Full Length Research Paper

Environment CSR initiatives of manufacturing units in India – An empirical study

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Corporate social responsibility (CSR) is a concept whereby companies integrate social and environmental concerns into their business operations and in their interaction with their stakeholders on a voluntary basis. Especially, manufacturing firms in developing countries such as India the world's 'manufacturing floors' – are under heavy scrutiny from many parties. This paper is an effort to research the status of CSR activities relating to 'environment' in Indian manufacturing sector. A review of literature shows little is available on the status of environment CSR practices in the manufacturing sector. This paper obtains data through a survey of 50 manufacturing companies belonging to automobile, cement, chemical, pharmaceutical and textile sectors. The findings reveal the emergence of environment CSR as corporate focus. The paper also provides suggestions on enhancement of environment CSR in the Indian manufacturing units.

Key words: Corporate social responsibility, stakeholders, environment, India.

INTRODUCTION

The concept of corporate social responsibility (CSR) is underpinned by the idea that corporations can no longer act as isolated economic entities operating in detachment from the broader society. CSR is a company's commitment to operating in an economically, socially and environmentally sustainable manner whilst balancing the interests of diverse stakeholders. It is a concept whereby companies integrate social and environmental concerns in their business operations and in their interactions with their stakeholders on a voluntary basis (EU Commission, 2001). "A stakeholder is any group or individual who can affect, or is affected by the activities and achievements of an organization". A growing number of scholars take the view that firms can no longer be seen purely as private institutions but as social institutions instead. The benefits from firms need to be shared collectively (Frederick et al., 1992; Freeman, 1984; Lodge, 1977; Wheeler and

Sillanpaa, 1997). So it seems that there is a natural fit between the idea of CSR and an organization's stakeholders (Carroll, 1991).

The social responsiveness has increased in the recent years and the emerging perspective on CSR focuses on responsibility towards stakeholders (Balasubramanian et al., 2005). An increasing number of companies are adopting a variety of 'voluntary initiatives' associated with improvements in environmental management systems and reporting on social and environmental performance (Baxi, 2005). Economic factors drive most environmental behavior including behavior beyond economic and regulatory demand. Firms have claimed that social responsibility is a driver of environmental behavior (Berry, 1998). The key dimension of social responsibility has been taken to be environmental initiatives and programs (Carter et al., 1999).

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ENVIRONMENT CSR AND ITS BENEFITS

Environment management involves being energy conscious, environment friendly and a sustainable business organization, which strives to achieve symbiosis with nature, and has been proceeding with efforts toward environmental protection in all aspects of its business activities. Environmental good practice is also about business efficiency, that is, best use of valuable raw materials.

Earlier, corporate dumped their wastes with impunity in the environment. With the growing awareness and concern about environmental degradation, depletion of natural resources like water and fossil fuels and the phenomenon of global warming, there is moral and legal pressure on corporate to realize that the earth needs to be preserved and looked after so that future generations are not adversely affected. In a study conducted in 1992, it was estimated that at all levels in India, the environmental damage cost India Rs 34,000 crores every year, which is 4.5% of the national GDP. Eleven years later, in 2003, the damage increased manifold. This is reflected in many ways like rising health costs due to growing air and water pollution, depletion of natural resources like deforestation, loss of revenue due to reduced international tourism, etc.

Many Indian companies have included environmental issues into their CSR practice (UNDP et al., 2002). The environmental policy of most companies primarily focuses on compliance with legislation. Only some large companies go a step beyond and try to minimize their impact or contribute in a positive way to the environment. Environmental pressures include investing in pollution abatement equipment, etc. CSR practices cover environmentally responsible practices relating to the management of the natural resources used in production (White, 2001). Environmental management systems improve operational efficiency by reducing waste production and water usage, increasing energy efficiency and in some cases, selling recycled materials (India CSR, 2010).

There is awareness of oil as a scarce resource but it is predicted that in India by 2020 there will be an acute water shortage because of wastage and also because of pollution of surface and ground water. So organizations can take a lead in harvesting rainwater, and reuse and recycle this precious vital resource. In India, CSR aspects are referred to as an important characteristic of business success (Brown, 2001). Majority of Indian companies referred to their responsibilities to the environment while defining CSR, especially in the form of pollution control and efficient use of fossil fuels (Brown, 2001). It was felt that the main role of corporations in the society in the coming years was protecting the environment. Environmental, health and safety issues have been integrated into CSR practice by many companies (Times 2008; UNDP, 2002). The environmental benefits due to practice of environment CSR arise out of recycling of pollutants or waste or effluent, effective disposal of waste, proper treatment of smoke or ash, installation of equipment to protect environment, regular environmental audit, tree plantation, natural resource management, integrated watershed development, rain water harvesting, reclaiming of waste land and environ-mental awareness programs in schools or colleges (Scope Award for CSR, TERI Award, Golden Peacock Award).

