

ENVIRONMENTAL REPORTING PRACTICES: A STUDY OF SELECT COMPANIES

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By
A. PORCHELVI

Research Supervisor
Prof. KAVITA SHARMA



**DEPARTMENT OF COMMERCE
DELHI SCHOOL OF ECONOMICS
UNIVERSITY OF DELHI
DELHI - 110007**

October, 2019

DECLARATION

I hereby declare that the thesis entitled, “**Environmental Reporting Practices: A Study of Select Companies**” Is an original research work done by me and any part or whole of the thesis is not submitted to any University or authority for award of any degree or diploma.

Date: **A. Porchelvi**

(Research Scholar)

Prof. Kavita Sharma

(Supervisor)

Department of Commerce
Delhi School of Economics
University of Delhi
Delhi-110007.

Prof. R. K. Singh

(Head and Dean)

Department of Commerce
Delhi School of Economics
University of Delhi
Delhi-110007.



**DEPARTMENT OF COMMERCE
DELHI SCHOOL OF ECONOMICS
UNIVERSITY OF DELHI
DELHI – 110007**

Date: _____

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A. Porchelvi

STUDENT APPROVAL FORM

Name of the Author	A. Porchelvi
Department	Commerce
Degree	Doctor of Philosophy
University	University of Delhi
Guide	Prof. Kavita Sharma
Thesis Title	Environmental Reporting Practices: A Study of select Companies
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ABBREVIATIONS

IED	Index of Environmental Disclosure
UK	United Kingdom
USA	United States of America
GRI	Global Reporting Initiative
EA	Environmental Accounting
ER	Environmental Reporting
UNEP	United Nation Environment Programme
14001	A series of environmental management standards developed and published by the ISO
ISO	International Organizations for Standardization v
FEE	Foundation for Environmental Education
SEEA.	System of Integrated Environmental and Economic Accounting
NGO	Non-Government Organization
KPMG	Multinational professional services network.
UNSD	United Nations Division for Sustainable Development
USEPA	U.S Environmental Pollution Agency
ISAE	International Standard for Assurance Engagements
UN CTC	United Nations Commission on Transnational Corporations
IASR	International Standards of Accounting and Reporting
MOEF	Ministry of Environment and Forests

EPA	Environment Protection Act
PCB`	Pollution Control Board
ICAI	Institute of Chartered Accountant of India
TERI	The Energy Research Institute
AICPA	American Institute of Certified Public Accountants
CICA	Canadian Institute of Chartered Accountants
ACCA	Association of Chartered Certified Accountants
ICAEW	Institute of Chartered Accountants in England and Wales
ICAS	Institute of Chartered Accountants of Scotland
NIVRA	Royal Netherlands Institute of Register Accountants
ICAA	Institute of Chartered Accountants in Australia
IFAC	International Federation of Accountants
IASB	International Accounting Standards Board
ONGC	Oil and Natural Gas Corporation
BPCL	Bharat Petroleum Corporation Ltd.
GDP	Gross domestic products
IAS	International Accounting Standards
GHG	Green House Gas
CETP	Common Effluent Treatment Plants
MORTH	Ministry of Road Transport and Highways
DV1	Dependent Variable one – Environmental policies and Initiatives

DV2	Dependent Variable 2 Environmental Expenditure
DV3	Dependent Variable 3 Environmental Pollution
DV4	Dependent Variable 4 Environmental Reporting Elements
DV5	Dependent Variable 5 Environmental Compliance
EMAS or BS 8555	Generic Environmental Management System

ABSTRACT

This present research seeks to provide insight into the corporate environmental reporting practices of manufacturing companies in India, United Kingdom and America. The study analyses whether environmental disclosure practices are more strongly influenced by corporate characteristics and the difference in extent of disclosure between developing and developed countries. These analyses use a recently developed content analysis instrument with 62 items named Index of Environmental Disclosure (IED), which is capable of measuring the diversity, quantity and quality of environmental disclosures. In order to address these issues data were collected through secondary sources. Annual reports for the year 1-4-2016 to 31-3-2017 have been analysed for a sample of 170 Indian companies, 25 UK companies and 25 US companies. Research literature provides a sound rationale not only for the conceptual development but also for testing empirically various hypotheses proposed in this study. The present study focused on the laws and rules prevailing in India, UK and USA. Findings of the study clearly shows that there are variations in disclosure practices between developing and developed countries .The study recognizes a need for concerted efforts on the part of regulatory bodies to monitor the environmental reporting practices of manufacturing companies in India. The relationship between environmental reporting practices (five categories of IED) and corporate size, age, industry type, financial performance and the amount spent on corporate social responsibility has been empirically tested by using statistical tool discriminant function analysis. It was observed that size of the company has significant impact on environmental policy and initiatives, environmental expenditure, environmental pollution, environmental reporting elements and environmental compliance. Financial performance of companies is predicted by profitability indicators and the results have significant association with the environmental disclosure.

Amount spent on CSR has positive association with all five dependent variables. The variable Age of a firm was found significant positive association with policy and initiatives. Environmental expenditure has negative relationship with age, and found there was no significant impact by age of the firm on the disclosure of environmental

pollution. Age has positive association with environmental reporting elements and negatively related with environmental compliance. Chi square test result shows the relationship between environmental disclosure and industry type. It was observed that industry type has positive impact on environmental pollution and environmental reporting elements. It was found that environmental policy and initiatives has no significant association with industry type. Environmental expenditure and environmental compliance have not influenced by industry type.

The evidence gathered from the research has shown that environmental accounting and reporting are being practised by a variety of companies and are also becoming more widespread, which demonstrates that accounting is playing an important role in handling environmental transactions. The research has also shown that environmental accounting and reporting are gaining a broader perspective and now embrace environmental management system, general environmental stewardship and resource efficiency. Overall, the study recognises and concludes that environmental accounting and reporting, although spreading should now be supported by environmental accounting and reporting guidelines from the accountancy profession, and in time, by legislation.

CHAPTER 1

INTRODUCTION

Sustainable development is rooted in the current economic, social and political conditions as well as building on current financial reporting paradigms. It provides a broad theoretical base on practical environmental indicators and how it can be operationalized. The World Summit on Social Development identified three core areas that contribute to the philosophy and social science of sustainable development. Economic development, social development and environmental protection the three “pillars” in many national standards and certification schemes, form the backbone of tackling the core areas that the world now faces. “Economic development” is about giving people what they want without compromising quality of life, especially in the developing world, and reducing the financial burden. “Social development” is about maintaining access to basic resources and improving the well-being of every individual in society so they can reach their full potential. The success of society is linked to the well-being of each and every citizen. Environmental protection is the primary concern of the future of humanity. It defines how we should protect ecosystems, air quality, integrity and sustainability of our resources and focusing on the elements that place stress on the environment.

Industrialization contributes major part for the economic development and prosperity of a country. It provides employment opportunities and wealth generation while on other hand it leads to environmental deterioration in varied manner: depletion of natural resources, air pollution, water pollution and soil pollution, global warming, climatic changes. Companies are by and large concerned with the means of production rather than the effect of production on the environment. Businesses are regulated to prevent pollution and to keep their own carbon emissions low. Pressures on companies to reduce pollution have varied over time with societal expectations and attitudes. Sometimes, polluting companies have not surrendered to social, political, and governmental pressures. Several companies have denied responsibility for pollution even when faced with strong evidence to the contrary. Other companies, after admitting responsibility, promise strong action, but deliver nothing. Still other

companies have performed admirably when it comes to being environmentally friendly. Industry has not always performed admirably with respect to its responsibility for the pollution it expels into the ecosystem. Very few companies are providing good information and the rest of the reporting seems to be aimed at publicity. There is lack of information with respect to the environment related issues and environmental expenditure & costs (Shukla & Vyas 2013).

1.1 Environmental Reporting:

Environmental awareness among Indian stakeholders gets strengthened with advancement in communication technology. Stakeholders are sensitive about the harmful impacts of industrial activities on environment. Such high propensity of environmental awareness ensures a more cautious approach among Indian corporations to be environmentally responsible. There was a need for a measurement system to assess industry's impact, but current accounting is inadequate for a variety of reasons. There was a need for new holistic accounting which captures corporate environmental impacts. Finally, it was debated that companies because of their stewardship function should report their environmental accounting to their stakeholders (Jones, 2010). Our society urgently needs to create a social mechanism by which economic entities can rationally estimate the good business practices that deliver economic benefits to environment-friendly businesses. Environmental information must be disclosed without impairing the usefulness of environmental reporting. It must meet the information needs of users with guaranteed quality and comparability with previous periods and other enterprises.

Environmental reporting is disclosure media of an organization regarding environmental efforts in their activities, and to provide useful information to decision making of interested parties. Environmental reporting refers to systematic and holistic statements of environmental policies, objectives, programs and their outcomes, organizational structures and systems for the environmental activities. The environment is the common heritage of mankind, and it could therefore be considered that organization should fulfil their accountability to report their environmental burdens, mitigation methods and environmental conservation efforts. As environmental consciousness in entities has risen in recent years, the importance of environmental

communication and social accountability, which promote voluntary disclosure of information and improve their reputation for the environmental performance, has been widely recognized. Environmental degradation caused due to uncontrolled growth of urbanization and industrialization has become so immoral, various legislations have been enacted at national and international level for protection of environment (Kolk, 2003). Corporate awareness and participative decision making is essential for long term environmental protection and equitable utilization of natural resources. The concern and commitment of industries would hold the key to sustained prevention of environmental pollution and degradation. The number of organizations that publish environmental reporting is steadily increasing, however the number is not yet a significant position in the entire business community. In India the Ministry of environment has separately issued “ECO-Action 21”(Environmental activity evaluation programme) which enable small businesses to design and operate environmental management programme to carry out conservation activities and to publish environmental reporting with relative ease. People, who make decisions about the environmental performance of an organization, need accurate and reliable environmental information.

In the backdrop of rising environmental concern and compelling pressure over an enactment and modification of disclosure laws by the modern welfare accounting bodies, the expansion and growth of the corporate form of business and the emergence of environmental accountancy as a recognized profession, there is an improvement in reporting practices. The literature on environmental reporting claims those corporate environmental reporting practices are less than satisfactory (Pramanik et.al (2007), MalarVizhi and Yadhav(2008) Cheriyan (2015). Moreover, the extent of disclosure varies from company to company. In some annual reports there may be more information than the others. Evidently, there are many factors which influence the extent of disclosure in corporate annual reports. Therefore, there is a need to identify and determine the extent to which these factors influence the extent of disclosure in corporate annual reports.

1.2 Research Gap

It is an essential commitment to identify the environmental problems which have become a global threat to understand the need for the environmental disclosures. In

order to respond to environmental reporting pressures, all over the world companies have made voluntary reports on their environmental performance and it has become an important dimension of accounting information systems. With the growing natural calamities, the need for incorporating environmental costs in the financial statements and directors reports has been greatly felt. Environmental awareness, to a certain extent, could be considered as an emerging value in our society. There is a problem of non - uniformity content and dissemination of reports. With respect to the impact of economic activity on the environment, the traditional measures are deficient in a number of ways like cost of expenditure, omitting the values of services provided by environment and not depreciate the natural resources in the accounting procedure. Legal authorities, standard setting bodies and other regulators have not come to a consensus regarding the conceptual framework of environmental accounting and its disclosure. Thus such revelation is not obligatory rather voluntary that has no specific format or style. Specific environmental accounting rules or environmental disclosure guidelines, for communication to different stakeholder groups, are not available for Indian companies. There is no mandatory requirement for quantitative disclosure of (financial) environmental information in annual reports neither under the Companies Act nor as per Indian Accounting Standards. In the present institutional environment, most social responsibility disclosures are voluntary and unaudited. Few efforts have been made to monitor firms' social activities or to validate their disclosures.

Since the end of the 1990s, sustainability reporting has become an increasingly relevant topic in business and academia. However, literature is still limited in quantity and no major reviews of the latest developments have thus far been presented. The recent interest in environmental reporting is consistent with the growing sensitivity of our society to understand how companies manage environmental issues in operations. The literature on accounting disclosure is very rich and addresses a wide range of disclosure related issues such as environmental disclosure practices, type and level of disclosure, as well as factors affecting the environmental disclosure. Past studies have identified the impact of organizational and economic factors on the environmental disclosure level. New research might extend the scope of this study by involving comparative studies between developing and developed countries in terms of extent of

environmental reporting practices, analysing the laws and regulations related with environmental disclosure practices.

1.3 Reporting to Society

Yet another important objective of corporate is to report to society on the progress of business clearly and responsibly. Society, in a broad sense, assigns to companies the responsibility of employing efficiently the resources which are at its disposal and in turn, it expects an account from companies. Accountability extends beyond the element of stewardship involved in the safe keeping of resources entrusted to custody. Companies can serve the cause of society by maintaining close co-ordination between the enterprise activities and national economic policies. To accomplish this, environmental reporting should reveal the extent to which companies are generally responsive to environmental changes and social needs. Furthermore, financial reporting with environmental information can help at building confidence in the investing public and facilitate corporate democracy. Such democracy functions effectively if public have full and fair information about company performance. To sum up, information contributes much towards influencing attitudes, promoting, understanding and creating an environment to co-operates. Environmental reporting, thus by generating confidence among people towards the company, plays the significant role in achieving enterprise's goal. This dissertation focuses on corporate environmental disclosure. In my research, nonetheless, I chose the term corporate "environmental" reporting because it afforded clearer boundaries than other types of reports that cover not only environmental information but also social, labour, human rights and corporate governance aspects. Such reports receive a variety of names including "sustainability," "triple bottom line," "corporate responsibility," or "non-financial" reports.

1.4 Scope of the Study

It is necessary for a researcher to delimit the parameters of the study. The following define and confine the scope of the present study. *Firstly*, it is limited to environmental disclosure in published corporate annual reports, other sources of information such as articles, research papers, journals, business magazines, websites have been taken in to consideration.

Secondly, the present study has included the annual reports of manufacturing companies of India, UK and USA only, therefore, it has not considered insurance companies, banks, finance companies .and public utility enterprises of the above three countries.

Thirdly, the study is concerned with the environmental informational needs of users making economic decision. There are other groups who also need social, financial and other kinds of information from the corporate annual report for various purposes. The informational needs of these secondary user groups have not been separately and specifically examined in this study.

Fourthly, the classification of companies to industry group is bound to be arbitrary, to some extent. Especially, where a company is manufacturing more than a single product .Also a company which might have changed its industry group over a period of time has been treated as belonging to its original group. This is a purely arbitrary convention whose only virtue is the important one of consistency.

Fifthly, since companies are allowed to choose their own accounting dates, they show little conformity in maintaining common ending dates. All the sample Indian companies have chosen 31st March. But UK and US companies' chosen 31st December. The practice adopted in preparing the data has been to select the annual report of company having accounting data for the particular year considered for study.

Sixthly, any research based on corporate data has certain inherent limitation such as lack of uniform accounting procedures among companies. There may be exist variations with regard to calculation of depreciation, valuation of inventories. These accounting problem subsequently influence the assets and reported net income of companies.

Finally, the Index of Environmental Disclosure has been examined only from the user view point and not from the preparer view point.

1.5 Objectives

The present study primarily aims to evaluate environmental accounting and reporting practices of Indian, U.S and UK companies. The study has the following specific objectives.

1. To identify the environmental disclosures and related regulatory requirements.
2. To conduct a comparative analysis of environmental disclosures in annual reports of Indian, U.S and UK companies.
3. To investigate the relationship between the environmental disclosures and firms' performance.
4. To find out the relationship between environmental disclosures and corporate characteristics.
5. To evaluate environmental laws/rules/guidelines prevailing in U.S.A, UK and India.

1.6 Methodology

As stated earlier, the primary purpose of the present study is to evaluate disclosure practices in published annual reports of companies covered in the study. To achieve this objective, an Index of Environmental Disclosure (IED) has been developed after making survey of literature in accounting and other related fields. This methodology has been used by many researchers to evaluate reporting practices in corporate annual reports, such as Singhvi and Desai (1971), Buzby (1974), Gyan Chandra (1974), Trotman and Bradley (1981), Wiseman (1982), Belkaoui (1984), Jawaharlal (1985), Howes (2000), UNO (2004), Cowan (2005), Chatterjee and Mir (2008), Malarvizhi and Yadhav (2008), Huang and kung (2010), Sen et. al., (2011), Sonia kundra (2013), Shukla & Vyas (2013), Ullah and Hossain (2013), Yusoff et.al (2013), Ahmad and Harat et.al (2013) and Japee (2015) .

The Index of Environmental Disclosure (IED) will contain items of environmental information suggested for disclosure in company annual reports by many studies and researches. Construction of index of environmental disclosure has been discussed in detail in chapter V. It consists of 62 items of information which have been chosen after an extensive study of relevant literature. Annual reports for period 1st April 2016 to 31st March 2017 are selected for Indian companies. For UK and US companies annual reports for the fiscal year (1st January 2016 to 31st December) have selected for the purpose of analysing environmental reporting practices.

Total sample size of the study 220, including 170 Indian manufacturing companies, 25 UK companies and 25 USA companies. All Indian companies are selected from “ET-Top 500 -2017” which is the rank list presented by the popular business magazine “Economics Time”. “Fortune Global 500” list has been used to select UK and US companies. Since non availability of required data, few companies are selected randomly through Google search.(Global data base and FTSE list). Selection has been made in a way as to represent different industries. The IED developed in the present study will be used as a checklist to evaluate disclosure practices and the extent of disclosure in the sample companies. Further, the disclosure practices obtained this way, of sample companies, will be applied to examine the relationship between disclosure practices and corporate variables selected in the study. The published annual reports of each company would be examined by employing percentage analysis to determine the extent disclosure. After examining annual reports of sample companies the following details have to be determined. (1) The number of companies disclosed an item of information in annual reports (2) the number of items disclosed by companies given in the index and the percentage of companies disclosing an item. Each item of information in Index of Disclosure has been assigned a score 0 and 1.If a particular item is disclosed in an annual report, score of “1” will be given. In case of non-disclosure of an item “0” score is given. A numerical measure of the extent of disclosure has been computed for each of the 220 companies in the sample.

The items of information have been classified under 5 major groups (i) Environment policy,(ii) Environmental expenditure (iii) Environmental Pollution (iv) Environmental Reporting Elements and (v) environmental compliance. Some of the items apparently related to more than one major group of information. Such items are placed with a major group having direct relation and implication (over the items) than the other. The extent of disclosure under each group of information has been determined to examine the level of reporting of items there in. The existence of possible relationship between company characteristics namely size of the firm, age of the firm, nature of industry, profitability factors, number of employees and amount spent on corporate social responsibility environmental reporting practices and the extent of disclosure in a corporate annual report has been investigated. For this

purpose, the appropriate statistical techniques have been employed. Accounting information of companies such as total assets, net profit margin, earnings per share, return on capital employed, return on investment etc., have been collected from PROWESS data base.

1.7 Organization of the Study

The study comprises 8 chapters; details of their organisation are given below.

Chapter 1, Introduction chapter discuss the meaning, importance of environmental accounting and reporting in general. It will include the relevance and objectives of the study. It will also give an insight into the research methodology adopted, and limitations of the study.

Chapter 2 presents the Conceptual Framework of environmental accounting and reporting. This chapter deals with the evolution of environmental accounting and demonstrates some insights into a number of accounting role with regard to the environmental dimension. It is argued that accounting can be a social tool which is now called upon to deal with environmental issues.

Chapter 3 dealt with Review of empirical studies which are focused on finding determinants of environmental reporting, theoretical and legal framework conducted in India, UK, USA and other countries in this area.

Chapter 4 analyses Environmental laws, rules and regulatory practices prevailing in India, USA and UK on environmental accounting and reporting.

Chapter 5 deals with the Research Methodology - explains Construction of Index, collection of data, sample companies, statistical tools used in the study.

Chapter 6, Evaluation of disclosure Practices – this chapter would present the empirical findings on extent of environmental disclosure made by sample companies and comparison between India, UK and USA.

Chapter 7, would be the analysis of data by using discriminant analysis and provide the empirical results of the relationship between environmental disclosure practices and company characteristics.

Chapter 8, Summary and Conclusion, would be the conclusion of the research work, recommendations and suggestions.

1.8 Limitations

All research studies do have some limitations. The present study has also some constraints and they are listed as below.

First, the study is confined to companies in the manufacturing industry. The companies belonging to non-manufacturing sector have not been covered. It is expected manufacturing companies are one of the major cause for environmental issues.

Second, the study considers only one year data to examine disclosure practices.

Third, environmental disclosure practices in different countries are likely to be influenced by different laws prevailing in those countries. Most developing countries are not follow-up and fulfil with regulations and environmental laws by implementing recognized standards, such as the ISO 26000 and Global Reporting Initiative (GRI).

Summary

This chapter has discussed the introduction part of the research study. Research gap, objectives, Data and methodology, organization of chapters and limitations of the study have been briefly explained.

CHAPTER 2

ENVIRONMENTAL ACCOUNTING AND REPORTING: CONCEPTUAL FRAME WORK

In this chapter, conceptual frame work of environmental accounting and reporting has been discussed .This chapter is divided into 7 sections.

- First section deals with the role of manufacturing industry & environment and historical development of environmental accounting.
- Second section would be discussing the concept of environmental accounting (EA), definitions, need, forms of EA, objectives, process of EA, forms of environmental accounting, challenges, environmental cost, environmental assets and liabilities, advantages, limitations and of environmental accounting.
- Third section of this chapter explains the concept of environmental reporting and its importance, types of reporting, benefits of environmental reporting and guidelines for environmental reporting.
- Development and current status of environmental accounting and reporting practices followed in India has been included in fourth section.
- Fifth part of this chapter deals with the status of environmental reporting practices existing in foreign countries.
- Finally, different theories related with environmental reporting would be discussed in this chapter.

2.1 Role of Manufacturing Industry in Economy and Environment

India has experienced rapid industrial growth since the enactment of the economic liberalization policies in 1991. Economic liberalization has accounted for a substantial impact on the manufacturing industry through an increase in the presence of manufacturing units, from 98,379 in a pre-liberalization period of 1987 to 1, 40,355 industrial units in 2007 reflecting a 42.67% growth during this 20 year period, and a rise in the production capacity and output within individual manufacturing facilities.

Industrialization has an important role to play in the economic development of the under-developed countries like India with huge man power and large and varied resources. An industry is the production of goods or related services within an economy. The major source of revenue of a company is the indicator of its relevant industry. Many developed countries and many developing countries (China, India etc.) depend significantly on manufacturing industry. Industrialization allows countries to make optimal use of their scarce resources. It increases the quantity and quality of goods manufactured in that company, which makes a larger contribution to gross national product (GNP).

The state of industrial development in a country can reflect the level of technology and innovation in the country, because industrial development must be supported by related development in technologies. Economic development is fundamentally a process of structural transformation. This involves the reallocation of productive factors from traditional agriculture to modern agriculture, industry and services, and the reallocation of those factors among industrial and service sector activities. If successful in accelerating economic growth, this process involves shifting resources from low- to high-productivity sectors, (Ocampo,2007). This rise in growth in the manufacturing sector is enabled ever-increasing rate of material use leading to manifold impacts to the environment. The National Productivity Council of India has estimated the cost of environmental damage at approximately \$32 billion. The contribution of the manufacturing sector to environmental degradation primarily occurs during the stage of procurement, use of natural resources, industrial processes, product use and disposal. Managing the natural resource base in a sustainable and integrated manner was essential for sustainable development. Increasing resource-use efficiency and enhancing technological innovation offered opportunities to reduce costs and increase competitiveness and employment. In that regard, the role of business and industry was important.

There was recognition that industrial development was crucial for economic growth, eradicating poverty and employment creation, as well as the achievement of the internationally agreed development goals, including the Millennium Development Goals. International financing and technology cooperation and transfer were

important to developing countries and their businesses and industries to facilitate adoption of cleaner, more efficient technologies. Industrial development was closely linked to the further integration of developing countries. The need for sustainable consumption of resources by employing efficient industrial processes and activities also helps improving the overall environmental impacts of a company by reducing wastage of resources, emissions and effluents. Pollution control measures have to be incorporated in industrial processes to ensure that wastes, emissions and effluents are disposed in a manner to have minimal environment impacts at the end of the process.

Rising pressures on the environment and increasing environmental consciousness have generated the need to account for the various interactions between all sectors of the economy and with the environment. There is, however no mechanism for efficient and optimal allocation of use of natural resources. Environmental accounting brings the ability to provide accurate information in the financial statements regarding estimated social cost occasioned by the production externalities on the environment. Environmental reporting has been seen as a way of increasing accountability of organizations regarding environmental issues. Environmental accounting is an inclusive field of accounting.

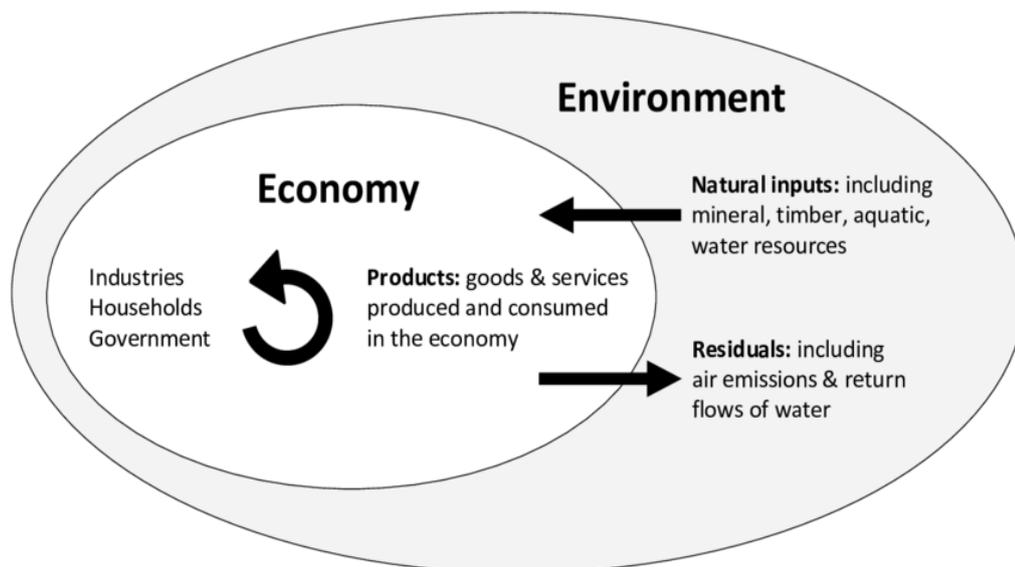


Figure 2.1: Physical flows in the SEEA Central Framework

Source: UN et al 2014a, <https://www.researchgate.net/> Date : 4/06/2019.

2.2 Environmental Accounting and Reporting- History

The environmental movement might be said to have begun centuries ago as a response to industrialization. Our responsibility to protect the health and well-being of that ecosystem began to dawn on the collective consciousness of the world. As universal concern about the healthy and sustainable use of the planet and its resources continued to grow, the UN, in 1972, convened the United Nations Conference on the Human Environment, in Stockholm. It was a landmark event, and its final declaration contains 19 principles that represent an environmental manifesto for our times. Since then, with the forming of the UNEP (United Nation Environment Programme), almost all countries have undertaken to monitor the quality of their air, water and other components of earth. The convention on international trade in endangered species of flora and fauna was come into force on 1st July 1975. India became a signatory in October 1976. Its main aim is to ensure that the international trade in wild animals and plants and their parts and products are not detrimental to the survival of the species. 1982: The United Nations Convention on the Laws of the Sea is adopted. 1984: The International Conference on Environment and Economics was concluded that environment and economics should be mutually reinforcing. This conference led to the Brundtland Report called "Our Common Future". The gathering momentum on environmental issues was given support and global focus and Agenda 21 was set out as a blueprint for action for the 21st century. In 1994 United Nations Convention on Desertification was held to take into consideration the heavy pressure on natural resources for livelihood etc. directly leading to land degradation and pressure on scarce water resources. In 1996, ISO 14000, was formally adopted as a voluntary international standard for corporate environment management systems.

Thirty-eight developed countries agreed to reduce their emissions of six greenhouse gases. Collectively, developed countries agreed to cut back their emissions by at least 5% below 1990 levels between 2008 and 2012. Developing Countries are in the process of becoming industrialized but have constrained resources with which to combat their environmental problems, which include China and India, have no formal binding targets but have the option to set voluntary reduction targets. The Kyoto Protocol also established emissions trading, joint implementations, and clean

development mechanisms to encourage cooperative emission reduction projects between developed and developing countries.

