

Project Report on

**GREEN HUMAN RESOURCE
MANAGEMENT-
NEED FOR TODAY**

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CERTIFICATE

This is to certify that the Project Report titled “Green Human Resource Management-Need for Today”, is a bonafide work carried out by Ms. Aditi Upadhyay of MBA 2012-14 and submitted to Delhi School of Management, Delhi Technological University, Bawana Road, Delhi-42 in partial fulfillment of the requirement for the award of the Degree of Masters of Business Administration.

Signature of Guide (Dr. Shikha N Khera)

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Place:

Date:

DECLARATION

I Aditi Upadhyay, student of MBA 2012-14 of Delhi School of Management, Delhi Technological University, Bawana Road, Delhi-42 declare that Project Report on **“Green Human Resource Management- Need for Today”** submitted in partial fulfillment of Degree of Masters of Business Administration is the original work conducted by me.

The information and data given in the report is authentic to the best of my knowledge. This Report is not being submitted to any other University for award of any other Degree, Diploma and Fellowship

Aditi Upadhyay

Place: New Delhi

Date:

ACKNOWLEDGEMENT

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ABSTRACT

The Green Human Resources Management (Green HRM) has emerged from companies engaging in practices related to protection of environment and maintaining ecological balance. The source of such initiatives, referred to as green management, is the green movement with its agenda of Protection of Environment and saving the planet Earth from future man made disasters. Green HRM encompasses all activities aimed at helping an organisation carry out its agenda for environment management to reduce its carbon footprint in areas concerning on boarding and acquisition of human resources, their induction, performance management, learning and development and compensation and reward management. Green HRM can play a useful role in business in promoting environment related issues by adopting and following Green HR policies and practices. Green HRM can enhance corporate image and brand. Green HR will play an important role in making the employees aware of and concerned for preservation of natural resources and contribute in pollution control, waste management and manufacture of eco-friendly products.

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1. INTRODUCTION

1.1 Carbon Footprint

Today, the term “carbon footprint” is often used as shorthand for the amount of carbon (usually in tonnes) being emitted by an activity or organization. The carbon component of the Ecological Footprint takes a slightly differing approach, translating the amount of carbon dioxide into the amount of productive land and sea area required to sequester carbon dioxide emissions. This tells us the demand on the planet that results from burning fossil fuels. Measuring it in this way offers a few key advantages.

On a practical level, the Ecological Footprint shows us how carbon emissions compare and interacts with other elements of human demand, such as our pressure on food sources, the quantity of living resources required to make the goods we consume, and the amount of land we take out of production when we pave it over to build cities and roads. According to the research conducted by Global Footprint Network, the carbon Footprint is 54 percent of humanity’s overall Ecological Footprint and its most rapidly-growing component. Humanity’s carbon footprint has increased 11-fold since 1961. Reducing humanity’s carbon Footprint is the most essential step we can take to end overshoot and live within the means of our planet.

The Footprint framework enables us to address the problem in a comprehensive way, one that does not simply shift the burden from one natural system to another.

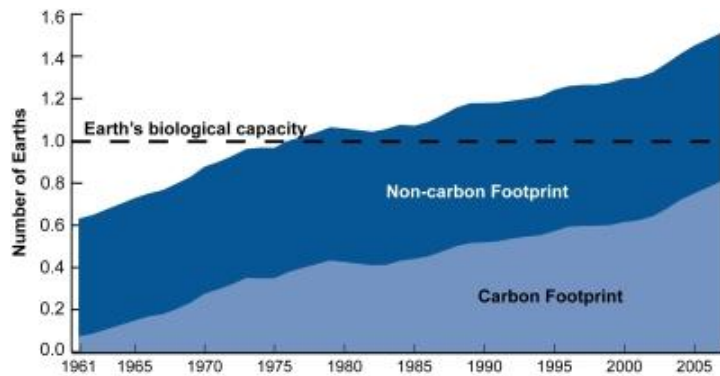


Figure 1(<http://www.footprintnetwork.org>)

1.2 Green HR

Green HR is a strategy used primarily for reducing the carbon footprint of each employee and talent retention. More employees are becoming more concerned about the environment and climate change. HR departments are seeing Green HR as a cutting edge way to keep top talent in house.

There is no question that green is definitely in fashion these days and as businesses are awakening to the fact that going green is not only the responsible thing to do but can also be good for their bottom line, they are often looking to their own HR teams to get their in-house green initiatives off the ground. For some, green HR practices involve directly addressing their organization's carbon footprint by reducing paper use, cutting back on unnecessary travel and generally looking for ways to streamline processes for more efficient use of resources. For others, a more holistic application of the concept of sustainability to their organization and workforce is the key to practicing what is coming to be known as "Green HR". For those who choose to take a more holistic approach to the greening of their organization and HR processes, include how to attract top candidates who value a commitment to the environment, how to retain knowledge gained by their more experienced workers, and keeping in contact with and recalling employees lost due to the economic downturn. To address these needs, clear green messaging and branding on corporate career sites and in job descriptions is recommended. While the word green has in recent years come to symbolize a commitment to conservation and the environment, it has had many other connotations in

the past, including young and inexperienced. Green HR is still a young one with room for many more voices and opinions.

The impact of our daily activities on the environment and the desire to go green has expanded from just individuals to organizations. More organizations are volunteering to operate in a more environmentally responsible way. Local municipalities are encouraging businesses to become greener by offering incentives. In the near future, “being green” could become the norm. In September 2007, the Society for Human Resource Management (SHRM) conducted the SHRM 2007 Green Workplace Survey to examine environmentally responsible practices from the perspective of HR professionals and employees. We are entering a green economy – one in which consumer and employee expectations and future environmental change will require businesses to address “green” issues. This survey brief explores types of practices organizations have in place, human resource professionals’ and employees’ perceptions of their organizations’ practices, and HR professionals’ role in their organizations’ environmentally friendly programs. Green HR is one which involves two essential elements: environmentally friendly HR practices and the preservation of knowledge capital. Business professionals consider it to be environmental initiatives to reduce employee carbon footprints. The initiative can be like electronic filing, car-sharing, job-sharing, teleconferencing and virtual interviews, recycling, telecommuting, online training, and energy-efficient office spaces. These ideas are being implemented to support existing green HR efforts focused on increased process efficiency, environmental waste reduction, and revamped HR products, tools, and procedures. These measures also have an impact on intangible yet invaluable assets such as brand and reputation.

2. OBJECTIVES OF THE STUDY

1. To identify the green practices undertaken by corporates.
2. To examine the benefits of green practices undertaken by corporates.
3. To suggest more eco friendly practices and propose a model.

3. LITERATURE REVIEW

Many researchers, especially in the area of HRM, argued that the effectiveness and successful in any management innovation and strategic tools are depending on the availability and ability of their human resources employed in the strategic manners (Boselie et al., 2001; Paauwe and Boselie, 2003). HRM system is defined as “a set of distinct but interrelated activities, functions, and process that are directed at attracting, developing, and maintaining (or disposing of) a firm’s human resources” (Lado and Wilson, 1994). Organization generally organizes HR practices into systems that are consistent with their culture and business strategy (Boselie et al., 2001). Many researchers agreed that HRM is the most effective tools which contribute to the creation of human capital, and in turn, contributes to organizational performance and competitive advantage (Boselie et al., 2001; Paauwe and Boselie, 2003). Currently, many corporations are implementing a proactive, strategic tool known as an EMS to gain competitive advantage (Daily and Huang, 2001). This system provides a structure that allows management of the firms the ability to better control the firm’s environmental impacts (Barnes, 1996; Florida and Davison, 2001). An EMS includes commitment and policy, planning, implementation, measurement and evaluation, review and improvement (Hersey, 1998). Callenbach et al. (1993) argued that in order to carry out green management, employee must be inspired, empowered and environmentally aware of greening to be successful. On the other hand, to effectively implement green management initiatives and fostering environmental innovations, corporations require a high level of technical and management skills (Callenbach et. al., 1993; Renwick et al., 2008).

Environment Management System

The incorporation of environmental objectives and strategies into the overall strategic development goals of a company helps in arriving at an effective environment management system (Haden et al., 2009). There are a wide range of factors which influences the adoption of an environmental strategy

by a company (Berry and Rondinelli, 1998) including financial performance (Sroufe, 2003), stakeholder pressure (González-Benito and González-Benito 2006) and corporate image (Suhaimi 2011) emerging to be the most important reasons. There is also a great deal of empirical research which highlights the impact of environment management practices on performance of the organization using a number of different indicators (Crowe and Brennan, 2007, Yang et al, 2010; Iraldo et al., 2009).

