accumulation of molds and mildew may also lead to sick building syndrome.

Work Culture

“Work culture may be defined as the rules/regulations, policies, Practices, traditions/rituals and values/beliefs of the organization”.

“Work culture is a consequence in an organization formed by a set of values and beliefs, carried forward from long time and has substantial impact in the behavior, quality, and quantity of work done by the employee in an organization”.

“Work culture which decides the way employees interacts with each other and how an organization functions”.

A decade ago, the system of Indian work culture had a big difference as compared to other worlds work culture, as compared specially to western countries. But, now there is an exemplars shift due to drastic development of Multinational corporations in IT sector India, BPO’s etc. Due to the emergence of globalization within the corporate life, the employees get an opportunity to work across the borders of the different countries, Howsoever, in sector rather than Government sectors of India and IT sectors the work culture varies a lot from that of other countries. A good working environment addresses the culture of the group and the humanity of the individual. It also acknowledges that some habitat needs are universal. The work culture of India is a reproduction of the various norms and standards followed by its people.

Employee Performance

Employee performance is about employees achieving the results, goals or standards as per the expectations set by the organization. Employees are rated on how well they do their jobs compared to the performance standards set. In short, it is the accomplishment of a given task measured against pre-set standards of accuracy, completeness, cost, and speed, the initiatives they take, their creativity in solving problems and the resourcefulness in the way they utilize their resources, time and energy. In summary, all references made to meaning, competence, self-determination, impact, empowerment and employee performance in the following pages of this paper, are defined as stated above. This is to ensure alignment of understanding of the terms and terminology used.

About Sanvik Manufacturing Company

Sandvik is a global industrial group with advanced products and world-leading positions in selected areas – tools for metal cutting, equipment and tools for the mining and construction industries, stainless materials, special alloys, metallic and ceramic resistance materials as well as process systems. In 2013, the Group had about 47000 employees in 130 countries, with annual sales of more than 87 000 MSEK. Sandvik started its operations in India 1960 and became one of the first Swedish companies to establish a subsidiary with a manufacturing unit in the country. Over the years, Sandvik has been a close partner of India’s economic growth through five manufacturing units in India that are located in Pune, Mehsana, Hosur, Hyderabad and Chiplun. With a talent pool of over

3500 employees, Sandvik is committed to partnering India in its next phase of growth and development.

OBJECTIVES OF THE STUDY

1. To determine the relationship between work environment and employee performance in the Sandvik manufacturing industry.
2. To ascertain the impact of physical & mental environment on employee performance.
3. To study the factors effecting on work environment.

Research Hypotheses

This study will test the following hypotheses:

There is a significant relationship between work environment and employee performance in the Sanvik manufacturing company.