The following research questions are central to this study:

1. What is the environment CSR profile of the sample manufacturing units in India?
2. What is the relationship between environment CSR and its factors?
3. How does the environment CSR differ in the sample manufacturing units across six classifications, namely, manufacturing sector, type of organization, region, experience, turnover and workforce?

HYPOTHESES

The followings are the various hypotheses of the study:

The CSR of the study units with regard to environment has been measured with eleven factors, namely, recycling of pollutants or waste or effluent, disposal of waste, allowing smoke or ash, installation of equipment to protect environment, environmental audit, tree plantation, natural resource management, integrated watershed development, rain water harvesting, reclaiming of waste land and environmental awareness program in schools and colleges. To see which factors are best predictors of them all, it has been hypothesized:

H_1: *Environment CSR is equally influenced by all the environment CSR activities.*

It is necessary to find out if there is any difference between the environment CSR and the profile of the sample units. So, the hypothesis is:

H2: There is a significant difference in the environment CSR activities among the manufacturing units based on manufacturing sector, type of organization, regions, experience, turnover and workforce.

The regions selected for the study are: Region 1 which comprises Chennai and Hyderabad (South India); Mumbai and Pune have been categorized as region 2 (West India); and Delhi, Indore and Kolkata have been grouped as region 3 (North East India). The association

between effectiveness of environment CSR undertaken by the study units and the regions was examined.

H3: There is a significant association between the environment CSR and the regions.

The next sections discuss the related literature, profile of the selected industries, methodology, limitations of the study, analysis and discussion and finally the study concludes with important findings, suggestions and recommendations for future research.

RELATED LITERATURE

There has been a significant amount of literature in the West about CSR. There are also a few studies on the subject done in India. A few important related studies have been carried out in India where 'environment' is among the main focus areas.

The first study in India on CSR reporting titled "Corporate Social Reporting in India" which developed a 33 item disclosure index including 'environmental' control measures (Singh and Ahuja, 1983).

A comparative study on the managerial attitudes to social responsibility in India and Britain showed that most of these Indian executives agreed that CSR is relevant to business and that business has responsibilities not only to its shareholders but also to other stakeholders, including the 'environment' (Khan and Atkinson, 1987). Another study "Altered Images – The 2001 State of Corporate Responsibility in India Poll", focused on environmental sustainability among the four dimensions of CSR (Kumar et al., 2001).

Centre for Social markets (Brown, 2001) have conducted a survey on "Corporate Social Responsibility: Perceptions of Indian Business" to understand modern Indian business' perceptions of, and attitudes towards, corporate social and 'environmental' responsibility. The survey has suggested that Indian companies are aware of environmental issues around waste and pollution control; ½ of the companies have an environmental policy; 11% of companies had qualified for ISO 14000 certification; market competition and pressure were main obstacles to improving social and environmental performance (60%). Every respondent had said 'yes' to the question on whether the characteristics of a successful modern Indian company are related to a company's social and environmental performance.

"A survey on CSR 2002 – India" was commissioned jointly by the UNDP, CII, and the British Council and executed by Price Waterhouse Coopers during 2002. 76% of respondents have 'defined' environmental requirements. Approximately 3/4 of the respondents had reported that they integrated environmental, health and safety issues into their CSR practice as a method of "proactively" dealing with regulatory requirements (UNDP et al., 2002).

Baughn et al. (2006) had examined two aspects of CSR practices – social and 'environmental' in 15 Asian countries. Drawing from over 8,700 surveys of firms in 104 countries in the form of Executive Opinion Survey using structured questions conducted through the World Economic Forum, this study demonstrated substantial country and regional differences in CSR. Strong relationships were found between CSR and the countries' economic, political and social contexts.

Mitchell and Hill (2009) investigated the development and use of corporate social and 'environmental' reporting by businesses within a large municipality in South Africa. There seemed to be a strong call for improved CSR, and a greater degree of accountability and transparency by businesses. The survey was conducted through the use of interviews following a structured questionnaire with the Global Reporting Initiative used as an appropriate framework. It was suggested that implementation of a comprehensive and externally controlled and certified standard, such as ISO 14001 would not only reduce environmental impacts, but facilitate increased CSR.

Brunklaus et al. (2009) reviewed the existing literature on 'environmental' indicators mentioned in the annual reports of the organizations. With the help of an operational approach, from organization theory, and a life-cycle approach, indicators were analyzed. The analysis revealed that formulating indicators for internal management was not an easy task; available guidelines were of little help. It was concluded that the environment can be managed internally by relating indicators.

Business for Social Responsibility and Globe Scan (2009) has conducted a survey on "BSR/Globe Scan State of Sustainable Business Poll, 2009" during October 2009. This was done among a sample of 274 corporate responsibility professionals from 15 countries who attended the BSR Conference, 2009. The findings revealed that 'Climate change' and 'human rights' were the most significant priorities for business sustainability efforts in the year ahead. Creating innovative products and business models designed for sustainability and measuring and demonstrating positive social and environmental impacts were two important actions which companies should take to improve public trust.