1 Rewards and Compensation

The study by Taylor et al., (1992) presented a generic view on importance of green management. In this study a qualitative approach was adopted wherein 16 companies were identified from 5 different countries. It was seen that when companies offered an incentive in terms of green awards employees were more inclined to follow principles of green management. The study by Denton (1999) examined the impact of employee involvement in pollution control. This study adopts a qualitative case study approach wherein employees from Dow chemical were interviewed. It was observed that employees were motivated and given rewards when they came up with innovative waste reduction ideas.

The study by Forman and Jorgensen (2001) studied the participation of employees in environmental work programs in different companies. This study adopted a qualitative research approach in which two different Danish companies were identified and employee participation in environmental programs was identified. The study presented a theoretical framework of which provision of rewards or compensation to employees in order to undertake the additional responsibility of participating in environmental efforts was undertaken.

The study by Ramus (2001) identified the importance of non financial incentives on impacting environmental policy implementation. This study is empirical in nature and conducted a survey among employees of European companies. It was identified that when there was perceived supervisory support and better acknowledgment in terms of praise letters and plaques

there was an increased commitment from employees towards upholding environmental policies.

2 Recruitment

Dechant and Altman (1994) studied the importance of employee perception of a firm's environmental behavior. This study is review article which identifies the importance of contemporary environmentalism in leading companies of America. In their review they argue that the employee perception is vital as employees are willing to work in a firm only when they feel it adds to their value profile.

Bauer and Aiman-Smith (1996) studied the effect a pro environmental stance would have on recruitment efforts. The study was empirical in nature and considered a fictitious firm. Their findings indicate that when a firm presents a proactive stand towards protection of the environment then it would help improve the attractiveness of the firm. Their study also indicated that intention to pursue employment with the pro environmental company will be higher along with acceptance of a job offer.

In the study by Frank (2003) the importance of ethical behavior of a company and its impact is presented. As a part of this survey it was identified that most of the respondents would prefer to choose an ethically and environmentally responsible firm like American Cancer society instead of for one like Camel cigarette even if their wages were slightly lesser.

The study by Brekke and Nybord (2008) identified how companies attracted responsible employees. Their study adopted a theoretical approach and arrived at a model which indicated that when there is equilibrium between socially responsible and socially non responsible firms then motivation among new recruits to join the companies would be higher towards green firms. Their research also identifies that if the wages presented as similar in both firms then applicants who approach socially responsible firms will be much higher than those who approach brown firms.

The study by Grolleau et al., (2012) identified the impact of environmental standards of a company on recruitment of an employee. This study makes

use of a bivariate probit model hence adopts an empirical approach by adopting specific survey presented to different private firms in France. The study results indicate that environmental commitment of the company adds to profile of a company. They were able to differentiate and identify those professionals more than non professionals were concerned with respect to the environmental stance of a company.

3 Training and Development

The study by Perron et al., (2006) examined importance of environmental training in promoting business value. This study involved a multiple case study approach wherein it was observed that two different companies were compared to identify the effectiveness of a developed environmental training program. It is observed that one company developed a training program for all their employees while the other was considered as a control which offered no training. From the results of the study it was identified that despite training presented to one group the level of knowledge with respect to environment management system was similar among employees of both the companies. This is despite the amount of investment that has gone into green training for employees of one company. The authors conclude that it is vital to develop specialized and customized environmental training programs to suit the needs of the organization and also identified the need for development of validated instruments to evaluate the resultant training.

Daily et al., (2007) conducted a study on EMS training framework and its relation to practices of HR in the organization. This study was empirical in nature as a survey was conducted among 437 employees. From the results of the survey it was identified that the formation of an effective green management system was directly dependent on environmental training. The study concluded that in order to manage effective green HR practices it is vital to promote environmental training in an organization as it presents essential knowledge for promoting green teams in an organization and presents them with the ability to deal with the different issues which emerge as a result of problems related to environment and the associated opportunities.

The study by Unnikrishnan and Hedge (2007) studied the importance of environmental training and its relationship to cleaner production strategies. In their paper they identify different types of organizational training strategies in Indian industries. This was an empirical study which examined eight firms from two different industrialized states in India. From the results it was observed that environment management training was focused however learning processes were not very strong. The study observed a lack in top management commitment, lack of suppliers of cleaner technologies and a gap between academic institutes and industries with respect to implementing green training policies as the key areas which Indian manufacturers should focus on to improve their green training programs.

The study by Sarkaris et al., (2010) identified the effect of stakeholder pressure and its relationship with promoting effective environmental training. This study was empirical in nature and conducted surveys across 157 companies in Spain. From the results of the study it is clearly identified that good environmental training by the management mediates the presence of a good green management practice. The authors propose the idea that companies which promote novel and effective green management practices always provide a methodological environmental training program to their employees.

The study by Jabbar et al., (2010) made an attempt to identify importance of HRM in promoting environmental management of a company. This study adopted an empirical approach wherein data was collected from 94 companies in Brazil and methodological triangulation was carried out. The results of this study identify that recruitment, training, employee motivation and rewards are important human dimensions which contribute to the improvement in employee implementation of green management principles. The study by Teixeira et al., (2012) identified the relationship between management of green HRM practices and its ultimate impact on environmental training in companies at Brazil. This study identified nine case studies in ISO 14001 certified companies and conducted interviews. From the results of the study it was observed that good practices of environmental training are intertwined with the promotion of good organizational culture and

teamwork. The study also proposed that the relationship between environmental training and green management is directly related to level of commitment expressed across all levels of the organization.

4 Employee Empowerment, Employee Training, Employee Teamwork and Managerial Environmental Training

The study by Jabbar et al., (2012) identified the impact of human resource management on principles of environmental management implementation in company and identified the link to operational performance. The study adopted a primary empirical approach and identified that HRM practices including recruitment, feedback and compensation were found to have an impact on environmental management practices of the company.

The study by Daily et al., (2012) proposed to identify the impact of training and empowerment of employees and its link to environmental performance of a company. The study adopted an empirical approach among companies in Mexico. The results of the study strongly identified that HRM factors including employee empowerment, employee training, employee teamwork and managerial environmental training had an impact on environmental performance of the company.

The study by Chinander (2001) makes an attempt to identify internal drivers related to environmental awareness. The study adopted a qualitative case study approach by identifying a steel manufacturing company. It was identified that the promotion of an effective environmental management program is dependent on the level of feedback that is obtained on specific environmental issues. Their results strongly identify that the promotion of feedback ensures that both employers and employees are well aware of their responsibilities and communication requirements thereby ensuring better promotion of environmental management and green promotion in the organization.

Govindarajulu and Daily (2004) presented a theoretical framework by identifying environmental performance of a company and its relationship to employee motivation. Their study identified that management commitment,

employee empowerment, rewards and recognition, feedback and feedback and review are important factors which need to be addressed in the HRM policy of a company in order to promote effective green management practices.

Issues arising from the literature

After a decade of research into Green Marketing (Peattie, 1992), Green Accounting (Owen, 1992), and Green Management (McDonagh and Prothero, 1997), gaps still exist in the Human Resource Management (HRM) literature on the HR aspects of environmental management. A number of issues emerge from our review of the literature in environmental management and HRM. These include (1) the difficulty in trying to operationalize Green HRM, (2) establishing causality between HR practices and environmental outcomes, (3) the contradictions between people's stated intentions and outcomes, (4) the relativism inherent in Green analysis, and (5) worker willingness to participate in Green HRM schemes.

4. GREEN INFORMATION TECHNOLOGY

Green Information Technology(IT) is creating a buzz these days, with a wide gamut of vendors - hardware suppliers, software developers, vertical integrators, service providers and customerstalking about the green activities and products in their organisation.

Green IT's benefits are innumerable. It spells efficiency and cost savings for not only the IT organisations but also various disciplines such as manufacturing, engineering services, transportation and more. It is also critical for regulatory compliance with the growing number of environmental policies across diverse geographies.

Green IT is a hot topic today, as a consequence of pressures of stakeholders and regulation. Stakeholders are increasingly aware of environmental issues and this change in attitude is leading to increased demand for sustainable practices and products. Besides, organizations need to comply with more and more governmental regulations and Industry standards. As stated in the introduction, also in cost reduction discussions Green IT is central.