Research Methodology

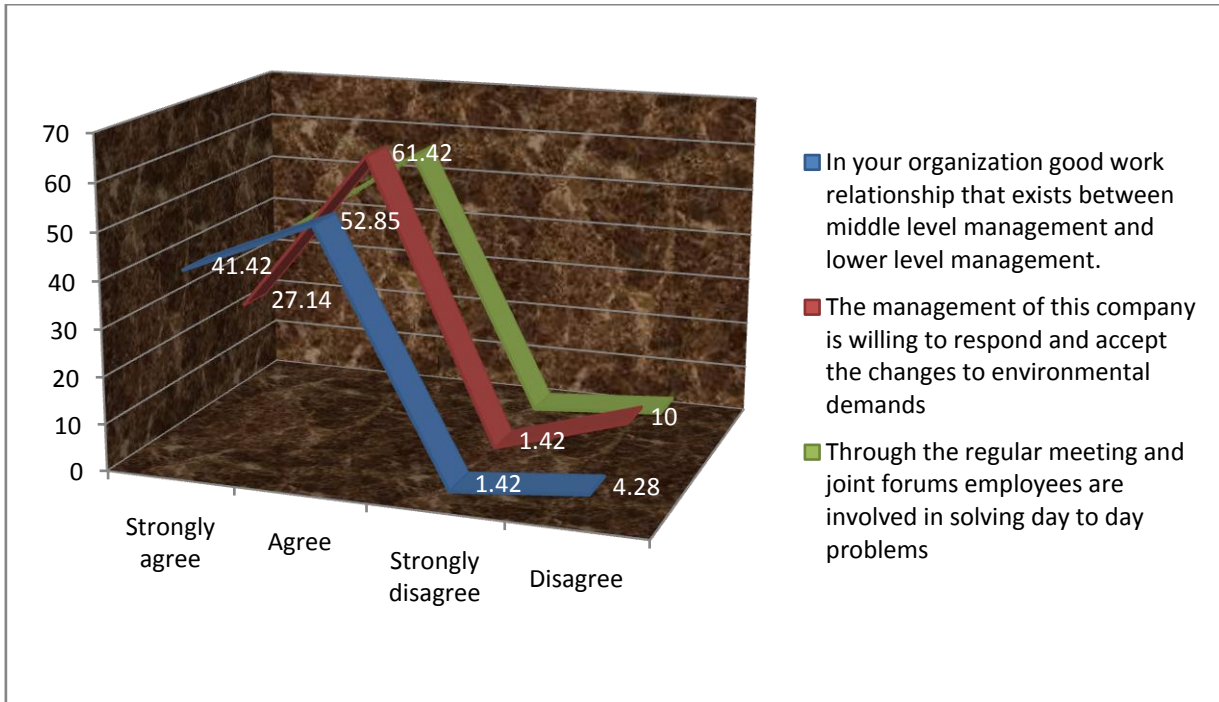
- **Area of study:** The area of study to respondents from Pune city.
- **Research instrument:** Structured questionnaire.
- **Sample size:** 140 workers respondents.
- **Sampling Technique:** Convenient& Random Sampling Technique
- **Data Collection:** The Primary Data has been collected through questionnaire and interview and the Secondary Data has been collected with the help of journals, magazines, books and internet.
- **Analysis of Data:** Once the data has been collected through questionnaire and interview then the simplest and most revealing devices for summarizing data is the statistical table. A table will be systematic arrangement of data in column and rows. The purpose of a table will be simplifying the presentation and to facilitate results

Data analysis & inference

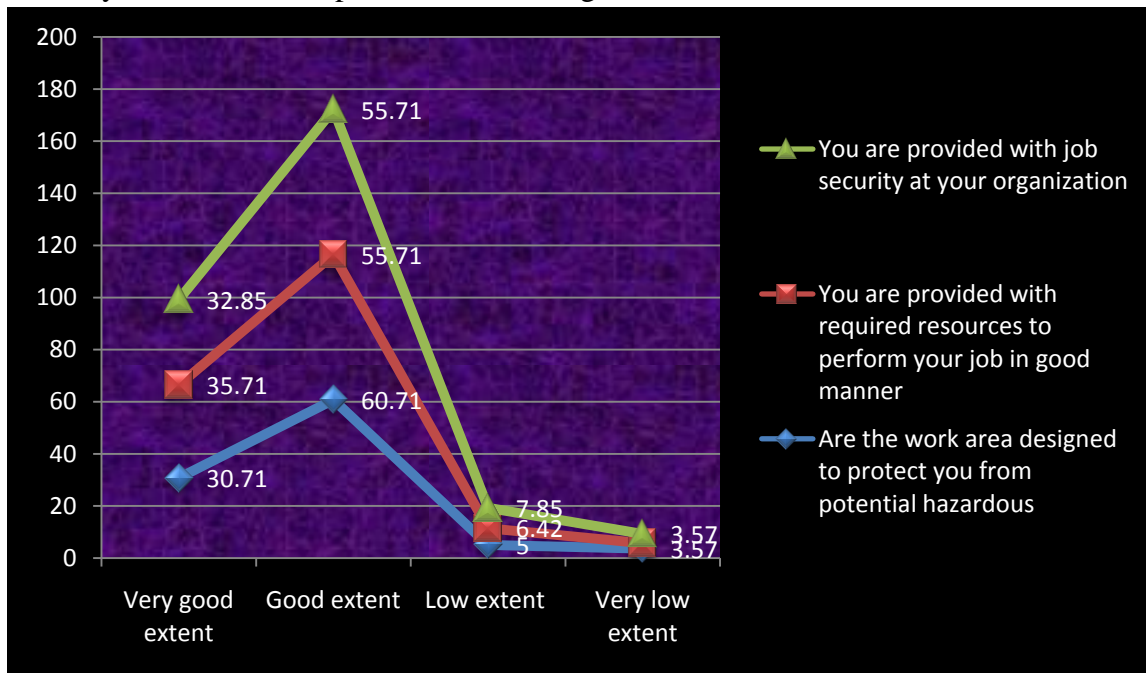
Particulars	Categories	Number of respondents	Percentage
In your organization good work relationship that exists between middle level management and lower level management.	a) Strongly agree	58	41.42
	b) Agree	74	52.85
	c) Strongly disagree	02	1.42
	d) Disagree	06	4.28