When environmental reports first emerged in the early 1990s, they consisted of green glossies and newsletters that were predominantly “feel good” public relations exercises where only positive information about what an organization was doing was disclosed (Deegan, 2000,). Since the early 1990s, the quantity of environmental reports produced has increased. The practice has expanded across different industry sectors (FEE, 2000). Results of an environmental reporting survey indicate that the vast majority of respondents (98%) believe the production of environmental reports will be standard business practice within the next five years (CMA, 1999). In spite of this trend towards increased reporting, only a small minority of companies on a global basis release environmental reports (Sustainability, 1999). The quality of the reports has improved as well over the last decade. Considerable progress has been made in identifying appropriate indicators for communicating performance and the key environmental issues that should be reported (FEE, 2000). Environmental indicators have become much more rigorous as organizations gain experience in their development and use. However, while many companies have improved their environmental performance, the majority still struggle to provide an acceptable and effective level of communication regarding their environmental impacts (Herremans & Hershcovis, 2001). The progress of the initiatives has been collectively taken by the world for the improvement of the environment.

2.3 Concept of Environmental Accounting

Developing economies are faced with problems of large population, hunger, malnutrition, unemployment and poverty. Under such circumstances, there is greater exploitation of land, forest, marine and coastal resources, and overcrowding of towns and cities which leads to atmospheric pollution and unhygienic living conditions. For developing countries like India, the concept of sustainable development is important and efficient policies are required for environmental evaluation. Inclusion of environmental dimension in the traditional accounting system could enable accounting statements at all levels to take sound decisions that support sustainable development, (Hamid, 2002).

Environmental Accounting has various terms and uses. Environmental accounting is defined as the process of environment-based categorization of business activities, collecting, analyzing and then monitoring these environment-related activities, then put all these information into business balance sheet to help an organization's decision making. Environmental accounting - sometimes referred to as "green accounting", "resource accounting" or "integrated economic and environmental accounting" - refers to modification of the system of national accounts to incorporate the use or depletion of natural resources. Environmental accounting, popularly known as Green accounting is a kind of accounting that attempts to issue environmental costs into the economic results of operations. Leading scholars, the media, policy makers, business leaders and working people around the world agree that "Green Accounting" is the corporate social responsibility, sustainability or some combination thereof. It has been noticed that environmental accounting in macro level as well as in micro level is gaining its importance. In macro level, National Environmental Accounting focuses on accounting of natural resources stocks & flows, environmental costs & externality costs etc. In micro level corporate environmental accounting tries to account for environmental impact on corporate activities, Goswamy (2014).

2.3.1 Definitions of Environmental Accounting

According to Schaltegger (2011) "environmental accounting may be defined as a sub-branch of accounting that includes the activities, methods and systems that record, analyze and disclose the environmental problems of a defined economic system or the economic effects of an environmental activity".

Environmental Accounting may be defined as the process of identification, measurement and allocation of environmental costs, the interaction of these costs into business, identifying environmental liabilities, if any, and finally communicating this information to stakeholder as a part of general purpose financial statement.

It is fruitful attempt to identify and bring to light the resource exhausted and cost rendered reciprocally to the environment by business house Pramanik et.al (2007). The environmental accounting at the corporate level helps the management to know whether corporate has been discharging its responsibilities towards sustainable

development while meeting business objectives, Anand and Sreenivasa (2014). Gray et.al (1993) have defined environmental accounting in the following terms: “it can be taken as covering all areas of accounting that may be affected by the business response to environmental issues, including new areas of econ-accounting”. Steele and Powell (2002) define environmental accounting as the identification, allocation and analysis of material streams and their related money flows by using environmental accounting systems to provide insight in environmental impacts and associated financial effects.

Wilmhurst and Frost (2000) define environmental disclosures as “those disclosures that relate to the impact company activities have on the physical or natural environment in which they operate”. Fortes (2002) argued that environmental reporting encompasses those information items that communicate whether natural resources have been used responsibly, Minimol and Mahesh (2014). Simply, environmental accounting is all about making environment related costs more transparent with corporate accounting system and reporting. It includes environment-related expenditure, environmental benefits of products and details regarding sustainable operations, Irish times (2000).



Figure 2.2 Sustainable Development

Developed by the National Institute of Standards and Technology (NIST), BEES refers to Building for Environmental and Economic Sustainability. 04/06/2019.

2.3.2 Need for Environmental Accounting

Hamid (2002) a researcher, focused his study on theoretical framework of environmental reporting, he has identified the reasons outlined by American Accounting Association. Current practices demonstrate that, no track for environmental costs was available as it was charged randomly. Therefore, there is a need for proper charging and allocation. Accounting for environmental costs and performance can support an organization's development and operation of an overall Environmental Management System (EMS) and ISO 14000 accreditation. Accounting should be responsible for measuring and evaluating and disclosure of environmental performance in financial statements or in its attachments.

- A proper environmental accounting system is the main tool for measurement, control and decision-making.
- Management needs financial data about environmental expenditures whether capital or operating costs increase dramatically day after day.
- There are increasing needs from different stakeholders (government, investors, lenders, banks, non-governmental organizations etc...) to have financial data on the environmental performance of different organizations.
- Many of the environmental activities are of quantitative and have a major effect on organizations costs, assets and liabilities.
- Environmental risks may result in huge environmental liabilities and subsequently the organization/entity may be obliged to outlay large payments which may affect seriously the liquidity and the financial position of the organization.
- Many environmental costs can be significantly reduced or eliminated as a result of investment in cleaner production, to redesign of processes/products.
- Managing resources properly in an environmentally friendly way will result in direct returns.

- Environmentally friendly processes, products, and services result in a competitive advantage for such organizations.
- The understanding of environmental costs and the performance of processes and products may lead to more accurate costing and pricing.
- Promote a company having wide environmental attitude.

There is a general trend to evaluate the organizations social and environmental effectiveness. Better management of environmental costs can result in improved environmental performance and significant benefit to the society as a whole.

2.3.3 Objectives of Environmental Accounting

- Identify environmentally related costs and revenues within the conventional accounting systems, recognize the values and try to mitigate the negative environmental effects,
- Devising new forms of financial and non- financial accounting systems, information system and control systems to encourage more environmentally oriented decisions.
- Developing new procedures of performance measurement, reporting and appraisal for both internal and external purposes. Identifying, examining and seeking to rectify areas in which conventional criteria and environmental criteria are in conflict.
- Taking the total stock of assets or reserves related to environmental issues, and changes.
- Minimizing environmental impacts through improved product & process design.
- Assessing the changes of environment in terms of costs and benefits.
- Reducing costs through resource cooperation & management, Gray et.al(1993).
- Realizing organizational accountability and increasing environmental transparency.

- Elaboration and measurement of indicators, relating to environmentally adjusted product and income.
- Ensuring effective and efficient management of natural resources to link the physical resource accounting with monetary accounting, Chauhan (2005).
- It determines the company's relationship with the society in general and the environmental pressure group in particular.
- By upholding friendly image, companies may be successful in attracting fund from 'green' individuals and groups; Pramanik et.al (2007).

2.3.4 Environmental Accounting and Disclosure Process

The entire process of Environmental Accounting encompasses three distinctive phases, Minimol and Makesh (2014).

- Physical Accounting determines the state of the resources types and extent in spatial and temporal terms.
- Monetary Valuation of tangible and intangible resources in terms of its monetary aspects.
- Integration with Economic Accounting of money value of environmental resources.

Environmental Disclosure Process includes,

- Identification of Environmental Reporting parameters
- Defining the Environmental Reporting Parameters
- Specify the Environmental Targets to be achieved
- Developing the Environmental Performance Indicators
- Report the Environmental Performance Results.

(i) Identification of Environmental Reporting Parameters

This is the first stage in environmental accounting process where, organizations identify their respective environmental reporting parameters such as environmental policy, health safety and environment, energy conservation, corporate sustainability/environmental initiatives, sustainability reporting, waste management, water management, wind/renewable energy sources, environmental information system, environmental disclosure practices, environmental targets, environmental reporting indicators, environmental cost and benefits, environmental liabilities and environmental assets.

(ii) Defining the Environmental Reporting Parameters

The second stage in the environmental accounting process requires the organization to clearly spell out the operational meaning of each parameter they identified and on the basis of which they wanted to measure the environmental performance in the long run.

(iii) Specify the Environmental Targets to be achieved

It is a stage that the organization tries to formulate the environmental targets to be achieved both in short run and long run, say the short term environmental policy of the organization as well as long term environmental policy.

(iv) Developing the Environmental Performance Indicators

In this stage, organizations need to develop the indicators of their environmental performance such as environmental policy framework, health and safety standards to be followed, energy conservation practices to be followed, waste management programmed to be undertaken, water Management policies etc.

(v) Measure the Environmental Performance Indicators

Here, organizations try to measure the actual environmental performance in terms of the predetermined standard performance indicators. Measurement may be either qualitative or quantitative in nature. For instance, indicators such as environmental policy framework need to be qualitatively measured while; waste management activities are to be measured quantitatively.

(vi) Report the Environmental Performance Results

In the last stage, organizations integrate their environmental performance with that of financial performance, so as to give the environmental impact on the financial performance of the organization, Minimol and Mahesh (2014). Preparation of short term as well as long-term environmental budget, find out the various elements causing for pollution of various types and show what types of action have been taken for control over the same. Financial or operational effect of environmental protection measures, contingent liabilities arise due to environmental related issue should be shown clearly either in the descriptive manner or quantitative manner or both. Various investments in pollution control equipment along with benefits to the environment should be disclosed.

2.3.5 Forms of Environmental Accounting

The concept of environmental accounting is very wide. It includes corporate level, national & international level. Corporate environmental accounting can be further subdivided into environmental management accounting, environmental cost accounting and environmental financial accounting.

- Global environmental accounting is an accounting methodology that deals areas includes energetics, ecology and economics at a worldwide level.
- National environmental accounting is an accounting approach that deals with economics on a country's level. National Level Accounting with a particular focus on natural resources stocks & flows.
- Internationally, environmental accounting has been formalised into the System of Integrated Environmental and Economic Accounting, known as SEEA. It records the flows of raw materials (water, energy, minerals, wood, etc.) from the environment to the economy. Also recorded the exchanges of these materials within the economy and the returns of wastes and pollutants to the environment and the price for these materials as are environment protection expenditures. SEEA is used by 49 countries around the world.

Corporate environmental accounting focuses on the cost structure and environmental performance of a company. It uses the cost and effect of its environmental conservation activities.

Following are the sub divisions of corporate environmental accounting: Environmental Management Accounting (EMA), Environmental Financial Accounting (EFA) and Environmental Cost Accounting (ECA), Chauhan (2005).

Environmental Management Accounting (EMA):

EMA is sufficiently defined to be the identification, accumulation, analysis and use of two kinds of information for internal decision making. Environmental management accounting focuses on material and energy used information as well as environmental cost information. It is concerned with the presentation of data about environmental costs and performance to management. EMA leads to improved decision by identifying hidden internal and external costs and allocating these particular products, process or facilities. This type of accounting can be further classified in the following subsystems:

- **Segment environmental accounting:** This is an internal environmental accounting tool to select an investment activity or a project which is environmental friendly from among all Processes of operations. It also helps in evaluating the environmental effects of the project for a certain period.
- **Eco balance environmental accounting:** This is an interior ecological accounting tool to support the firm for sustainable environmental management activities.
- **Social environmental accounting:** It has been broadly defined as the preparation and publication of an account about an organization's social, environmental, employee, community, customer and other stakeholder interactions and activities and the consequences of those interactions and activities.

Environmental Financial Accounting (EFA)

It focuses on reporting environmental liability costs and other important environmental charges. EFA includes usually environmental cost and assembles, investigates records data which are shown in financial statements .It deals with a specific aim on describing ecological liability charges and other significant environmental charges (Chauhan, 2005:721).

Environmental Cost Accounting (ECA)

A sophisticated step of development of environmental accounting is development of environmental cost accounting (ECA). Cost accounting is characterized as the use of the accounting record to directly consider the charges to products and methods. In this approach, charges are accounted for by their specific determinants. Environmental activities include contamination prevention, ecological conceive and ecological administration. Environmental costs comprise both internal and external costs and relate to all costs appeared in relative to environmental impairment and protection.



Figure 2.3: Subfield of Environmental Accounting

Source: Slideshare.net June 4,2019.

2.3.6 Advantages of Environmental Accounting

Environmental accounting brings several advantages in to business, notably; the complete cost, of environmental remediation; long term environmental consequences and externalities can be quantified and addressed. Companies and other organizations

are required to have accountability to stakeholders, such as consumers, business partners, investors, employees, local residents, and administration, when utilizing environmental resources, i.e. public goods, for their business activities.

- 1) It helps to measure the organization environmental performance.
- 2) It helps to measure the environmental problem impact of each and every process and operation on the air, water, soil, worker's health and safety and society at large.
- 3) It provides database and suggests how environmental management can be improved.
- 4) It helps the management to develop its environment strategy for moving toward a greener corporate culture.
- 5) Proper environmental accounting system facilitates appropriate reporting.
- 6) Environmental accounting leads substance to verify compliance to local, national and international standards.
- 7) Environmental accounting is helpful in presenting in a transparent manner, the utilization of natural resources of the country, the costs incurred to use them and the income earned there from.

2.3.7 Limitations of Environmental Accounting

- 1) There is no accounting standard and uniform procedure to disclose the environmental information.
- 2) Comparison of firm's environmental performance between countries is not possible.
- 3) Input for environmental accounting is not available as the cost and the benefits relevant to environment are not easily measurable.
- 4) Large and well managed business entities and government organization could not adequately track the use of energy, the cost of inefficient material use, waste

management and related issues. Many organizations therefore significantly underestimate the cost of environmental performance.

- 5) It mainly considers the internal cost which is related to the company and excludes the cost to the society.
- 6) Environment accounting is long term process therefore to draw conclusion with help of it is not easy.
- 7) Environmental accounting cannot work independently. It should be integrated with financial accounting which is not easy.
- 8) Environmental accounting must be analyzed along with other aspects or branches of accounting.
- 9) The user of environmental report needs adequate knowledge to understand the process of environmental accounting, rules and regulations prevailing in that country either directly or indirectly related to environmental aspects.
- 10) Environmental Loss cannot be measured exactly in monetary value.

These environmental problems experienced with industrialization caused a better understanding of importance of environmental accounting approach in the business world. To that end, firms are motivated to disclose sufficient and adequate environmental information to their stakeholders to ensure that their behavior is perceived to be legitimate and to aid stakeholders' decision making.

2.3.8 Environmental Cost

Practically accounting for the cost of impacts of organization's activities, products and services on natural resources and society for which the organization is not

financially responsible known as **externalities or societal costs**. The organization has incurred to prevent the degradation and deterioration in the quality and quantity of environmental resources by its activities, services and products and the accounting for the cost is known as **Private cost**.

Organizations need to consider all potentially significant environment related costs that may influence the return on investment, such as materials flow costs, site recovery costs and any costs associated with certain future regulations, Popescu et.al (2008).

Gray et.al (1993) argues that environmental accounting ought to adopt:

- accounting for contingent liabilities; accounting for asset revaluation and capital projections:
- amount spent in key areas such as energy, waste and environmental protection: assessing the costs and benefits of environmental improvement programmes
- Developing accounting techniques which express the value of assets and liabilities in ecological (non-financial) terms.

Business firms need to manage and control both external environmental costs from their activities and internal environmental costs relating to waste management, energy consumption etc., Companies going for environmental accounting should identify internal environmental costs in the first instance. Organizations also need to ensure that environmental managers and technical experts and accountants work together to provide the full picture of environmental related costs and benefits that are relevant for making an investment decision. a) regulatory cost b)voluntary cost c) gray line cost d)operational cost e) break end cost, f)conventional cost g) direct costs, h) hidden costs, i)overhead costs j) general and administrative costs k)contingency costs l) research and development, m) exit cost n) cost of monitoring emissions o)license, permits and authorization costs p)special insurance fees to cover the use of hazardous chemicals and q)Payment of fines and charges. (Pramanik, “Environmental Accounting and Reporting”, P 2-5).

These costs are related to environmental financial and environmental cost accounting. Simply, environmental accounting is about making environmental related costs more transparent with corporate accounting systems and reports.



Fig 2.4 Environmental Cost

2.3.9 Environmental Assets

These are the assets invested or acquired to control environmental degradation. Such assets can be classified as;

- Water pollution treatment plants and sewage treatment plants.
- Air pollution preventive system, investment in social foresting.
- Human training and development cost.
- Renewable energy source and eco- friendly production machines, packaging materials etc.,

Environmental Liabilities

These are the obligations payable or incurred in discharge of environmental responsibilities by a corporate. The environmental liabilities greatly influence the

corporate financial status. The objective of any corporate is to minimize its liabilities by being friendly to its environment. Environmental liabilities include:

- Amount of compensation payable according to court rulings, NGO's rulings.
- Pending law suits occurs against environmental hazards.
- Amount of damages yet to be addressed.

Environmental liability may be a quantifiable one or non-quantifiable one. If it a quantifiable one – that is if we can measure its value accurately, give it in the balance sheet otherwise give a footnote explaining the nature of such liability.

2.4 Environmental Reporting(ER)

Environmental reporting means incorporation of environmental issues in the corporate annual report of business entities. It denotes voluntary and involuntary disclosures by companies on the impacts of its activities on environment. Recently the business enterprises taking in to consideration all the costs incurred by consuming non-renewable resources, damages to the environment and environmental cleaning up and restoration, developing the idea of “Environmental Accounting and Reporting”. Environmental reporting covers the preparation and provision of information, by management, for the use of multiple stakeholder groups(internal and external) on the environmental status and performance of their company or organization .Corporate sustainability is a business approach that creates long-term stakeholder value by embracing opportunities and managing risks deriving from economic, social and environmental development, Popescu et.al (2008). Environmental accounting provides reports for both internal use, generating environmental information to help management decisions on pricing, controlling overhead and capital budgeting, and external use, disclosing environmental information of interest to the public and to the financial community, Rajnikant and Rima (2014).

The emergence of Corporate Environmental Reporting (CER) in India has been an important development, both for better environmental management and overall corporate governance. There is some variety in disclosure over time, between countries and between industries. Social disclosure in general and environmental

disclosure in particulars reflects the changing business climate, social, economic and political environment in which they occur. Environmental reporting has been defined as the disclosure of environment related information regarding environmental risks, impacts, policies, strategies, targets, costs and liabilities, for those who have an interest in such information. Although the term “environmental reporting” and “environmental disclosure” are used interchangeably nowadays, “environmental reporting” has a broader meaning as it encompasses both recognition and disclosure. Global awareness of stakeholders on corporate environmental performance has already made traditional reporting redundant, Sen et.al (2011).

Voluntary disclosure and transparency plays a significant role in corporate reporting practices. Voluntary disclosure provides various benefits like increased management credibility, higher institutional ownership, increased liquidity etc., Voluntary disclosure is the provision of information by a company's management beyond certain statutory requirements and primary goal of voluntary disclosure is reduction of information asymmetry between managers and investors and thereby cost of capital.

Mandatory reporting is nothing but a minimum prescribed reporting requirement. Companies around the world aspire consciously for improved transparency in disclosure as their core competence. Environmental disclosure through internet would be the future of scientific reporting. A number of recent national and international surveys have identified increase in growth of companies reporting on Internet, Rajnikant and Rima(2014).

2.4.1 Types of environmental reporting

As ER is not regulated in these countries, the environmental disclosures practice normally falling in to **3 categories**.

- i. **Descriptive and performance reporting:** UK companies tended to lead the development of the descriptive and performance approach to environmental reporting. This report includes description of environmental policies and corporate activity plus data on performance in such areas as emission control and energy savings.

ii. **Quantitative environmental accounting:**

This approach describes the company's environmental policy, the scope of its market share of "environmentally friendly" products. Most of these reports include a form of a "quantitative input-output analysis".

iii. **Financial environmental reporting;** this approach has been preparation of comprehensive document specifies the content of standard environmental report which should satisfy both stakeholders and companies.

2.4.2 Benefits of Environmental Reporting

The companies of different countries have started the practice of making environmental reporting in their annual report.

- i. Reporting on environmental performance strengthens the company's commitment to gaining a higher level of environmental performance.
- ii. Environmental reporting would discharge the organization's accountability and increase its environmental transparency.
- iii. Reporting on environmental performance demonstrate the information about progress made:
- iv. Reporting on environmental performance allows problems are to be identified.
- v. Environmental report assists in improving public relation for the company.

By taking this enlighten approach of environmental reporting, companies can increase their image and thus, can be regarded as enlightened companies. Different approaches to present their environmental information are adopted by many countries.

2.4.3 Guidelines for Environmental Reporting

It is important to understand as to how far standard setting improves credibility in reporting through major surveys, a survey by International accountancy firm KPMG (2005) shows that there is not just an increase in the number of corporate responsibility (CR) information in annual (financial) reports but also on the assurance. There are standards available for assurance on non - financial information like the

International Standard for Assurance Engagements (ISAE) 3000, and Accountability's AA1000 Assurance Standards. GRI guidelines provide principles and detailed indicators for reporting on all aspects of CR performance. Sustainability Reporting Guidelines of the Global Reporting Initiative (GRI) developed through a multi-stakeholder process bring in dramatic increase in corporate reporting practices. There are 660 companies spread over 50 countries report on the basis of GRI guidelines. It has also been argued that corporate social and environmental disclosure may not apply universally to all countries which are in various stages of economic development and with corporations having differing levels of awareness and attitudes towards corporate environmental disclosure, Rajnikant and Rima(2014).

Environmentalists and other proponents of new and more stringent environmental regulations have argued that increasing the stringency of environmental regulations provides an incentive for firms to develop new and less costly ways of reducing pollution or, potentially, entirely new methods of production that eliminate particular types of emissions and reduce costs of production, Jaffie and Palmer(1997).U.S Environmental Pollution Agency (USEPA ,1995) was first practical guide, produced regionally to help organizations with environmental sensitive accounting, United Nations Division for Sustainable Development(UNSD ,2001) was first collaborated efforts under the aegis of UN Division of Sustainable Development for organizational implementation of Environmental Management Accounting, Ahmad(2012). The most significant development in the environmental reporting within the conventional financial reporting has come from United Nations Commission on Transnational Corporations, Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting (UN CTC, IASR). The Ninth Session of UN CTC IASR (1991) made detailed recommendations as to the types of environmental disclosure that corporations should undertake with an intention that each sovereign government should adopt these recommendations, Goswamy,(2014). National Voluntary Guidelines on Social Environmental and Economic Responsibility of the business (2011), mentions that business should provide goods and service that are safe and contribute to sustainability throughout their life cycle. In pursuance of that a business should report:

- Percentage of materials used that are recycled input materials
- Total energy consumed and energy saving processes by the business entity for its operations
- Use of renewable energy as percentage of total energy consumption
- Total water consumed and the percentage of water that is recycled and reused
- Statement on quantum of emissions of greenhouse gases and efforts made to reduce it
- Statement on discharge of water and effluents indicating the treatment done before discharge and the destination of disposal.
- Details of efforts made for reconstruction of bio-diversity.

The disclosures of above mentioned information are voluntary and there are no specific guidelines on format of reporting. On the other hand accounting standard board and Ministry of Corporate Affairs is till silent on environmental accounting and disclosure issue in corporate accounting and reporting, (Grayet.al,2001).

2.5 Development and Status of Environmental Accounting and Reporting Practices - Indian Scenario.

The Department of Environment was established in India in 1980 to ensure a healthy environment for the country. This later became the Ministry of Environment and Forests (MOEF) in 1985. The EPA (Environment Protection Act), 1986 came into force soon after the Bhopal Gas Tragedy and is considered an umbrella legislation as it fills many gaps in the existing laws. As per Indian Constitution, Article 51A of Directive Principles “It shall be the duty of every citizen of India, to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures.” Government of India has made its first public announcement about the need for environmental disclosure in annual reports.

In addition to the above requirement, companies are required to prepare director's report as per director's report rules, Specific environmental accounting rules or environmental disclosure guidelines, for communication to different stakeholder groups, are not available for Indian companies, Makori and Jagongo (2013). Government of India in 1991 (Ministry of Environment and Forest) has announced that "Every company shall in the report of its Board of Directors disclose briefly the particulars of steps taken or proposed to be taken towards adoption of clean technologies for prevention of pollution, waste minimization, waste recycling and utilization, pollution control measures, investment on environmental protection and impact of these measures on waste reduction, water and other resource conservation", Baxi and Ray (2009). A Gazette Notification on Environmental Audit has been issued by the Ministry of Environment and Forest in 1992 which requires submission of an Environment Statement by the companies to the Pollution Control Board (PCB). The Companies Bill, 1997, Section 173 has proposed that every company should disclose through its Board of Directors' Report the measures taken for the protection of environment (Parmanik et al., 2007). The regulatory framework governing corporate disclosure in India includes the Companies Act, 1956 (now known as Companies (Amendment) Act, 2002); According to an amendment made in the Companies Act, 1998, disclosure of information relating to "Energy Conservation" was made mandatory in the annual reports, Chatterji and Mir (2008). In India, the application of environmental accounting is limited to certain industries such as oil and petroleum, cement, power and electronics, natural gas, steel, engineering and textile industries, Sen et.al (2011). In order to control emissions from production processes, air quality regulations lay down stringent equipment specifications that are required to be implemented by the polluting industries.

To minimize the global environmental problems, India has made the production and abatement technology mandatory (Chakrabarti and Mitra, 2005). Recently, Institute of Chartered Accountant of India (ICAI) has decided to converge with International Financial Reporting Standard, which brings some hope for implementation of sustainability reporting standards in India, Sen et.al (2011). In year 2001, a country wide survey, the first of its kind, was carried out by Business Today, a business

magazine, and The Energy Research Institute (TERI, 2001) to understand the environmental practices of corporate India. Findings of the survey revealed that more than 75% of the sample had environmental policy; about 70% have environmental audit system; 60% had an environment department; four out of every ten Indian Companies had formal environment certification (ISO 14001), Makori and Jagongo (2013).

A study on price of pollution in India made by two World Bank officials for 1992 (M. Bala chandran 2002), have calculated that damage to environment costs about Rs. 34,000 cr per year, about 9.5 per cent of gross domestic product accounting has emerged to determined that both government or individual has been fulfilling their responsibilities towards environment or not, Chauhan (2005). In India the stand-alone reporting practices exist, but with limited content and information. Companies are more inclined towards reporting their efforts rather than focusing on impact on the society. Indian companies are practicing only voluntary environmental disclosure as there are no comprehensive guidelines relating to environmental accounting and reporting apart from a few amendments and acts. Most of the listed Indian companies do not have a stand-alone report. These reports are qualitative rather than quantitative in nature. The quantitative measures of reducing solid wastes, air and water pollution, and carbon emissions are usually not described in the reports. The reports lack in systematic formulation of Environmental Management System. There is no mandatory requirement for quantitative disclosure of (financial) environmental information in annual reports neither under the Companies Act nor as per Indian Accounting Standards, Rajni Kant and Rima (2014).

2.6 Status of Environmental Accounting and Reporting Practices - International Scenario

Many countries of the world and their accounting professional and standard setting bodies like in USA (AICPA), Canada (CICA), UK (ACCA, ICAEW, ICAS), the Netherlands (NIVRA), Australia (ICAA), etc. and international bodies such as IFAC, IASB and, especially, FEE in Europe are seem to be active in environmental accounting issue. Few countries like Denmark, Netherlands, Norway, and Sweden have made environmental disclosures mandatory in business reporting, Goswamy (2014).

An increasing number of countries impose requirements on companies to report on their environmental performance. **Denmark** was the first country to adopt legislation on public environmental reporting. In this country, the companies are required to prepare a so-called “Green Account”. In the **Netherlands**, new legislation on mandatory environmental reporting has been adopted. Both Danish and Dutch regulations require reporting to the authorities and to the public.

In **Norway**, the new Accounting Act requires that all companies include environmental information in the annual report from 1999 onwards. In **Sweden**, similar legislation has been adopted for mandatory environmental disclosure in annual financial reports. **In Canada, the** Securities Commission requires public companies to report the current and future financial or Operational effects on environmental protection requirements in an Annual Information Form. **Australian** companies are now expected to give information on performance with regard to the environmental regulations that apply to them. In addition, a National Pollutant Inventory (NPI) is being created which requires industrial companies to report emission and inventories for specified chemicals.