Thus, the main objectives of Green IT are cost reduction, compliance with regulations and improving corporate image for stakeholders. Nevertheless the most mature organizations will be lead by social responsibility resulting in by employee demands as a part of the authentic Green culture within the organization and it's employees.

Green IT can be anything to everything. From data centre migration, desktop virtualization to remote workforce activities and everything in between. Essentially all the activitiesthat save cost by utilizing fewer resources (material and non material) can be encompassed under Green IT efforts. The real crux of the issue is how do monitor, measure, and report on how good a corporate citizen we actually are in the name of Green IT. People, process and planet should all be considered when adresing Green IT.



Figure 2(Source:<http://www.opengreenitpolicy.org/>)

In the Gartner report “Hype Cycle for Green IT and Sustainability in India, 2013,” analysts said while businesses and investors in India are slowly waking up to green and sustainability issues, policymakers in the government are clearly pushing for changes that will likely set the tone for green and sustainable, low-carbon economic growth in the country in the coming years.

India's Spending on Green IT & Sustainability Initiatives to double to \$70 billion in 2015, up from \$ 35 billion in 2010. In 2012 Green IT & Sustainability spending was \$45 billion.

What's driving adoption of Green IT

- 1) Adopting green IT and sustainability solutions are emerging as key concerns for businesses, investors and technologists across industries and policy makers in India.

Operational cost of making energy-efficient resources available is pressuring CIOs in Indian companies to develop strategies to optimise ICT utilisation, including companywide energy management,

while not compromising on growth or deployment of newer technologies.

2) Global Influence - the increasing global focus on energy efficiency, energy security, green IT and sustainability issues is now causing the executive leadership in the technology sector to track, report and manage sustainable and resource-efficient business practices.

3) Government policy initiatives – one of the major drivers

- National Action Plan on Climate Change (NAPCC), outlines the nation's strategy to manage greenhouse gas (GHG) emissions

- Indian Economic Survey and India's 12th Five Year Plan - Inclusion of Green IT in these strategic planning documents shows the significance given by Indian Govt.

Policy initiatives:

National Telecom Policy

National Information Technology policy

National electronics Policy

National Telecom Policy:

National Telecom Policy-2012 aims at promoting research and development (R&D), design in cutting edge ICTE technologies, products and services for meeting the infrastructure needs of domestic and global markets with focus on security and green technologies.

To promote Green Telecommunications, Telecom Regulatory Authority of India (TRAI) had issued recommendations on 'Approach towards Green Telecommunications'.

The Government of India has accepted the TRAI recommendations and decided to adopt measures to green the telecommunication sector setting broad directions and goals to achieve the desired reduction in carbon emission through the use of renewable energy technologies and energy efficient equipments.

Some of the key concerns noted by the industry with regards to the Department of Telecommunications' Guidelines on the Implementation of Green Technologies for Telecom sector are listed below:

- Telecom Industry accounts for a fraction of the carbon footprint, should not be singled out; Policy should encompass all sectors for a worthwhile result
- Use of Diesel is a compulsion not a choice; Guidelines for Green Telecom must take into account ground realities
- Sub-optimal spectrum allocations lead to more sites & higher diesel consumption; a spectrum policy that ensures adequate spectrum can overcome this constraint
- Targets for deploying Renewable Energy Technologies are very stringent in the initial period; DoT may prescribe more reasonable gradation
- Lower capacity factor of Solar will deter site sharing; proper study is required to strike the right balance for use of solar cells for powering the BTSs
- Target for Carbon emission should be prescribed on a per unit of traffic basis to cover both voice and data
- Baseline needs to be set as year 2012-13, Measurements should be as declared by CEA & Reporting should commence after a period of two years
- Green Passport [GP]" by 2015, to be harmonized with international standards; DoT to facilitate meeting with TEC to begin work on "Green Passport" norms

DoT pushes green policy for telecom sector

Aiming to adopt green policy in the telecom sector, the Department of Telecom (DoT) set a 2019 deadline for service providers to reduce carbon emission from mobile networks by 17 per cent.

The roadmap to encourage green energy in the telecom sector, prepared by the DoT, says at present 80-90 per cent of power requirements for rural towers are met by diesel generator sets, each of which consumes 8,760 litres of diesel a year if it runs eight hours a day. It is estimated that 5.12 billion litres of diesel is consumed by telecom towers annually, and total emission due to this is around 10 million tonne of carbon dioxide.

Of the total 7.42 lakh mobile telecom towers in the country, around 3.5 lakh in rural areas run mostly on diesel generators. The DoT wants these towers converted to green energy sources like solar, biomass or wind.

To be precise, the green telecom policy requires mobile operators to migrate 75 per cent of all cell towers in rural areas and 33 per cent in urban areas to hybrid power by 2020. However, many telecom companies have expressed their inability to adopt green energy technology due to huge expenses, and have been demanding viability gap funding (VGF) as a pre-condition to invest in green energy technologies.

In attempt to push telecom companies to invest more in green energy technology, now DoT plans to provide easy bank financing, by way of softer interest rates and longer loan tenures, since telecom towers enjoy infrastructure status. Telecom tower companies will also be eligible for higher overseas borrowing limits, lower import duties and excise exemptions on telecom infrastructure equipment, said a DoT note.

Apart from reducing carbon emission, the government also wants to reduce the consumption of diesel by telecom towers, which is companies purchase mostly from the open market, sources in the DoT told Deccan Herald.

The DoT last year engaged PricewaterhouseCoopers' Indian unit to examine the techno-commercial feasibility of powering some 3.5 lakh mobile towers with alternative energy sources. Once the DoT receives the report, it is likely to announce sops for telecom firms to reach the government target in adopting green energy standards.

National Information Technology policy

The National Policy on IT aims to maximally leverage the power of ICT to help address monumental economic and developmental challenges the country faces. It is rooted in the conviction that ICT has the power to transform India and improve the lives of all Indians.

One of the objectives include to encourage adoption of ICT based Green technologies as well as to promote green technologies by making them competitive through appropriate fiscal & nonfiscal policies.

STRATEGIES

1. Creating ecosystem for a globally competitive IT/ITES Industry

1.1 To make requisite policy changes to make India a preferred destination to establish and operate IT/ITES enterprises including a stable tax regime and strengthening of the enabling infrastructure.

1.2 To formulate Fiscal and other Policies to attract investment in IT Industry in Tier

II & Tier III cities and rural areas for expanding the base of IT and for creating employment opportunities across the country.

2. Creating an ecosystem for Internet and mobile driven Service Industry

2.1 To leverage Internet and Web technologies for developing new products, technologies and businesses.

2.2 Enable seamless, ubiquitous, secure and personalized delivery of government and non-government services through Internet based and mobile based delivery of services throughout the country.

2.3 Foster an ecosystem for innovation in services by leveraging Aadhaar as well as financial and location-based services

2.4 To leverage mobile devices as instruments for enabling secure transactional services including financial services.

2.5 To promote development of an ecosystem for enabling innovation and entrepreneurship related to mobile Value added Services.

3. Enabling Service Delivery through e-Governance

3.1 To implement the National e-Governance Plan (NeGP) and mandate provision of all Government Services through Electronic mode within a fixed time frame by enactment of the Electronic Delivery of Services (EDS) Bill and through reengineering processes to enhance efficiencies of service delivery.

3.2 To mandate public procurement through electronic mode across all departments to enhance transparency and competition.

3.3 To set up a widespread network of Common Service Delivery Access points for enabling assisted access to electronic services.

3.4 To accelerate and standardize delivery of electronic services by providing Common Shareable Service Delivery Platforms by leveraging technologies like Cloud Computing.

3.5 To develop, adopt, evolve and notify standards for seamless interoperability of data and applications.

3.6 To promote open standards and open technologies.

3.7 To enhance institutional framework for Capacity Building Programme for imparting training across all levels.

3.8 To design and create a citizen engagement framework for utilization of social media by the government and its agencies.

3.9 To design and implement policy framework for placing data in public domain for use and value addition.

3.10 To promote Public Private Partnerships in e-Governance projects and facilitate flow of private sector financial and technical capabilities into the national egovernance effort especially in areas where viable investments are feasible.