Are the work area designed to protect you from potential hazardous	a) Very good extent	43	30.71
	b) Good extent	85	60.71
	c) Low extent	07	5
	d) Very low extent	05	3.57
You are provided with required resources to perform your job in good manner	a) Very good extent	50	35.71
	b) Good extent	78	55.71
	a) Low extent	9	6.42
	b) Very low extent	3	2.14
You are provided with job security at your organization	a) Very good extent	46	32.85
	b) Good extent	78	55.71
	c) Low extent	11	7.85
	d) Very low extent	5	3.57
The management of this company is willing to respond and accept the changes to environmental demands	a) Strongly agree	38	27.14
	b) Agree	86	61.42
	c) Strongly disagree	2	1.42
	d) Disagree	14	10
Through the regular	a) Strongly agree	54	38.57

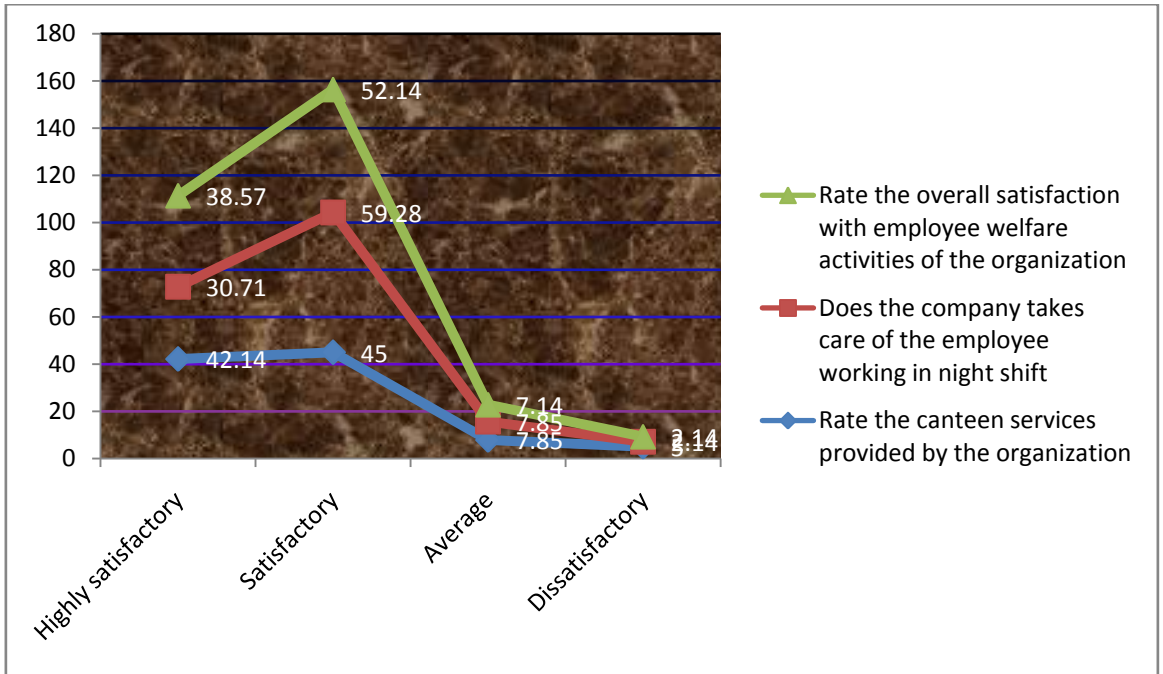
meeting and joint forums employees are involved in solving day to day problems	b) Agree	79	56.42
	c) Strongly disagree	2	1.42
	d) Disagree	5	3.57
Rate the canteen services provided by the organization	a) Highly satisfactory	59	42.14
	b) Satisfactory	63	45
	c) Average	11	7.85
	d) Dissatisfactory	7	5
Does the company takes care of the employee working in night shift	a) Highly satisfactory	43	30.71
	b) Satisfactory	83	59.28
	c) Average	11	7.85
	d) Dissatisfactory	3	2.14
Rate the overall satisfaction with employee welfare activities of the organization	a) Highly satisfactory	54	38.57
	b) Satisfactory	73	52.14
	c) Average	10	7.14
	d) Dissatisfactory	3	2.14