In the **European Union**, based on Article 15 of the Integrated Pollution Prevention and Control (IPPC) Directive, Member State will be required to register emission data from large companies and report this data to the Commission. Existing literature on environmental reporting status in **UK** suggests that most of the British companies are still at general level in respect of environmental disclosure (Harte and Owen, 1991). Holland and Foo (2003) examined the environmental reporting practices within **UK** and **US** annual reports and found that the volume of environmental legislation has increased dramatically in both the countries. In UK disclosure appears to be clearly identified in the annual reports and is largely concerned with the management of environmental activities through management system. Campbell (2004) observed that in UK, larger and *more profitable firms have disclosed more environmental information.*

Brammer and Pavelin (2006) found in 450 UK sample companies, high quality of disclosure is primarily associated with larger firms and with those sectors that are

closely related to environmental concern. Disclosures by USA companies increased after environmental accidents such as the Valdez Oil Spills and issuance of some regulations by FASB (Gamble et al., 1995). It was also observed that poor performers provide more disclosures and most of these appeared within the Management and Discussion Analysis section and Notes section (Hughes et al., 2001).

In Hong Kong, a study carried out by Ho et al. (1994) found that out of 182 companies only nine companies (representing only 4.9%) disclosed environmental information in their annual reports for the year 1991. A recent **Korean** study by Choi (1998) shows that out of 770 listed companies 64 companies (8.3%), The average amount of disclosure per company was 7.5 lines. Tsang (1998) made a longitudinal study of social and environmental reporting in **Singapore** over a ten year period from 1986 to 1995.

He covered 33 listed companies and found that only 17 (52%) companies made social and environmental disclosures during the late 1980s and then a stable pattern since 1993. In a study of 22 large multi-national corporations in Nigeria, Desu and Gray 1998 noted that less than a quarter of companies made disclosures in the environmental. Indian companies have faced strong international competition over the past few decades, especially after the opening of the Indian economy in the early 1990s, as international competitors tried to establish their footholds in India. These international firms are disclosing non-financial information including environmental information, leading to an enhanced expectation from Indian companies to act responsibly towards the environment and be accountable to the society in that regard. Hence, to improve corporate image concerning socially responsible behaviour, it is expected that an increasing number of Indian companies will report their environmental performance, Chatterji and Mir(2008).

2.7 Legitimacy Theory

A number of different theories have been used to explain why corporations might voluntarily disclose social and environmental information to outside parties. According to Gray et al. (1995), the theories that seem to have been most successful in explaining the content and the level of social and environmental information

disclosures are the legitimacy theory and the stakeholder theory. Perrow (1970) defines legitimacy as a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values and beliefs, Juhmani(2014).

Legitimacy theory has become one of the most cited theories within the social and environmental accounting area. The theory of legitimacy will always be associated with the problems associated with the community. According Ghozali and Chariri in Paramitha (2014) reveals the definition of the theory of legitimacy as "a condition or status, that is when a company's value system in line with the value system of a larger social system in which the company is a part". Legitimacy theory focuses on the expectations of society at large, while the shareholder theory focuses on the expectations of certain interest groups. According to Nor Hadi (2014), the theory of legitimacy can be used as a vehicle for the construction of the company's strategy, especially related to efforts to position themselves in the middle of the more advanced society ". Legitimacy theory does offer a powerful mechanism for understanding voluntary social and environmental disclosures made by corporations, and that this understanding would provide a vehicle for engaging in critical public debate. Theory, deals with how organizational structures as a whole have gained acceptance from society at large. Organizations seek to establish congruence between the social values associated with or implied by their activities and the norms of acceptable behavior in the larger social system in which they are a part. Legitimacy often has been conceptualized as simply one of many resources that organizations must obtain from their environments.

Legitimacy theory is based on the concept of the social contract and is integral to the firm's environmental performance model. Corporations need to maintain their legitimacy to survive in today's business conditions. Legitimacy theory provides a more comprehensive viewpoint on corporate social disclosure as it clearly recognizes that organizations are bound by the social contract, Juhmani(2014). Environmental disclosures in the corporation's annual report may be used to maintain the firm's legitimacy with regard to environmental matters. The more environmental problems that a firm has, then the greater the firm's reaction will be to changes in public policy regarding the environment. Legitimacy theory has been used by researchers studying

social and environmental disclosures, and they indicate that corporations legitimize their activities because corporate management reacts to community expectations (e. g. Hartikayanti et .al(2016) and Juhmani(2014).Therefore, legitimacy theory assumes that voluntary corporate social and environmental disclosures are in response of social, economic and political factors.

2.8 Stakeholder theory

The “shareholder theory,” posited in the early 20th century by economist Milton Friedman, says that a company is beholden only to shareholders - that is, the company must make a profit for its shareholders. Stakeholder theory was first described by Dr. F. Edward Freeman, suggests that a company’s real success lies in satisfying all its stakeholders, not just those who makes profit from its stock. Friedman’s view is that companies are compelled to make a profit, to satisfy their shareholders, and to continue positive growth. By contrast, Dr. Freeman suggests that a company’s stakeholders are "those groups without whose support the organization would cease to exist." These groups would include customers, employees, suppliers, political action groups, environmental groups, local communities, the media, financial institutions, governmental groups, and more. This view decorates the corporate environment as an ecosystem of related groups, all of whom need to be considered and satisfied to keep the company healthy and successful in the long term. Stakeholder theory is even more important in the new global economy, An organization needs to be mindful not only of those who hold stock in the company, but also of those who work in its stores, those who work and live near its factories, those who do business with it, and even of competitors, as the company may shape the landscape in its industry. Under stakeholder theory, however, those shareholders could be joined by several other types of stakeholders, each with its own interests relative to the company. Here are a few possible stakeholders:

Employees: The employees want to be treated and compensated fairly, and work reasonable hours. If the company underpays the employees, or gives them lengthy and difficult work shifts, the employee attitude and buy-in in the company is going to erode.

Suppliers: Under stakeholder theory, suppliers should also be operating their own businesses ethically, fairly, and equitably. If the company truly wants long-term success,

stakeholder theory holds, it should treat suppliers and vendors well, but also do due diligence on how the supplier companies themselves do business.

Manufacturers:

In a global economy, sometimes parts or even whole products are manufactured in other countries, far away from the main marketplace or the location of the project. The company must think of its manufacturers and their employees as stakeholders too. So, working conditions and wages must be fair and equitable for them as well.

Environmentalists: These people who care about the local ecology would, under stakeholder theory, be considered stakeholders in the project, and should be kept apprised of plans and developments so they can have a chance to review them and weigh in with their thoughts. People who live in the city and neighbourhood where the housing development is being constructed want to be assured that the environment, water system, power sources, and other things potentially affected by the project, are protected in as transparent a way as possible.

1. Housing activists:

As more and more housing projects are built in increasingly dense cities, many local activists have a political voice and stake in how new developments are handled. If the construction company is truly subscribing to stakeholder theory, it will want to get buy-in from these activists. It's good public relations, but more than that, it's truly satisfying real stakeholders.

2. Governmental bodies

The city, county, and state likely have density, environmental, and other concerns. Even with governmental approval, a construction project needs regular check-ins with governmental bodies, regulated agencies like gas and electric companies, and more. All of the aforementioned are valid concerns to these stakeholders.

3. Neighbours

Neighbours should feel as though their quality of life is being maintained or enhanced - but not reduced because of the project of the company. The effective use of stakeholder theory also yields good public relations.

2.9 Agency Theory

Agency theory states the relationship between the parties accept the authority of that agency (managerial) with those who authorize i.e principal (owner / investor). Meckling (1976) introduced the idea that within the company is a nexus of contract which implies that within the company there is a set of reciprocal contract between the owner of the company, employees, suppliers and various other participants associated with the company. Potential problems that arise in the agency theory are the existence of information asymmetry. Parramatta (2014), argues that the reason for conflict between the agent and the principal was due to the asymmetry of information. The management (agent) would better understand the internal state of a company compared with the owner (principal). Such conditions would trigger the potential for fraud management to satisfy personal interests. One form of fraud which presents information that does not correspond to the actual condition of the company. This asymmetry may lead to a misallocation of capital. Environmental disclosure can be associated with agency theory, which means that the disclosure of social responsibility is one of the management's commitments to improve environmental performance; particularly social performance can improve the positive relationship between the principal and agent. Good environmental disclosure by managers is proof to investors that the company's resources have been managed effectively and efficiently. Thus, environmental disclosure will reduce the agency conflict, Hartikayanti et .al(2016).

2.10 Characteristics of Good Information

One of the fundamental objectives of reporting environmental performance is to communicate useful environmental information to the intended audience. Qualitative characteristics relevance, reliability, understandability and comparability are considered important for enhancing financial reporting are generally applied to the practice of environmental reporting as well.

These characteristics are deemed just as important as quantitative information, in establishing the credibility of a report (FEE, 2000).

Timeliness:

Environmental reports should be produced on a regular basis and clearly define the reporting period covered. If the interval between the reports is greater than a year, reasons for this decision should be provided (GRI, 2000).

Summary: Theoretical frame work of environmental accounting and reporting is the base for research study which provides the significant information about the role of organizations 'responsibility in environmental concerned activities and reporting to stakeholders. Different forms of environmental management accounting, types of environmental costs and the process of environmental reporting would be the major requirements for business entities irrespective of size and other characters of companies. By adopting environmental reporting in their annual report, they could avail many advantages. Also, management should provide environmental information with all its characters to satisfy all kind of stakeholders, Minimol and Makesh (2014).

CHAPTER 3

REVIEW OF LITERATURE

A number of studies have been conducted on the various aspects of environmental accounting and Reporting practices in India and other countries. Some of these studies focused on specific themes, such as *environmental conceptual frame work, evaluating the extent of environmental reporting practices, environmental legal and regulatory frame work, the relationship between environmental reporting practices and environmental performance, relationship between determinants or corporate characteristics and environmental reporting, relationship between environmental reporting and financial performance*. In this chapter, studies conducted in India, USA, UK and other countries have been reviewed to understand the status of environmental reporting practices and the development of prior literature in this field. All the three countries have contributed to environmental accounting and reporting literature in the categories of theoretical, legal and relating the variables oriented studies. This chapter has been structured into five sections.

The first section reviews the prior studies conducted on *theoretical framework of environmental accounting*. Conceptual framework plays an important role in guiding the entire process of the research study. Theories are constructed in order to explain, predict and master phenomena such as relationships, events, the behaviour and others. It is highly necessary for any research work.

Second section of this chapter deals with the *environmental legal and regulatory framework*, standards, rules and laws existed in India, UK and USA.

The phase of business has changed from traditional concept to modern concept. Now a day, business is making financial and social reporting on their official website. Size of company, nature of business and their revenue etc., are the influencing factors on environmental disclosures. Third section would describe the relationship between determinants or *corporate characteristics and environmental reporting*;

Fourth section dealt with analysing the relationship between *environmental reporting and financial performance*. Final section would be discussing the relationship between environmental reporting practices *and environmental performance*.

3.1 Studies Related with Theoretical basis

In recent years, there has been emerging stakeholder interest in voluntary non-financial disclosures. In fact, academic and corporate awareness of green, environmental or sustainable practices has increased in recent years. The theme of corporate social responsibility in the Indian context began in the 1950. Across the globe corporate environmental reporting has been voluntary in nature. The following table gives the summary of studies undertaken on the Conceptual or Theoretical framework of environmental reporting process. Following studies have discussed about the theoretical foundation of environmental accounting and reporting, *Forms of Environmental Accounting, perception and position of environmental reporting, general trends in corporate environmental internet reporting practices, status of social and environmental reporting, scenario of green initiatives, how environmental accounting is a tool for business etc., All these themes have been discussed in the prior literature and the review of literature would support research work to proceed further.*

Table 3.1: List of Studies Reviewed on Environmental Reporting - Theoretical Basis.

S.no	Author	Country	Methodology	Sample	Findings
1.	Chauhan (2005)	India	Conceptual	NO	Environmental accounting is in preliminary stage in India.
2.	Pramanik et. al (2007)	India	Conceptual	NO	The level of environmental related disclosures was not an encouraging level in India.
3.	Shenbagakulal Voymozhi (2008)	India	Questionnaire	260	Environmental reporting was yet to be seriously taken into consideration by the Indian companies.
4.	Chatterjee and Mir (2008)	India	Content Analysis	45	Indian companies were providing their environmental information both on their web sites as well as in their annual reports.
5.	Malarvizhi and yadhav (2008)	India	Content Analysis	24	Indian companies followed diverse reporting practices on the internet viz., stand-alone environmental reporting or reporting along with the Annual/Financial Reports, or Sustainability Reporting.

S.no	Author	Country	Methodology	Sample	Findings
6.	Baxi.C.V and Ray (2009)	India	Case Study	10	The major focus of reporting was based on qualitative description: need to achieve higher standards of transparency and accountability.
7.	Sen et. al., (2011)	India	Content Analysis	22	Revealed positive or neutral news , but none of them disclosed any negative news.
8.	Sonia kundra (2013)	India	Content Analysis	50	Serious about this issue and are reporting their green practices.
9.	Shukla & Vyas(2013)	India	Content Analysis	2	BPCL & ONGC are totally concern about the major issues of environment.
10.	Minimol and Makesh (2014)	India	Interview schedule.	25	Environmental accounting and reporting practices were in the nascent stage in India.
11.	Anand and Srineevasa (2014)	India	NA	NA	Corporate prepare a firm environmental policy, take steps for pollution control, comply with the related rules and regulations , and mention adequate details of environmental aspects in the annual statements.
12.	Murthy (2014)	India	NA	NA	Environmental reporting practices are in preliminary stages in India. The paper suggested ways to mitigate the adverse impact. The study revealed that most of the information has been in descriptive manner.
13.	Goswami (2014)	India	Primary and Secondary	12	Most of the information was non-quantitative in nature. Only few sample companies expressed quantitative disclosures.
14.	Malik and Mittal(2015)	India	NA	NO	Environment information in descriptive manner.
15.	Cheriyen (2015)	India	NA	NO	Absence of a standardized environmental accounting practice and disclosure norms and no satisfactory level of disclosure.
16.	Japee (2015)	India	Content Analysis	100	Large majority of the companies did not prepare environmental accounts for external reporting mainly because 'it is not mandatory '.

S.no	Author	Country	Methodology	Sample	Findings
17	Barbara J.et.al (1981)	UK	NA	NO	Current trends of accounting for the environment have been increased in disclosures in annual reports.
18	Wiseman (1982)	UK	Content Analysis	26	No relationship existed between the measured contents of the firms' environmental disclosures and the firms' environmental performance.
19	Hecht (2000)	UK	---	NA	If monetary valuations of no marketed items were readily available, they would provide a much more accurate understanding of the real impact of public policies and recommendations. In the current political climate, a concerted effort will be needed to help both the economy and the environment.
20	Kolk (2005)	USA, Japan And Europe	---	250	US multinationals has stabilised, a significant rise can be noted in both Japan and Europe. Multinationals from the UK and especially 'other European countries were the most likely to publish an environmental report in both years, and those from France the least.
21	Bainbridge (2006)	USA	---	NO	Environmental accounting is also increasingly in demand for policy development by NGOs' and a range of levels of government.
22	Ahamid (2002)	Egypt	NA	NA	He found that petroleum sector was not supported the sustainability. In order to achieve sustainable development precautionary policies such as environmental impact assessment, natural reserve areas, environmental awareness, environmental researches and environmental accounting and corrective policies such as pollution control, reallocating industries, monitoring have to be followed.
23.	Cowan (2005)	Australia	Content analysis Negative, neutral or positive	25	Australian listed companies have a propensity to disclose higher levels of positive environmental disclosures in the voluntary sections of the annual report than in the statutory sections of the annual report.
24.	Huang and	China	Content	759	As for intermediate stakeholder

S.no	Author	Country	Methodology	Sample	Findings
	kung (2010)		analysis 18 items 4 categories		groups, environmental protection organizations, and accounting firms were greatly influenced by managerial choices regarding their environmental disclosure strategies.
25.	Ying jun lu (2012)	China	Content analysis, 4 categories, 18 items	NA	The results indicated that good financial performance and large firm size were favourable to the socially responsible reputation of a firm.
26.	Ullah, md and hossain(2013)	Bangladesh.	Content Analysis, 56 items	30	Sample companies disclosed the expected information in their annual reports and environmental disclosure volume and size of the companies are significantly correlated.
27.	Yusoff et.al (2013)	Malaysian and Australian	Content Analysis.	100	The findings implied that this type of communicating environmental information did not contribute greater corporate accountability among companies in fulfilling stakeholders' needs and demands for environmental information.
28	Ahmad and Harat(2013)	Malaysia	Content Analysis	30	Both extent and quality of environmental disclosures were very low and most companies provided 'soft' disclosures. Companies were not consistent with the extent, nature or quality of environmental disclosures made over time.
29.	Ahmad (2012)	Bangladesh	Primary and Secondary data	40	Environmental disclosures in the form of expenditure in energy, waste management, and safety related measure and environment protection presented in their annual reports were not remarkable in the sample companies.
30.	Stray(2007)	UK	Content Analysis	40	Statistical tests of significance indicated that there was no significant difference between the two. However, neither industry devoted much attention to environmental accounting information.

Chauhan (2005) studied the *Forms of Environmental Accounting such as Environmental Management Accounting, Environmental Financial Accounting, and Environmental National Accounting have been described in this study*. Environmental responsibilities, the scope of environmental accounting, limitations and various laws relevant to environmental protection were discussed in this paper. He also described the status of environmental reporting practice in India. Very few corporations give adequate information regarding environmental issue. He concluded that *Environmental accounting is in preliminary stage in India*. For sustainable development of country, a well-defined environmental policy as well as proper follow up and proper accounting procedure is a must.

Pramanik.et. al (2007), analysed the theoretical foundation of environmental accounting and reporting with special reference to India. *The concept of environment accounting was focused on environmental cost*. The study pointed that, environmental accounting is a system that attempts to make the best possible quantitative assessment of the costs and benefits to an enterprise due to the environmental preservation activities that it undertakes. Further the paper discussed the functions, objectives, benefits, legislative issues, guidelines for environmental accounting and reporting. *The study concluded that, the level of environmental related disclosures in the corporate annual reports, both financial and non-financial is not an encouraging level in India*. The main reasons for this poor disclosure of environmental information may be its voluntary in nature. Lack of awareness and /or commitment on the part of the company management about the social responsibility of the company also found not satisfactory.

Sonia kundra (2013) *provided an insight in to the scenario of green initiatives in Indian context*. Also attempted to check environmental initiatives were industry specific or not. A sample for the study was 50 Nifty companies and the required data collected from companies' websites .An index was prepared with 40 items and content analysis used. The study revealed that, *green initiatives were industry specific to some extent, going green was the new trend in the modern business*. Companies operating in India were also serious about this issue and are reporting their green practices.

Cheriyann (2015), concluded that there is a lack of awareness and responsibility, *the absence of a standardized environmental accounting practice and disclosure norms at national as well as international levels spur the corporates to be away from the environmental accounting practices and to shut their eyes towards the deterioration in the environment.*

Malarvizhi and Yadhav (2008), examined the general *trends in corporate environmental internet reporting practices and to gain an insight into the corporate environmental internet reporting practices of selected companies.* The objective of understanding environmental accounting disclosure practices followed by Indian corporate on the internet, through a sample of 24 companies has been analyzed with extensively used secondary data. For analysis the sample were classified as manufacturing and non-manufacturing sectors and used various parameters. *This research had observed that Indian companies followed diverse reporting practices on the internet viz., stand-alone environmental reporting or reporting along with the Annual/Financial Reports, or Sustainability Reporting.* Involvement and commitment of corporate accountants in environmental management appeared to be limited due to lack of regional reporting guidelines.

Shenbagakulalvoymozhi (2008), focused mainly on *environmental reporting, and analysed the perception and position of environmental reporting among selected Indian Companies.* The study has discussed environmental threats due to industrialization. The study discussed about Perspective of companies and Perspective of investors. To understand both the perspectives, Questionnaire method was used to collect the required primary data. A sample size of 46 companies to study the perspective of the companies and a sample size of 260 investors to study the perspective of the investors were analyzed with various statistical tools. The study has revealed that though there is adequate environmental legislation, the enforcement of such legislation is at its primitive stage. And so, *the environmental reporting is inadequate and unsystematic.* Overall, *the environmental reporting is yet to be seriously taken into consideration by the Indian companies.* Though the number of companies reporting environment, has considerably increased over the years, the reporting pattern needs to be improved much at par with international standards.

Shukla and Vyas (2013), presented, *the theoretical foundation of environmental accounting and reporting with special reference to industry like ONGC, BPCL*. Environmental reports of two Indian Petroleum & Gas company named ONGC and BPCL were studied for three consecutive years 2008, 2009 and 2010 to analyse their environmental disclosure practices and the places of this disclosure in the annual report, its type and length to check the quality of environmental disclosure. The findings of the study showed that BPCL & ONGC were totally *concern about the major issues of environment that directly hamper the environmental performance and they agreed that they should pay their duty with their best by providing fully information about environmental related disclosure*, but industries provide only less information about the environmental related issues. There is also a lacking of quantitative information.

Baxi. C. V and Ray (2009), have analysed the *status of social and environmental reporting of companies in India*. The study has explained the social and environmental disclosure practices of ITC, L&T, Reliance, TCS and other popular companies. The analysis was based on personal discussions with the CEOs, CFOs, independent directors, whole time directors, nominee directors, executive directors and general managers of public and private companies. It was observed that the quantitative measures were not described, lack in systematic formulation of environmental management system, environmental policy is qualitatively designed with no environmental targets and Environmental Impact Assessment of different projects was not accounted in reports. They concluded that the current business practices in Indian companies do not reveal substantive approach towards environmental and social disclosures and reporting. *The major focus of reporting is based on qualitative description of their functions and roles. Corporations presently need to achieve higher standards of transparency and accountability by way of good corporate governance.*

Minimol and Makesh (2014) have studied *the green accounting and reporting practices*. The study focused on the extent to which Indian corporates practice, voluntary environmental reporting with regard to the environmental parameters identified. The study developed a model with four basic dimensions of green

accounting such as, environmental assets, environmental liabilities, environmental expenditures/costs and environmental incomes/benefits were explained. The study covered Annual Reports of 25 Indian Companies – 12 from manufacturing sector and 13 from non-manufacturing sector and collected primary data. Factor analysis was used and concluded that, *environmental accounting and reporting practices were in the nascent stage in India.*

Mitali Sen et al (2011), studied the *existing status of environmental disclosure practices in* four major industries, namely oil and petrochemicals, mining and minerals, cement and steel industry. Waste disposal costs and other environmental liability costs are crucial information to be disclosed by core sector companies as they have direct impact on the environment. Various theories related to environmental disclosures have been discussed in this paper. Sample for the study comprises of 22 core sector. Content analysis had been used on the basis of certain criteria or themes related to environmental information. A total of 15 themes had been identified for the study. *It was observed that almost all the sample companies disclosed most of their environmental information in their director's report and a few information was disclosed in chairman's report. The study also found out that most of the sample companies had revealed positive or neutral news, but none of them disclosed any negative news.*

Anand and Srineevasa (2014), attempted to examine, how *environmental accounting is a tool for business.* He discussed that environmental accounting is an inclusive field of accounting and described the status of environmental accounting. A trade-off between environmental protection and development is required. A careful assessment of the benefits and costs of environmental damages is necessary to find the safe limits of environmental degradation. *Very few corporations give adequate information regarding environmental issue. People of India are not made aware towards environmental safety; It is the time that corporate prepare a firm environmental policy, take steps for pollution control, comply with the related rules and regulations, and mention adequate details of environmental aspects in the annual statements.*

Chatterjee and Mir (2008), *the purpose of this paper was to explore the state of environmental reporting by Indian companies on their web sites and also in their*

annual reports. This paper has applied the legitimacy theory to explain the reasons behind the disclosure of environmental information in annual reports and web sites of Indian companies. Legitimacy theory suggested that the organisation must appear to consider the rights of the public at large, not merely those of the investors. The paper discussed about regularity aspects in India. The sample companies for study comprised the top 45 Indian companies by market capitalisation as listed on www.indiaonline.com as on 31 December, 2003. Content analysis had been used the extent of environmental information disclosure. A comparison of the disclosure of environmental information between web sites and disclosure in annual reports suggested that a greater number of companies have disclosed environmental information on their web sites compared to within their annual reports. Also, the total number of sentences disclosed on web sites was significantly more than in annual reports. *The study revealed that although not mandatory, Indian companies were providing their environmental information both on their web sites as well as in their annual reports.* It was also observed that most of the sampled companies have provided the news of a positive and neutral nature and none of them disclosed any “bad” news.

Goswami (2014), *tried to address the development of corporate level environmental accounting and the problems associated with that.* The study based on both primary and secondary data with a sample of 12 companies from the list of top 50 companies of National Stock Exchange, consisting cement industry, pharmaceutical and energy industries for the year 2012-2013. *It also recognized the fact that the increase in level of environmental awareness, most of the Indian companies report environmental initiative in their annual report. However, such reporting was mere descriptive and nothing was disclosed about its financial implications and accounting policy of environmental cost.* Another important fact was that the most of the information were non-quantitative in nature. Only few sample companies expressed quantitative disclosures.

Malik and Mittal (2015), *concentrated on exploring the concept of green accounting, its practices and reporting in India.* Mandatory reporting is nothing but a minimum prescribed reporting requirement. Preliminary investigation of this study

showed that Indian companies practice more of voluntary environmental reporting in the form of satellite reporting, sustainability reporting, GRI reporting and internet reporting. *Very few corporations give adequate information regarding environmental issue, there was very little and inadequate information provided by the companies and larger companies are more likely to disclose than smaller companies. It was also revealed that most of the companies disclose the environment information in descriptive manner.*

Japee (2015), *presented various theoretical and legal considerations relating to environmental accounting and reporting (EAR).* The study surveyed the attitudes of senior executives in 100 large manufacturing companies in India (the preparers group) on various issues relating to EAR. The required information was obtained by using two structured questionnaires. The first questionnaire was used to obtain opinions of the CAs on various issues relating to EAR. The second questionnaire was used to examine EAR practices followed by the companies in India. 100 Manufacturing companies from both public and private sectors were selected from the recognized stock exchange's List of top 500 companies in India. An analysis of environmental accounting practices *revealed that a large majority of the companies did not prepare environmental accounts for external reporting mainly because 'it is not mandatory'. By and large, the qualified accountants as well as the senior accounts executives preferred use of conventional financial accounting principles in treating environmental costs in the financial statements.*

Barbara J.et.al (1981), *described history of accounting for the environment from its past to the present, comparing the United States with Western Europe and the United Kingdom, presented justifications of the issue including social accountability.* The research work explained the complexity surrounding the Legislation regarding environmental accounting in UK and USA . The UK's policy included suggestions on sustainable development, raising awareness, institutional framework, climate change, tropical forests, ozone layer, waste management, energy, industrial development, transport, agriculture, the North Sea, countryside and wildlife conservation, water resources, global population, international debt and international conservation of species and their habitats. Accounting for the environment in the US had a much

higher profile (i.e. publicity) than in the UK. *It is concluded that current trends of accounting for the environment has been increased in disclosures in annual reports. However, the type of information being reported varies among corporations and countries.*

Wiseman (1982), *evaluated the quality and accuracy of environmental disclosures made in corporate annual reports.* Annual report disclosures made by 26 firms in environmentally sensitive industries were examined. An indexing procedure was used to measure the contents of the disclosures, and the relationship between the disclosure contents and the firms' environmental performance was tested. The study provided a detailed measure of environmental disclosure contents. Results indicated that corporate environmental disclosures were incomplete and they were not related to the firms' actual environmental performance. *The findings indicated that the voluntary environmental disclosures were incomplete, providing inadequate disclosure for most of the environmental performance items included in the index. Further it was demonstrated that no relationship existed between the measured contents of the firms' environmental disclosures and the firms' environmental performance.*

Hecht (2000), *provided his views on green accounting. He attempted to construct conceptual frame work on green accounting.* "Environmental accounting," sometimes called "green accounting" or "green GDI*" is the effort to build information systems on environmental issues that can be linked to economic data. He suggested that environmental protection expenditures- recycling, sewage treatment, trash disposal, manufacture of treatment equipment should be integrated to regulatory changes or to improvements in environmental quality. The study revealed that, "green GDP" discussions of environmental accounting always considered adjusted macroeconomic indicators, particularly GDP. *In the current political climate, a concerted effort will be needed to help both the economy and the environment.*

Bainbridge (2006), *provided an insight into the theoretical concept of environmental accounting. Environmental accounting is developing rapidly and improving decision-making around the world. Challenges, benefits and different approaches of environmental accounting were described and the study was concluded with the status*

of environmental accounting concepts. Environmental accounting demands new skills, tools, and more integrated accounting across department and division lines within companies and all the company or organization stakeholders.