Karmayog CSR Ratings report that 'environment' is one among the three main CSR areas (Karmayog, 2007, 2008, 2009 and 2010).

Times Foundation (Times Foundation, 2010) undertook a national survey on "Corporate Social Responsibility Practices in India" to understand the underlying dynamics of CSR and the current situation in India, amongst leading business organizations from various sectors. The findings of the survey place 'environment' among the most

popular areas of intervention for companies as part of their CSR initiatives.

Tiago and Garrido-Morgado (2012) used the technique of panel data in a sample of 320 American listed companies from 2003 to 2007 to estimate a model of corporate reputation, measured by the Fortune index. They proposed that CSR is a key driver of corporate reputation given its potential to foster hard-to-duplicate competitive advantage. Their model symbolized the multidimensional concept of CSR, presenting a five dimensional constructs – employee relations, diversity issues, product issues, community relations, and 'environmental' issues – and interacting them with industrial effects. The results indicated that the five dimensions of CSR have a significant impact on corporate reputation and this impact is moderated by the industry of the firm.

Reviewing the various studies on CSR where 'environment' has a special emphasis, it was felt that there was no specific study in the manufacturing sector focusing on the CSR initiatives towards environment in India. The stakeholder's concept is a central theme in CSR. Stakeholders are groups and individuals who benefit from or are harmed by corporate actions. Companies are increasingly embracing these stake-holders by considering or including them in decision making. The term 'stakeholder' puts CSR into a specific direction as to whom the corporation is responsible. Indian companies have started facing pressures from stakeholders to adopt CSR practices. Also, manu-facturing industries are important for an economy as they employ a huge share of the labor force and produce materials required by the society. Therefore, this research paper focuses on the extent of environment CSR initiatives present in the manufacturing units in India. Also, a few initiatives based on the survey results have been suggested for the companies to adopt.

Profile of the selected industries

The automobile industry in India is the ninth largest in the world with an annual production of over 2.3 million units in 2008. In 2009, India emerged as Asia's fourth largest exporter of automobiles, after Japan, South Korea and Thailand. CSR has become the focal point for the auto-motive industry as the general public has become more concerned about how corporations deal with 'environment' issues and give back to society from which they profit. In a 2006 survey to understand the general public perception of the automotive sector regarding corporate, social, environmental, and philanthropic activities, in India, eight out of ten consumers indicated that they have purchased a product or service specifically because it was produced in a responsible, ethical, or 'environmental' friendly way.

The Indian cement industry is a mature and world class industry in terms of productive technology, efficiencies of the process, product quality and variety. It has a unique record of continuous annual growth of 7 to 8% over the past two decades. India started production of cement in 1914, with a production level of 1000 tons/annum. India is the second largest cement producer in the world, next only to China. In industrial sectors, cement industry is the second largest emitter of carbon dioxide and accounts for 5% of global human-made carbon dioxide emissions. Ninety three percent of the total industry is based on modern and 'environmental' friendly dry process technology and only seven percent of the capacity is based on the old wet and semi-dry process technology. The industry is the country's second highest payer of central excise and a major contributor to GDP.

An industry lobby report stated recently that India's chemical industry has undertaken the greatest number of CSR initiatives during 2008-09. The study by the Associated Chambers of Commerce and Industry of India (Assocham) stated that out of three hundred Indian companies across eighteen broad sectors, spending on social initiatives in the last fiscal year, seventy-four were from the chemical sector that contributes 12% to the overall CSR initiatives.

The Indian pharmaceutical market is the fourth-largest in the world by volume. By value (Rs. 27,000 crore), it is 13th in the global stack-up. A CII study estimates that the industry revenues will touch Rs. 1,20,000 crore by 2010. In branded formulations, the top 50 companies account for 80% of the market. The Indian pharmaceutical industry is at the center stage in the global phar-maceutical arena and estimated to be worth $ 4.5 billion, growing at about 14% annually. The industry is equipped with competent work force, cost-effective chemical syn-thesis, legal and financial framework, improved research and development facilities in India. Medicines produced by the pharmaceutical industry are a key part of the delivery of an effective health service.

The Indian **textiles and clothing industry** is the largest foreign exchange earner of the country and second most important sector only after agriculture. The sector contributes over 20% of India's exports and 14% of industrial output, as well as representing some 5% of the national GDP and providing direct employment to 38 million people. The textile sector came third with fifty-three companies according to the study by the Associated Chambers of Commerce and Industry of India. India has become more a viable competition in the textile industry since the end of the quota system in 2005 under the Multi-Fiber Agreement Act. After the dismantling of the quota system, India's textile exports to the US went up by 34% and 30% in Europe.

Table 1. Environment CSR in sample units.