5. GREEN BANKING

The banking sector is one of the major sources of financing industrial projects such as steel, paper, cement, chemicals, fertilizers, power, textiles, etc., which cause maximum carbon emission. Therefore, the banking sector can play an intermediary role between economic development and environmental protection, for promoting environmentally sustainable and socially responsible investment. 'Green banking' refers to the banking business conducted in such areas and in such a manner that helps the overall reduction of external carbon emission and internal carbon footprint. To aid the reduction of external carbon emission, banks should finance green technology and pollution reducing projects. Although, banking is never considered a polluting industry, the present scale of banking operations have considerably increased the carbon footprint of banks due to their massive use of energy (e.g., lighting, air conditioning, electronic/electrical equipments, IT, etc), high paper wastage, lack of green buildings, etc. Therefore, banks should adopt technology, process and products which result in substantial reduction of their carbon footprint as well as develop a sustainable business.

Imperatives of Green Banking:

Green banking is very important in mitigating the following risks involving the banking sector:

- i) **Credit Risk:** Due to climate change and global warming, there have been direct as well as indirect costs to banks. It has been observed that due to global warming, there have been extreme weather conditions which affect the economic assets financed by the banks, thus leading to high incidence of credit default. Credit risk can also arise indirectly when banks lend to companies whose businesses are adversely affected due to changes in environmental regulation.
- ii) **Legal risk:** Banks, like other business entities, face legal risk if they do not comply with relevant environmental regulation. They may

also face risk of direct lender liability for cleanup costs or claims for damages in case they actually take possession of pollution causing assets.

- iii) Reputation Risk: Due to increasing environmental awareness, banks are more prone to reputation risk, if their direct or indirect actions are viewed as socially and environmentally damaging. Reputation risks emerge from the financing of environmentally objectionable projects.

As India has committed to reducing its carbon intensity by 20-25 percent from 2005 levels by 2020, we are working towards developing a low carbon economy. In a low carbon economy, there will be many challenges and opportunities to banks. Green banking will be at the forefront of this drive to harness banking expertise and build the post-carbon economy. The biggest impact of the carbon cut commitment will be on small and medium Enterprise, steel and cement industries which are carbon intensive. In order to avoid credit risk in these loan portfolios as well as to grab new business opportunities, Indian banks must immediately adopt green banking strategies to reduce the carbon footprint of individual banks will not only make them socially responsible corporate citizens but will also help save substantially operational costs. There are lot of opportunities and challenges for Indian banks in adopting 'Green Banking' as a profitable business.

Green Banking Strategies:

Indian Banks can adopt green banking as a business model for sustainable banking by launching some of the following strategies:

- i) Carbon credit business: Under the Kyoto protocol, clean development Mechanism (CDM) provides for co-operation between annexure –1 (developed) and non annexure-1 (developing) countries. The operational mechanism of CDM's involves an investment by a legal entity from an annexure-1 country into a project in non-annexure-1 country, which results in emission reduction. These emission reductions have to be certified by an

appropriate authority and these certified Emission Reductions (CERs) which are commonly known as carbon credits can be used to meet the commitments of annexure-1 countries under the Kyoto protocol. These carbon credits are traded in the markets. CDM projects are those projects that contribute to credible and sustained reduction in GHG emissions. Indian banks can involve themselves in carbon credit business, wherein they can provide all the services in the area of CDMs and carbon credits including services of identification and funding of CDM projects, advisory services for registration of CDM projects and commercialization of CERs under different structures to meet the requirements of its customers, acting as an intermediary for buying CERs on behalf of end-users or carbon funds, financing against CERs and CERs receivables, and other related banking services. As India has huge potential for carbon credit business, Indian banks can set up dedicated carbon credit cells to capture a major share of this carbon credit business.

- ii) Green Banking Financial Products: Indian banks should develop innovative green banking financial products which can directly or indirectly help in the reduction of carbon emissions. These banks can introduce a 'Green Fund' to provide climate conscious customers the option of investing in environmental friendly projects. Banks can also introduce green bank loans with financial concessions for environmental friendly products and projects. Besides introducing specific green banking products, banks can incorporate an Environmental Impact Assessment (EIA) in their project appraisal while financing any project to measure the nature and magnitude of environmental impact as well as suggest environmental risk mitigation measures. Banks can also conduct environmental audits of the financed projects. Banks need to redesign their credit products to assist SMEs to adopt quality and conform to environmental standards. Banks should also include

green guidelines in their credit policies to raise the green loan portfolio.

iii) Green Mortgages

Banks such as Citigroup Inc., Bank of America, and JP Morgan Chase & Company are just a few of the mortgage lenders offering special discounts on mortgages used to build or update buildings and homes to be more green. One of the reasons for the push for green mortgages is that green building and rebuilding tends to incorporate more energy-efficient materials and building plans.

There are two types of green mortgages: the Energy Improvement Mortgage – it's like a second mortgage that is to be used to upgrade a home or building to energy efficient by installing energy saving items such as solar panels and improved insulation - and the Energy Efficient Mortgages for the construction of new energy efficient homes and buildings.

There are many states getting in on the green mortgage by offering subsidized green mortgages so that more home-owners and business owners can “green-up” their buildings. In addition to helping save the environment by using less energy, these mortgages offer many advantages to consumers by reducing monies spent on high utility bills and on high costs of obtaining a mortgage. The Residential Energy Services Network reported on a recent study showing that the market value of a home increases \$20 for every \$1 decrease in energy costs.

iv) Carbon Footprint Reduction: Carbon foot-print is a measure of the impact of our activities on the environment. It relates to the amount of GHG (Greenhouse Gas) we are producing in day-to-day business while burning fossil fuels for electricity, heating, transportation, etc. Banks can reduce their carbon footprints by adopting the following measures:

a) Paper-less Banking: As banks have computerized their branches, there is ample scope for doing paperless or less-paper banking. Mostly PSBs use huge quantities of paper for

office correspondence, audit reporting, recording public transactions, etc. These banks can switch over to electronic correspondence and reporting. Banks should encourage their customers also to switch over to electronic transactions and popularize e-statements.

- b) Energy Consciousness: Developing energy-consciousness, adopting effective office time management and automation solutions and using compact fluorescent lighting (CFL) can help banks save energy consumption considerably. Banks can conduct energy audits in all their offices for effective energy management. They can also switch over to renewable energy (solar, wind, etc.) to manage their offices and ATMs.
- c) Using Mass Transportation System: PSBs can become fuel efficient organizations by providing common transport for groups of officials posted at one office.
- d) Green Buildings: The Indian banking industry uses more than one lakh premises for their offices and residential houses throughout the country. These banks should develop and use green buildings for their office and employee accommodation.

These measures will not only help banks reduce their carbon footprint but also save the operational costs considerably.

- v) Social Responsibility Services: As part of the green banking strategies, Indian banks can initiate various social responsibility services such as tree plantation camps, maintenance of parks, pollution check-up camps, etc.

6.RESEARCH METHODOLOGY

Secondary research has been undertaken to identify the green practices undertaken by corporates and to examine their benefits. It includes information assembled by government agencies, industry and associations, media sources, environmentalist and so on. It includes sources of information such as reports, articles, newspapers, magazines. Research has been conducted on two areas namely, Green IT and Green Banking. And a model has been proposed on the basis of previous research and my analysis .

7. ANALYSIS

Green Information Technology (IT) and Green Banking are the sectors which have been chosen to conduct the research upon. Green IT has been chosen because IT infrastructure consumes large amounts of electricity and as the rise in demand for extra technology increases, so does the carbon footprint for IT-based systems. Green IT is the systematic application of practices that enable the minimization of the environmental impact of IT and allow for company-wide emission reductions based on technological innovations.”

As the country's environment is facing threats in various ways hindering sustainable economic growth and endangering human health, experts feel green banking can be an avenue to reduce pollution and safe the environment. Banking sector is one of the major sources of financing for commercial projects which is one of the most important economic activities for economic growth.

The green practices have been identified by conducting research upon organisations in each sector and simultaneously their advantages.

7.1 Green Banking

In this sector, research has been done on two organisations namely, ICICI and SBI.

7.1.1 ICICI

ICICI Bank's Green initiatives aimed at customers are driven by the objective of collaborating with each of customers and making 'Green' a part of all everybody's lives. These initiatives range from Green offerings/ incentives, Green engagement to Green communication to customers.

Green Products & Services

- 'Instabanking' - It is the platform that brings together all alternate channels under one umbrella and gives customers the convenience of banking anytime anywhere through Internet banking, i-Mobile banking, IVR Banking. This reduces the carbon footprint of the customers by ensuring they do not have to resort to physical statements or travel to their branches.
- Vehicle Finance- As an initiative towards more environment friendly way of life, Auto loans offers you 50% waiver on processing fee on car models which uses alternate mode of energy. The models identified for the purpose are, *Maruti's LPG version of Maruti 800, Omni and Versa, Hyundai's Santro Eco, Civic Hybrid of Honda, Reva electric cars, Tata Indica CNG and Mahindra Logan CNG versions.* Each car that hits the road impacts the environment...make an informed choice for a better earth.
- Home Finance- ICICI Home Finance offers reduced processing fees to customers who purchase homes in 'Leadership in Energy and Environmental Design' (LEED) certified buildings.