Murthy (2014), *described the conceptual frame work of environmental accounting* and stated that environmental accounting provides a structure for coordinating data on the use a of natural assets and ecological assets as well as expenditures on environmental defence asset management. *He concluded that environmental reporting practices in preliminary stages in India.* The study revealed that most of the information has been in descriptive manner.

Kolk (2005), *investigated the differences in patterns and trends in reporting by Triad(USA,Japan and Europe) multi nationals, also examining whether Convergence had occurred and to find the factor influenced the environmental reporting* focusing on the Triad Fortune 250 multinationals, both years 1999 and 2002. It was mentioned in the study that, in 2001, the European Commission published a recommendation to stimulate voluntary disclosure on environmental and social issues in annual reports, reflecting societal concerns in this direction. The study concluded that while environmental reporting by US multinationals has stabilised, a significant rise can be noted in both Japan and Europe. Multinationals from the UK and especially 'other European countries were the most likely to publish an environmental report in both years, and those from France the least. Industrial sector of industry was still the most important determinant for explaining environmental reporting by Triad multinationals. The study had shown that in the period 1999-2002, the publication of environmental reports by Triad multinationals increased significantly from 40% to 51%. Considering Europe as a whole, a convergence between Europe and Japan can be noted, but inside Europe differences have increased. *It was revealed that there was no support for the convergence, but rather showed a trend towards increasing importance of the country of origin as far as accountability on environmental issues was concerned.*

An article by **Huang and Kung (2010)**, *investigated stakeholder expectations associated with corporate environmental disclosure.* Results showed that the level of

environmental disclosure was significantly affected by stakeholder groups' demands. *As for intermediate stakeholder groups, environmental protection organizations, and accounting firms were greatly influenced by managerial choices regarding their environmental disclosure strategies.*

Ahamid(2002), aimed to set *the conceptual framework for environmental accounting for different purposes*. It can support natural resource accounting at macro level, ecological accounting at local administration level and at micro level related to financial accounting, cost accounting or managerial accounting. Author has selected the petroleum sector and analysed the efforts in the environmental protection as a case study. He found that petroleum sector was not supported the sustainability. In order to achieve sustainable development precautionary policies such as environmental impact assessment, natural reserve areas, environmental awareness, environmental researches and environmental accounting and corrective policies such as pollution control, reallocating industries, monitoring have to be followed. *He concluded that there is a room introduce a system of environmental accounting in petroleum sector. No doubt that the suggested system will help filling the existing gap.*

Cowan (2005), *extended the literature in the environmental disclosure area by examining annual report disclosure practices of Australian companies within the combined voluntary and mandatory environmental disclosure system*. Content analysis was used to investigate the environmental disclosures over three consecutive years in the annual reports of companies. The disclosures were then classified into three subcategories according to whether the disclosure was negative, neutral or positive in its reflection of the organisation's approach to environmental issues. According to the study mandatory environmental disclosures are those appearing in the director's report with environmental regulation and the company's compliance with such regulations. Therefore, voluntary environmental disclosures are those appearing in sections other than the directors' report. *The study found that Australian listed companies have a propensity to disclose higher levels of positive environmental disclosures in the voluntary sections of the annual report than in the statutory sections of the annual report.*

Yingjun Lu. (2012), investigated corporate social and environmental disclosure practices in the context of the largest developing country – China. The study inquired into three research issues related to the current state of social and environmental disclosure practices of socially responsible Chinese listed firms, the determinants influencing Chinese firms' social and environmental disclosure and the link between firms' CSR reporting and the quality of CSR report . Content analysis was used to collect empirical data, a questionnaire survey was used to collect the data about disclosure quality, a stakeholder panel consultation was used to collect the data about disclosure quality relating to items through investigating stakeholders' perceptions on the relative importance of disclosure items. The research found that for those socially responsible firms, publishing a CSR report and the quality of disclosure in the CSR report had positive effects on their socially responsible reputation. *The results indicated that good financial performance and large firm size were favourable to the socially responsible reputation of a firm.*

Ullah, Md and Hossain (2013), *evaluated the latest 30 annual reports of the 30 sample companies were collected for the year 2011.* The study was conducted on the basis of secondary data. A manual content analysis approach was followed in analyzing the annual reports. A data set consisting of 56 items of environmental information were classified into six classes and used in this study. It was found that sample companies disclosed environmental information basically in written form and sometimes through pictures. *The study revealed that on an average sample companies disclosed 8.53 (15.23%) of the expected information in their annual reports and environmental disclosure volume and total asset of the companies are significantly correlated. The study opined that companies of Bangladesh are disclosing very inadequate environmental information in their annual reports.*

Yusoff et.al (2013), *investigated the state of environmental reporting by Malaysian and Australian companies on 'other' reports, i.e. other than annual reports.* The paper employed content analysis to study the environmental disclosures made by the selected 100 companies in the two countries. Regression analysis was performed on potential influencing factors for environmental reporting. . This study comparatively explored the environmental practices and interprets the possible relationship between influencing

factors and actual environmental reporting practices in Malaysia and Australia. *The findings implied that this type of communicating environmental information did not contribute greater corporate accountability among companies in fulfilling stakeholders' needs and demands for environmental information.* Hence, it was suggested that to promote better and greener environmental reporting practice need more effort.

Ahmad and Harat (2013), provided empirical evidence with a sample of largest 30 companies, utilized a content analysis to examine the extent of disclosures and counted the number of sentences. Both extent and quality of environmental disclosures were very low and most companies provided mostly “soft” disclosures. They also make very few “hard” disclosures, comprising objective, verifiable data. Thus, the Malaysian Government needs to seriously consider making environmental reporting mandatory and to provide more detailed and comprehensive environmental reporting guidelines. Another major finding was that companies were not consistent in the extent, nature or quality of environmental disclosures made over time.

Ahmad (2012), *evaluated the environmental accounting and reporting practices in the selected companies.* Both primary and secondary data were collected and analysed the need for environmental accounting for 40 companies, evaluated the environmental reporting awareness, examined the position of environmental information in the annual reports, and identified the problems involved in environment reporting. The study revealed that, i) the respondents have felt the strong need for environmental accounting and environmental reporting in their annual reports, ii) the respondents have also been aware for environmental reporting practices, iii) it is observed that only qualitative disclosures in positive sense have been provided in the annual reports either in Chairman or Managing Director statement, Directors' reports and a separate section “Environmental Compliance”, iv) *Environmental disclosures in the form of expenditure in energy, waste management, safety related measure and environment protection presented in their annual reports were not remarkable in the sample companies except expenditure in energy.*

Stray (2007), *investigated sectorial differences in two industrial sectors the Water industry and the Energy industry.* It was observed that many companies addressed most

of the issues raised in the guidelines. A total of 27 environmental reporting categories were eventually identified. These were based on three main categories which were subdivided into a total of 17 sub-categories. Three were further sub-division of 13 categories. The study found that the Water industry typically reported more than the Energy industry, but statistical tests of significance indicated that there was no significant difference between the two. Water industry devoted twice as much reporting to category one on the consideration of summaries of policies, targets and achievements in environmental conservation than the Energy industry. Energy industry only 17 of the 40 companies provided environmental reports there were clearly considerable variations both within and between the two sectors in terms of how much is reported, and the specific topics that are reported and upon where efforts are concentrated.

3.2 Studies Related with Legal and Regulatory Framework

The concern for the environment has been further stimulated by economic liberalisation and deregulation in India, attaching further significance to production, manufacturing and services. In order to control emissions from production processes, air quality regulations lay down stringent equipment specifications that are required to be implemented by the polluting industries, the governments of India are promoting more and more regulations. Environmental legislation is creating additional corporate obligations, Environmental legislation and enforcement vary among jurisdictions, and these differences may impact competitiveness and, consequently, trade and investment. In India, over the past few years, there has been an increase in environmental regulations and guidelines requiring disclosure by companies. The following table provides the list of prior studies undertaken by researchers on law and regulations followed on environmental accounting and reporting. Review on *environmental national policy and the challenges, Governmental and business control of environmental regulation generally and small-scale industrial pollution in particular, level of compliance by listed Indian firms with disclosure requirements of Indian Accounting Standards. overview of the environmental accounting and reporting laws and regulation across the countries, overall scenario of green accounting and existing forms and legal practices followed by Indian corporate houses,* etc have been discussed in this section.

Table 3.2: List of Review of Studies on Environmental Laws and Regulations.

S.NO	Author	Country	Sample	Findings
1	PRABHU (1999),	India	NA	India pursued policies which complement mitigation of climate change and efforts include national programs for energy conservation, India is responding to the challenges and opportunities of sustain able development through innovative reforms and restructuring.
2	STULIGROSS (1999),	India	NA	The Government does not have the massive resources required to enforce existing environmental regulations and, if these regulations were enforced, they would place an especially grave strain on small-scale industries.
3	KOHLI (2012)	India	156	Study indicated none of the companies in the sample was fully compliant with the mandatory requirements of the Indian Accounting Standards. Moreover, results indicated a strong and positive association between level of disclosure and the size, profitability and timeliness of reporting of the sample companies.
4	BORA AND DAS (2013)	India		Most of the organizations in India are now trying to be environmentally friendly not only to avoid penalty and other costs associated with environment but also for availing the greater benefits that corporations may attain in the forms of effective decisions made on the basis of information provided by accountants on environmental issues.
5	SHIL (2013),	India	NO	The study concluded that environmental accounting and reporting was in preliminary stage in India and the disclosure showed in the accounts in this regard is more or less compliance of relevant rules and regulation in the Act.
6	BEWLEY (1998),	Us & Canada	No	US sample indicate that this coefficient becomes less negative after the regulatory change in 1993.
7	FOO. (2002)	UK &Us	37	The volume of environmental legislation has increased dramatically in both UK and US.
8	BARBU ET.AL(2012),	UK, Germany & France	193	Environmentally sensitive firms exhibit higher overall disclosure scores and larger firms reported more environmental information. German firms disclosed less environmental monetary information than British and French ones. There was no international standard exclusively dedicated to environmental issues, half of the firms did not report any environmental information.
9	IRENE ET.AL (2008),	Spain	78	But still remains a considerable level of non-compliance and some of the problems associated with voluntary disclosure persist
10	RENGA (2013),	India	NO	Observed that environmental friendly programs and practices resulted in better competence and enhanced environmental performance.

Shil (2013), *observed overall scenario of green accounting and existing forms and legal practices followed by Indian corporate houses*. It had been argued that gross domestic product ignores the environment and therefore decision makers need a revised model that incorporates green accounting. The study was relied on secondary data. He found the disclosure showed in the accounts in this regard is more or less compliance of relevant rules and regulation in the Act. *Business houses have to prepare a concrete environmental policy, take steps for pollution control, comply with the related rules and regulations, and mention sufficient details of environmental aspects in the annual reports*.

Prabhu (1999), *presented his views on the environmental national policy and the challenges*. The study focused on ***framing national policy*** which can balance economic development and environmental protection. He discussed the regulatory status that India is striving towards strengthening monitoring instructions. Policy initiatives relate to the handling of hazardous substances in industry and transportation and the dangers posed by chemical accidents to human life and the environment. State governments are also identifying waste disposal sites where both public and private sector build the tools and frameworks necessary for profitable and attractive environmental investments. He has pointed out the commercial Centre Mumbai has its peculiar environmental problems related to coastal regulations, lack of housing and amenities, growth of the chemical industry, regulation of hazardous substances, and, of course, vehicular pollution. *It was concluded that environmentally sound development policies are necessary to preserve India's natural beauty. India pursued policies which complement mitigation of climate change and efforts include national programs for energy conservation, renewable energy, and fuel substitution and pollution abatement*.

Stuligross (1999), *analysed the political and economic constraints on Governmental and business control of environmental regulation generally and small-scale industrial pollution in particular*. Four Institutional mechanisms have identified as status quo challengers: electoral politics, the courts, non-governmental organizations (NGOs), and aspects of international trade and diplomatic interaction. India's domestic environmental conditions are bad and getting worse. Four arguments were explained

by the author. The first argument was one of institutional access. There was a reason to believe that more stringent and broader environmental orders would be passed because India's vibrant civil society is poised to influence both elected officials and the court. The second, addressed the global political-economy, shows that pressures for internationally binding agreements can affect domestic governmental calculations. A final pair of arguments combined to explain how direct interaction between the Indian and world environments. *The government does not have the massive resources required to enforce existing environmental regulations and, if these regulations were enforced, they would place an especially grave strain on small-scale industries.*

Bora and Das (2013), summarized laws and guidelines relating environmental accounting and reporting in some selected countries. The authors have investigated how environmental disclosures vary under environmental laws across the countries. They found that environmental accounting regulation in India was still at nascent stage. In the absence of suitable enforcement mechanisms, real convergence and harmonization was unlikely to happen. The study discussed the regulatory framework of some selected countries like Denmark, France, Norway, Australia, Germany, Sweden etc.

However, only a few international accounting standards exist on environmental issues. *Most of the organizations in India are now trying to be environmentally friendly not only to avoid penalty and other costs associated with environment but also for availing the greater benefits that corporations may attain in the forms of effective decisions made on the basis of information provided by accountants on environmental issues.*

Kohli (2012), empirically investigated the disclosure requirements of Indian Accounting Standards. It was argued that, India's Accounting Standards have been gradually converging with the International Financial Reporting Standards (IFRS) since 2001. India currently stands on the approach of adopting the International standards.. This study addressed two research issues to determine current level of compliance with selected disclosure requirements of Indian Accounting Standards and key corporate characteristics that affect their level of compliance. The data used for

the study pertains to the financial year 2009-2010, reviewed annual reports of 156 listed Indian firms and utilized disclosure and compliance index methodology to calculate the level of disclosure. *The findings of this study indicated none of the companies in the sample was fully compliant with the mandatory requirements of the Indian Accounting Standards. Moreover, results indicated a strong and positive association between level of disclosure and the size, profitability and timeliness of reporting of the sample companies.*

According to **Ranga (2013)**, India is one among the pioneer of developing countries to practice more of voluntary green performance reporting. Various forms of environmental accounting like, Environmental Management Accounting, Segment Environmental Accounting, Eco Balance Environmental Accounting, Corporate Environmental Accounting, Environmental Financial Accounting and Environmental National Accounting have been defined in this study. Environmental legislation is creating additional corporate obligations. Environmental legislation and enforcement vary among jurisdictions, and these differences may impact competitiveness and, consequently, trade and investment. *Environmental laws, however, not specified how the corporation's financial records should reflect these new responsibilities. (Conklin Archibald).*

Bewley (1998), investigated the economic consequences of regulatory intervention on the financial reporting of environmental liabilities. It described the introduction of new financial reporting standards that relate to managers' and auditors' responsibilities in estimating and reporting environmental liabilities. The impact of the intervention was measured by multiple linear regression of share price levels on environmental liability book values and other relevant financial statement variables. *The empirical analyses indicated that the market places a negative valuation on environmental liabilities.* Results for the US sample indicate that this coefficient becomes less negative after the regulatory change in 1993.

Irene et.al (2008), have investigated the effectiveness of Corporate Social, Ethical and Environmental Reporting (SEER) regulation and, more particularly, the effectiveness of improved standards. It firstly pursued to establish whether companies

provide complete and reliable reporting to stakeholders in an improved legal framework. Secondly, they aimed to understand the role of SEER in relation to disclosure obligations. The sample consisted of the consolidated annual accounts of listed companies from 2001 to 2003. A sample included 78 companies and thematic content analysis was used in this study to construct different measures of disclosure. *Overall, the results suggested that progressive and improved regulation could increase the volume and quality of SEER disclosure. But still remains a considerable level of non-compliance and some of the problems associated with voluntary disclosure persist: reporting was used to manage the public impression of the environmental performance of the firm, reporting good news rather than bad news.*

Foo. (2002), *investigated current corporate environmental reporting practices within UK and US to determine whether companies disclose environmental information in their annual reports.* Also the study tried to discover the differences of disclosures between the UK and the US and to examine how and why these arise. 20 biggest companies based on the total amount of market capital were selected from each country. Finally, a total of 37 annual reports were obtained, where 19 annual reports were from UK and the rest from US. In this study, content analysis was employed to collect the necessary data. Though environmental legislation in the UK was not as considerable as that of the US, more companies in the UK sample produced stand-alone reports and/or included a separate environmental section than US companies. UK companies produced stand-alone reports compared to 39% in the US. *The research had outlined the result of KPMG survey- 1999, that the rate of publishing external environmental and HSE reports increased in all countries. The volume of environmental legislation has increased dramatically in both UK and US.*

Barbu et.al (2012), *investigated whether the level of environmental disclosure under IFRS was related to the size of the reporting firm and the strength of legal and regulatory constraints on environmental disclosures in the country where the firm is domiciled.* The analysis of IAS/IFRS showed that no international standard was exclusively dedicated to environmental information, but environmental issues were mentioned in several standards and interpretations. Results indicated that environmental disclosures imposed by IFRS increased with firm size, just like

voluntary environmental disclosures. Application of IFRS was affected by the reporting practices that prevailed prior to IFRS adoption. Results also proved that firms domiciled in countries with constraining environmental disclosure regulations (i.e. France and the UK) report more on environmental issues than do firms domiciled in countries with weakly constraining regulations (i.e. Germany). It was discussed in the study that, UK, France and Germany were selected because of their traditions in environmental protection and they are the largest European economies with their contribution to the European Union's budget amounting to approximately 48 % . At the same time, these three countries are the largest polluters in the EU. There are 35 German companies, 41 French ones, and 117 British firms that belong to the selected super-sectors. *The interpretations showed that there was no international standard exclusively dedicated to environmental issues, half of the firms did not report any environmental information at all, environmentally sensitive firms exhibit higher overall disclosure scores and larger firms reported more environmental information. German firms disclosed less environmental monetary information than British and French ones.*

3.3 Influence of Environmental Disclosure on Financial Performance.

Survey of empirical literature show that corporations are disclosing social and environment information in corporate annual reports and this has increased over years. Companies' disclosure practices are influenced by many internal and external factors. Basically, the firm's financial status or performance is assumed as a key indicator to expect adequate full disclosure on financial and social reporting, specifically environmental reporting. However, most of the prior studies concentrated on developed countries and very few studies focused on developing countries such as India. The reviews of Indian studies are discussed below. To measure the financial performance, Return on capital employed (ROCE) , Earnings per share (EPS), Dividend per share (DPS) Net profit Margin (NPM), Return on Assets (ROA), and Return on Equity (ROE) have been commonly used in the studies. Although researchers have drawn from a wide range of theoretical perspectives, they have consistently wondered that larger, more profitable firms and those in more 'socially-'

and 'environmentally-sensitive' industries can be expected to make greater use of the voluntary disclosure of information about their social and environmental activities.

Bewley (1998), investigated the economic consequences of regulatory intervention on the financial reporting of environmental liabilities. It described the introduction of new financial reporting standards that relate to managers' and auditors' responsibilities in estimating and reporting environmental liabilities. The impact of the intervention was measured by multiple linear regression of share price levels on environmental liability book values and other relevant financial statement variables. *The empirical analyses indicated that the market places a negative valuation on environmental liabilities.* Results for the US sample indicate that this coefficient becomes less negative after the regulatory change in 1993.

Table 3.3: Impact of Environmental Disclosure on Financial Performance.

Author & year	Country	Method	Sample	Variables	Findings
Makori and Jagongo (2013)	India	Content Analysis	14	ROCE, EPS, DPS And Net profit Margin.	There was significant negative relationship between environmental accounting and Return on Capital Employed (ROCE) and Earnings per Share (EPS) and a significant positive relationship between Environmental accounting and Net Profit Margin and Dividend per Share.
Rajnikant and Rima (2014),	India	NA	Reliance	ROCE, NPM, DPS, EPS	Positive relationship with the Net Profit Margin (NPM) and Dividend Per Share (DPS) and a negative relationship with Return on Capital Employed (ROCE) and EPS.
Singh and Jackson (2015)	India	NA	Primary data	NA	Reported that Firms experiencing significant environmental performances over time also experienced similar financial performance changes.
Cohen et.al (1997),		Content Analysis	Two industry-	ROA and	It was reported that over 80% of the portfolio, the

Author & year	Country	Method	Sample	Variables	Findings
			balanced portfolios	ROE	"low polluter" portfolio performs better than the "high polluter" portfolio. ROA and ROE were significantly lower for the "high TRI" portfolio, although not statistically significant.
Malarvizhi and Matta(2016)	India	Content Analysis	85	ROCE, ROE, NPM & EPS	There was no significant relationship between the level of environmental disclosure and firm performance.
Harte and Owen (1991)	USA & UK	NO	30	NA	Revealed that most of the environmental reporting was still at a general level and very close to a mere general commitment to green issues. P
Gray et.al(2001),	UK	Content Analysis	100	Size, profit and industry Affiliation.	There was no any stable relationship between any measure of disclosure and any corporate characteristics.
Yap et.al (1996)	Singapore.	Content analysis	60	Net profit	There was a significant and positive relationship between the extent of environmental disclosure and financial performance.
Norhasimah et.al (2015)	Malaysia	NO	100	NPM	There was a significant relationship between total environmental disclosure and profit margin.
Smith et.al(2007)	gKuala Lumpur	Content Analysis	40	Industry membership, financial performance, share price fluctuations, political cost	The findings suggested that environmental disclosure was negatively associated with company financial performance
Liu and v. Anbumozhi (2009)	CHINA	GRI	175	size, The role of shareholders and creditors .	The better the company's economic performance, the more information on environmental investment and pollution control cost was disclosed.
Ong et.al (2016)	Malaysia	Content	100	ROA,ROE and	The results showed that

Author & year	Country	Method	Sample	Variables	Findings
		analysis		EPS	only the quality of environmental disclosure has the positive relationship with the company's Earnings per Share (EPS).
Connelly and Limpaphayom (2004),	Thailand.	Content Analysis	200	NA	It was summarized that corporations have an obligation not only to act responsibly towards stakeholders but also to disclose their actions to other stakeholders.

Makori and jagongo (2013), evaluated the significant relationship between environmental accounting and profitability of selected firms listed in India. The study collected annual reports and accounts of 14 randomly selected quoted companies in Bombay Stock Exchange in India. The data were analysed using multiple regression models. The key findings of the study showed that *there was significant negative relationship between environmental accounting and Return on Capital Employed (ROCE) and Earnings per Share (EPS) and a significant positive relationship between Environmental Accounting and Net Profit Margin and Dividend per Share.* The sample size considered for this research is too small to generalize and conclude for diverse sectors of Indian companies.

Malarvizhi and Matta (2016), Primary objective of this research was to understand the significant relationship between *corporate environmental disclosure and firm performance* of selected companies listed in Bombay Stock Exchange (BSE), India. This research used content analysis methodology by developing an environmental disclosure index and formulated hypotheses to test the association between firm performance and level of environmental disclosure through a sample of 85 companies from chemical, energy and metal sector listed in BSE. A regression model with environmental disclosure index as dependent variable and return on capital employed (ROCE), return on assets (ROA), net profit margin (NPM) and earnings per share (EPS) as independent variable was used to analyze data for this research. *Results showed there was no significant relationship between the level of environmental*

disclosure and firm performance. Only few large sized companies are disclosing their environmental information and level of reporting for the rest of the companies continues to be low. Government should make environmental reporting mandatory to ensure increase in the level of reporting.

Harte and Owen (1991) *focused on the disclosure of the information relating to the external environmental impact of corporate activity. Latest annual reports of 30 British companies were collected for the year 1990 and to investigate the environmental reporting practices in their annual reports and suggested for external standards on environmental reporting. Their study revealed that most of the environmental reporting was still at a general level and very close to a mere general commitment to green issues. In the U.S., disclosures on environmental (i.e., pollution) and energy matters were widely reported. The surveys showed the trend towards a greater coverage of green issues while at the same time they illustrated the diversity of reporting practice.*

Cohen et.al (1997), *examined how an individual firm's environmental performance impacts its financial performance. The objective of the study was to describe the environmental performance of the Standard and Poor's 500 companies. Two industry-balanced portfolios were created and compared, also examined the stock market reaction to new information on the environmental performance of individual firms. Environmental performance data included nine different measures and accounting returns and stock market returns were used for economic performance. Accounting returns were measured using return on assets (ROA) and return on equity (ROE) .It was reported that over 80% of the portfolio, the "low polluter" portfolio performs better than the "high polluter" portfolio. ROA and ROE were significantly lower for the "high TRI" portfolio, although not statistically significant.*

Yap et.al (1996), *investigated the relationship between environmental disclosures and financial performance using a sample of potentially polluting publicly-listed companies in Singapore. Content analysis was used to determine the environmental disclosure variable. The sample consisted of 60 Singapore publicly-listed companies. The authors found that sample 30 companies, actually disclosed environmental*

information in their annual reports and the other half did not. Regression analyses were also employed to investigate the overall relationship between financial performance and environmental disclosure. *There was a significant and positive relationship between the extent of environmental disclosure and financial performance. Firms with better prior financial performance make greater subsequent environmental disclosures.* Firms with more environmental disclosures would have a positive impact on subsequent financial performance.

Rajnikant and Rima (2014), tried to establish whether there was any significant relationship between environmental accounting and profitability of Reliance Industry Limited, Gujarat. The data for the study were collected from annual reports and accounts of Reliance Industry Limited. The data were analysed using multiple regression models. Amount spent by each company as their environmental cost was used as proxy for environmental accounting while Return on Capital Employed (ROCE), Net Profit Margin (NPM), Dividend Per Share (DPS) and Earnings Per Share (EPS) were used as proxy for firm's profitability. The study revealed that Environmental accounting has a positive relationship with the Net Profit Margin (NPM) and Dividend Per Share (DPS) and a negative relationship with Return on Capital Employed (ROCE) and Earnings Per Share (EPS) in the period under study. The sample size considered for this research was too small to generalize and conclude for diverse sectors of Indian companies.

Gray et.al (2001), distinguished the concept of study between (a) whether the disclosures are mandatory or voluntary and (b) the areas of activity to which the disclosure relates (e.g environmental, community and employee). This database comprised the social and environmental disclosures in the annual reports of the top 100 UK companies on a year by year basis and content analysis was used in the study. Data were collected as volumes of disclosure which were categorized by 4 subject of disclosure. In the UK, at least, corporate social and environmental disclosure was related to corporate characteristics of size, profit and industry affiliation. *Consequently, they were unable to claim that there was any unique and/or stable relationship between any measure of disclosure and any corporate characteristic.*

Smith et.al (2007), examined the extent to which the environmental disclosures in annual reports of companies listed on the Kuala Lumpur Stock Exchange are associated with corporate characteristics. The annual reports of the 40 companies' identified as producing corporate environmental reporting in 2002 were analyzed. A checklist instrument outlining the criteria for identifying disclosures was designed in order to codify the environmental information contained in the annual reports. Variables like industry membership, financial performance, share price fluctuations, political cost proxies, dependence on debt and the capital market have been analyzed in this study. *The findings suggested that environmental disclosure was negatively associated with company financial performance. A significant inverse relationship between disclosure score and return on assets was apparent. Environmental disclosure in Malaysia had different priorities from disclosures elsewhere.*

Norhasimah et.al (2015), investigated the existences of the environmental disclosure and financial performance among top 100 company of market capitalization in Malaysia for the year 2011. The information was examined by using content analysis of the companies' annual report. The dependent variables of this study were: Return on Asset, Return on Equity, Earnings per Share, Profit margin as measurement of financial performance of the firm. Thus, the environmental index for environmental disclosure had been used in this study. Value for total environmental disclosure was the independent variable of this study. The analysis showed mixed results between the existence of the environmental disclosure practices in Malaysia and financial performance. *The finding of this study revealed that there was a significant relationship between total environmental disclosure and profit margin.*

Singh and Jackson (2015) attempted to understand the corporate performance in terms of social performance. *A comprehensive and extensive literature review developed a framework for examining the environmental and financial performance of the hospitality industry.* The paper used multidimensional scaling, a methodology that summarizes data about associations between firms' sustainability and financial performance. The authors reported that firms experiencing significant environmental performances over time also experienced similar financial performance changes.