As per above analysis diagram me the researcher argued that the organizational good work relationship that exists between middle level management and lower level management is good 52.85% of workers were agreed about the same, 41.42% were strongly agreed about the same and only 4.28% workers were disagreed about the same. In case of the management of the company is willing to respond and accept the changes to environmental demand 61.42% workers were agreed about the concerned statement, 27.14% of the workers were strongly agreed about the same and only 10% were disagreed about the same. Through the regular meeting and joint forums employees are involved in solving day to day problems in this case the 56.42% Of workers were agreed about the same, 38.57% of the workers were strongly agreed about the same statement and only 3.57% of the respondents were disagreed about the same statement.



As per the constructed diagram me 55.71% of the workers were accept that they are provided with job security at their organization in a good extent. 32.85% of the workers were accepting the same but in a very good extent. 7.85% of the respondents accept the same but in a low extent about the same. In case of the required resources to perform the job 55.71% of the workers argued that in a good extent. 35.71% of the workers were accepting the same in a very good extent and only 6.42% of the workers were accept the same but in a low extent. 60.71% of the respondents were argued about the work area designed to protect them from potential hazardous in a good extent. 30.71% of the respondents were accepting the same but in a very good extent. And finally only 5% of the workers accept it in a low extent.



With the help of above constructed diagram me the researcher opined with the help of workers 59.28% were satisfactorily accept the situation that the company takes care them in a night shift. 30.71% of the respondents were highly satisfied about the same, 7.85 % of the workers were in a average and only 2.14% of the workers were not satisfied about the same. In case of the canteen services provided by the organization 42.14% of the workers were highly satisfied about the same. 45% of the workers were satisfied about the same and 5% were not satisfied about the same. Finally in case of the overall satisfaction of the employee’s welfare activities provided by the organization 38.57% of the workers were highly satisfied about the same.52.14% of the respondents were satisfied about the same and only 2.14% of the workers were not satisfied about the same.

VERIFICATION OF HYPOTHESIS

The hypothesis formulated for the purpose of the study has been verified in the following manner.

H1 - There is a significant relationship between work environment and employee performance in the Sanvik manufacturing company.

As per the general observation of the researcher and his interpretation of data collected it has been found out that there is a significant relationship between work environment and employee performance in the Sandvik manufacturing company.

Hence the hypothesis of the study has been verified positively.