Environment CSR	Highly effective	Effective	Moderately effective	Less effective	Very less effective
Recycling of pollutants or waste	40 (80)	6 (12)	3 (6)	1 (2)	0
Disposal of waste	39 (78)	9 (18)	2 (4)	0	0
Treatment of smoke or ash	42 (84)	4 (8)	3 (6)	0	1 (2)
Installation of equipment to protect environment	40 (80)	8 (16)	2 (4)	0	0
Environmental audit	40 (80)	6 (12)	3 (6)	1 (2)	0
Tree plantation	42 (84)	6 (12)	1 (2)	1 (2)	0
Natural resource management	40 (80)	8 (16)	1 (2)	1 (2)	0
Integrated watershed development	19 (38)	27 (54)	3 (6)	1 (2)	0
Rain water harvesting	23 (46)	22 (44)	4 (8)	1 (2)	0
Reclaiming of waste land	17 (34)	29 (58)	3 (6)	1 (2)	0
Environmental awareness program	41 (82)	7 (14)	2 (4)	0	0

(Figures in parenthesis indicate percentages) (N = 50). Source: Primary data.

METHODOLOGY

An empirical study was conducted on the manufacturing companies in India belonging to automobile, cement, chemical, pharmaceutical and textile industries by using sample survey method. The population of the study comprises the companies in the selected industries, the information obtained from the website of a business directory of industries and its companies in India namely, www.fundoodata.com. The total number of companies belonging to these five manufacturing sectors was 2554 in number, comprising 95 automobile companies, 218 cement companies, 692 chemical companies, 908 pharmaceutical companies and 641 textile companies. Companies were ranked according to annual turnover which was greater than ten crore rupees per annum. The top 20 companies were included in the survey and questionnaire was sent to them. Only those companies which responded to the question-naire have been included in the study. Only 50 companies responded after repeated reminders and follow-ups. This works out to approximately 2% of the population. The sample size of the study is therefore 50.

The study was done based on primary and secondary data. **Primary data** were collected through survey technique. A structured questionnaire was designed to collect the data from the sample units in the study area. The questionnaire with direct, closed-ended and multiple-choice questions was prepared. The questionnaire was based on the following – company's profile and CSR initiatives related to environment. The environment CSR initiatives have been identified from Golden Peacock Award, SCOPE Award for CSR, TERI Award. Factor analysis was used to analyze the factors affecting the environment CSR. The extraction method used was principal component analysis, along with varimax rotation. All the variables were retained for the factor analysis. The result of the sample adequacy test (KMO and Bartett's test) is 241.33, which means that environment CSR is significant at 1% level. The reliability analysis shows that Cronbach alpha value is 0.721 for environment CSR variables. The questionnaire was then appended to the chosen companies.

The 5-point Likert scale format used to measure CSR was 'Always, Frequently, Sometimes, Occasionally and Never' and 'Highly Effective, Effective, Moderately Effective, Less Effective and Very Less Effective' with a scoring of 5, 4, 3, 2 and 1 respectively if the question is positive and reversed if the question is negative.

The respondents were asked to rate their company with an unconditional assurance of complete confidentiality. Responses to several Likert questions have been summed up and the scores have been used to analyze and interpret the data. The collected data were analyzed by using SPSS version 12.0.

Secondary data were generated from the newspapers, journals and magazines, books on CSR, company annual reports, reports on CSR, information downloaded from sites on the World Wide Web, industrial sources, past researches, commercial sources, online databases such as Proquest, EBSCO and ScienceDirect and other miscellaneous sources.

Limitations

Corporate social responsibility is a qualitative phenomenon which cannot be accurately quantified or measured. Sample selection was very difficult because the sample units were spread throughout India and the response rate was very low. Information collection turned out to be tedious since companies responded only after regular follow-ups and frequent reminders. Since it was not possible to administer to all manufacturing sectors in India, the survey was limited to certain sectors. Time and money factors have been constraints and the research exercise was conducted within a limited time.

DISCUSSION

This section is divided into three parts as follows.

Part I highlights the Environment CSR where variables such as recycling of pollutants or waste or effluent, disposal of waste, treatment of smoke or ash, installation of equipment to protect environment, environmental audit, tree plantation, natural resource management, integrated watershed development, rain water harvesting, reclaiming of wasteland and environmental awareness program in schools and colleges have been used (Table 1).

Recycling of pollutants or waste or effluent: Recycling is the key to providing a livable environment for the future. The recycling of pollutants or waste or effluent is 'highly effective' in a high majority (80 per cent) of the study units. This shows that these study units take steps to ensure that they do not pass on to the environment, any liquid effluent or solid waste or pollutant.

Disposal of Waste: Waste management is the collection, transport, processing, recycling or disposal and monitoring of waste materials. It is undertaken to reduce their effect on health and the environment. More than three-fourths (78 per cent) of the study units have 'highly effective' waste disposal system. None of the study units have 'less effective' and 'very less effective' systems of disposal of waste.