Green Engagements

ICICI Bank has conducted Green themed events with customers during Diwali to build awareness about the environment amongst employees and customers alike. During this event Money Plants were presented to customers as token of prosperity and also as a token of collective responsibility in building a greener society.

In line with the 'Go Green' commitment, ICICI Bank has partnered the Green themed CNBC- Overdrive Auto Awards this year.

'Earth Hour' - In furtherance of its 'Green' commitment, ICICI Bank pledged its support to the world's largest global climate change event- the 'Earth Hour'. On Saturday- March 28, 2009, ICICI Bank switched off all lights in its premises, Branches and ATMs between 8.30 PM- 9.30 PM- the designated 'Earth Hour'. We are sure, one hour of darkness will help bring to light one of our generation's largest challenges "Climate Change".

World Environment Day- June 5, 2009-ICICI Bank celebrated the World Environment Day on June 5, 2009. To mark the occasion, branches across the country undertook a number of activities. Branches along with their customers took the green pledge through signature campaigns, planted and distributed saplings, conducted drawing and painting competition for children, conducted cycle rallies.

Employees at the ICICI Bank Towers, BKC, took the Green pledge by wearing the Green ribbon and endorsing the Green cause. As a gesture of its commitment towards the environment, ICICI Bank also switched off lights in its offices, Branches and ATMs on Friday- June 5, 2009- 8.30 PM- 9.30 PM.

ICICI Bank, Lucknow also celebrated the 'Environment Week' from June 1- 8, 2009 wherein ICICI Bank further strengthened its commitment to the environment by planting a tree for every new account opened during this period.

Green Communication

ICICI Bank has extensively capitalized on the existing internal media-statements, inserts, Credit Card Charge slips- to reach out to the customers and seek their collaboration in the 'Go Green' movement. The communication on Online Bill pay, Online Funds Transfer and Subscribing to e-statements are aimed at migrating customers to 'paperless' and 'commute-free' mode of conducting some of their banking transactions.

GreenPartners

ICICI Bank is working on and looking forward to partnerships with national and international 'Green' organisations and NGOs. In the past ICICI Bank has been associated with BNHS in the past and has also partnered the Green Governance Awards set up by BNHS to recognise and appreciate the participant organisation's efforts beyond meeting the statutory compliance for protection and conservation of the environment.

For employees:

It includes day to day functioning to identify and implement 'Green' measures. These measures ranged from reduction in consumption of energy and paper to employee engagement.

Power Go Green Contest

ICICI Bank invited ideas for Going Green from employees through the Power Go Green contest. The contest received an overwhelming response with participation through over 540 ideas. The ideas were evaluated and selected for implementation by a panel from the Organisation Excellence Group on parameters of effectiveness and efficiency like Novelty, Ease of Implementation, Impact, Scalability and Cost efficiency.

Chlorophyll

The 'Go Green' movement was started about in 2009 and initiatives - both internal as well as external- undertaken to create a starting point for the Go Green movement within ICICI Group. This movement is based on principles of participation and collaboration and is aimed at moving our people, products and processes to a more environment conscious plane.

'**Chlorophyll**', our monthly newsletter, started in September 2009, is an endeavour to strengthen and spread this movement across ICICI Group. It manifests the basic premise of the 'Go Green' movement- 'Each one for a better earth' through the various features covered:

- **Prologue**- *The Senior Management's Perspective*
- **Employee Corner**- *Going Green through an individual's lens*
- **In-Focus Initiative**- *Showcasing a 'Go Green' initiative within the ICICI Group*
- **Green Alert**- *Updates on developments in the 'Green' field across the world*
- **Green Bytes**- *Some Green facts about the environment and Green tips to help contribute towards a greener earth*
- **Green Quiz**- *Test your 'Green' Quotient*

Conserving Energy

- Encouraging turning off and/or unplugging all lights and electronic equipment (computers, monitors, photocopiers, cell phone chargers, printers, radios, etc.) when not in use, and fully utilizing power-saving settings when in use
- Recycling and refilling ink cartridges for our printers
- Replacing incandescent bulbs with CFLs when they need to be replaced, internally and externally
- Utilising online "Webinars" for shorter meetings that involve people who might otherwise have to travel a long distance

- Encouraging use of carpool and use public transportation

Saving Paper

- Upgrading to a higher percentage post-consumer waste recycled paper internally (copy and printer paper) and externally (brochures, etc.)
- Shredding and recycling all paper internally
- Sharing electronic files, voice mail and e-mail instead of paper memos
- Duplexing (two-sided printing) when possible as well as limiting printed materials/e-mails/memos to only what is necessary

Dateless Diaries

The dateless diaries are issued to all employees. It re-affirmed ICICI Bank's commitment to going green. With this initiative, they saved 395 trees and enough water to supply to 10,500 rural households for a month.

e- Calendar

ICICI Bank continued to Go Green with the launch of e-calendar for 2010. The e-calendar facilitates paperless operations by allowing the user to set reminders and update appointments. It rests permanently on the desktop and is accessible at the click of a button.

7.1.2. State Bank of India

The Bank had launched 'Green Channel Counter'(GCC) facility on State Bank Day (01.07.2010), at 57 select branches of the Bank spread across the country. This was an innovative step taken by the Bank towards changing the traditional way of paper based banking in a limited way, to card based 'Green Banking' focusing on reduction in paper usage as well as saving transaction time. This is a pioneering concept taken which saved both paper and time resources.

At the dawn of State Bank Day 2011 (01.07.2011), and on the First Anniversary of the launch of GCC, this facility has been made available at 5000+ branches across the Country. At the IBA Banking Technology

Awards – 2010, SBI won the “Best Customer Initiative” Award for the Green Channel Counter. In addition, this has led to the saving of enough papers to avoid felling of approximately ‘5 Trees’.

As such, the GCC aims at providing our Customers with a simple, secure and quick way of executing daily Banking transactions. It enhances Customer ease as there is no need to remember the 11 digit account number or carry passbook, fill in pay in slips / withdrawal forms, etc. Only the ATM cum Debit Card and PIN is needed to identify a Customer and his / her Bank Account.

It is a counter manned by a Teller where a Transaction Processing Device(TPD), similar to a PoS machine, is attached to the terminal. Customer swipes the Shopping cum Debit Card, selects a particular transaction and enters the amount and the PIN. Post authentication, the transaction gets transferred to the Teller’s terminal who enters denominations of cash to be paid / received, then pays / receives cash and completes the transaction. The Customer is provided with a printed receipt generated from TPD. This receipt is much smaller than traditional voucher. Moreover, as only one receipt is printed per transaction, there is zero paper wastage.

Three types of transactions have been enabled through this facility viz Cash Deposits, Cash Withdrawals and Funds Transfer. The transaction amount has been fixed as Rs 40,000/-.

Customers can use the Green Channel Counter without queues and without taking the token. They may simply walk up to the Counter, Swipe their card and execute the transaction. Also it has been observed that while normal branch banking transactions take 2 to 4 minutes for completion, a transaction routed through the GCC takes less than a minute.

Thus the Green Channel Counter is not only an endeavour to offer ease of transactions to all Customers especially senior citizens, but also an environment friendly initiative.

7.2 Green IT

Information Technology (IT) has, without doubt, substantially improved business productivity and enhanced the overall quality of our lives. Consequently, there has been a proliferation in the number and size of IT facilities, the equipment and people working in these facilities. This growth is placing a tremendous burden on our environment, both in the consumption of natural resources such as fuel, water and other raw materials as well as in greenhouse gas emissions and the waste that is generated. This phenomenon is raising several red flags in the minds of corporate executives, governmental organisations, environmentalists and the broader public, thus leading to green IT initiatives.

7.2.1 TCS (Tata Consultancy Services)

TCS (Tata Consultancy Services) has won an Earth Care Award 2014 in the category of 'Greenhouse Gases Emission Reduction in Industry'. Between 2007-2008 Tata Consultancy Services reduced its carbon footprint by 34% and further reduced by 26% in 2009.