SUGGESTIONS

1. As per the observation from the above study the researcher point out that there must be good working relations among the officers as well as workers, it will increase the level of coordination among each other in the organization.
2. Most of the organizations coming under the hazardous working areas, so it is the duty of the such kind of companies to arrange some safety measures to protect the employees.
3. Proper communication should be required at the working place also supply of adequate resources is much important for effective performance of the organization.
4. Providing job security is the essential need in the modern world, it will help to get certain level of assurance about their job. So it will directly affect on the efficiency of the employees in a positive manner.
5. Due to the modernization in the business world each and every organization should be up to date about the technology. It will increase the level of status as well as goodwill of the company.
6. For the purpose of effective work environment it is mandatory that organization should provide the ancillary facilities to the employees for e.g. canteen facility, restroom facility, clubhouse etc.

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QUALITY OF WORK LIFE: PERCEPTION OF TEACHERS TOWARDS WORKING CONDITION

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ABSTRACT

Human resource indicates or represents different knowledge, abilities, and skills and aptitude of employees. There is a old proverb work is worship but today's generation attitude towards work is very different. Today's employees would not believe in such old values about work but instead now a days employees work for better salary and environment and if condition of work are encouraging then they feel better quality of work life. Quality of work life programme is another way in which organisation knows their responsibility toward employees like to develop job, better working conditions which will be beneficial for the employees and the organisation too. Quality of work life is increasingly becoming a part of the business strategies which will help employees to retain in the organisation and to be more productive and more importantly to help them to maintain a work life balance and be more committed towards job.

INTRODUCTION:

Human resource indicates or represent different knowledge, abilities, and skills and aptitude of employees. There is a old proverb work is worship but today's generation attitude towards work is very different. Today's employees would not believe in such old values about work but instead now a days employees work for better salary and environment and if condition of work are encouraging then they feel better quality of work life.

Quality of work life programme is another way in which organisation knows their responsibility toward employees like to develop job, better working conditions which will be beneficial for the employees and the organisation too. Quality of work life is increasingly becoming a part of the business strategies which will help employees to retain in the organisation and to be more productive and more importantly to help them to maintain a work life balance and be more committed towards job.

WHAT IS QUALITY OF WORK LIFE?

Quality of work life refers or indicates the relationship between employee and work environment. Quality of work life consider people their asset in the organisation which need to be groomed up or improved time to time according to the needs. This approach believes that people can perform better if they have given opportunity to take their own

decision at work. So, in other words we can say that quality of work life is nothing but managing people in better and creative way. Quality of work life covers various programmes like techniques, theories, methods, leadership style, management style which help the employee to take decision in right manner for better productivity or better performance:

WORKING DEFINITIONS OF TERMS USED

Quality of work life: Quality of work life refers to the favorable (or) unfavourable of a job environment for people. The basic purpose is to developed jobs that are excellent for people a well as for production. Quality of work life is large step for forward from the traditional job design of scientific management which focused mostly on specialization and efficiency for the performance of narrow tasks. The major indicators of quality of work life are job involvement, job satisfaction and productivity.

OBJECTIVE

1. To study the perception of employees about the working condition of the organisation.
2. To study the quality of worklife.

RESEARCH METHODOLOGY

Research design

The research design is the basic framework or structure for the research that helps in collection of data and its analysis. Quality of work life :percepttion of teachers on working condition , this study is used Descriptive research. The information is collection from the teachers of selected schools and analyzed with the help of different statistical tools.

SOURCES & METHODS OF DATA COLLECTION

Method of data collection:

In this research data was collected with the help of questionnaire which was specially designed for the high school teachers of various selected school.first hand information was collected form the teachers in order to make this study more meaningful through primary and secondary data

Sources of Data collection:

The concept of quality of work life is discussed with teachers and the respondents were fully assured that their responses would not be disclosed to anybody and would only be used or utilized for the research purpose.