Ong et.al (2016) aimed to examine the relationship between environmental disclosures and financial performance of public listed companies in Malaysia. Content analysis approach was adopted to determine the quantity and quality of the environmental disclosure in the annual reports of 100 listed companies for the year 2009 until 2013. In order to measure the company's financial performance, Return on Assets (ROA), Return on Equity (ROE) and Earnings per Share (EPS) are chosen as the indicators of financial performance of the company. The results showed that only the quality of environmental disclosure has the positive relationship with the company's Earnings per Share (EPS). Interestingly, the results of this study indicated that less environmentally sensitive industries disclosed more and higher quality of environmental disclosure than environmentally sensitive industries. *In conclusion, the environmental disclosures practices in Malaysia was still in an adaptation stage as many Malaysia companies still do not disclose any environmental information in their annual reports. Hence, more effective efforts are needed from regulatory bodies to increase the environmental awareness in Malaysia.*

Connelly and Limpaphayom (2004), examined the relation between corporate environmental reporting (CER) and firm performance. A sample included more than 200 public companies representing the largest market capitalisation and secondary data used in this study. The environmental compliance and disclosure ratings were developed from publicly available data such as annual reports and stock exchange filings. Empirical results also revealed that there was no relation between environmental activity reporting and accounting performance. It was summarized that corporations have an obligation not only to act responsibly towards stakeholders but also to disclose their actions to other stakeholders. *As a result, the government had imposed new rules and standards covering environmental disclosure in Thailand.*

Liu and v. Anbumozhi (2009), identified the determinant factors affecting the disclosure level of corporate environmental information on the basis of stakeholder theory, and gave an empirical observation on Chinese listed companies. The corporate environmental disclosure effort is significantly related to its environmental sensitivity and its size. The role of shareholders and creditors were considered as determinants

and tested in this study. *The better the company's economic performance, the more information on environmental investment and pollution control cost was disclosed.*

3.4 Influence of Corporate Characteristics on Environmental Reporting

Corporate Environmental Accounting and Disclosure is dependent on several corporate attributes and there are studies which empirically examined the extent of environmental disclosure and measured the relationship between environment disclosure and several corporate attributes. However, most of these studies concentrated on developed countries and very few studies focused on developing countries such as India. Of the many themes in the social and environmental accounting and reporting literature, there are regular attempts to explain this disclosure by reference to observable corporate characteristics typically size, profit and industry affiliation. Studies to date have not comprehensively addressed the potential impact that corporate characteristics may have upon the different types and areas of environmental reporting. The following table shows the prior studies examined the relationship between corporate characteristics and environmental reporting.

Table 3.4: Influence of Corporate Characteristics on Environmental Reporting.

Author	Country	Methodology	Sample	Variables	Findings
Jagan (2007)	India	Content Analysis	200	Size, Age, Foreign Influence, Risk	On the whole, the level of environmental disclosure was found positively associated with the financial performance, age, size, foreign influence and negatively associated with the systematic risk.
Pahuja (2009),	India	Content Analysis	91	Size, Profitability Sector Industry.	The results provided strong evidence in support of environmental disclosure practices he influence of variables size, profitability, sector, industry and

Author	Country	Methodology	Sample	Variables	Findings
					environmental performance.
Joshi et.al (2011)	India	Content Analysis	45	Size, profit, leverage, AF,FOREIGN operation,	a positive association between size and industry type, profitability and financial leverage have no impact on the disclosure level. However, accounting firm, profitability, age of the company, foreign operations , and leverage were not supported by the empirical findings in Indian context.
Gupta (2011),	India	Content Analysis	50	Size, Industry, Debt equity ratio,	The study reported that, the attributes such as high polluting industries, size of the company, high debt to equity ratios and environment performance have positive impact on the environment disclosure.
Chaklader and Gulati (2015)	India	Content Analysis	50	Size, Profit Age, Leverage.	Bigger-sized companies and the environmentally certified companies by an external agency disclosed More environmental information. Environmental certification reduces the agency cost.
Goyal(2015)	India	Content Analysis	50	Size, profitability ,Age, Leverage.	Environmental disclosures are positively correlated with age and size of the company. There is negative relation between leverage and disclosure score of the company. Further, disclosures in public sector companies were

Author	Country	Methodology	Sample	Variables	Findings
					better than private sector companies.
Prasad et al.(2016)	India	Content Analysis	137	Legitimacy theory.	Firm specific characteristics like industry, size, age and foreign customers have significant positive influence on environmental disclosures , while leverage has negative impact on disclosures.
MEEK ET.AL (1995)	US,US& Europe	Content Analysis		size, country, listing status, and, to a lesser extent, industry	The factors explaining voluntary annual report disclosures differ by information type. The largest MNCs were the trend setters in providing voluntary disclosures of nonfinancial and financial information.
LEARY (2003)	USA	NA	182	size, profitability, industry and regulatory influence	a positive and significant association between size, industry, and the amount of required environmental disclosure, mixed support for an association between regulatory influence and the percentage of required disclosure. A negative and statistically association exists with profitability.
KUMAR (2007),	ITALI & USA	2007	36	NA	While among the USA companies the relationship was significant only in the utilities industry. In terms of the quality of disclosures, only the utility industry in the Italian sample was significant .size of the company was

Author	Country	Methodology	Sample	Variables	Findings
					a significant predictor of the volume of disclosures made.
BRAMMER AND PAVELIN(2008)	UK	Content Analysis 5 broad categories	450	NA	The study revealed high quality disclosure to be primarily associated with larger firms and those in sectors most closely related to environmental concerns and the media exposure of companies plays no role in stimulating voluntary disclosures.
HASSAN AND IBRAHIM (2012)	UK	Content Analysis 7 categories	100	Industry, external assurance, stakeholder engagement, management system,	Management system is a influencing factor for an award. The study did not find any association between disclosure on formal or external assurance, and on packaging and recycling activities.
SALAMA ET.AL (2012)	UK	Content analysis	200	Size, Industry	Size and industry had significant positive impact upon environmental disclosures while profitability had a negative impact upon disclosures.
ADAMS (2015)	UK & GERMANY	Interview			The study was concluded that some clearly shared the public concern regarding corporate impacts and some were clearly more concerned about enhancing corporate image in the face of such pressure.
FRANCISCO (2014)	Portugal	Content analysis	24	Size, Profitability	The association between firm size and the ED level was not statistically relevant ,a positive and significant

Author	Country	Methodology	Sample	Variables	Findings
					relationship between the profitability and EDI and the firms that belong to “critical” sectors, on average, disclosure more EI than those belonging to “non-critical” sectors.
Galani et.al(2011),	GREEK	Content Analysis	100	Size, listing status,	There was a positive relationship between corporate size and the disclosure of environmental information in annual reports. However, neither profitability nor listing status seems to explained differences in environmental disclosure practices between Greek companies.
AKBAS (2014)	TURKEY	Content Analysis	62	size, leverage, profitability, industry membership and age of	Indicated that company size and industry membership were positively related to the extent of environmental disclosure , while profitability was negatively related. However, neither leverage nor age had a statistically significant relationship with the extent of disclosure.
Juhmani (2014)	Bahrain	Content Analysis, 22 items	NA.	All listed companies on Bahrain stock exchange	The level of social and environmental information disclosed on the Bahraini listed companies’ websites was low with wide variations between companies and sectors, and the level of social and environmental disclosure was

Author	Country	Methodology	Sample	Variables	Findings
					substantially affected by company financial leverage and audit firm size.
Hartikayanti et.al(2016)	Indonesia	GRI-4	17	Size of the company, profitability, type of industry and foreign ownership.	partially firm size, profitability and foreign ownership have no significant effect whereas the type of industry has a significant effect on environmental disclosure.

Jagan (2007), studied the status of corporate environmental reporting practices in India both in terms of quantity as well as quality of disclosure. Also, the study focused on factors determining the level of disclosure of environmental information. Additionally, chartered accountants perceptions regarding environmental disclosure had also been evaluated. Annual reports of 200 companies were considered. The opinions of 142 Chartered Accountants were collected with the help of a structured questionnaire. Content analysis was prepared with 20 voluntary items of environmental information and one item of statutory environmental information. The six corporate characteristics chosen were the corporate financial performance, the company size, company age, the foreign influence, the outsider's influence and the level of systematic risk involved in the company. The level of disclosure in the high polluting industries was found to be high as compared to the low polluting industries. *On the whole, the level of environmental disclosure was found positively associated with the financial performance, age, size, foreign influence and negatively associated with the systematic risk.*

Pahuja (2009), tested the influence of selected company and industry related variables on environmental disclosure practices (EDPs) of the large manufacturing Indian companies. An index of environmental disclosure was constructed consisting of 23 items of environmental information. Opinions of chartered accountants were obtained on the importance of each of these items, in making sound investment and other decisions. Annual reports of 91 large manufacturing companies were examined

by using index. Environmental disclosure scores (EDS) percentages were calculated for each of the companies for all the three years. *The results provided strong evidence in support of environmental disclosure practices he influence of variables size, profitability, sector, industry and environmental performance.*

Gupta (2011), examined annual reports of Top 50 companies as listed in National Stock Exchange of India (NSE) were studied for 3 consecutive year's .i.e. 2007-08, 2008-09, 2009-10 have been examined to analyse their environmental disclosure practices. An 'Index of environment disclosure' listing 23 items of information had been used to find out the actual disclosure practices in these companies. The study reported that, the attributes such as high polluting industries, size of the company, high debt to equity ratios and environment performance have positive impact on the environment disclosure. Most polluting industries disclosed significantly more information on environment related issues than less polluting industries. Companies having foreign association disclosed more information on environmental issues than domestic companies.

Joshi et.al (2011), *examined the relationship between environmental disclosure practices of Indian industrial listed companies and to analyze the factors influencing the level of environmental disclosure information from a sample of 45 Indian industrial listed companies in their websites and annual reports.* The study used 19 items of environmental disclosure. The evidence showed that there was a tendency to disclose the environmental protection information but the level of disclosures was still low. Multiple regression analysis showed a positive association between size and industry type with the disclosure index. They found positive and significant relationships between the existence of environmental reporting and company size and environmental sensitivity. *The results of multiple regression supported SIZE and INDUS hypotheses in this study. However hypotheses related to accounting firm (AF), profitability (PROFI), age of the company, (AGE), foreign operations (FO) and leverage (LEV) were not supported by the empirical findings in Indian context.*

Goyal (2015), *focused on progress made in environmental accounting and its disclosure to make some suggestions for future improvement.* Annual reports of 50

companies, taking 10 companies each from five sectors namely Cement FMCG, Oil and Gas, Textile and Pharmaceutical, for a period of 5 years from 2007-08 to 2011-12 have been studied. For the purpose of study, index based on United Nations Environment Programme (UNEP) disclosure index has been adopted. Relation between various environmental disclosures and related company attributes such as profitability, size of company, age of company and leverage is also determined. Results of the study showed that highest overall disclosures on environmental information are in cement sector closely followed by Oil and Gas sector. Other sectors under the study are far behind with very less disclosure score. *Results of study also showed that environmental disclosures are positively correlated with age and size of the company. There is negative relation between leverage and disclosure score of the company. Further, disclosures in public sector companies were better than private sector companies.*

Salama et.al (2012), analysed the relationship between a number of corporate characteristics and corporate environmental responsibility disclosures (CERD) in major UK companies. The initial sample population chosen was based on the largest 200 companies by market capitalisation across all major stock market sectors in the UK. The study applied content analysis, using a coding sheet to measure the level of CERD within the annual reports. *The authors found that size and industry had significant positive impact upon environmental disclosures while profitability had a negative impact upon disclosures.*

Prasad et al. (2016), examined the extent and the quality of environmental disclosure made by Indian companies using legitimacy theory. The study used a sample of 137 companies for 2011–2012 and 134 companies for 2014–2015 representing eleven different industries. Content analysis of 137 companies' annual reports for the years 2011–2012 and 2014–2015 applied to evaluate the environmental reporting practices and found that the extent of disclosure and the quality of disclosure have increased over the two-year period the, quality is largely descriptive and disclosures vary between industries and within industries. The results of the econometric model suggested that firm-specific characteristics like industry, size, age and foreign customers have significant positive influence on environmental disclosures (extent

and quality), while leverage has negative impact on disclosures. *The quality of these disclosures may remain largely descriptive and lack quantitative details, as the criteria or guideline for the disclosures have not been clearly specified in the regulations.*

Chaklader and Gulati (2015), studied the environmental disclosure practices of Indian companies and also the impact of different independent variables on environmental disclosure index (EDI). The study conducted with 50 companies on the basis of turnover from the list brought out by ET 500. The independent variables of the study were Profitability, size, type of industry, financial leverage, multinational status and environmental certification studied with the dependent variable an environmental disclosure. The statistical tool of year-wise pooled regression model was employed. The result of the study found that in all the four years, size and environmental certification were statistically significant at the 1 Percentage level and are positively associated. The study indicated that bigger-sized companies and the environmentally certified companies by an external agency disclosed more environmental information. *Environmental certification reduces the agency cost as it reduces the monitoring cost since the firms voluntarily follow an external set of measured objectives. No other variable was found to be significant.*

Galani et.al (2011), focused on the Greek setting and it could make a significant contribution to the environmental reporting literature in the context of European countries. They focused on the largest companies and selected a sample of 100 biggest Greek companies. The result obtained was that the degree of development of environmental accounting practices was low and there was a positive relationship between corporate size and the disclosure of environmental information in annual reports. *However, neither profitability nor listing status seems to explained differences in environmental disclosure practices between Greek companies.*

Meek et.al (1995), analysed the factors influencing the voluntary disclosures of strategic information, nonfinancial, financial information contained in the annual reports of MNCs from the U.S., U.K. and Continental Europe. Specifically, this study examined company size, country of origin, industry, leverage, degree of multi-

nationality, and profitability as potential explanatory variables for observed voluntary disclosures by MNCs in their annual reports. While company size, country, listing status, and, to a lesser extent, industry were the most important factors explained voluntary disclosures overall, the importance of the factors varied by information type. The samples contained an equal number of both internationally listed and domestic listed MNCs. The final checklist consisted of eighty-five items of information and they were categorized into three major groups of information types. *Thus, the results indicated that the factors explaining voluntary annual report disclosures differ by information type. The largest MNCs were the trend setters in providing voluntary disclosures of nonfinancial and financial information.*

Leary (2003), *examined the extent to which Fortune 500 firms disclose environmental liability information required by Generally Accepted Accounting Principles. The study also examined whether firms expanded voluntary environmental disclosure and the factors (size, profitability, industry and regulatory influence) influencing the level of mandatory environmental disclosure.* The sample companies consisted of 182 firms in 33 industries with categories which are essential for the study. The study developed a comprehensive environmental disclosure index to evaluate the extent of mandatory disclosure. The findings of the study indicated a positive and significant association between size, industry, and the amount of required environmental disclosure, mixed support for an association between regulatory influence and the % of required disclosure. *A negative and statistically significant association was found between the level of required environmental disclosure and profitability.*

Brammer and Pavelin (2008), *examined patterns in the quality of voluntary environmental disclosures made by a sample of around 450 large UK companies drawn from a diverse range of industrial sectors.* The study firstly analysed the quality of voluntary environmental disclosures through indicators. Secondly they tried to find the impact of firm and industry characteristics upon voluntary environmental disclosure and thirdly statistical analysis was employed to find out the influence of factors on voluntary disclosures. Five dependent variables were analysed independently, POLICY, INITIATIVE, IMPROVE, AUDIT and TARGET. *They found a highly significant positive effect on firm size, but no significant effect on profitability. However, there was*

significant variation across components regarding media exposure, environmental performance, board composition and ownership structure.

Kumar (2007), investigated the factors drive the voluntary disclosure practices of companies in Italy and in the United States. The study has developed index list of 42 performance indicators. A sample of 36 award received companies was chosen from the list of companies. The other 36 companies were those that had not received any award in past for the quality of their corporate communication. Size, Instability and volatility, business complexity, Relevance of market-based intangible asset management, corporate governance structure, and company emphasis on stakeholder management were considered as independent variables .Results showed that size of the company was a significant predictor of the volume of disclosures made. This relationship was found among both Italian and USA companies. *As regards the effect of industry, the evidence was weak. In case of Italian companies, the effect of industry on the volume of disclosures made was significant in the utilities and the clothing industries; while among the USA companies the relationship was significant only in the utilities industry. In terms of the quality of disclosures, only the utility industry in the Italian sample was significant.*

Hassan and Ibrahim (2012) identified the factors that may influenced companies' success in attaining environmental awards empirically using a sample of UK FTSE 100 companies. The selected variables considered were industry membership; stakeholder engagement; external (formal) assurance; the presence of an environmental management system (EMS); and specific environmental activities. The results revealed that the influencing factors for receipt of an environmental award were the presence of an environmental management system (EMS); industry membership; Environmental activities. Companies belonging to carbon-intensive industries were found to be more likely to receive an award than companies from non-carbon intensive industries. *The study did not find any association between disclosure on formal or external assurance, and on packaging and recycling activities.*

Adams (2015), empirically tested the factors which are influential in determining the extent and nature of corporate social reporting. Interviews were conducted with

seven large multinational companies in the chemical and pharmaceutical sectors of the UK and Germany in order to identify any internal contextual factors influencing the nature and extent of reporting. *The study was concluded that some clearly shared the public concern regarding corporate impacts and some were clearly more concerned about enhancing corporate image in the face of such pressure.* Further, development of reporting processes, sound governance structures, auditing guidelines improve corporate accountability on ethical, social and environmental impacts leading to better performance.

Francisco (2014), *focused on the environmental disclosure (ED) promoted by firms, due to the strong demand for information and identification of the relevant data that pursuit the new legal requirements.* Environmental Disclosure Index of 25 items (EDI) was used in published listed firms' annual reports during the period of 2007-2009. The research examined the significant relationship between environmental information and factors like size, profitability and economic sectors. *Authors conclude that the disclosure level was increased over time and there had been more and more items of environmental matters published in the firms.* According to the statistic results, the association between firm size and the environmental disclosure level was not statistically relevant, *a positive and significant relationship between the profitability and environmental disclosure index and the firms that belong to "critical" sectors, on average, disclosure more than those belonging to "non-critical" sectors.*

Juhmani (2014) attempted to determine the influence of firm size, profitability, financial leverage, firm age and audit firm size on the level of social and environmental information disclosures under legitimacy theory. The current study included all listed companies on Bahrain Bourse in year 2012, and it examined the level of social and environmental information disclosure by Bahraini companies on websites using content analysis. Descriptive statistics and multiple regressions analysis were used. The findings indicated that 57.57% of the sampled listed companies provided social and environmental information in their 2012 annual reports and their websites. *The study concluded that on the basis of legitimacy theory, the content and the level of social and environmental information disclosed on the Bahraini listed companies' websites was low with wide variations between companies*

and sectors, and the level of social and environmental disclosure was substantially affected by company financial leverage and audit firm size.

Akbas (2014) investigated the sample of 62 listed non-financial firms, variables that may influence the extent of environmental disclosures of sampled companies, namely, size, leverage, profitability, industry membership and age of the firm were empirically tested. There were 8 main themes related to the environmental information are determined. Results of the regression analysis indicated that company size and industry membership were positively related to the extent of environmental disclosure, while profitability was negatively related. However, neither leverage nor age had a statistically significant relationship with the extent of disclosure.

Hartikayanti et.al (2016), *attempted to determine the effect of corporate characteristics on environmental disclosure.* Characteristics of the company used that the size of the company, profitability, type of industry and foreign ownership. The method used was quantitative methods to the type of survey of secondary data. The sample consists of 17 companies selected by purposive sampling technique. Corporate Social Responsibility Rating System from Global Reporting Initiatives (GRI) G4 was used to measure the disclosure score. Multiple linear regressions were employed to analyze the data. *The results indicated that the corporate characteristics significantly influence the company's environmental disclosure. However, partially firm size, profitability and foreign ownership have no significant effect whereas the type of industry has a significant effect on environmental disclosure.*

3.5 Influence of Environmental Performance on Environmental Disclosure

This study viewed on the other possibility by examining the relationship between measures of firm's environmental performances and the environmental disclosures contained in the firms' annual reports. For the disclosures to be useful there should be a correspondence between the disclosures and actual events. Our assumption was that if firms' environmental disclosures are reflective of their environmental activities, a high degree of correlation should exist between these indices and the content of their disclosures. The following table presents the literature related with environmental disclosure and environmental performance.

Table 3.5 Influence of Environmental Performance on Environmental Disclosure

<i>S. No</i>	<i>Author</i>	<i>Country</i>	<i>Method</i>	<i>Sample</i>	<i>Findings</i>
1	Ingram and Frazier (1980)	USA	Content analysis	40	Weak association between quantitative measures of disclosure content and independent measures of social performance.
2	Robert(1991),	European countries	Content analysis	4 countries	The highest level of disclosure is found in German reports. Swedish companies disclosed more information than France, Sweden and the Netherlands.
3	Lober(1996)	USA	Content analysis	NA	Positive relationship with environmental disclosure and environmental performance.
4	Sulaiman et .al (2004)	USA	Content analysis	198	Obtained results that “good” environmental performance is significantly associated with “good” economic performance.
5	Clarkson et.al (2007)	USA	Content analysis	191	The study revealed positive association between environmental performance and environmental disclosures.
6	Lucia and Connors (2011)	USA	NA	NA	Firms with better environmental performance provide more voluntary information.

Sulaiman et .al (2004), conducted an integrated analysis of how management’s overall strategy jointly affected among environmental disclosure, environmental performance, and economic performance. The study used a cross- sectional sample of 198 US firms selected from “Standard & Poors 500”. Specific pollution measures and occurrences was analysed for calculating environmental performance. The study adopted simultaneous equations approach, obtained results that “good” environmental performance is significantly associated with “good” economic performance, and also with more extensive quantifiable environmental disclosures of specific pollution measures and occurrences. It was found in the study that a positive association between environmental performance and environmental disclosure.

Ingram and Frazier (1980), *examined the relationship between measures of firm’s environmental performances and the environmental disclosures contained in the firms’ annual reports.* The methodology of content analysis involved the selection of

analytical categories within the context of the content material. Environmental disclosures identified in each of the 40 annual reports used in the analysis. The relationship between firms' environmental performances (CEP index scores) and the content of the firms' environmental disclosures (content analysis scores) was estimated and multiple regressions were then used to determine the multivariate association between the content analysis scores and the CEP indices. *The results of this study indicated a weak association between quantitative measures of disclosure content and independent measures of social performance.* Authors of this study analysed the reason for this weak association may be due to the lack of external monitoring of firms' social disclosures.

Robert (1991), *attempted to investigate the incidence of corporate environmental disclosures across mainland Europe with respect both overall level and the type of information disclosed.* Also the study identified the differences in the patterns of disclosures Across European countries. Sample companies selected from France, Germany, The Netherlands, Switzerland and Sweden. A checklist of 54 specific items was designed and analysed the environmental disclosure in six categories. It was found that there were relatively few consistent differences in terms of number of items disclosed and for certain items proved industry specific patterns disclosure exists. *There was some evidence that country specific patterns of disclosure existed. The highest level of disclosure is found in German reports. Swedish companies disclosed more information than France, Sweden and The Netherlands.*

Lober (1996) *focused to find "what criteria might be used to define and measure a company's environmental performance and how might these criteria be organized?"* The paper explained and evaluated several organizational effectiveness models like, organizational goals, system resources, internal processes and operations, and strategic constituencies to assess the effectiveness of corporations. A model for a corporate green index was used 256 measures of a state's environment including various measures of the quality of the environment. *It was a real effort to respond positively to the environment, if they improve their environmental performance on the criteria established above, it seems inevitable that they would have positive relationship with environmental disclosure and environmental performance.*

Clarkson et.al (2007), attempted to revisit the relationship between environmental performance and environmental disclosures. A sample of 191 firms from five most polluting industries were considered for the study. The study had identified and evaluated many environmental parameters. The study revealed positive association between environmental performance and environmental disclosures. Preliminary investigation of this study showed that Indian companies practice more of voluntary environmental reporting in the form of satellite reporting, sustainability reporting, GRI reporting and internet reporting. *Findings of the survey revealed that more than 75% of the sample had environmental policy; about 70% have environmental audit system; 60% had an environment department; four out of every ten Indian Companies had formal environment certification (ISO 14001).*

Lucia and Connors (2011), analyzed the effect of environmental performance and disclosure on the capital structure of U.S. firms in the electric utility industry. The purpose of the study was to analyze the relationship between environmental performance, voluntary environmental disclosure, and capital structure measured as leverage. The sample was comprised of companies in the electric utility industry that filed with reportable TRI (Toxics Release Inventory)emissions and have information available in the “Compustat” database between 2001 and 2007. The correlation coefficient between leverage and environmental disclosure was negative. Regression result of this study indicated that firms with better environmental performance provide more voluntary environmental information. *Results suggested that firms with lower toxics emissions exhibit higher leverage and voluntary disclosure and that leverage was negatively associated with disclosure.*

Summary

The review of empirical studies provided detailed insight about the subject matter included in disclosures overtime period and the general relationship between the corporate characteristics and the propensity to disclose environmentally relevant information. However, the above review reveals that there is scarcity of studies on corporate environmental disclosure. No comparative reporting practices type of study has been conducted in India to examine the status of corporate environmental disclosure. The present, study is an attempt to find the usefulness and the importance of environmental accounting and reporting.

CHAPTER 4

LEGAL AND REGULATORY FRAMEWORK IN INDIA, UK AND USA

The development of more effective environmental laws and legal systems throughout the world has thus become critical to directing economic development and growth onto a path of environmental sustainability. No international standard is exclusively dedicated to environmental information, but environmental issues are mentioned in several standards and interpretations. There are many international bodies who have taken keen interest in corporate environmental reporting aspect and some of these have issued guidelines in this connection. There are attempts to harmonize reporting on environmental issues.

4.1 Guide lines

Guidelines regarding issues on environmental accounting have been issued by many organisations such as

- Financial Accounting Standard Board's (FASB),
- Canadian Institute of Chartered Accountants (CICA)
- International Standards of Accounting and Reporting (ISAR).
- International Integrated Reporting Committee (IIRC),
- Global Reporting Initiatives (GRI),

The Global Reporting Initiative (GRI) and the US Sustainability Accounting Standards Board (SASB) have each been established to provide guidance which companies can, if they wish, adopt in order to enhance the information value and credibility of their reports. With the passage of time, more guidelines are coming in customized format that may lead us to reach a common format for recognizing environment related data and disclosure thereof through financial statements. At present, no accounting standard has been issued for accounting treatment of these

specific problems. Some guidelines regarding these issues have been issued by many organizations such as International Chamber of Commerce (ICC), The Japanese Industry Association (“KEIDANREN”), The Chemical Manufacturers Association Federation Experts Compatibles Europeans (FEE), and Accounting Advisory Forum (AAF) etc., (Alok, 2005).

Global Reporting Initiative (GRI): The GRI is a network-based organization that produces a comprehensive sustainability reporting framework that is widely used around the world. The GRI’s core goals include the mainstreaming of disclosure on environmental, social and governance performance. GRI issued its first set of guidelines in 2000, the second in 2002 (known as G2 guidelines) and third in late 2006 (G3 guidelines) and fourth in 2013 (G4 guidelines).

With the introduction of GRI (Global Reporting Initiative) in 2000, the era of sustainability reports were introduced which has set certain guidelines social, environmental and financial reporting of many companies. The **most recent** of GRI's reporting frameworks are the **GRI Standards**, launched in October 2016. Developed by the Global Sustainability Standards Board (GSSB), the **GRI Standards** are the first global standards for sustainability reporting and are a free public good. There are some GRI standards have been updated in the year 2018, related with water management. Water treatment involves physical, chemical or biological processes that improve water quality by removing solids, pollutants, and organic matter from water and effluents. Minimum requirements for treatment might be specified in national, state, or local legislation; however, the organization is expected to consider its overall water discharge impacts and the needs of other water users in setting treatment levels.

- This Standard includes disclosures on the management approach and topic-specific disclosures. These are set out in the Standard as follows:
 - Management approach disclosures
 - Disclosure 303-1 Interactions with water as a shared resource
 - Disclosure 303-2 Management of water discharge-related impacts
 - Topic-specific disclosures
 - Disclosure 303-3 Water withdrawal
 - Disclosure 303-4 Water discharge
 - Disclosure 303-5 Water consumption.