There are several green practices employed across TCS facilities. These include opportunities for (i) energy savings (for example, energy efficient LED lighting, sensor based light turn on/off, building design for cooling efficiency, automatic cooling system modulation based on need and load, alternate energy for lighting and cooking), (ii) reducing water consumption (for example, recycling, rain water harvesting) and ground water recharging, (iii) waste reduction (for example, paper reduction, composting and digesters for bio waste) and (iv) fuel and emissions reduction through cycling, car-pooling and buses. TCS has made significant strides across all these fronts, leading to 12.5% reduction in electricity consumption, 76 MWH of solar energy generation, 1.5M cubic metre of water reuse, 28% and 67% reduction in paper and printer cartridge consumption, leading to a 2% reduction in the carbon footprint in FY 07-08 compared to the prior year. This has been achieved through corporate level policies, raising awareness of employees, setting targets and achieving them systematically, and obtaining ISO 14001

[2] certification for 22 of our delivery centers and LEED [3] green building certification for 3 locations.

IT has several roles to play in reducing consumption of fuel and other raw materials, and making engineering and business processes eco friendly.

Transportation and Fuel

IT and telecommunications have started playing a critical role in reducing travel across different units of an enterprise. At TCS, we use teleconferencing and video conferencing to replace face-to-face meetings. In addition to saving costs and contributing to eco-friendliness, these options allow greater flexibility for the attendees, enabling meetings that would have otherwise been difficult to schedule. We have also adopted webinars for presentations, enabling a larger audience spread across geographical sites to participate, as well as online meeting and collaboration tools to facilitate teamwork without mandating physical proximity. With many of these measures being mandated as a corporate policy, we have observed substantial reduction in travel costs year-over-year despite a rapid rise in the fuel costs over the same period. The advent of laptops, mobile phones and high-end mobile devices such as blackberries has, for the most part, played a positive role in reducing travel-induced carbon footprints. On the downside, the multitude of these devices, compared to their desktop or data centre counterparts mandates their environment-friendly disposal and/or reuse after their lifecycle, including batteries that contain toxic chemicals.

In addition to travel reduction, IT is also widely used for route planning and reducing fuel usage in transportation services (airlines, fleet cars). Simulation software can also be a training platform for fuel-efficient driving.

Going Paperless

Online forms, business processes and workflows have yielded a significant reduction in paper consumption for all our operations. Measures to enforce double-sided printing, shared printing services and recycling printer cartridges have led to a 28% reduction in paper consumption and a 68% reduction in printer cartridges in 2007 compared to the prior year.

Engineering and Industrial Services

Software is already playing a vital role in the design and manufacture of numerous industrial products and is instrumental in rendering these products and processes environment friendly. Computer-aided design (CAD) and other simulation tools can be used for designing energy efficient products (as in Fig.3), reducing waste and enhancing the efficiency of the manufacturing process. In many cases, these simulation tools can help avoid the physical process of prototype generation and evaluation, which has high costs, energy requirements and possibly non-ecofriendly waste.

At TCS, our R&D and delivery teams in Engineering and Industrial Services have served the design and manufacturing community with environmental friendly technologies on several fronts using innovative IT capabilities. We have developed customised cultures for a variety of agro-wastes and set up highly efficient bio-methanation plants based on our adapted cultures, non-edible oil cakes, tobacco waste, tea waste, night soil and water hyacinth. In addition to the biogas thus produced, the residue generated in the process is an excellent fertilizer.

Our researchers have also developed patented technologies for replacing precious wood with rice husk as a fuel in curing of tobacco. Rice husk ash from this process has also been demonstrated to be an excellent insulating material for tobacco barns. It is also an excellent additive in cement manufacture and a remarkably efficient filtration (including removal of pathogens) medium for water purification. We have developed a domestic filter to provide potable drinking water in rural areas that is not just economical but also does not require any electricity.

TCS has also made innovations in the production of Eco-cements, exclusively produced from a combination of different industrial and mining wastes. Our energy efficient Eco-cements with physical properties comparable to Portland cements have been successfully made from fly ash and steel plant wastes, gold ore tailings sands, fertilizer chalk waste, municipal incinerator ash, red mud and pot lining waste from aluminum

refineries. We have also designed efficient solar dryers for different industrial applications and clean coal combustion technologies.

Design and simulation software has been used in different client engagements for reducing fuel consumption in the airline and automobile machinery. We are also using software to model the cooling efficiency of physical infrastructure, including data centres, which can be used to supply and modulate the cooling capacity for maximum efficiency. Some of these design and simulation tools can be very resource and time consuming because of the spatial and temporal granularities mandated by the simulation model. TCS is availing high performance computing facilities (such as, the supercomputing facility at the Computational Research Laboratory from the Tata Group) and Grid technologies as vehicles for executing such large scale design and evaluation models.

Environmental Services

In addition to the design of eco-friendly products and services, IT can play a direct role in managing the environment in several ways. For instance, Geographical Information Systems housing large spatial data warehouses are extensively used by environmental organisations, government agencies and numerous industries to track natural resources, manage their usage and logistics and study the impact of the different possible scenarios. For instance, TCS has been engaged by the National Centre for Antarctic and Ocean Research (NCAOR) to undertake a comprehensive marine geophysical data acquisition programme for the Antarctic region that will help understand the marine ecosystem and the global changes in weather and environment better. Similarly, the emerging area of wireless sensor networks has significantly enhanced environmental monitoring and management. Applications include monitoring for natural disasters such as earthquakes and tsunamis, habitat monitoring for different flora and fauna, monitoring for weather prediction and so on. Rather than passive raw data gathering of past years, sensor networks are becoming smarter, with the ability to integrate and act upon multiple sources of information. For instance, the mKRISHI project at TCS uses a sensor network of weather and soil sensors, camera

phones, cellular networks and GPS technologies to provide customised environmental information to grape, cotton, soybean and potato farmers in several rural Indian villages.

Business Processes, Compliance and Accounting

With the Kyoto protocol mandating the retracement of greenhouse gas emissions to 5% below 1990 levels, the need for tracking, accounting, managing and enforcing these emissions will filter down from the national level to the corporate levels and eventually individual business processes, services and products. Tracking and managing these footprints at the magnitude and scale of current enterprises requires sophisticated software that can integrate with supply chains and workflows in the existing infrastructure as pointed out in a Gartner briefing (as in fig.4.).

Creating Awareness

One of the biggest hindrances to the adoption of Green IT initiatives is the deficiency of awareness among clients, partners, employees and management of the importance of the issue and what each individual can do at a personal level to address them. Educating this population about the emerging rules and regulations, which may be quite specific to a geography, cost savings together with the growing business opportunities in Green IT can be key drivers towards rapid adoption of Green IT initiatives. On an individual basis, periodic education on how small ideas collectively executed across the population produce large savings can motivate adoption. IT can also help increase the awareness by sending key messages to individuals in an effective manner. For instance, we, at TCS use screen saver messages of what individuals can do (turn off monitors/LCDs, adopt darker versions of frequently visited web pages, planting a tree, and so on) to drill down simple ideas to our associates. We are also piloting a desktop power meter that would make individuals aware of their power consumption and how they are faring compared to the rest of the team members in the business unit. Our internal online eco-footprint calculator enables associates complete a questionnaire to gauge their eco-friendliness and identify scope for improvement.

TCS has also built an internal Green IT social networking portal. This is not just an informational site on different issues related to Green IT, but also a useful channel for submitting ideas, finding out what worked in different sites, sharing experiences and obtaining a critical mass of like-minded people across geographic boundaries.

7.2.2 Infosys

Sustainability has been a core business principle at Infosys since the company's inception.

Sustainability initiatives focus on three key areas:

Social Contract - Infosys has pledged to make a difference to society by actively participating in community development. Our 'social contract' inspires more than 1,00,000 employees to contribute to community welfare, environment sustainability and digital literacy

Resource Intensity - Infosys believes in using natural resources responsibly to protect the environment. Our resource efficiency framework is based on a smart approach to logistics, buildings and data centres. We reduce our ecological footprint with sustainable practices across several areas:

Green infrastructure - All new buildings since 2008 are registered for green building rating (LEED/GRIHA) and aim to achieve the highest level of green rating. Our new buildings are, on average, 50 percent lower in energy consumption as compared to the 2007 levels. We aim to be carbon neutral by FY 2018.

Energy conservation - We have committed to reduce our per capita energy consumption by 50 percent over FY 2008 levels by FY 2018, and also source 100 percent of all our electricity from renewable resources by FY 2018. Across our India operations, we have already reduced our per capita energy consumption by 23 percent in FY 2011, as compared to FY 2008 levels.