THEORETICAL FRAMEWORK

Quality of work life

Quality of work life plays a very vital role in organisation to attract and retain the employees.it is basically to learn the organizational practices or conditions. Various scholars has defined different meaning or definition of quality of work life. A number of

researchers have tried to identify the kinds of factors that determine and their effort has resulted in different perspectives.

Quality of work life has been growing very well now days, basically this tries to understand the nature of human being under certain situations. Quality of work life can be improved through various factors according to Waltons view i.e. better compensation, training, career opportunities, decision making, communication , employees participation etc,

Many authors have proposed various models of quality of work life with different factors. Quality of work life depends upon the individual in different way as everybody's need and demand is different. Organisation now a days is very keen on employee's development and satisfaction and keep try to motivate so that they can retain them, because quality of work life has become a social issue also.

QWL has been well recognized as a multidimensional construct and it may not be universal or eternal. Each person has different needs when it comes to their careers; the quality level of their work life is determined by whether those needs are being met. While some people might be content with a simple minimum wage job as long as it helps pay the bills, others would find such a job to be too tedious or involve too much physical labour and would find such a position to be highly unsatisfactory

Richard E.Walton explains quality of work life in terms of eight broad conditions of employment that constitute desirable quality of work life (QWL). He proposed the same criteria for measuring QWL. Those conditions/criteria include:

1. Adequate and fair compensation.
2. Safe and healthy working condition.
3. Opportunity to use and develop human capacities.
4. Opportunity for career growth.
5. Social integration in the work force.
6. Constitutionalism in the work organisation.
7. Work and quality of life and
8. Special relevance of work.

CONCEPT OF QUALITY OF WORK LIFE

The concept of quality of work life is the important part of the employees. Quality of work life term first used in 190's .and from that period till today's it has been growing tremendously .It was first discussed in 1972 during an international labour relations conference. Later it refers as to the relationship between a worker and his environment with different dimensions. Quality of work life is multidimensional concept. Different researchers have come up with different definitions or categories of QWL. So, different people gave different meaning of quality of work life some said it's a physiological needs to reach the goal.

MEANING OF QUALITY OF WORK LIFE

Quality of work life means organizational environmental, ambiance, or denotes all organizational inputs which affects directly or indirectly to the people working in an organisation. It also defines as how people react in the organisation.

OBJECTIVES OF QWL

The main objectives of the QWL are to

1. To Improve employee satisfaction (I.e related to job , salary, etc).
2. Improve physical and psychological health of employees.
3. Enhance productivity of employees.
4. Reinforce workplace learning.
5. Improve management of the ongoing change and transition and
6. To Build the positive image of the company.

IMPORTANCE OF QUALITY OF WORK LIFE

- To improve the standard of living of the employees.
- To increase the productivity
- To create a positive attitude in the minds of the employees.
- To increase the effectiveness of the organization (profitability, goal accomplishment etc.,)

WORKING CONDITION

Quality of work life is also depends upon various aspects of employee work life. First is economical part and second is employment condition. Working condition is nothing but the working environment or physical condition where employee is working.

Working conditions come under ‘Hygiene factors’ of Herzberg’s two-factor theory of motivation (FridLuthans).

Physical Working conditions are for e.g., lighting, water, sitting facility etc. at the outset they may seem negligible, but bad working-conditions assumes importance as an employee spends 8 hours of the day at his work-place. Good working conditions encourage the employees to be more dedicated and motivated towards their job. Hence, providing good working condition reduces the stress and dissatisfaction towards job. So, good building with good furniture and other amenities keeps employees attitude positive towards organisation.

Comfortable sitting position, good lighting and ventilation, sufficient rest duration to relax are all the factors which keep the employee in good spirit throughout the day. With inadequate facilities an employee gets tired soon and cannot concentrate on his work.

Working conditions comes under Herzberg theory (hygiene factors). As such, though they do not motivate an employee but non-existence of good conditions do dissatisfy them. Physical working condition may seem negligible , but bad working conditions

creates stress among employees as employees has to spend max 8 hrs of the day at their work place.