- **International Integrated Reporting Council (IIRC)**

“Integrated Reporting is a new approach to corporate reporting that demonstrates the linkages between an organization’s strategy, governance and financial performance and the social, environmental and economic context within which it operates. By reinforcing these connections, Integrated Reporting can help business to take more sustainable decisions and enable investors and other stakeholders to understand how an organization is really performing”.

- **International Standard Organisation (ISO)** has developed an extensive range of standards. Among those ISO 14000 series is directly related to the environment. The voluntary criteria of ISO 14001: Environmental Management Standards (EMS) represents an international consensus on what constitutes best practice about environmental management systems. ISO 14001 assists organizations to improve their performance and make a positive impact on business results. ISO 14001 accredited companies are obliged to develop their mission, targets, policies and procedures that continuously monitor the effects of their operations against the natural environment.
- **UNCTAD:** United Nation Conference for Trade and Development (UNCTAD), an intergovernmental body plays a positive and pioneering role in the matter of environmental accounting.
- **The International Integrated Reporting Committee (IIRC)** was established in 2010 to achieve a globally accepted integrated reporting framework.

4.2 International Financial Reporting Standards (IFRS) in Environmental Reporting

International Financial Reporting Standards (IFRS) are standards, interpretations and the Framework for the preparation and presentation of financial statements set and adopted by the International Accounting Standards Board. IFRS has replaced the older term international accounting standard. IFRS are considered “principles based” set of standards in that they establish broad rules as well as dictating specific treatments. IFRS 6 directly deals with extractive industries and IFRS 5 provides the

guidance for decommissioning, rehabilitation and restoration of environment related expenditure. Rights (allowances) to emit pollutant continue to be treated as intangible assets to be accounted for according to IAS 38 (Intangible Assets). IAS 37 (provisions for contingent liabilities and assets) can be linked to environmental liabilities (Bora and Das, 2013). In particular, a director must make decisions concerning the company's compliance with the Companies Act requirement to report on environmental issues. In such circumstances, the carrying amounts are reduced to the value in use or realisable value (IAS 16/FRS 15).

- IFRS 3 Business combinations and FRS 7 Fair values in acquisition accounting require identifiable assets or liabilities acquired in a business combination to be measured at their fair value at the date of acquisition, which should, if appropriate, reflect environmental impacts.
- Issued in 2004, IFRIC 3 Emission rights required an entity to account for emission allowances as intangible assets, recorded initially at fair value. Actual emissions give rise to a liability for the obligation to deliver allowances to cover those emissions (or to pay a penalty). When allowances are awarded by government for less than fair value, the difference is treated as a government grant. In addition to the method in IFRIC 3, two alternative methods of accounting for emissions are used by companies.
- Intangible assets, which include greenhouse gas emission allowances, are subject to an impairment test on their carrying value if they exceed the recoverable amount from use or realisation (eg, through trading) (IAS 38/ IFRS 10).
- cost of settlement approach based on initial market value; and cost of settlement approach where provision is only made for the cost of buying emissions rights not covered by allowances. Possible liabilities that give rise to a provision include waste disposal, pollution, decommissioning and restoration expenses. There may also be liabilities arising from participation in a specific market, such as vehicle production or the manufacture of electrical and electronic equipment. A provision is recognised when an entity has a present obligation as a result of a

past event, it is probable that a transfer of economic benefits will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation - IAS 37/FRS 12, (Bora and Das,(2013).

kyoto protocol The Kyoto protocol is a 1997 international agreement which came into force in 2005, which has introduced a cap and trade system for the six major greenhouse gasses. In Cap and Trade scheme, governments issue rights or allowances to participating entities to emit specified level of emissions. Emissions trading (or Cap and Trade) is an administrative approach used to control pollution by providing economic incentives for achieving reductions in the emissions of pollutants (Encyclopaedia). A central authority sets a limit or cap on the amount of a pollutant that can be emitted. Companies or other groups are issued emission permits and are required to hold an equivalent number of allowance (or credits) which represent the right to emit a specific amount. The total amount of allowances and credits cannot exceed the cap, limiting total emissions to that level.

Companies that need to increase their emissions must buy credits from those who pollute less. The transfer of allowances is referred to as a trade. In effect, the buyer is paying a charge for polluting, while the seller is being rewarded for having reduced emissions by more than was needed. The issues on environment arising from the Kyoto Convention have further implications for need for compliance to regulations and for pollution prevention and environmental protection. In several countries, various regulations impose corporate reporting requirements on environmental issues. Research recognizes that environmental disclosures are country specific. They depend on the legal, social, financial, cultural and political contexts in which the company operates (Adams et al., 1998; Adams et al., 2000).

4.3 Legal framework in USA

United States, the individual provinces and states have significant jurisdictional responsibility for environmental matters, and they have implemented a wide variety of environmental legislation. Financial analyses rely heavily on corporate accounting records, but the rapid changes in environmental laws are creating confusion and ambiguities in the analysis of many corporations' financial statements. Corporate

obligations arising from new environmental laws are not being presented consistently. The absence of standard accounting practices across countries, and the wide scope for the individual management's subjective interpretation, means that even corporations operating in the same business sector and the same jurisdiction may not have strictly comparable financial statements. This lack of harmonization is creating differences in production costs, which threaten to alter some trade and investment patterns, Conklin (1993). In some cases, states have enacted more rigorous laws, which then have an impact on a firm's level of environmental responsibility. Regulations can either address past actions, or can control and prevention of current and future pollution.

4.3.1 Statement of Financial Accounting Standard

- The Financial Accounting Standard Board (FASB) has provided some direction for corporate disclosure of environmental Matters. The standards that relate specifically to environmental disclosure contain guidance on disclosing the capitalization of or expensing of environmental outlays and contingent liabilities. Accounting for Contingencies, issued in 1975, states that a loss contingency must be accrued if both the following conditions are met.
 - (1) There is information available that indicates that it is probable that an asset has been impaired or a liability incurred at the date of the financial statements, and
 - (2) The amount can be reasonably estimated. Further, if the first condition is met and a range of estimated values is available. First, the liability is for response and remediation costs, as well as for damages and health assessment costs. Compensation and Liability Act of 1980 (CERCLA or the Superfund Act) established the Superfunds and regulates the clean - up of inactive waste disposal sites and spills.
- Interpretation No. (FIN) 14, Reasonable Estimation of the Amount of a Loss;
- FI N 39, Offsetting of Amount Related to Certain Contracts. The minimum related to Certain Contracts, issued in 1993, states that firms may not offset a

liability with an expected recovery unless the amounts are determinable and the right to set off is enforceable by law.

- EITF Issue 90-8, Capitalization of Costs to Treat Environmental Contamination, effective July 12, 1990; and EITF Issue 93-5, Environmental Remediation Guidelines, effective May 20, 1993, provide additional guidance. Statement of Financial Accounting Standards Emerging Issues Task Force (EITF) 89-13, Accounting for the Cost of Asbestos Removal and other remediation expenditures (EITF) 90-8 Capitalization of Costs to Treat Environmental Contamination: Specifically addresses costs incurred to treat asbestos and concludes that costs should be capitalized as betterment, subject to an impairment test. The general consensus is that the cost should be expensed in the period incurred unless one of three specified conditions are met: the costs (1) extend the life, increase the capacity, or improve the efficiency or safety of the equipment; (2) mitigate or prevent future environmental contamination; or (3) are incurred to prepare a property for sale, then the cost may be capitalized.

4.3.2 Environmental Remediation Guidelines 93-5, reached consensus on two issues: (1) the circumstances under which recoveries can offset the amount of a probable loss and (2) when it is acceptable to discount an environmental liability. An environmental liability may be discounted only if the total amount of the obligation and the amount and timing of payments are fixed and/or reliably measurable and footnotes should be given.

- In addition, the Securities and Exchange Commission (SEC) requires disclosures on legislative compliance, judicial proceedings and liabilities in relation to the environment in Form K-10. In the early 1990's, the U.S. Securities and Exchange Commission (SEC) became worried about the lack of disclosure of environmental issues in financial statements. The SEC issued Staff Accounting Bulletin (SAB) 92, which increased the disclosures required in the Management Discussion and Analysis section of financial reports submitted to the SEC, (i.e., for publicly traded companies).

- The additional disclosures required under SAB 92 include enhancements to Item 103, which requires the corporation to describe its legal proceedings, pending and contemplated, that could affect the corporation or subsidiaries;
- Item 303, which requires a discussion of any known trends or any known demands, commitments, events, or uncertainties that are likely to affect the registrant's liquidity in a material way; and Financial Reporting Release 36, which requires disclosure when management is unable to determine that a material effect is "not reasonably likely" to occur (Jorgensen and Soderstrom, 2006) US regulator and lawmakers have focussed their attention on sustainability.
- In Chicago, an exchange has traded carbon offsets since 2003. In late 2008, 10 north eastern US state opened the nation's first market for trading greenhouse gas permits, with buyer demands for "allowance" four times the existing supply. Seven western states plan a similar system in 2012 (KPMG International Survey of Corporate Responsibility Reporting 2008).

In U.S.A., the companies are required to submit data on emissions of specified toxic chemicals to the Environmental Protection Agency under the Toxic Release Inventory (TRI), established in 1989, is a publicly available EPA database that contains estimated data on toxic chemical releases and other waste management activities reported annually by firms in certain designated industry sectors and by federal facilities (U.S. Environmental Protection Agency 2003d, 2003f). The estimates include specific toxic emissions from manufacturing plants of ten or more employees. The categories of toxic emissions tracked by the EPA are transfers off-site to disposal, on-site land releases, underground injection, surface water discharges.

1. **The Beaches Environmental Assessment and Coastal Health (BEACH) Act amended the Clean Water Act in 2000.** It is designed to reduce the risk of disease to users of the Nation's coastal recreation waters. The act authorizes the EPA to award program development and implementation grants to eligible states, territories, tribes, and local governments to support microbiological

testing and monitoring of coastal recreational waters, including the Great Lakes and waters adjacent to beaches or similar points of access used by the public.

2. **The Clean Air Act (CAA)** is the comprehensive federal law that regulates air emissions from stationary and mobile sources. Among other things, this law authorizes EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emissions of hazardous air pollutants. One of the goals of the Act was to set and achieve NAAQS in every state by 1975 in order to address the public health and welfare risks posed by certain widespread air pollutants.
3. **The Chemical Safety Information, Site Security and Fuels Regulatory Relief Act** establish amended provisions for reporting and disseminating information under Section 112(r) of the Clean Air Act. The law has two distinct parts that pertain to: Flammable fuels and Public access to Off-Site Consequence Analysis (OCA) data.
4. **The Clean Water Act (CWA)** establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but the Act was significantly reorganized and expanded in 1972. "Clean Water Act" became the Act's common name with amendments in 1972.
5. The Comprehensive Environmental Response, Compensation, and Liability Act -- otherwise known as **CERCLA** or Superfund -- provides a Federal "Superfund" to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. Through CERCLA, EPA was given power to seek out those parties responsible for any release and assure their cooperation in the clean-up. EPA cleans up orphan sites when potentially responsible parties cannot be identified or located, or when they fail to act. Through various enforcement tools, EPA obtains private party clean up through orders, consent decrees, and other small party settlements.

6. **The Endangered Species Act (ESA)** provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The lead federal agencies for implementing ESA are the U.S. Fish and Wildlife Service (FWS) and the U.S. National Oceanic and Atmospheric Administration (NOAA) Fisheries Service. The FWS maintains a worldwide list of endangered species. Species include birds, insects, fish, reptiles, mammals, crustaceans, flowers, grasses, and trees.
7. **The Energy Policy Act (EPA)** addresses energy production in the United States, including: (1) energy efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) Tribal energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology. For example, the Act provides loan guarantees for entities that develop or use innovative technologies that avoid the by-production of greenhouse gases. Another provision of the Act increases the amount of biofuel that must be mixed with gasoline sold in the United States.
8. **The National Environmental Policy Act (NEPA)** was one of the first laws ever written that establishes the broad national framework for protecting our environment. NEPA's basic policy is to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment. NEPA requirements are invoked when airports, buildings, military complexes, highways, parkland purchases, and other federal activities are proposed. Environmental Assessments (EAs) and Environmental Impact Statements (EISs), which are assessments of the likelihood of impacts from alternative courses of action, are required from all Federal agencies and are the most visible NEPA requirements.
9. **Noise Control Act of 1972** establishes a national policy to promote an environment for all Americans free from noise, the Act also serves to (1) establish a means for effective coordination of Federal research and activities in noise control; (2) authorize the establishment of Federal noise emission standards for

products distributed in commerce; and (3) provide information to the public respecting the noise emission and noise reduction characteristics of such products.

10. **The Oil Pollution Act (OPA)** of 1990 streamlined and strengthened EPA's ability to prevent and respond to catastrophic oil spills. The OPA requires oil storage facilities and vessels to submit to the Federal government plans detailing how they will respond to large discharges. EPA has published regulations for aboveground storage facilities;
11. **The Pollution Prevention Act** focused industry, government, and public attention on reducing the amount of pollution through cost-effective changes in production, operation, and raw materials use. Opportunities for source reduction are often not realized because of existing regulations, and the industrial resources required for compliance, focus on treatment and disposal.
12. **The Resource Conservation and Recovery Act (RCRA)** give EPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances.

4.4 Legal Framework in UK

Greater awareness of environmental issues has led to increased demands on business for disclosures. Recent years have seen an increasing volume of legislation and regulation on environmental issues, much of which affects business, particularly in the areas of: planning and assessment; operational impacts on the quality of air, water and land; and waste and recycling. Much of this was originally prompted by EU directives which have been implemented in UK law. EU directives on Accounts Modernisation and Transparency have also influenced corporate reporting. These have been reflected in UK law in the 2006 Companies Act, as amended in 2013 by the requirement for all except small companies to include a strategic report as a separate section in their annual reports. This requires disclosures on certain relevant environmental matters, with key

performance indicators- materials, energy, water, biodiversity, emissions, effluents and waste, suppliers, products and services, compliance and transport. Listed companies are also required to publish disclosures on their greenhouse gas emissions in their directors' report. Guidance on how to apply these directives is provided by the Financial Reporting Council's Guidance on the Strategic report.

In UK, The Institute of Chartered Accountants in England and Wales (ICAEW) in 2009 published a report on "Environmental issues and annual financial reporting". This report shows how the existing accounting and reporting framework, including the business review, is already capable of generating useful information about environmental performance, one of the key dimensions of sustainability. The UK accounting standards most likely to be relevant to the treatment of environmental issues are those concerned with valuation, provisions and transparency of presentation in the case of tangible fixed assets such as land, plant and machinery, impairment often arises from an incident of contamination, physical damage, or noncompliance with environmental regulations.

In the UK, the Companies Act of 1985 forced all listed companies to publish an annual operating and financial review (OFR) that had to include information on significant corporate environmental impacts. These disclosure requirements were extended to large non-listed companies by the Companies Act of 2006, which imposes disclosure of key environmental performance indicators in the Business Review section of annual reports. However, the Companies Act gives managers considerable discretion in the information to be disclosed, which potentially undermines the integrity of the reported information, Barbu et.al(2012) .Further it is worth noting, that there is no obligation for audits of environmental information in any of the countries under study in the last ten years, Across the globe corporate environmental reporting has been voluntary in nature. Netherlands and Denmark had introduced mandatory disclosures way back in 2001.

4.4.1 Environmental Reporting from the Company's Perspective

Companies can be proactive and make positive use of their annual reports to inform not only investors but also other stakeholders who could be important to the business.

This includes ensuring that the company captures adequate environmental data, of sufficient granularity and reliability, through its accounting and other information systems. The company's directors have primary responsibility for its annual report and auditors are not expected to have the same depth of knowledge of its business. The auditor should assess the quality of the systems of internal control that the company's directors and management have established, bearing in mind the degree to which its business is exposed to environmental risks. These can include any environmental management system that has been established, particularly if this has been certified under ISO 14001, EMAS or BS 8555.

The auditor also needs to understand the external factors that can affect the company, including at least a general understanding of its legal and regulatory framework, and take these into account in planning the audit. Further action will be required if the auditor becomes aware that the company may have failed to comply with any relevant environmental legislation or regulation. Auditors need to be ready to use their professional judgement and may want to request formal representations from management where there are material environmental issues but little or no related documentation or evidence. Under the regulations quoted companies are required to report on their greenhouse gas emissions from activities for which they are responsible. Many companies have established reporting practices using GHG accounting methodologies such as the GHG Protocol Corporate Standard and ISO 14064-1. These companies should satisfy themselves that their existing GHG accounting approaches cover emissions from activities for which they are responsible. Companies are required to quantify and report on emissions of the following greenhouse gases - carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydro fluorocarbons (HFCs), per fluorocarbons (PFCs) and sulphur hexafluoride (SF₆).

Quoted companies must report on all material emissions of the 6 Kyoto gases from direct sources and from purchased electricity, heat, steam and cooling. Quoted companies must state in their directors' report if they have omitted any material emissions. In Europe EM AS (Eco-Management and Audit Scheme), had been voluntary so far. EMAS is a voluntary body designed to promote environmental

compliance standard of the companies. It was established by European Regulation 1836/93, which was later replaced by Council Regulation 761/ 101. EMAS' main objective is to reward those companies which go beyond the minimum legal compliance and continuously improve their environmental performance. Baxi and Ray(2009).

4.4.2 Recent Developments - Legal and reporting requirements

Proactive companies choose to publish information on their environmental and broader sustainability performance which goes beyond what they disclose in their annual reports. However, since this is entirely voluntary, there are no regulations or mandatory standards on either the content or the format of this additional information. Several larger companies have developed sophisticated processes to report on their environmental performance to a broad range of stakeholders, through either a series of stand-alone periodic reports or, increasingly, through online reporting which can be updated in real time.

There is a steadily expanding body of UK legislation and regulation dealing with the reporting of environmental issues by companies, much of which originates from EU directives. Increasing public concern over the environment in recent years has led to an increasing volume of legislation and regulation affecting business and the ways in which its activities can cause environmental impacts. These impacts can be in a number of different areas including emissions to air, water and land and the disposal of waste. UK environmental legislation is largely driven by EU directives, which cover the business cycle as a whole and apply the principle of 'extended producer responsibility' which was first defined in 1999 by the Organisation for Economic Cooperation and Development (OECD). This principle's aim is to encourage the 'internalisation' of the environmental costs that are associated with products over their full life cycles. This makes sure that businesses which have caused negative environmental impacts cannot simply pass the costs of these on to others as externalities but instead incur them as internal costs which are reflected in their income statements. The directives can be grouped around three broad areas of the business process are: issues of planning and assessment; operational impacts through emissions to air, effluents to water and impacts on land; and waste disposal and recycling.

4.4.3 EU directives are specifically aimed at regulating planning

1. Environmental Impact Assessment Directive;
2. Strategic Environmental Assessment (SEA) Directive.
3. Industrial Emissions (IE) Directive. 4. Integrated Pollution Prevention and Control (IPPC) Directive,

These were transposed into UK law by the Environmental Assessment of Plans and Programmes Regulations, and aim ‘to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development’. The IE Directive came into force on 1 January 2011 and recast seven existing directives, including the IPPC Directive under a single title.

It aims to prevent, reduce and eliminate pollution at source through the efficient use of natural resources. It covers several different types of impact: • emissions to air, land, and water • noise and vibration • energy efficiency • waste minimisation • environmental incidents such as spills • site protection. It requires permits to take into account the whole environmental impact.

i Air Quality Framework Directive

The Air Quality Framework Directive sets objectives designed to reduce air pollution and to assess and improve ambient air quality, by setting standards for air quality throughout the EU ‘to avoid, prevent and reduce harmful effects on human health and the environment as a whole’. This sets limits for emissions of sulphur dioxide, nitrogen oxides and dust. These are implemented in the UK through a number of different regulations.

ii Emissions Trading System (ETS)

The EU’s ETS was introduced in 2005 and are now the largest multi-country, multi-sector emissions trading system in the world. It includes around 11,000 power stations and manufacturing plants, plus flights between and within most European countries, accounting for about 45% of EU greenhouse gas emissions. It was implemented in the

UK through the Waste and Emissions Trading Act 2003 and is a central component in UK Government policy on carbon dioxide emissions. Companies wishing to emit more than their allocated allowances, must purchase additional allowances at auction or on the open market. If a company emits less than its free allocation, it can sell the surplus to other companies. This provides a positive incentive for companies to reduce their emissions as well as a disincentive for poor performance.

iii Environmental Liability Directive

The Environmental Liability Directive, which is implemented in UK law through the Environmental Damage Regulations, is based on the ‘polluter pays’ principle by which those responsible for any threats of damage or actual damage are made financially liable. It covers certain types of damage such as to natural habitats and species protected by EC law, in a site of special scientific interest, to water resources, and land contamination which presents a threat to human health.

iv CRC Energy Efficiency Scheme

The CRC Energy Efficiency Scheme (originally known as the Carbon Reduction Commitment) was launched in 2010 and substantially revised in 2013. It is a mandatory UK-wide trading scheme which targets carbon dioxide emissions from large public and private sector organisations and is designed to reduce them through a number of incentives.

v Water Framework and Drinking Water Directives

The Water Framework Directive covers surface, ground and coastal waters. It aims to manage river basin catchment areas in an integrated way, with any costs to clean up pollution being borne by the industries and farmers who are responsible. The Drinking Water Directive deals with the quality of water intended for human consumption.

vi Evaluation, Authorisation and Restriction of Chemicals regulation (REACH)

The Registration, Evaluation, Authorisation and Restriction of Chemicals regulation (REACH) covers potentially hazardous chemical products. It came into force in

2007. It requires each manufacturer or importer of chemicals to register and to provide information on the chemicals with which it is dealing, and to evaluate the potential risks.

vii Landfill Directive

The Landfill Directive affects directly the operators which manage landfill sites for the disposal of waste, and indirectly those who through their activities create the waste in the first place. It encourages the recycling and reduction of wastes, and addresses the risk of pollution from landfill sites, by: • setting out a framework for waste management; • requiring formal authorisation for waste disposal facilities, incineration and specific wastes; and • setting strict limits on the quality and quantity of waste that can be disposed of as landfill. The UK enacted the Landfill Directive through the Environmental Protection Act 2000 .

viii End-of-Life Vehicles Directive

The End-of-Life Vehicles Directive (implemented in the UK through regulations) is directed at the auto manufacturing sector, and requires manufacturers and importers to pay take-back and recovery costs for passenger cars and light commercial vehicles sold after 1 July 2002. It encourages manufacturers to plan at the design stage for the end of the vehicle's life, such as through easier recyclability of components. It was the first EU waste directive to apply the concept of extended producer responsibility.

ix Waste Electrical and Electronic Equipment and Restriction of Hazardous Substances Directives

The Waste Electrical and Electronic Equipment (WEEE) Directive prohibits the disposal of electrical and electronic equipment at the end of its life into general waste streams, and requires it to be collected separately and then re-processed. These re-processing costs are borne by the original producers of the products. The Restriction of Hazardous Substances (ROHS) Directive complements this by setting restrictions on the material content of the electronic equipment which manufacturers produce. The overall aim is for the EU to recycle at least 85% of electrical and electronics waste equipment by 2016.

x The EU Accounts Modernisation Directive (AMD) and Transparency Directive

The EU Accounts Modernisation Directive (AMD) and Transparency Directive are part of the drive for a single European market. The AMD also gave a strong impetus to corporate reporting on environmental matters. The Transparency Directive aims to harmonise the disclosure by EU-listed companies of accurate, comprehensive and timely information. The AMD aims to increase comparability between European companies through a common reporting framework. This requires common financial reporting standards that are transparent, fully understood, properly audited and effectively enforced. The Companies Act 2006 enacted the AMD in UK law. It sets an overriding requirement on company directors that: requirement for all large and medium-sized companies to include within their annual reports a business review which provides a 'fair review' of the business and its principal risks and uncertainties, including, where appropriate, information on environmental matters, with additional requirements on quoted companies. In 2013 the business review requirement was replaced by a requirement for a strategic report instead. The strategic report is presented as a separate section of the annual report, rather than being part of the directors' report. An important new disclosure requirement (greenhouse gas emissions reporting) was introduced into quoted companies' directors' reports in 2013.

4.5 Strategic report – aims and content

The aim of the strategic report is to pull together the company's strategy, business model and risks and link these through to the financial statements. The strategic report should recognise that environmental risks and uncertainties provide the opportunity for gain as well as loss. Gains might occur, for example, from enhanced reputation and sales as a result of an environment-friendly product, or from owning tradable emissions allowances in excess of what the business needs. Losses might occur due to fines for pollution, breach of licence or illegal waste activity, market disruption or collapse due to product failure, or the emission of greenhouse gases in excess of the allowances owned by the company.

The need to include key performance indicators (KPIs) is explicitly stated in the Companies Act 2006. 'The strategic report must, to the extent necessary for an understanding of the development, performance of the company's business, include: •

analysis using financial key performance indicators; and analysis using other key performance indicators, relating to environmental matters and employee matters. 'Key performance indicators means factors by reference to which the development, performance or position of the company's business can be measured effectively.' Since 2007 quoted companies have also been required to disclose information about environmental matters to the extent necessary. Data disclosed in the strategic report and directors' report does not have to be independently audited, verified or assured. However, the auditor of the financial statements should review them and consider whether the information they provide is consistent with the financial statements and whether it is materially incorrect based on, or materially inconsistent with, the knowledge they acquired while performing the audit. Guidance on preparing strategic reports is provided by 'Guidance on the strategic report' from the Financial Reporting Council (FRC) and by 'Reporting guidelines on environmental key performance indicators' from Defra. The guidelines suggest a number of appropriate performance indicators, and offer guidance on the reporting process.

- There are a number of ways in which a company that holds emission rights can account for them. The main alternatives are: as intangible assets, recorded initially at fair value. When allowances are awarded by government for less than fair value, the difference is treated as a government grant; • cost of settlement approach, based on initial market value; and • cost of settlement approach, where provision is made only for the cost of buying emissions rights not covered by allowances.

- **Provisions**

There are several environmental aspects of doing business that could cause a liability requiring that a provision be made, including: • waste disposal • pollution • decommissioning • remediation costs. For companies in certain sectors, liabilities could also arise from end-of-life legislation such as for vehicles and electrical equipment. Environment-related items should be reported in a way that reflects the substance of the transaction, determined by whether a transaction gives rise to new assets or liabilities (IAS 8). Exposure to inherent risks, including environmental risks, is evidence that an entity has an asset. Where environmental expense or income is a material item, it may require separate disclosure as part of the profit or loss arising from the company's

normal activities. Under IAS 37, a provision is recognised when: • an entity has a present obligation as a result of a past event; • it is probable that a transfer of economic benefits will be required to settle the obligation; and • a reliable estimate can be made of the amount of the obligation. Even if an event does not give rise to an obligation immediately, it might do so later if the law changes. It is management's responsibility to ensure that the company conducts its operations in accordance with all relevant laws and regulations, including environmental, otherwise the result could be fines or penalties. In extreme situations this could even extend to the withdrawal of any licence or permit which the company needs to operate, which could raise doubt over its ability to continue as a going concern. Where a severe violation is identified the Environment Agency is authorised to prosecute directors under criminal law and this could result in a director being disqualified, fined or even jailed.

4.6 Legal Framework in India

Though the **Ministry of Environment and Forests (MOEF)** is the nodal agency in the administrative structure of the Central Government for the planning, promotion, co-ordination and overseeing the implementation of India's environment related policies and programmes, it is important to recognize and appreciate the fact that environmental issues cut across various developmental sectors.

- i **National Environment Policy:** To achieve the objectives of prevention and control of pollution and conservation of environment, a National Conservation Strategy and Policy Statement on Environment and Development, 1992, and Policy Statement on Abatement of Pollution, 1992 were adopted. These policies emphasized pollution prevention/abatement, and promotion of cleaner technologies to reduce industrial pollutants. The National Environmental Policy (NEP) was adopted in 2006. The NEP articulates the spirit of 'sustainable development'; NEP proposed strategies and actions for protection and conservation of environment.
- ii **National Green Tribunal (NGT) Act** was introduced in 2010. It is a green court established for the effective and expeditious disposal of conflicts related to environmental conservation and protection of other natural resources of the

country. In addition, to address the delay in award of environmental clearances and improve the monitoring of clearance conditions in projects requiring (Environmental Impact Assessment) EIA, creation of independent National Environmental Appraisal and Monitoring Agency (NEAMA) is proposed to be established in other recent policy initiatives the 12th Plan. A number of other policy and legislative initiatives have been taken by MOEF in the 11th Five Year Plan. These include:

1. Re-engineering of environmental clearance process in 2006
2. Notification of Hazardous Waste (Management, Handling and Trans boundary Movement) rules in 2008 and its amendment in 2009.
3. Amendment in National Ambient Air Quality Standards in 2009.
4. Establishment of National Ganga River Basin Authority in 2009.
5. E-waste (Management and Handling) Rules in 2011.
6. Plastic Waste (Management and Handling) Rules 2011.
7. Coastal Regulation Zone Notification in the year 2011.