Treatment of smoke or ash: Smoke or ash is emitted by the manufacturing units. If such emission is not properly treated, it may lead to air pollution. A high majority (84 per cent) of the study units are involved in a 'highly effective' treatment of smoke or ash arising out of their manufacturing process.

Installation of equipment to protect environment: Manufacturing units have to always look for different ways to save the environment. A sustainable environment is needed for better quality of life. Purchasing office equipment with energy star label is one way of saving electricity which will lead to protection of environment. The installation of equipment to protect environment is 'highly effective' in a high majority (80 per cent) of the study units.

Environmental audit: Environmental audits are intended to quantify environmental performance and environmental position. The environmental audit conducted by a high majority (80 per cent) of the study units is 'highly effective'.

Tree plantation: "The trees come up to my window like the yearning voice of the dumb earth" said Rabindranath Tagore. The importance of trees in purifying the air, as natural resources, maintaining the ecological balance, preventing soil erosion, as medicines, habitats for faunal species, providing nutrients to the soil etc. is well known. Table 1 highlights that the tree plantation done by a high majority (84 per cent) of the study units is 'highly effective'.

Natural resource management: Natural resource management refers to the management of natural resources such as land, water, soil, plants and animals, with a particular focus on how management affects the quality of life for both present and future generations. This is congruent with the concept of sustainable development, a scientific principle that forms a basis for sustainable global land management and environmental governance to conserve and preserve natural resources. The term environmental management is also similar to natural resource management. The natural resource management of four-fifths (80 per cent) of the study units is 'highly effective' and 16 per cent of the study units have an 'effective' natural resource management. This also means that these study units specifically focus on a scientific and technical understanding of resources and ecology and the life-supporting capacity of those resources.

Integrated watershed development: Watershed development and management is defined as the integrated use, regulation and development of water and land resources of a watershed to accomplish sustainable use of land, water and vegetables for the benefit of its dependents. The emphasis is on soil and water conservation. Integrated watershed development of more than half (54 per cent) of the study units is 'effective' followed by 38 per cent having a 'highly effective watershed development system. This reveals that watershed development initiatives of the study units promote a vital objective – water conservation and soil enrichment.

Rain water harvesting: Rainwater harvesting is the gathering, or accumulating and storing, of rainwater. Rainwater harvesting has been used to provide drinking water, water for livestock, water for irrigation, etc. A rainwater harvesting system comprises components of various stages - transporting rainwater through pipes or drains, filtration, and storage in tanks for reuse or recharge. A very high majority (90 per cent) of the study units have been equipped with either 'highly effective' or 'effective' rainwater harvesting system.

Reclaiming of waste land: Land is a scarce commodity, yet India is fraught with wasteland. What essentially is required for reclamation of wasteland is technology and resources. But unfortunately, barring a few corporate, the idea has not hit corporate India. The advantage of reclaiming of wasteland is that raw material can be sourced and huge employment opportunities for the people of the area are possible, as plantation is a labour-intensive activity. It will open opportunities for nurseries and allied areas and other agro-based cottage industry as well. It can be seen from Table 1 that a very high majority (92 per cent) of the study units have been either 'effective' or 'highly effective' in reclaiming of wasteland.

Environmental awareness program in schools or colleges: Environmental education is a process of recognizing values and clarifying concepts in order to develop skills necessary to understand and appreciate the interrelationship among men, their culture and bio-physical surrounding. This life long process should begin at the school level, so that the future generation is sensitized about environmental issues. According to Table 1, 82 per cent of the study units have conducted 'highly effective' environmental awareness programs in schools and colleges.

The table highlights that a majority (above 80 per cent)

Table 2. Relationship between environment CSR and its factors.

Independent variables	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	**Std. error**	**Beta**		
Constant	0.774	0.353	000	2.193	0.035
Recycling of pollutants (X_1)	-0.096	0.192	-0.108	-0.499	0.621
Disposal of waste (X_2)	0.155	0.212	0.136	0.732	0.469
Letting of smoke (X_3)	0.048	0.157	0.060	0.305	0.762
Installation of equipment (X_4)	-0.090	0.234	-0.078	-0.386	0.702
Environmental audit (X_5)	0.210	0.173	0.236	1.215	0.023
Tree plantation (X_6)	0.235	0.233	0.227	1.008	0.320
Natural resource management (X_7)	0.039	0.228	0.039	0.173	0.863
Integrated watershed development (X_8)	-0.174	0.200	-0.194	-0.873	0.388
Rain water harvesting (X_9)	0.489	0.267	0.583	1.833	0.015
Reclaiming of waste land (X_{10})	-0.244	0.230	-0.266	-1.064	0.294
Environmental awareness program (X_{11})	0.109	0.193	0.092	0.563	0.577

Dependent variable: environment CSR; multiple R = 0.534; R^2 = 0.285; F value = 1.378; d.f. (11, 38); $P > 0.05$.

of the study units undertake most of the environment CSR activities in a highly effective manner except 'Rain water harvesting' (46%), 'Integrated watershed development' (38%) and 'Reclaiming of waste land' (34%).