Water sustainability - We are working towards being water sustainable and have reduced our per capita water consumption by 8 percent in FY 2011, as compared to FY 2008 levels across our India operations.

Preserving and promoting bio-diversity - We plant one new tree for every employee who joins us, and have planted more than 81,000 trees in the last three years alone, taking the total count to 1,80,000.

Waste management - We have set up biogas plants in our Mysore campus to recycle organic waste to generate energy, which is utilised in our campuses.

Green Innovation - Infosys is focused on Green IT to improve the quality of life, protect the environment and transform business. We also help our clients to make their operations more sustainable, and to transform into low carbon businesses.

We offer solutions to clients in areas such as Green Logistics, Smart Grid, Green Building design and management in partner programmes.

Infosys also undertakes research to create client-specific innovation agendas through co-creation and to ensure business value realisation.

The Infosys Green IT Maturity Model(GITMM) expands on the established Green Grid Data Maturity Model. The Infosys GITMM is based on five pillars; Data Centre, EUC, Asset LifeCycle, ITSM and People Practices. The Data Centre pillar is aligned with the Green Grid maturity model with overlap with ITSM and People Practices. Each pillar contains two categories of model components; required components and expected components. It aims to assess the greenness of individual functions within an organisation. The model is built such that each function within the organisation is graded individually and overall maturity score is obtained for the organisation as a whole. The model also helps benchmark an organisation's initiatives or programs against industry best practices. The individual functions which are

assessed are: Data Centre & Facilities, End User Computing, IT service Management, Asset Lifecycle, People Practices and Culture. The model breaks down into five levels. Each level has a predefined set of goals that must be met to achieve the level of maturity. Further the goals are ever evolving based on the latest technology and industry trends.

8. THE IMPORTANCE OF DEVELOPING AN ECO-SAVVY WORKFORCE

- **More inspired problem solving:** Employees who bring a sustainability lens to business decisions allow for a broader perspective that sparks innovative solutions to both common and newly emerging climate change-related business problems.
- **Increased desirability as an employer:** Intellectually knowing what sustainability is and practicing it in daily decision-making are two different animals. As one become known as a desirable green employer, one will have one's pick of the green talent pool – individuals who already understand sustainability and have practice in maximizing people, planet, and profit through business strategy. Bringing them onboard gives a powerful market edge. The synergy that builds from green-minded employees working together in a business can be unbelievable.
- **Less stressed budget:** Many employees who are committed to sustainable careers are amenable to flexible compensation and benefits, often preferring alternative transportation, flex work schedules, and other low-cost benefits over hard dollar cost-of-living increases. These options can give more bend in budget.
- **Improved employee retention:** Many green companies these days boast low turnover rates compared to their non-sustainable counterparts. That's not just talk. In a green workplace survey conducted by the Society for Human Resource Management (SHRM), 61 percent of respondents who worked for an environmentally conscientious company said they were "likely" or "very likely" to stay at the business because of those practices.

9. SUGGESTIONS

9.1 Investment in climate bond

Climate bonds are used to finance – or re-finance – projects needed to address climate. They range from wind farms and solar and hydropower plants, to rail transport and building sea walls in cities threatened by rising sea levels. Only a small portion of these bonds have actually been labelled as green or climate bonds by their issuers.

A Green Bond is where proceeds are allocated to environmental projects. The term generally refers to bonds that have been marketed as “Green”. Green Bonds proceeds could be used for a wide variety of environmental projects, or even parks development; but in practice they have mostly been the same as Climate Bonds, with proceeds going to climate change projects.

Largely corporations and state-owned rail companies, with some from multilateral development banks and some asset-backed bonds issue such bonds. The vast bulk of climate bonds have been bought by institutional investors like pension funds and fund managers. In the Netherlands and South Africa banks have also offered green bonds to individuals; and some fund managers have, using World Green Bonds, created special funds that individuals can invest in. The climate/green bond market includes all of those bonds which have been issued to help finance climate-friendly projects. At present, the climate bonds market has an estimated value of \$346bn. There are around \$14.5 billion outstanding of labelled climate bonds and green bonds.

They offer the same returns as other bonds, but with the added benefit that funds are only going to climate change solutions.

Scope:

India has both the most to lose and the least to lose from climate change. India may be growing rapidly, but it lags well behind the other regions in our survey in terms of economic development. While the need to develop and alleviate poverty may seem to trump longer-term climate

concerns, the challenge here is to build infrastructure and foster economic growth down paths which entail fewer greenhouse gas emissions.

Yet in 2012 India was the world's fourth-largest market for new wind power projects, it has ambitious solar energy targets, and it has significant government programs focused on energy efficiency (Global Wind Energy Council 2012). Renewable energy, energy efficiency, and land use policies have been about improving energy security, reducing energy imports, improving the nation's balance of payments, creating new and profitable industries, and providing affordable energy and food to the poor.

India's climate policy challenge—and one shared by the other rapidly developing countries in our study—is to ensure that it can realize the full long-term economic benefits of low-carbon development, without sacrificing short-term growth. Further, the challenge is to ensure that institutional and technological development in India, along with technology transfer, foreign aid, and investment from outside India, can continue to reduce the costs and increase the benefits of low-carbon development.

The policy challenge is confounded by the state of the Indian economy and the immature financial markets in India, by differences between the Indian states, by the democratic imperative to develop policy that is fair to all, while limiting opportunities for corruption. All of these challenges exist in a country that is eager to learn from international experience and technology and eager to accept foreign investment, even as a colonial legacy makes the country wary of undue outside influence

The key sectors driving emissions in India are power, industry, and agriculture. Both emissions and power generation have increased dramatically, more than doubling in 15 years. India's economy is very energy intensive, and coal accounts for 42% of consumption (EIA 2011). While the vast majority of the increase in power demand has been met through coal and natural gas generation, recently wind generation has increased significantly. And demand for power will continue to increase, as some 40% of Indians, mostly in rural areas, do not have access to electricity. In the industrial sector, productivity gains have outpaced emissions growth: Since the early 1990s, industrial productivity has tripled, but emissions have gone

up only about 60%. Agricultural emissions have increased, driven mainly by an increase in fertilizer use.

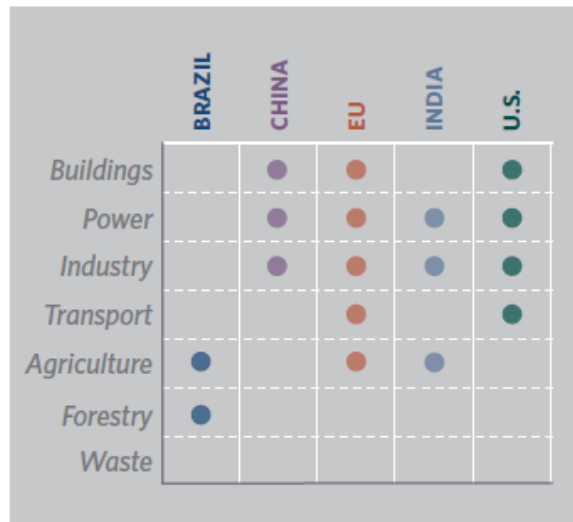


Figure 3 Source: CPI Analysis

Low-carbon development in India faces four major challenges. First, the particulars of the Indian economy and financial markets change the way policy will act—and could make low carbon investment more difficult. Second, major differences between states require that Indian policymakers tailor policies to the state level. Third, there are overarching policy priorities that will guide the design of low-carbon growth policies. These include fundamental principles of fairness, as well as concerns about corruption. Finally, India balances its openness to foreign investment with the desire to avoid excessive foreign influence.

It is found that the biggest barrier to renewable energy in India is the inferior terms of debt – i.e., high cost, short tenor, and variable rate – which raises the cost of renewable energy in India by 24-32% compared with similar projects in the US. While a number of financing instruments that have been used elsewhere could contribute to solving the main problems in financing renewable in India, none are currently available.

9.2 Green ERP

Implementing environmentally-friendly Enterprise Resource Planning (ERP) can allow firms to cut costs while helping the planet.

An ERP system can provide a paperless organization and less paper means more trees saved. Another benefit is the elimination of costs associated with copying, printing and faxing documents. With a paperless system, your accounts department can simply scan an invoice and take care of all subsequent client correspondence on the web. The accounts department can easily share information without wasting much time on manual processing.