Policies of sectorial Ministries

1. Restoration of Ponds - Ministry of Water Resources
2. Municipal Solid Waste Management - Ministry of Urban Development.
3. Waste-to-energy programme - Ministry of New and Renewable Energy.
4. Industrial Infrastructure Development Scheme supporting funding of CETPs and solid waste management projects – Ministry of Commerce.
5. Vehicular pollution – MORTH

iii Regulatory Mechanism Assessment and Implementation

The introduction of legislative measures for pollution control in the country commenced with the enactment of the

- Water (Prevention and Control of Pollution) Act, 1974,
- Air (Prevention and Control of Pollution) Act, 1981,
- the Environment (Protection) Act, 1986
- National Green Tribunal Act, 2010

To implement these legislations, the Ministry formulated various regulatory instruments (e.g., environment standards, consent administration, authorization, environment clearances, etc.) and created institutional infrastructures at the national, regional and state levels in the form of Central Pollution Control Board (**CPCB**), regional offices of Ministry of Environment and Forest (MOEF), State Pollution Control Boards/Pollution Control Committees (**SPCBs/PCCs**), State Department of Environment, and Environmental Research Institutes/Organizations, etc. The Ministry has also launched several plan schemes to strengthen the regulatory mechanism for pollution abatement. Charter on Corporate Responsibilities for Environment Protection (CREP), Comprehensive Environmental Pollution Index (CEPI) for estimation of pollution load for Industrial Clusters, recognition of environmental laboratories, roadmap for Bharat Stage emission-norms are also being implemented.

An elaborate network of water and air quality monitoring network is in place to facilitate enforcement of environmental regulations. In addition to expansion and modernization of monitoring network, online emission monitoring system has also been introduced in Delhi and Manali & Cuddalore (Tamil Nadu) to get real time data. Other new regulatory tools to address industrial pollution include industrial self - Monitoring, and Representing Verification (MRV) and third party audit. The re-engineering of CPCBs/ SPCBs has been initiated by operational restructuring, strengthening manpower, augmentation of resources, IT-enabled consent management and data management and capacity building.

4.6.1 Status of implementation of regulations

To ensure environmental compliance, the Ministry has been implementing various regulations at national, regional and state levels. The tools employed to ensure compliance include:

1. Inspection and monitoring (I&M) to ensure compliance to environment standards at the State level.
2. Consent to Establish/Operate, authorization to handle hazardous waste at the state level.
3. Environment clearances and post-project monitoring at both the Central and State levels.
4. Annual environmental audit statement submitted by industries.

These reports do not report any violation on account of any environmental parameter. Consent to industries for meeting the standards for disposal of treated liquid effluent and gaseous emissions are described under Section 25/26 of the Water Act and under Section 19 of the Air Act, respectively. At present only 3 SPCBs out of 35 get financial support from the States. Other SPCBs which are not financially supported by their State Governments with little or no resources of their own, find it difficult to monitor the environmental compliance.

There are states which are not industrially developed but have large number of small-scale industrial units which have adverse impact on human health and environment. The ecology is also more vulnerable to assimilation of pollution in these regions. Presently, only about 75 per cent of the bio-medical wastes generated in the country is collected, segregated and treated in accordance with the Bio-Medical Waste Rules, 1998 and the rest is apparently disposed of without any treatment along with the municipal solid waste. To coordinate implementation of provisions for import and export of hazardous wastes, an inter-ministerial coordination committee has also been constituted to co-ordinate effective implementation of the Hazardous Waste rules. The occupier of the facilities generating hazardous wastes, and recyclers, etc. are required to file annual return, regarding the hazardous wastes handled by them, to the State pollution Control Board concerned. The annual audit statement submitted by the industrial units under EP Act is only a ritualistic exercise. These reports do not report any violation on account of any environmental parameter.

4.6.2 Air pollution and air quality management

Deterioration of air quality has been a matter of concern in the backdrop of increasing urbanization, industrialization and vehicular pollution. In major cities, there are multiple air polluting sources viz. vehicles, industries, power plants, generator sets, construction activities, etc. with varying extent of contributions. Air pollution and vehicular pollution includes ensuring supply of clean fuel, use of clean technologies for power, promoting public transport, conducting health related studies, promotion of renewable energy and supply of clean coal. However, in order to achieve desired air quality, emissions from different source groups need to be controlled. With growing concerns about air pollution levels, the National Ambient Air Quality standards (NAAQS) have been revised in 2009. According to the revised standards, industrial areas will have to conform to the same standards as the residential areas.

Noise Pollution

Along with rising air pollutant concentrations, noise levels have also raised many folds in the urban centres across the country. A National Committee on Noise Pollution Control has been constituted in Central Pollution Control Board for advising on the issues concerning noise. Apart from evolving ambient noise standards, noise limits for automobiles, sound making fire crackers, generator sets and domestic appliances have been notified. The 'noise' has been included in the definition of 'air pollutant' through an amendment in the Air Act, 1981.

Air quality management:

At present there are 46 continuous ambient air quality monitoring stations (CAAQMS) have also been installed across 28 cities and towns. Few public sector companies like NTPC, Coal India, SAIL, petroleum refineries; ONGC, etc. have also installed CAAQMS in their units.

4.6.3 Water Pollution and Abatement Measures

Water pollution has become a global problem and would intensify over time due to rising domestic, industrial and agricultural demands. Central pollution control board observed the quality of groundwater indicates that salinity and organic pollution is above the desired levels for beneficial uses. Analysis of monitoring results indicates

that the organic and bacterial contaminations are the critical parameters in water bodies responsible for water quality degradation. The CPCB has established a network of monitoring stations on water bodies and rivers across the country, comprising of 2000 stations spread over the country.

The parameters monitored for water quality include physical parameters, nutrients, major ions, and organic and pathogenic pollution. CPCB has identified 150 polluted stretches of rivers in the country in five priority categories depending upon the risk, i.e., degree/frequency of violation with respect to water quality criteria. The main sources of water pollution in the country are municipal sewage, effluents generated from industrial processes, agricultural run-off contaminated with fertilizers and pesticides, etc.

- a. **Industrial effluents:** In industrial clusters in the country, only 1/6th of the capacity required for the treatment of effluents exists. The problem is worse in the case of small scale industries because of their capacity limitations and financial constraints. This would require installation of adequate number of Common Effluent Treatment Plants (CETPs). Most of the major industries have effluent treatment plants for industrial effluents, but running with limited efficiencies.
- b. **Municipal sewage:** As reported by the CPCB, against an estimated sewage generation of about 38254 million litres per day (MLD) from Class I cities and Class II towns of the country, Municipal sewage is the major source of pollution from the land based activities in the coastal water. Waste water gets various level of treatment. Still, the remaining quantity is being discharged without any kind of treatment to the coastal water. Industrial clusters along the coast are another major source of pollution.
- c. **Agricultural wastewater:** outline application of fertilizers and pesticides for agriculture and runoff generated is increasingly being recognized as significant source of water pollution. The MOEF has notified 42 categories of effluent standards under E (P) Act, 1986 so far. Of these, 13 no. of standards were notified during the 11th Plan. States are also required to earmark

allocations/mobilise necessary resources for funding sewerage infrastructure and their maintenance.

4.6.4 Solid waste management

The complex nature of the waste and rising levels with inefficient collection, processing, and disposal are posing threat to environment that is impacting the health of humans as well as the ecosystem. As per CPCB estimates, around 57 million tonnes per annum of solid waste is presently generated in the country. Based on its physic-chemical characteristics, the solid waste generated in Indian cities is suitable for composting. At present, the country has a rated capacity of processing around 6000 tonnes per day of mixed waste into compost.

- a) **Hazardous Waste** means any waste that, by reason of its physical, chemical, reactive, toxic, flammable, explosive, corrosive or infectious characteristics, causes danger or is likely to cause danger to health or the environment, whether by itself or in contact with other wastes or substances. These wastes require careful handling, treatment and disposal due to their complex multiphase nature and hazard. The Hazardous Wastes Rules, 1989 and as amended thereafter were re-visited in 2007 and the Hazardous Waste Rules, 2008 were published on 24th September, 2008. As per the rules, every person, who is engaged in generating or handling of hazardous waste, is required to obtain authorization from the concerned SPCB/PCC. Further, for recycling of the hazardous wastes listed in Schedule IV, the units in addition to authorization are required to be registered with the SPCB concerned.
- b) Ministry has notified the **Municipal Solid Waste (Management and Handling) Rules**, in 2000 which is applicable to every municipal authority responsible for collection, segregation, storage, transportation, processing and disposal of municipal solid wastes in the country.
- c) For proper management of **Bio-Medical Wastes (BMW)** generated in the country, the Ministry of Environment & Forests notified the Bio-Medical Wastes Rules in 1998, under the E (P) Act, 1986. The Bio-Medical Wastes Rules, 1998 provides for segregation, packaging, storage, transportation,

treatment and disposal of the bio-medical wastes. As per these Rules, it shall be the duty of every occupier of an institution generating BMW, to take all steps to ensure that such waste is handled without any adverse effect to human health and environment.

- d) At present, **e-waste** management is regulated under the Hazardous Wastes Rules, 2008. Since E-waste is one of the fastest growing waste streams in the country, a need for separate rules on e-waste management was felt. The Ministry has notified the E-waste Rules, 2011 and implemented on 1st May 2012.
- e) The Ministry has also notified the **Plastic Waste** (Management and Handling) Rules, 2011. The Municipal authority shall be responsible for setting up, operationalization and coordination of the waste management system and for performing the associated functions, namely: collection, storage, segregation, transportation, processing and disposal of plastic waste.
- f) To ensure proper management of **chemical** accidents, the Ministry has notified two sets of rules namely - the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 and the Chemical Accident Rules, 1996. The MSIHC Rules provide indicative criteria for hazardous chemicals and listed 684 hazardous chemicals.

4.7 Pollution Abatement Strategies

Environmental Impact Assessment (EIA): EIA is one of the well-recognized management tools for incorporating environmental concerns in the development project at the planning stage. Environmental clearance has been made mandatory since January, 1994 in respect of 32 developmental activities including industry, Thermal Power, Mining, River Valley and Infrastructure projects and new constructions and industrial estate projects etc.

Environmental Education and Awareness: Six schemes have been grouped under this head. These are Environment Education and Awareness (11th Plan); National Museum of Natural History (NMNH) (1978); Centres of Excellence (CoEs) [1983]; Environment Information System (ENVIS); information technology; and State of

Environment Project (11th Plan). The major thrust of the schemes is enhancing people's understanding of the relationship between human beings and the environment and to develop capabilities/skills to improve and protect the environment.

Clean Technology

Clean technologies, as distinct from end-of-pipe abatement technologies minimize the generation of waste in the production process and utilize waste from consumption of goods or other production processes rather than treating the waste. Primary objective of the scheme is to facilitate and support development of clean techniques/technology aimed at specific end-use to protect the environment.

Waste Minimisation: The scheme on Industrial Pollution through Preventive Strategies lays emphasis on preventive aspects of pollution abatement and promotion of processes to reduce industrial pollution.

Sewage treatment and solid waste management: creation of infrastructure, cleaning of ponds, implementing waste-to-energy projects and infrastructure related to biomedical waste.

4.8 Conservation of Environment.

The concern for the environment has been further stimulated by economic liberalisation and deregulation in India, attaching further significance to production, manufacturing and services. India's existing policy framework concerning environmental protection is outlined in three documents, that is, the **National Conservation Strategy on Environment and Development of 1992**, the **Policy Statement for Abatement of Pollution of 1992**, and the **National Forest Policy of 1988**. The National Conservation Strategy imparts the basis for the integration of environmental considerations in the policies and programs of different sectors. It stresses sustainable lifestyles and proper management and conservation of resources. **Conservation of various elements of biodiversity** (genes, species and ecosystems as defined by the Biological Diversity Act, 2002) outside the protected area system is governed by a variety of legislations in a sectorial manner. Most of the wild biodiversity, mainly in form of trees, are regulated through prevalent Central / State

forest legislations such as the Indian Forest Act, 1927. The conservation of habitats, corridors, and threatened and endangered species is largely governed by the provisions of the Wildlife (Protection) Act, 1972. Convergence of policy and legal provisions over the period, a variety of policy measures has been developed. Many of these measures provide opportunities for strengthening documentation and data collection; empowering local communities by recognizing responsibilities, ownerships, rights, and concessions; and creating suitable institutions.

The mandates of National Forest Policy 1988 and National Environment Policy 2006 recognize the need to address the conservation of areas of biodiversity importance, increasing forest productivity, and restoring degraded areas.

Indian Forest Act, 1927, Defined concessions, Village Forests, Protected Forests, Transit of forest produce

Wildlife (Protection) Act, 1972: Management of National Parks and Wildlife Sanctuaries, protection to Scheduled Species, Community and Conservation Reserves.

- ❖ **Environment (Protection) Act 1986:** Restoration of degraded lands, management of watersheds, Wetland management, and identification of Ecologically Sensitive Areas.
- ❖ **Biological Diversity Act, 2002:** Guidance on sustainable use of biodiversity, Access and Benefit sharing of biodiversity for commercial use, identification of species of conservation importance, documentation of People's Biodiversity Registers (PBRs), declaration of Biodiversity Heritage Sites, local institutional mechanism in form of Biodiversity Management committees, and financial mechanism in form of National State-Local Biodiversity Fund.
- ❖ **Forest Rights Act (FRA), 2006**, also referred as The Scheduled tribes and Other Traditional Forest Dwellers Act, Defines Community Forest Resources, Critical Wildlife Habitats, provides ownership of minor forest produce to the local communities, and provides security for forest dwelling communities. The functioning of the provisions is also linked with performance of the ecosystems in terms of delivering the ecosystem services for livelihoods.

- ❖ **Green India Mission** has been launched; where 10 million hectares of land are targeted for improving qualitatively and quantitatively through village level institutions.
- ❖ Garo Hills Autonomous District (Management and Control of Forests) Act, 1961 recognize the traditional forest land use systems such as Law Lyngdoh, Law Kyntang, and Law Niam.
- ❖ **Protection of Plant Varieties and Farmer's Rights Act, 2001:** Mandate of conservation of plant genetic resources, financial mechanism in form of National-State-Local Gene Fund.

There is a need to develop a co-ordinated approach for having convergence of these numbers of provisions. To evolve this convergence there is need to understand the utility and the interconnectedness of these provisions at local, sub-national, and national levels.

4.9 Environmental Laws

Environmental law is the collection of laws, regulations, agreements and common law that governs how humans interact with their environment. Laws may regulate pollution, the use of natural resources, forest protection, mineral harvesting and animal and fish populations. India has a Union Ministry of Environment with the motive of coordinating among the states and the various ministries, the environmental protection and antipollution measures. The Indian constitution lays down the foundation for all environmental laws. Since the late 1980s and early 1990 s there has also been clear trend of environmental policies being driven by the judiciary in India to ensure the protection of environment. There are regulations for direct control of effluent/emissions discharge by industrial units besides indirect control, such as reduction in the resource consumption, industrial pollution and incentives for introduction of clean technologies. The latest Companies Act, 2013 also incorporates a stress on green initiatives. The various laws pertinent to environmental protection in the country are listed in two different heads

I. Directly related to the protection of environment

- Water (Prevention and Control of Pollution) Act, 1974
- Water (Prevention and Control of Pollution) Cess Act, 1977
- Air (Prevention and Control of Pollution) Act, 1981
- The Forest Conservation Act, 1980
- The Environment (Protection) Act, 1986

II. Indirectly related to the protection of environment

- The provision in the Constitution (Article 51A)
- The Factories Act, 1948
- Hazardous Waste (Management and Handling) Rules, 1989
- Public Liability Insurance Act, 1991
- The Motor Vehicle Act, 1991
- Indian Penal Code
- The National Environment Tribunal Act, 1995
- Indian Fisheries Act, 1987

The major environmental legislations presently existing in the country include:

- ❖ The water (prevention and control of pollution) act 1974 The main purpose of this Act is to prevent and control the pollution of water. Along with this objective, it also tries to maintain or restore wholesomeness of water and to constitute Pollution Control Boards for the aforesaid purpose.
- ❖ The air (prevention and control of pollution) act 1981 The Air (Prevention & Control of Pollution) Act was enacted by the Parliament in 1981. This is an Act to provide for the prevention, control and abatement of air pollution, for the establishment, with a view to carrying out the aforesaid purposes, of Boards, for

conferring on and assigning to such Boards powers and functions relating thereto and for matters connected therewith. Under Section 19 of this act the whole of National Capital Territory of Delhi has been declared as air pollution control area by the Central Government. Under this section the government approved fuels to be used in the air pollution control area.

- ❖ The environment (protection) act 1986 consists of 26 sections and is divided into four chapters. This is an Act to provide for the protection and improvement of environment and for matters connected therewith. By protecting and improving environment, it aims at prevention of hazards to human beings, other living creatures, plants and property. This was enacted to supply the deficiencies of Water Act and Air Act which had failed to produce the desired effect (Chauhan, 2005).
- ❖ Hazardous wastes (management and handling) rules, 1989 In exercise of the powers conferred by Sections 6, 8 and 25 of the Environment (Protection) Act, 1986, the Central Government has made the rules relating to 18 categories of hazardous wastes and their management and handling.

Some other legislation indirectly related with environmental issues prevailing in the country are: Merchant of Shipping Act - 1958, Indian Port Act, Indian Penal Code, The National Environment Tribunal Act - 1995 , Environmental Impact Assessment Notification - 1994 , Environmental Impact Assessment (Public Hearing) Notification - 1997, Bio-medical waste (Management and Handling) Rules - 1998 , Noise pollution (Regulation and Control) Rules, 2000. The Ministry of Environment and Forests has proposed its first public announcement in 1991 that “Every company shall, in the Report of its Board of Directors, disclose briefly the particulars of steps taken or proposed to be taken towards adoption of clean technologies for prevention of pollution, waste minimization, waste re-cycling and utilization, pollution control measures, investment on environmental protection and impact of these measures on waste reduction, water and other resource conservation”.

A Gazette Notification on Environmental Audit has been issued by the Ministry of Environment and Forests on 03.03.1992, requires submission of an Environment

Statement to the Pollution Control Board (PCB). This notification is applicable to any person carrying on an industry, operation or process requiring consent to operate by under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974, under Section 211 of the Air (Prevention and Control of Pollution) Act, 1981 or both, or authorization under the Hazardous Waste (Management and Handling) Rules, 1987, issued under the Environment Act, 1986).

In the environment statement, the concerned industry is required to provide information on:

1. Water and Raw Material Consumption;
2. Pollution generated;
3. Nature of hazardous waste and solid waste and disposal practice;
4. Impact of pollution control measures on conservation of natural resources.

In 2011, the Securities and Exchange Board of India mandates listed companies to report on Environmental, Social and Governance (ESG) initiatives undertaken by them, according to the key principles enunciated in the 'National Voluntary Guidelines on Social, Environmental and Economic Responsibilities of Business.' The Companies act 2013 emphasizes on corporate social responsibility that makes it mandatory for certain class of profitable enterprises to spend money on social welfare activities. It is mandatory for companies with net worth of more than Rs.500cr, or turnover of Rs.1,000cr to adopt a CSR policy. Also it provides that the companies are required to give more disclosures besides Company's general state of affair and financial performance regarding conservation of energy and environmental protection.

It is mandatory in the country to get an environmental clearance for all new projects that concerns both the Union Ministry of Environment and Forests and the corresponding State Government department of environment. There are various guidelines in this regard and all such projects are expected to obtain environmental and antipollution clearance before they are actually set up. It can be observed through their accounts that mainly the following set of information is disclosed.

- ❖ What type of devices are installed to control pollution
- ❖ The steps taken for energy conservation
- ❖ Steps taken for optimum utilization of resources
- ❖ Steps taken for decompose the waste water and production process waste
- ❖ Steps taken for improving the quality of product and services, production process etc.
- ❖ Measures taken for environmental protection, and Steps taken to popularize the benefits of environmental accounting and reporting among the corporate sector.

4.10 Disclosure Requirements under Companies Act, 2013

Section 134(3)(m) requires the Board of Directors to include in their Annual Report, inter-alia, the prescribed particulars in respect of (i) conservation of energy and (ii) technology absorption. Section 166(2) of the Companies Act 2013 requires that a director of a company shall act in good faith in order to promote the objects of the company for protection of the environment.

When the Companies Act 2013 is examined from an environmental point of view, a number of insights can be made such as; - Activities relating to ensuring environmental sustainability should be incorporated by companies in their Corporate Social Responsibility Policies (Schedule VII). - Director should report the details about the policy developed and implemented by the company on corporate social responsibility initiatives taken during the year [Section 134 (3) (o)] - At least two per cent of the average net profits of the company made during the three immediately preceding financial years, in pursuance of its Corporate Social Responsibility Policy [Section 135 (5)]. Further if the company fails to spend such amount, under sub-section (3) of section 134, specify the reasons for not spending the amount. The disclosures required under the Companies Act have a minimum scope but constitute a starting point for voluntary disclosure by Companies.

Fines and penalties for non-compliance with environmental regulations

The EP Act has been in force since 1986. Even after 25 years, **the penalties** mandated for environmental violations remain unchanged. These penalties no longer act as a

deterrent to defaulting industries. In case of noncompliance, the guarantee is forfeited. This acts as a powerful monetary penalty for a violator and a deterrent against future non-compliance. The section 5 of the EP Act related to issue of directions needs to have provision for furnishing of suitable bank guarantee to ensure environmental compliance. Such bank guarantee also needs to be obtained upfront at the time of grant of environmental clearance for developmental projects. Wherever cases of violating of standards of water or air pollution have been detected, show cause notices have been issued to industrial units and all such units are being kept under constant surveillance (Chauhan. M, 2005).

The Ministry of Environment and Forests is responsible for planning, promotion, coordination and overseeing of Environmental programmes in India.. In order to minimize the global environmental problems, India has made the production and abatement technology mandatory (Chakrabarti and Mitra, 2005).

4.11 Legal reform for pollution prevention and control

Water Cess is levied on the basis of quantity of water consumed by the industries and municipalities based upon the purpose for which water is consumed. The water rates, however, are low providing little incentive for its consumption. User charges/administrative charges in the shape of consent fee are being charged from polluting industries under Water and Air Acts. Other instruments used for environment management include reduction/waiver of tariff/duty and higher depreciation etc., for pollution control equipment. There is a need to integrate **ecological taxes** as a component of the reforms of taxation of goods and services. Such reforms while facilitating green shift in taxation, need not result in an increase in the overall tax burden. India is likely to introduce a major change in its system of indirect taxation by bringing in a comprehensive

Goods & Services Tax, GST. The basic issues that need attention while integrating eco-taxes in the GST regime include:

- The overall GST logic calls for a single uniform rate for all goods and services, while Eco taxes call for differentially higher rates for polluting inputs and outputs

- In GST, rebate on input taxes will make taxation of polluting inputs ineffective.
- In destination based system, producing states do not collect tax to cope with Environment damage, loss of minerals, and damage to productivity of soil, but Consuming states enjoy the revenues without suffering pollution.
- Incidence of pollution is regionally differentiated and states need to have autonomy to Levy eco taxes on inputs and outputs without rebate.

A recent initiative in environmental taxation include levying of a **cess on production** and import of coal, and setting up of National Clean Energy Fund from its proceeds to fund research and innovative projects in clean energy technologies. This is in pursuance of the objectives of combating global warming, as harnessing renewable energy sources and reducing dependence on fossil fuel is recognized as a credible strategy to combating global warming and climate change. On development of **Green accounting**, Ministry has launched in February 2011 a major new project to value the immense wealth of natural resources and biodiversity in India. To promote energy efficiency in energy intensive industries, an **Energy Efficiency Mission** has been launched under the National Action Plan on Climate Change. The Mission aiming at Perform, Achieve, and Trade under energy has put in place a major market based programme to stimulate energy efficiency.

Recent Updates or Developments

- 1) Several states have recently banned plastic packaging for products and imposed strict obligation on generators of plastic waste, which is a trend expected to grow across most states in India and companies have to proactively address this shift.
- 2) The one major development is that a specific soil contamination law will be adopted in the near future.
- 3) A report on the Development of National Program for the rehabilitations of polluted sites has recently been submitted to the MoEF. The report also contains the contaminated sites(identification and Management Rules) which will

provide standards for soil and water pollution, carrying out mandatory site assessment and reporting on the determination of contaminated site.

- 4) Environmental insurance liabilities: The environmental risk insurance is still in its infancy and not much is publicly available pertaining to such insurance claims.
- 5) Overall environmental policy approach: India submitted its intended Nationally determined contribution (“INDC”) in October 2015, which outlines the post-2020 climate actions the country intends to take, the reduction in the emissions intensity of its GDP by 33% - 35 % by 2030 from 2005 levels and to create an additional carbon sink of 2.5 – 3 billion tons of CO₂ equivalent through additional forest and tree cover by 2030.
- 6) There are no mandatory GHG reporting obligations, but there are several industry driven voluntary initiatives to encourage such GHG reporting.
- 7) Emission trading scheme: There is no specific carbon trading scheme in place in India it has been a leading host country of clean development mechanism investments enabling developed countries to invest in emission reducing projects in developing countries, thereby earning certified emission reduction.
- 8) Under the national mission on enhanced energy efficiency, India launched a National Action Plan on Climate Change in 2008, which focuses on the following areas of “missions”. (i) Solar (ii) enhanced energy efficiency (iii) Sustainable habitat (iv) water (v) Sustaining the Himalayan Eco system (vi) a “Green” India (vii) sustainable agriculture and (viii) strategic knowledge for climate change.
- 9) Environmental Liability disclosure: A company is under an obligation to disclose potential environmental liabilities as contingent liabilities in its financial audit. Non-disclosure of any such liability in the account shall be treated as falsification of accounts, which are punishable with imprisonment or fine or both.

- 10) The Water act, Air act and EP act state that every person who shall be deemed to be guilty of all offences and liable to be proceeded against and punished accordingly. Under these provisions any person who breaches the consent application process is punishable with imprisonment for 18 months to 6 years and fine.
- 11) The Supreme Court and state High court can do and impose exemplary for damages to the environment. In Sterilities Industry case (2013), one of the largest copper smelter plants in India was found to be operating without a valid renewal of its environmental consent to operate. It was determined that 10 % profit (PBDIT) had to be paid as compensation which amounts to INR 1 billion.
- 12) The NGT Act contains penalty provision and more specifically sec 26 (1) of the National Green Tribunal Act states that a person who fails to comply with an order, award or decision of the Tribunal is punishable with imprisonment for a term up to 3 years or a fine up to INR 10 crore or both (1 cr = 10 million).
- 13) Different waste rules impose different responsibilities and requirements regarding waste storage; for instance, the E waste rules – which are based on the extended producer responsibility – only allow the storage of E waste on site up to 180 days after its generation, and the producer shall find its way to a registered recycler or storage disposal facility, collection centre and take back process etc.,

4.12 Environmental Crime

The designation "environmental crime" is applied to behaviours that contravene statutory provisions enacted to protect the ecological and physical environment (Clifford and Edwards 1998). Environmental crimes are diverse both in nature and in the harm they cause. They include littering, improper disposal of radioactive materials, taking game out of season, and intentional discharge of hazardous substances into storm drains or waterways, and theft of flora, fauna, and natural resources. The victims of some environmental crimes are few and easily identified, as when industrial firms discharge toxic chemicals that subsequently contaminate and render unsafe the water wells of nearby residents. In year 2001, a country wide

survey, the first of its kind, was carried out by Business Today, a business magazine, and The Energy Research Institute (TERI, 2001) to understand the environmental practices of corporate India. Findings of the survey revealed that more than 75% of the sample had environmental policy; about 70% have environmental audit system; 60% had an environment department; four out of every ten Indian Companies had formal environment certification (ISO 14001) .