Part II: Multiple regression has been employed to show the relationship between several independent variables affecting environment CSR and the best predictor out of them (Table 2).

$$\hat{Y} = 0.774 - 0.096x^1 + 0.155x^2 + 0.048x^3 - 0.090x^4 + 0.210x^5 + 0.235x^6 + 0.039x^7 - 0.174x^8 + 0.489x^9 - 0.244x^{10} + 0.109x^{11}$$

Where $\hat{Y}$ is the estimated effectiveness of environment CSR. The above equation describes that the environment CSR increases by 0.489 for every one unit increase in 'rain water harvesting', 0.235 unit for every one unit increase in 'tree plantation', 0.210 unit for every one unit increase in 'environmental audit', 0.155 unit for every one unit increase in 'disposal of waste', 0.109 unit for every one unit increase in 'environmental awareness program in schools or colleges', 0.048 unit for every one unit increase in 'letting of smoke or ash or molasis' and 0.039 unit for every one unit increase in 'natural resource management'.

Other variables namely, recycling of pollutants (0.096), installation of equipment (0.090), integrated watershed development (0.174) and reclaiming of waste land (0.244) have not made contribution towards the effectiveness of environment CSR. The multiple R found to be 0.534 revealed that there exists a relationship of 53.4 per

cent between environment CSR and the environmental activities carried out by the sample units. The R^2 of 0.285 confirmed that the explanatory variable explained only 28.5 per cent variations in the effectiveness of environment CSR. Finally, the result of F test revealed that the calculated significance of the regression coefficient of the independent variables 'Environmental audit' and 'Rain water harvesting' was significant at 5% level.

In Part III a comparison of the environment CSR of the sample units with their organizational profile namely, manufacturing sector, type of organization, region, experience, turnover and workforce has been done. First, the scores obtained by the sample units for each stakeholder is shown based on the organizational profile. Then two-way ANOVA was applied to identify the differences between the environment CSR initiatives of the sample units segregated on the basis of their profile (Table 3).

Table 3 shows 'environment CSR' of the sample units according to the profile of the sample manufacturing units.

Manufacturing sector: The classification is based on the nature of product manufactured by the sample units, namely, automobile, cement, chemicals, pharmaceuticals and textiles. Table 3 highlights that the 'automobile' units have better environment CSR (82.73%) when compared to other manufacturing units. The "textile" units have secured the least score (68.73%) revealing lesser performance with regard to environment CSR. So, automobile units give more importance to the environment and take

Table 3. Environment CSR according to profile.

Profile		Recycling of pollutants	Disposal of waste	Letting of smoke	Installation of equipment	Environment audit	Tree plantation	Natural Resource management	Integrated Watershed development	Rain Water Harvesting	Reclaiming of wasteland	Environmental Awareness Programs	Average Score
Manufacturing sector	Auto (n=10)	78.00	78.00	78.00	78.00	78.00	98.00	98.00	98.00	98.00	98.00	98.00	82.73
	Cement (n=10)	86.00	86.00	86.00	86.00	86.00	86.00	86.00	86.00	86.00	86.00	86.00	76.00
	Chemical (n=10)	78.00	78.00	78.00	78.00	78.00	78.00	78.00	78.00	78.00	78.00	78.00	81.82
	Pharma (n=10)	94.00	94.00	94.00	94.00	94.00	94.00	94.00	94.00	94.00	94.00	94.00	80.00
	Textile (n=10)	82.00	82.00	82.00	82.00	82.00	82.00	82.00	82.00	82.00	82.00	82.00	68.73
Type of organisation	Private (n=36)	77.78	77.78	77.78	77.78	77.78	77.78	77.78	77.78	77.78	77.78	77.78	75.10
	Public (n=9)	97.78	97.78	97.78	97.78	97.78	97.78	97.78	97.78	97.78	97.78	97.78	85.45
	MNC (n=5)	100	100	100	100	100	100	100	100	100	100	100	84.00
Region	Region 1 (n=16)	91.25	91.25	91.25	91.25	91.25	91.25	91.25	91.25	91.25	91.25	91.25	80.45
	Region 2 (n=17)	81.18	81.18	81.18	81.18	81.18	81.18	81.18	81.18	81.18	81.18	81.18	77.75
	Region 3 (n=17)	78.82	78.82	78.82	78.82	78.82	78.82	78.82	78.82	78.82	78.82	78.82	75.51
Experience (in years)	< 25(n=13)	70.77	70.77	70.77	70.77	70.77	70.77	70.77	70.77	70.77	70.77	70.77	73.71
	25 to 50 (n=19)	85.88	85.88	85.88	85.88	85.88	85.88	85.88	85.88	85.88	85.88	85.88	79.14
	> 50 (n=18)	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	79.45
Turnover (in crores)	< 50 (n=6)	46.67	46.67	46.67	46.67	46.67	46.67	46.67	46.67	46.67	46.67	46.67	48.79
	50 to 100 (n=4)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	75.91
	> 100 (n=40)	89.50	89.50	89.50	89.50	89.50	89.50	89.50	89.50	89.50	89.50	89.50	82.41
Workforce (in number)	< 500 (n=23)	74.78	74.78	74.78	74.78	74.78	74.78	74.78	74.78	74.78	74.78	74.78	71.46
	1500 to 3000 (n=15)	96.00	96.00	96.00	96.00	96.00	96.00	96.00	96.00	96.00	96.00	96.00	81.82
	> 3000 (n=12)	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.15