A green ERP is especially useful when identifying the requirements of personnel involved. It helps them plan their time better. If it is identified that the service personal has no need to travel anywhere for a particular day, maybe the management could ask him to work from home. This would save on his/her travelling time and thereby help reduce whatever little fuel he/she might use in getting to work. With ERP, it is very easy to work from home without compromising on quality.

A green ERP minimizes the pilferage and wastage that can occur during the supply chain transactions. It also ensures forecast of extra inventory in case of emergencies, thus minimizing consumption of raw materials and preserving the ecological resources. It helps manufacturers understand what their products are made up of on a raw material level, the environmental impact of creating those materials, manufacturing them or mining them and the impact of transporting them to their plant.

How can an environmentally responsible ERP have an effect on product lifecycle? It helps you measure how your product is used, how much energy it consumes, how much emission any substances when in use, etc.

The following functionalities available through many ERP software solutions help facilitate lean and green organizations with energy savings, the re-use of resources, the reduction of waste, electronic data management,

sophisticated forecasting, inventory optimization, and numerous others means:

1. Real-time alerts can be used to send information, internally or externally.
2. Document Flow Manager (DFM) and Electronic Data Interchange (EDI) functions can be used to automatically process electronic documents and communications. The transactions can be sent and received digitally.
3. Web based modules facilitate direct communications and visibility and provide transactional capability with trading partners.
4. Sophisticated ERP solutions can easily integrate disparate systems and create custom solutions to streamline processes.

10. GREEN HR SYSTEM

RECRUITMENT	PERFORMANCE MANAGEMENT & APPRAISAL	TRAINING AND DEVELOPMENT	EMPLOYEE RELATIONS	PAY AND REWARD
Green job descriptions for employees	Green performance indicators into performance management system and appraisal(PMA)	Introduce training on EM, & processes/ material use Analysis	Employee involvement & participation (EI&P) in Green suggestion schemes, & problem-solving circles	Tailor packages to reward green skills acquisition
Green job candidates	Managers are set green targets, goals and responsibilities	EM training needs Analysis	Staff independence to form & experiment with green ideas	Use of non-monetary based EM rewards (sabbaticals, leave, gifts)
Recruitment of candidates who are Green aware becomes part of interview schedule	Roles of managers in achieving Green outcomes included in appraisals	Training in EM aspects of safety, energy efficiency, waste management, and recycling	Green elements into the health and safety process	Use of recognition-based EM rewards (awards, dinners, publicity, external roles, daily praise)
Green aspects introduced to the induction process	Writing & integrating green criteria in appraisals	Development of employee skills, and competence building in EM	Encouraging employees to use green forms of transport	Link participation in Green initiatives to promotion/ career gains (managers advance through supporting staff in EM)
Green employer branding	Appraisals assess number of green incidents, use of environment responsibly, & successful communication of environmental policy	Use of Green teams in EM	Increase line/supervisory support behaviours in EM	Establish PRP for all to gain green stewardship / citizenship (esp. seniors)

(Webmeyer(1996), Ramus and steger(2000) Fernandez, Junquera and Ordiz (2003))

11. GREEN HRM MODEL

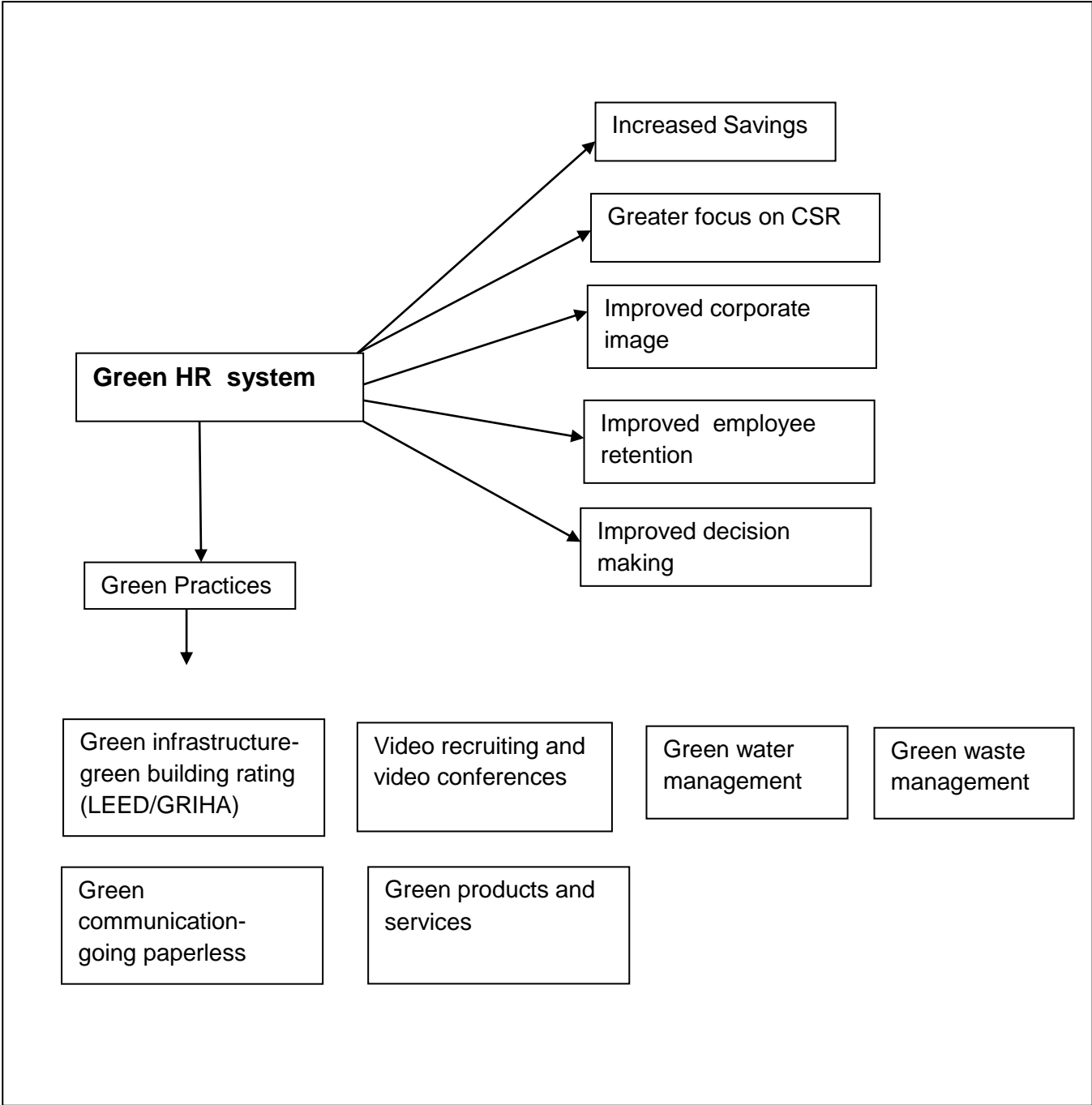


Figure 4

Based on the previous research and my analysis on green hrm the above model can be proposed which depicts the green practices incorporated by professionals and their benefits simultaneously.

12. CONCLUSION

This report has reviewed the literature on Green HRM and suggested few green practices and offered a model in Green HRM. In conclusion, future research into Green HRM may provide interesting results for all stakeholders in HRM. For employers and practitioners, these may be to establish the usefulness of linking employee involvement and participation in environmental management programmes to improved organisational environmental performance. In India, green movement and Green HR is still in infancy, though through CSR – programmes Green awareness is generated and some organizations have started environmentally friendly HR-practices and the preservation of knowledge capital. Green HR involves reducing the carbon footprint via less printing of paper. To conclude one can say that HR has a role in the pursuit of greener business practices, a role to save planet earth and recruit new employees and enforce greener working practices and change environmentally unfriendly behaviours. HR has significant opportunity to contribute the green movement and motivate employee / people to work for greener business.

13. LIMITATIONS AND FUTURE SCOPE OF THE STUDY

This study adds to the literature and the understanding of the Green Human Resource Management(HRM); however I am aware of several limitations of the study that suggest opportunities for future research. The following limitations can be:

- First, the study was based on the data collected from secondary resources, not directly observed. Because of time and financial constraints, this study was limited to data collection from secondary resources.
- Next, The information and the data may not be accurate.
- Finally, my data was limited to two areas i.e. Green IT and Green Banking.

The scope includes the further research on other areas like Green Supply Chain, Green Computing, Green Management etc. And also research can be done to check the reliable source of the data. Also data can be collected from primary sources.

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