Hence, providing good working conditions play an important role in reducing employee dissatisfaction about the job. Comfortable sitting position, good lighting and ventilation, sufficient rest duration to relax are all the factors which keep the employee in good spirit throughout the day. A healthy/good physical condition at work places which is second home for employees is thus an important factor in measuring QWL.

REVIEW OF LITERATURE

Chandrasekar (2011) examined that the workplace environment impacts on employee morale, productivity and Job performance both positively and negatively. If the work place environment is not liked by the employees so, they get demotivated and their performance also affected.

Adeyemi (2010) investigated the relationship between the leadership styles of principals and teachers job performance in secondary schools. He found that the principals mostly used democratic leadership style in schools as compared to autocratic style. He also found that there is a direct relationship between leadership styles by principals and teachers job performance and concluded that the performance of teachers is better in those schools where principals are having autocratic leadership styles.

Davidson (2005) focused on role of teachers in providing good quality education in primary schools through motivation where it suggested some initiatives to increase the teachers level of motivation which will improve the education system.

KAdzamira (2006) studied on Teachers motivation and incentives in Malawi and his study found that the bad working and living conditions have an adverse effect on the teachers' performance. So, it is essential to consider the terms and conditions of service for the purpose of motivating and retaining teachers.

Taleghani and Negahdarian (2011) conducted a study to determine relationship between quality of working life and organizational commitment of employees working at bank Melli of Iran. The result showed that there is a positive relationship between quality of work life and organizational commitment of employees, and continuous commitment of employees.

DATA ANALYSIS

Perception of teacher towards quality of work life.

(N-110)

Sr	Statement	Mean	S. D	Rank
1	The environment offers due respect to individual space and rights.	4.11	0.31	1
2	All necessary resources and equipment are readily available.	3.93	0.54	6

3	The payment is equitable to work I perform.	3.76	0.57	12
4	The pay is both timely and consistent	3.97	0.60	5
5	The job design offers me clear role and definition.	3.98	0.49	3
6	I derive satisfaction from the current job.	3.57	0.61	14
7	The design of my job offers me independence in decision making	3.51	0.66	15
8	The job design offers me good work and family life balance	3.61	0.64	13
9	I am satisfied about leave facilities.	3.86	0.50	10
10	I am satisfied with the grievance handling procedure.	3.86	0.50	9
11	There is a well-defined career path in the organization	3.83	0.47	11
12	Promotion is based on fairness and deservedness	3.88	0.44	8
13	Performance appraisal reports are considered in promotion.	3.97	0.34	4
14	Promotion are often open and transparent.	3.91	0.44	7
15	I am satisfied with the quality of work life here.	4.01	0.44	2

Perception of teachers towards working conditions

(N-110)

Sr	Statement	Mean	S.D	Rank
1	The environment offers due respect to individual space and rights.	4.1	0.3	1
2	All necessary resources and equipment are readily available.	3.9	0.5	4
3	The job design offers me clear role and definition	4.0	0.5	3
4	The design of my job offers me independence in decision making	3.5	0.7	5
5	I am satisfied with the quality of work life here.	4.0	0.4	2

FINDINGS

- Organizations offer individual space and rights.
- Teachers have given all necessary resources and equipment's.
- Many teachers has neutral opinion payment i.e it is not equitable to work about this.
- Teachers agreed that payment is both timely and consistent.
- Organizations are giving well defined career path to the respondents.
- Majority of teachers are satisfied with the quality of work life.

SUGGESTIONS

- Teachers should be free to share their views and ideas.
- Teachers should get freedom to take decision or independence to decision making.
- Job design should offer good work and family life balance.
- Payment should be equitable to work.

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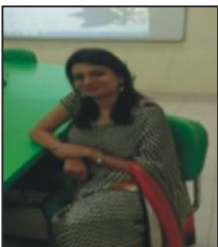


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