Source: Primary data; Figures in the parenthesis indicates number of units.

measures to safeguard the same.

Out of the factors affecting environment CSR 'installation of equipment' (90.40%) is the factor which has been carried out mainly by all manufacturing units. The least undertaken activity has been 'reclaiming of wasteland' (62%) followed by 'integrated watershed development' (63.20%). The overall score (77.85%) reveals that the sample units must still enhance their environment CSR. The results of two-way ANOVA revealed that at 1% level of significance, there is a significant difference between environment CSR of various manufacturing sectors (F-value = 8.667, p-value = 2.48E-07, p-value<0.01) and also between the extent of environment CSR activities undertaken by the manufacturing units (F-value = 5.933, p-value = 0.00076, p-value<0.01).

Type of organizations: Organizations are categorized as private sector Indian company, public sector company and multinational company. The table shows that public companies have overall environmental performance better (85.45%) than their counterparts. They have also secured maximum scores for the factors 'installation of equipment' 100% and 'tree plantation' (100%), whereas the 'integrated water shed development' is the least scoring factor (62.22%). So, environment CSR is better

practiced by public companies. For public companies, the maximum scores are for the factors 'recycling of pollutants' (100%) and 'disposal of waste' (100%). The least scoring factors are 'rain water harvesting' and 'reclaiming of wasteland' (68%) each. MNCs have the least overall score (75.10%). The factor with the highest score is 'installation of equipment' (87.22%) and the least score is 'reclaiming of wasteland' (58.89%).

Two-way ANOVA test examined whether there is a significant difference between the sample units based on type of organization and their environment CSR. The results reveal that at 5% level there is a significant difference between the various environment CSR activities of the sample units based on the type of the organization (F-value = 3.048, p-value = 0.016, p-value<0.05). At 1% level, it can be also inferred that the sample units based on the type of organization differ in the environment CSR (F-value = 579.234, p-value = 1.98E-18, p-value<0.01).

Region: The different regions in India where the data were collected for the study have been categorized as follows: Region 1 comprises Chennai and Hyderabad (South India); Mumbai and Pune have been categorized as Region 2 (West India); and Delhi, Indore and Kolkata have been grouped as Region 3 (North East India). Table 3 shows that "Region 1" has scored the highest total score (80.45%) when compared to Regions 2 and 3. Therefore, Chennai and Hyderabad comprising Region 1 practice environment CSR well. Regions 1 and 3 have obtained a high score for the factor 'installation of equipment to protect the environment' which is the least scoring factor (56.25% and 56.47%). Region 2 has secured the highest score for the factor "tree plantation" (88.24%) and the least score for the factor 'integrated waste land development' (68.24%).

The association between effectiveness of environment CSR undertaken by the study units and the regions was examined through chi-square test and the results indicate a significant association between them (χ^2 = 12.510, df = 4, p = 0.014).

The results of two-way ANOVA to examine whether there is a significant difference between the sample units based on region and their environment CSR have shown that at 1% level, there exists a significant difference in the extent of environment CSR activities undertaken by the study units based on region (F-value = 8.461, p-value = 3.05E-05, p-value<0.01).

Experience: The age of the study units has been categorized as less than 25 years, 25 to 50 years and above 50 years. Table 3 has highlighted that the highest score has been achieved by the study units having experience above 50 years (79.45%), while the lowest score has been that of study units having an age less than 25 years (73.71%). So, environment CSR is well undertaken by the most experienced units. The study units having experience less than 25 years have obtained

high scores for 'installation of equipment' (86.15%) and least scores for 'rain water harvesting' (60%). The study units having experience between 25 to 50 years have secured high scores for the factor 'tree plantation' (94.12%) and the least scores for 'awareness programs in school and colleges' (57.65%). The study units having experience above 50 years have obtained high scores for the factor 'disposal of waste' (95%) and low scores for 'reclaiming of waste land' (61%).

The results of two-way ANOVA to examine whether there is a significant difference between the sample units based on experience and their environment CSR activities has proved that at 1% level there is a significant difference among the environment CSR factors (F-value = 4.842, p-value = 0.001, p-value<0.01) and also between the environment CSR of the sample units based on experience (F-value = 61.569, p-value = 2.84E-09, p-value<0.01).

Turnover: Companies belonging to various sizes in terms of turnover have been included in the study. The range of the turnover is from below Rupees 50 crores, Rupees 50 to 100 crores and above Rupees 100 crores. It can be seen in the above table that the highest environmental CSR has been that of the sample units having turnover above Rs. 100 crore (82.41%) whereas the lowest environment CSR has been recorded by the sample units having turnover less than Rs. 50 crore (48.79%). So, large companies (according to turnover) undertake environment CSR more extensively.

The results of two-way ANOVA to examine whether there is a significant difference between the sample units based on turnover and their environment CSR indicate that at 1% level, there exists a significant difference in the environmental CSR between the sample units based on turnover (F-value = 651.616, p-value = 2.18E-27, p-value<0.01).

Workforce: The classification of the study units is according to the number of employees working in their organizations. The study units are divided into three categories such as less than 1500 employees, 1500 to 3000 employees and above 3000 employees. Table 3 shows that the study units having workforce 'above 3000' have secured the highest total score (85.15%) followed by the study units having workforce between '1500 to 3000' (81.82%). So, large companies (based on workforce) exhibit a higher level of environment CSR. The study units having workforce 'less than 1500' have secured the highest score for the factor 'installation of equipment '(86.09%) and the lowest score for the factor 'reclaiming of waste land' (53.91%). The study units having workforce between '1500 to 3000' have scored the highest for the factor 'environmental audit' (97.33%) and the lowest for the factor 'integrated watershed development' (60%). The study units having workforce 'above 3000' have obtained the highest score for the

factor 'disposal of waste' (98.33%) and the lowest score for the factor 'reclaiming of wasteland (73.33%).

Two-way ANOVA to examine whether there is a significant difference between the sample units based on workforce and their environment CSR have produced the result that at 1% level, there is a significant difference among the environment CSR activities (F-value = 8.176, p-value = 3.93E-05, p<0.01) and also between the environment CSR undertaken by the study units based on workforce (F-value = 103.075, p-value = 2.93E-11, p<0.01).

CSR and the notion of stakeholder approach are pivotal concepts which have gained importance in recent years. Companies recognize that they are accountable not only to their shareholders but also to a wider range of stakeholders, especially the environment. The CSR of the study units with respect to the environment has been analyzed using various influential factors. Environment CSR has been studied by using eleven factors which are based on initiatives to protect and better manage the environment. But not all the activities have made significant contribution towards their environment CSR. CSR of companies relating to the environment depends upon whether the companies are private sector or public sector Indian companies or multinational companies. Environment CSR changes among regions show that CSR practices differ across South, West and North East India. The level of environment CSR increases as the number of years of existence goes up. The officials of the units had different styles and ways of implementing environment CSR practices in the sample units. Companies also seem to install equipment needed to protect the environment (90.40%). This shows their concern for the environment.

CONCLUSION AND RECOMMENDATIONS

The study has highlighted that a majority (above 80%) of the study units undertake most of the environment CSR activities in a highly effective manner except 'Rain water harvesting' (46%), 'integrated watershed development' (38%) and 'Reclaiming of waste land' (34%). The automobile units have obtained the highest scores for environment CSR (82.73%). So, automobile units give more importance to the environment and take measures to safeguard the same. Public companies have highest environment CSR (85.45%). 'Region 1' comprising Chennai and Hyderabad has scored the highest total score (80.45%) with regard to environment CSR. The highest score has been achieved by the study units having experience 'above 50 years' (79.45%). The highest environment CSR has been attained by the study units having turnover 'above Rs. 100 crore' (82.41%). The study units having workforce 'above 3000' have secured the highest total score (85.15%) for environment CSR.

However, companies can improve their environmental CSR by increasing their tree plantation activities inside and outside their premises and also undertaking integrated watershed development. The companies may continue undertaking reclaiming of wasteland and integrated watershed development. This would contribute towards attaining an enhanced environment CSR and also protecting land which is a scarce commodity in India.

RECOMMENDATIONS

The following are the areas of further research in CSR in relation to stakeholders.

1. The researcher has done the analysis only for Indian manufacturing industries; so the study can be extended by including other industry sectors like service industry, banking industry, SME industry, etc.
2. Further research may be to compare CSR between the manufacturing and service industries.
3. The research is restricted only to CSR of five stakeholders, but other stakeholders such as suppliers, government agencies, etc. can be included in further research.
4. Further researchers can do in-depth studies on comparisons between the CSR of private and public companies.
5. Cross country study can be done on CSR within Asia or across the globe.
6. Exclusive study on CSR of multinational companies can be done.
7. Further research can include some other control variables to mitigate endogeneity problem by employing firm specific and industry specific variables.
8. The research on CSR of the group-affiliated companies in India can help regulators to develop new codes.

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