Summary: Companies are now increasingly adopting the GRI framework of reporting standards (Baxi and Ray, 2009). Environmental accounting and reporting in most of the countries is still voluntary in nature including India. Some of the countries introduce mandatory reporting requirements on environment for companies. The international and national accounting standard setters have generally chosen to avoid dealing directly with the topic of environmental issues in financial reporting. Some professional accounting bodies and International Organisations have issued guidelines on environmental accounting and reporting. GRI and IIRC initiative made the environmental reporting an important part of corporate accounting and reporting system worldwide.

CHAPTER 5

RESEARCH METHODOLOGY

In this chapter discussion is focused on the overall information about data collection and methodology adopted in this research to attain the objectives of the study. It comprises the data collection process, sample selection process and statistical tools applied to analyses the data. This chapter would be divided in to 5 sections and explain about

1. Selection of sample companies
2. Significance of Annual Report
3. Content Analysis as a tool for evaluating annual report
4. Construction of Index of Environmental Disclosure (IED)
5. Measurement of Independent Variables.

5.1 Selection of sample companies

The study is exploratory in nature. Secondary source of data is used in this research. The primary objective of the study is to evaluate the extent of environmental reporting practices of manufacturing companies in India, UK and USA. The main source of data would be published Annual reports of the company. Other secondary sources like books on environmental accounting and reporting practices, Magazines, information provided in company's websites and other organizations, printed forms of thesis, research articles and journals have also been used. Through the Google search, annual reports of financial year 1-4-2016 to 31-3 2017 for all the sample companies have been downloaded from their official websites. Financial indicators and corporate democratic characters information have been collected through "PROWESS" data base. An instrument "Index of Environmental Disclosure" has been developed. Content analysis is used to evaluate companies' reporting practices. Empirical part of the work is analysed using "SPSS" a statistical package to find out the significance impact on environmental disclosure by independent variables. Statistical techniques like descriptive analysis and discriminant analysis have been employed in this study.

The sample companies for the study have been selected from “ET -2017 top 500”(Economics Times) survey list containing top 500 manufacturing companies in India. From this list, 190 non –manufacturing companies were not considered for sample selection. Because, the study focused on the manufacturing industries and their procurement of materials, production process and their volume of activities are the main reasons for the environmental damage. Further, due to Non- availability of updated financial indicators and negative financial information, nearly 80 companies have not included in this sample selection process. 60 companies have not given business responsibility report in their annual report of the year undertaken for the study, which is the major source of environmental performance of companies, are also eliminated by the researcher in the sample process. Finally 170 Indian companies are selected for the sample for this study and it represent 55% of the total manufacturing ranked companies in the year 2017.

A sample of 25 USA manufacturing and 8 UK manufacturing companies selected from” Fortune Global 500” data base .Since, “Fortune Global 2017” list has included more number of non- manufacturing, financial and information technology and other service sector of UK region, 17Uk manufacturing companies have been selected randomly through Google search.(Global data base and FTSE list). Final sample of study consists 220(170 India + 25 UK + 25 US) manufacturing companies and they belong to different industry group. An important justification for choosing these companies is that they cover a broad range of industrial and commercial activities and account for a significant proportion of the economic development. The below table gives an account of number of companies selected under different industries.

Table 5.1: Sample Profile – Indian Companies.

S.NO	INDUSTRY	Number of Companies	Percentage%
1	Automobile	15	8.8
2	Cement &Construction	16	9.4
3	Chemical	21	12.4
4	Consumer durables	12	7.1
5	Electricals & Electronics	12	7.1
6	Engineering	7	4.1
7	Food and Agricultural	13	7.6

S.NO	INDUSTRY	Number of Companies	Percentage%
8	Garment &Text	13	7.6
9	Iron &Steel	6	3.5
10	Minerals& Mining	6	3.5
11	Petrol, oil, gas and refinery	11	6.5
12	Pharmaceuticals	12	7.1
13	Power & energy	14	8.2
14	Plastics & Packing	12	7.1
	Total	170	100.0

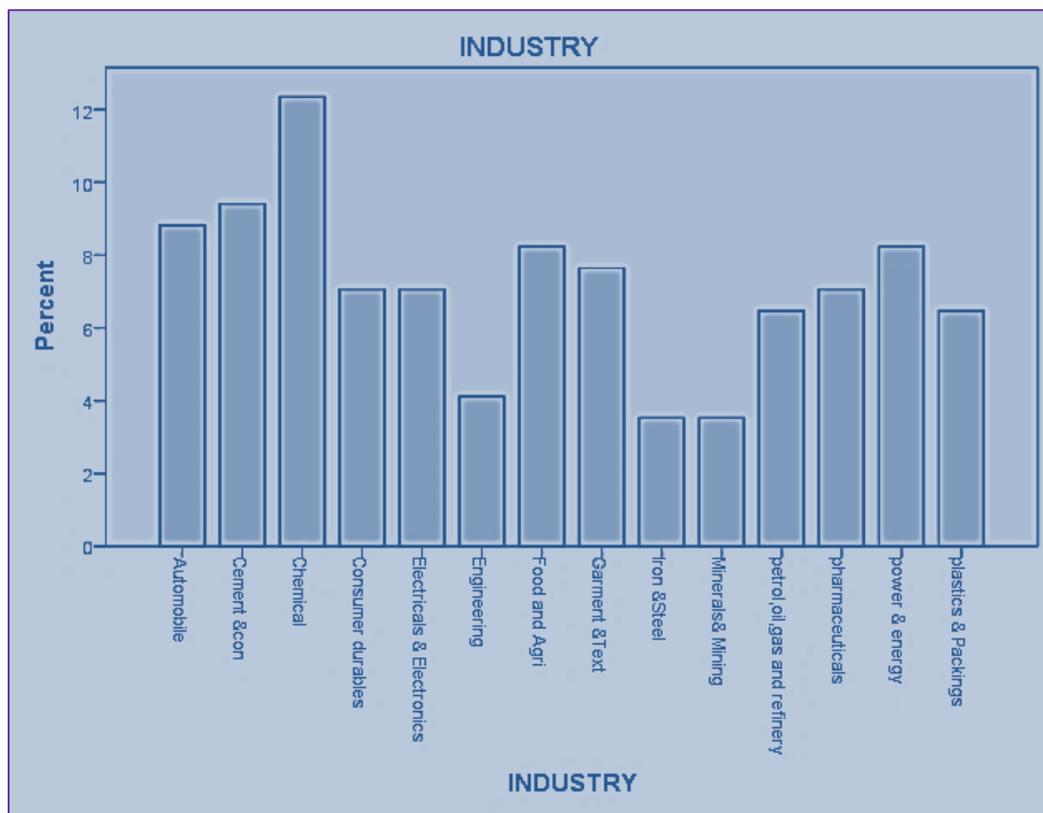


Figure 5.1: Sample Companies

Table 5.2: Sample companies UK

S.NO	Name of the Industry	No. of. Companies
1	Automobiles	3
2	Consumer Durables	1
3	Construction	1
4	Engineering	1

S.NO	Name of the Industry	No. of. Companies
5	Iron & Steel	2
6	Mining and Minerals	3
7	Plastics and packaging	1
8	Power & Energy	9
9	Pharmaceuticals	3
10	Textile	1
	Total	25

Table 5.3: Sample Companies USA

S.NO	Name of the Industry	No. of. Companies
1	Automobiles	05
2	Consumer Durables	02
3	Chemicals	01
4	Electronics	02
5	Engineering	01
6	Food and Beverages	03
7	Information Technology	06
8	Petrol ,Oil & Gas	04
9	Pharmaceuticals	01
	Total	25

5.2 Significance of Annual Report

The annual reports are the most widely used and popular mode of disclosing any relevant information. These reports are authenticated by external qualified auditors. Company annual reports provide information on the strength of the company to stakeholders, the media and community. An annual report provides information on the company's fiscal year. Annual reports include a balance sheet, income statement, financial summary and cash flow statement. Financial notes also may be added to explain accounting methods the company uses to report and record its transactions. The financial information provided in annual reports helps readers to determine what the company owns and how the company is funding operations and growth, and how good the company is at making money for investors. Annual reports come in many formats, ranging from basic typewritten pages to full colour, glossy publications.

Understanding the purpose of the annual report can help us to ensure that the report contains pertinent information required by stakeholders. Annual reports deliver information on the company's mission, history and summarize the company's achievements in the past year. In recent decades companies are providing not only financial information in their annual reports, but also non- financial disclosure of information which is very much essential to various stakeholders.

The concept of sustainability reporting is a new trend in annual reporting by corporates. A sustainability report is a report published by a company or organization about the economic, environmental and social impacts caused by its everyday activities. Sustainability reporting can be considered as synonymous with other terms for non-financial reporting; triple bottom line reporting, corporate social responsibility (CSR) reporting, business responsibility report, and more. A sustainability report demonstrates the link between its business strategy and its commitment to a sustainable global economy. Sustainability reporting can help organizations to measure, understand and communicate their social, economic, environmental, and governance performance effectively. It is also an intrinsic element of integrated reporting; a more recent development that combines the analysis of financial and non-financial performance. Sustainability reports are released by companies and organizations of all types, sizes and sectors, from every corner of the world. The annual report was selected as the source for corporate environmental disclosure and it is proved that annual reports are the exact source of all kinds of information satisfying the different needs of public.

The annual report has been the source for virtually all previous corporate disclosure research (Buzby, 1974; Cerf, 1961; Singhvi and Desai, 1971) and the source for all the social disclosure research previously discussed in review of literature chapter. The annual reports are compulsory as they are required by legislation and so they are produced regularly especially by all listed companies and by these reasons making comparisons relatively easy (Tilt, 2001: 193).

The annual report is a mandatory document which all companies are required to prepare. Annual report also has a wide availability and is the most often used

communication channel by the companies in order to communicate with all stakeholders in a systematic manner (Hughes et al., 2001: 224). The nature of this study makes it feasible to test our hypotheses using a single year (2017), building on the large volume of environmental disclosure research in studies by Belkaoui (1989), Brammer and Pavelin (2006), Anbumozhi (2009) using years 1973, 2000 and 2004 respectively.

5.3 Content Analysis as a tool for evaluating annual report

Content analysis is a guide consisting of coded documents of transcripts, newspapers, speech, and films that is used in order to study the counts of word-phrase clusters for the purpose of conducting qualitative statistical analysis. Content analysis refers to a set of procedures for collecting and organizing information in a standardized format. Categories in index or checklist need to be provided as they give the structure for grouping recording units (Chatterjee and Mir, 2016). Content analysis is defined as the method of a research technique for the objective, systematic, and quantitative description of the manifest content of communication (Berelson, 1971). Content Analysis is considered one of the most important methodologies in communication research and has been widely utilized by researchers trying to obtain reliable and valid information from narratives that appear in the natural context of the phenomenon being investigated. The application of content analysis technique in this study consisted for four interrelated phases. First, the choice of the framework used for classifying the information; second, the definition of recording unit; third, the development of coding procedure, and finally the assessment of the reliability and validity of the coded information, (Boesso and Kumar, 2007).

Uses:

- To understand the change in the trend of the content over time.
- To explain why there is special attention or focus on certain topics of content
- The analysis can be used to compare the international differences in the content.
- The analysis helps in comparing the group differences in the content.
- Helps in tracing the theoretical development in intellectual history.

- The researcher can draw a comparison between the actual content and the intended content.
- The researcher can test hypotheses and it can be used by a researcher for coding purposes.

Content analysis may have qualitative or quantitative measurements. The present study employs content analysis to measure the quantity of voluntary environmental disclosures, which is a consistent approach with prior studies examining environmental disclosures. The following table contains the information of studies conducted on environmental reporting and they used content analysis method.

Table 5.4: Studies Applied Content Analysis

S.NO	AUTHOR	No. of Items	S.NO	AUTHOR	No. of Items
1.	Singhvi and Desai (1971)	34	11.	Sen (2011)	15
2.	Francisco (2014)	25	12.	Soniakundra(2013)	40
3.	Joshi et.al (2011)	19	13.	Meek et.al (2001)	85
4.	Malarvizhi and Matta(2016)	19	14.	Pahuja(2009)	23
5.	Leary (2003)	37	15.	Jagan (2007)	20
6.	Juhmani (2014)	22	16.	Joshi et.al (2011)	19
7.	Minimol M.C and Makesh (2014)	15	17.	Gupta (2011)	23
8.	Zeng (2010)	10	18.	Hossain (2013)	56
9.	Norhasimah(2016)	20	19.	Robert (1991)	54
10.	Smith(2007)	40	20.	Stray (2007)	27

A number of studies of environmental disclosures have used the environmental disclosure index developed by Wiseman (1982); A significant step in content analysis is the selection of the recording unit for analysis; recording unit refers to a specific segment of the context unit in the written material that is placed in a category. There are several choices in regard to determining the recording unit, such as a word, a group of words, a sentence, a paragraph or an entire document. The use of “words” is not the correct method as comprehending the meaning of individual words in isolation is difficult .A “paragraph” is not appropriate unless the whole document is about

environmental information. This study uses “number of sentences” as a recording unit for the purpose of content analysis. Number of sentences has been used in the previous empirical studies like; (Chatterjee and Mir, 2008). They considered number of sentences both as the most appropriate measure of disclosure, and also as the most appropriate basis for coding and analysis (Sen et.al 2011).

However some companies have given elaborate information through charts and tables on pollution levels or emission of pollutants. Thus, majority of companies disclose only qualitative/descriptive information on the environment in the annual report. Though a few companies have started reporting quantitative /financial figures on the issue, the information provided is generally brief and lacks specific details. Moreover there is no consistency in this kind of reporting. The present study has utilized the content analysis technique by developing a tool called “Index of environmental disclosure”. Items of information to be included in the index were selected through a review of the environmental reporting literature. These sources provided proposed formats for environmental reports including items of information considered essential for complete environmental disclosure.

5.4 Construction of Index of Environmental Disclosure (IED)

The present study aims to determine the disclosure practices by measuring the extent of disclosure in published corporate annual reports, as well as to examine the influence of company characteristics, viz Size of the firm, age of the firm, nature of industry, profitability, total amount spent on Corporate social responsible activities and number of employees on the extent of disclosure in corporate annual reports. The accomplishment of these objectives requires that an index of disclosure has to be constructed. Therefore, some of the basic considerations relevant to the construction of such an index of disclosure and the manner in which it has been designed have been presented in this chapter. The following aspects relating to construction of index of disclosure have been discussed in the following pages.

(A) Preliminary Consideration

(B) Selection of Item of Information

(C) Grouping of items of Information.

(D) Scoring of Items of Information.

5.4.1 Preliminary Consideration

There are two basic points are considered before an index of environmental disclosure can be constructed.

1. What medium of disclosure is to be studied and
2. For whom and what purpose is the information to be disclosed?

As stated earlier, this study has used the annual reports of selected public and private limited companies as the pivotal point because they are an important source of public information about financial performance, environmental performance and other social responsibilities. Similarly, construction of index of disclosure also depends upon who is to use the information and for what purpose. The potential existing investors, NGO's, social workers and others are the primary users of corporate annual reports. Moreover, there is variability as to purposes among those users who do make extensive use of annual reports. Because of the variability, it is necessary to specify the purpose for which information is to be disclosed. In this study, the purpose of the information disclosed in corporate annual reports is assumed to help the stakeholders in making economic decisions. It may be emphasized here that constructing an index of disclosure for all users and purposes would present a serious designing problem due to the combination of different informational needs.

5.4.2 Selection of item of information

The first step in designing an index of disclosure involves the selection of items of information to measure the disclosure in annual reports. This approach has been followed by earlier researchers. The pioneer in this field developed an index of environmental disclosure consisting different number of items. After doing an extensive survey on the prior empirical studies, nearly 52 studies have been identified which were done their research using index or checklist or content analysis. Then, items included in their index and their major classification or groups have been listed. The repeated major categories and items of disclosure were eliminated to avoid the duplication of presence of items of disclosure.

The items in the IED have been chosen on the lines of above researchers with suitable modification. These items cover the possible contents of an annual report as a whole; Items included in the index are more than what is conveniently presented in the social responsibility statements of annual report. The items in the index thus are relevant to stakeholders for making investment decisions. The relevance of information to users' decision models has been widely recognized as information selection criterion. Items of information are pertinent to the understanding of company's past, present and future operations. There are some items of information in the index which do not indicate a single piece of information, but represent categories of information. In such cases an item is broken into possible sub-items and credit is thus given for disclosure of these sub items. Finally, the index of environmental disclosure has been prepared with 62 items or statements. However, it does not imply that the index includes all items of information that various stakeholder need for making economic decisions, although it does cover most of such items.

Table 5.5: Studies Applied Content Analysis with categories

S.NO	Author	Categories
1.	Al-Tuwaijri et al., (2004)	1. The total amount of toxic waste generated, transferred or recycled, 2. Financial penalties resulting from violations of laws, 3. Potential responsibility designation for the cleanup the hazardous waste sites and 4. the occurrence of oil and chemical spills.
2.	Ahmad (2012)	10 items, 3 categories: Legal problems, Organizational problems, Individual Level problems.
3.	Brammer (2008)	5 categories: Policy, Initiative, Improve, Audit and Target.
4.	Clarkson et.al.(2007) Nik et.al.(2013).	51 items, Governance Structure and Management Systems, Credibility, Environmental Performance Indicators Environmental Spending, Vision and Strategy Claims, Environmental Profile, Environmental Initiatives.
5.	Douglas(2006)	60 items: Environmental Policy, Code of Environmental Ethics and Standards, Corporate Structure, Employee Involvement, Environmental Management Systems, Sustainable Relationship with Natural Ecosystems, Environmental Liabilities, Compliance and Penalties, Total Quality Environmental Management , Materials, Energy, Water Usage .
6.	Gupta (2011)and Pahuja(2009)	23 items: Organizational Overview, Repair of environmental damage, Pollution control measures , Conservation of natural resources, Environmental accounting, Project planning management, Social costs, Asthetic improvement and other.
7.	Hassan and Ibrahim(2012)	Specific environmental activities, Packaging, Waste management, Recycling, Climate change risk, Climate change activities and Carbon footprint.

S.NO	Author	Categories
8.	Ingram and Frazier (1980)	20 items: Evidence, Time, Specificity, Theme.
9.	Joanne Wiseman(1982)	18 items: Economic factors, Litigation, Pollution abatement, Other environmentally related information.
10.	Liu Anbumozhi(2008)	16 items: Materials, energy and water, Biodiversity, Emissions, effluents and waste, Products and services, Compliance.
11.	Shukla and Vyas (2013)	Green House Gas Emission, Direct Energy Consumption at Marketing SBUs, Indirect Energy Consumption at Marketing SBUs, Water Withdrawal /reused (refineries).
12.	Robert(1991)	54 items: Environmental protection statement, Process related information, Product information, Environmental related investments and R & D, Energy use, Political, Health and safety information.
13.	Jose and Lee (2007)	34 items: 7 Categories. Environmental planning considerations, top management support to the institutionalization of environmental concerns, environmental structures and organizing specifics, environmental leadership activities, environmental control, external validations or certifications of environmental programs, and forms of corporate environmental disclosures.
14.	Stray(2007)	29 items: Summary of policies, targets and achievements, State of Environmental Management, State of activities for reduction of environmental burdens.
15.	Ullah(2013)	56 items: Environmental policy , environmental pollution items , environmental energy items , environmental audit items , environmental financial items and environmental other items.
16.	Yusoff(2013)	24 items: Financial factor, pollution abatement, environmental initiatives, Environmental Litigation, Environmental Preservation and Other Environmentally Related Information.
17.	Zhang(2013)	30 items: Material, energy, water, biodiversity, emissions, effluents and waste, products and services, compliance, transport and overall.
18.	Salama et.al(2012)	(1) corporate environmental policy; (2) product and process-related information (e.g. packaging, recycling, waste management, product development, efficient use of materials and accreditation to the International Standards Organization ISO 9001 quality series standard);2 (3) regulatory compliance; (4) environmental auditing or review processes; (5) sustainability; and (6) other environmentally related items that do not fall into any of the previous categories
19.	Chaklader and Gulati(2015).	1.Environmental Initiatives 2 Environmental Commitments 3 Environmental Management Framework 4 Environmental Disclosure 5 Environmental Expenditure 6 Products and Technologies Contributing to Environment
20.	Ying jun lu(2008)	18 items: 4 categories. General information, Environmental financial information, Pollutant discharge and abatement, Sustainability.

5.4.3 Grouping of items of information

Since the present work aims at evaluating disclosure practices, the index have been classified under five major groups viz., (i) Environmental policy and initiative (ii) Environmental Expenditure (iii) Pollution (iv) Environmental reporting elements and (v) Environmental compliance has been created and the disclosure items related to each major category is grouped. The rationale of such grouping lies in the fact that on stakeholders cannot evaluate the environmental performance of a company directly from some individual items. Ex. Energy policy, green building policy, green gas emission etc., hence an attempt has been made to classify all the items of information in to five different categories. In such category, items which relate to more than one group have been placed with the group with which it is more directly related. This would help in evaluating the environmental disclosure practices of companies relating to various groups listed above. Group-wise items of information included in the index of disclosure and their respective scores have been given in appendix.

Since the purpose of the present study is to evaluate environmental disclosure practices in corporate annual reports of manufacturing industries, the items selected in the index of environmental disclosure are applicable to manufacturing companies in the private and public corporate sector in India. Thus, the items in the IED are not applicable to companies engaged in extractive operations, banks, investment companies, transport companies. As manufacturing companies may be more homogenous in nature, it is possible to construct an index of disclosure suitable to measure the extent of disclosure in their annual reports. A great degree of accuracy and explicitness in the index of disclosure has been achieved.

5.4.4 Scoring information

Each item in the IED has been assigned a score either 0 or 1. If an item is disclosed in the annual report, the item is assigned score 1. In case of non-disclosure, score 0 is given. The score for each annual report is then summed up. The total represents score attained by a given annual report. The maximum applicable score has been computed as 62. In the final step, in scoring process, the actual score attained by a company is divided by company's maximum applicable score. This quotient is multiplied by 100. The resulting percentage is the company's disclosure percentage. Companies

were not penalized if a disclosure item was either quality or quantity. The main purpose was disclosure of an item presented in the annual report or not. In order to assess this aspect, the entire annual report was studied and judgment was made on the matter. Thus, the dependent variable is the total score obtained by each company in each category. The voluntary disclosure score for each company is additive and un-weighted.

Pilot Study

A pilot study, pilot project, pilot test, or pilot experiment is a small scale preliminary study conducted in order to evaluate feasibility, time, cost, adverse events, and improve upon the study design prior to performance of a full-scale research project. To reduce data reliability problems often associated with the content analysis method, a pilot test was carried out with a sample of 25 annual reports from different industries. This is consistent with Ahmad and Harte (2013) and Nik et.al (2013) assertion that trial runs are necessary before main data coding. The selection of companies for the pilot test was based largely on convenience sampling. The outcome of this preliminary work shall present useful insights for carrying out further studies on environmental disclosure (Sen et.al ,2011). The annual reports of all these companies were to check whether environmental index statements were reported or not. The purpose was to confirm that the environmental disclosure items selected in the IED was disclosed by all kind of companies irrespective of its size, age and nature of business. Content analysis converts large amount of information into data useful for study in a systematic way. This trend is increasing over time. Disclosures made by companies on environmental policy, environmental expenditure, pollution, environmental reporting elements and compliance items were assigned scores and summed up analysed further for accomplishment of objectives of the study. Before using IED in the present research, it was rechecked and verified by two senior professors, totally 3 times and by the researcher 2 times.

5.5 Measurement of Independent Variables

Company attributes are specifically influenced the voluntary reporting information such as social and environmental performances. Voluntary disclosure on social and environmental matters is showing increasing trend .One of the major reason is the

influence of corporate characteristics like size of the company, age of the firm, economic results and the industry type in which they work. The present study identified five dependent variables namely (i) Environmental policies and Initiatives,(ii) Environmental expenditure,(iii) Environmental pollution, (iv)Environmental reporting elements and (v)Environmental compliance. Corporate size (measured by assets and number of employees), age, industry type (sensitive and non – sensitive), profitability ((measured by Net profit Margin, PBITDA and Total income) and amount spent on CSR are the independent variables used to predict the impact on environmental disclosures. The assumption is that disclosure in annual report is not an independent variable but it is likely to be influenced by the above variables. Use of the raw values of the independent variables in a regression or other statistical analysis would give enormous influence to the information from a small number of very large companies. The logarithmic transformation reduces the influence on the results due to the very large companies. All the independent variables have been transformed to Log values(L₁₀) for obtaining better results in statistical tests. Chi square test would be conducted to understand the association between environmental disclosures and sensitive and non-sensitive industries.

5.5.1 Size of the firm

Many authors assert that firm size is an important determinant for the environmental disclosure level (Boesso and Kumar ,2007: Joshi and Bremser 2003). Boesso and Kumar (2007) believed that large firms disclose more information because they have a wider ownership base than smaller companies. Large firms will have a greater need for using a variety of accounting policies. Therefore, across countries there will be a higher variability of disclosure and measurement practices for large firms than for small firms. The accumulation and dissemination of information is a costly affair. Smaller companies may not possess necessary resources to gather the huge amount of information and to disseminate it to the public (Akbas (2014), Cormier and Magnan, 1999,Gray et al., 2001, Huang and Kung, 2010; Liu and Anbumozhi, 2009; Pahuja, 2009;). Small companies feel threatened by competitive forces if they pursue a policy of full disclosure. On the other hand larger companies may be less fearful of aiding their competitors;

Larger companies are generally subject to more public attention and watch by various government authorities. Environmental disclosure will create confidence and minimize the public criticism and pressure from government. Branco and Rodrigues (2008) and Brammer and Pavelin (2008) discussed the parallel opinion that size is also used commonly as a proxy for public visibility. Larger companies are more susceptible to scrutiny from stakeholder groups since they are highly visible to external groups and more vulnerable to adverse reactions among them; Large companies have more number of shareholders to satisfy with information make more extensive use of the securities market for external financing of their operations. Smaller companies do not raise funds through the securities market and therefore cannot realize the possible benefits of adequate environmental disclosure as it will improve marketability of shares and provide ease in financing. Finally, because of regular interaction, with financial community larger companies are probably more aware of user informational needs. Normally, large companies operate over wider geographical area, have multi-product business and have multiple locations of operations (Jawaharlal,1985). Under legitimacy theory, firms' societal existence depends on the acceptance of the society where they operate.

Therefore, large firms with higher societal existence may have taken more legitimacy and may have a higher reputation and involvement of social responsibility than smaller firms. In order to attract the investors, larger companies are willing to disclose more information to reduce agency costs arising from asymmetric information and to gain public support (Jhumani2014). International accounting harmonization is also affected by the firm size. Many studies conclude that firm size affects the adoption of IFRSs and the degree of compliance with their requirements (Alia and Branson, 2011). A variety of variables can be used for measuring the size of the company. Some of these measures include total annual sales, total assets, fixed assets, paid-up capital, and log of total assets, market capitalization, number of employees and turnover. Some studies have also used a combination of one or more measures for their study.

5.5.2 Age of the firm

Company age has been considered as another important company characteristic that can influence the extent of environmental disclosure. The variation in disclosure

levels of the companies may be due to the difference in age of the companies. It is expected that older companies disclose more information in their annual reports than new companies. New companies may lack a "track record" for the purpose of disclosures. This is one of the main reasons that new companies are not interested in disclosing the information. For the purpose of this study the age of the company is measured in terms of years as companies generally prepare and issue annual reports on yearly basis.

Ideally the age of the company is measured from the date of its corporation as only after incorporation, company becomes a legal entity. (Jawaharlal,1985). It is the common belief that more mature the company is, the better is the quality of disclosure. The more mature a corporation is, the higher can be value of the reputation and more involvement in social responsibility activities. With maturity the companies become aware of the benefits of greater disclosure, Jaganathan (2007).

Previous studies support the significant association between age of firm and environmental information disclosure (e. g. Roberts, 1992; Yang, 2009; Prasad et.al, 2016; Zhang 2013). Jhumani(2014), conversed in his study that legitimacy is assumed an important resource determining their survival therefore, older companies with longer societal existence may have taken relatively more legitimacy and may have a higher reputation and involvement of social responsibility than younger companies. Liu and Anbumozhi(2009) argued that as a company matures, its reputation and involvement in discretionary activities, such as environmental protection activities and disclosure of environmental information, can become entrenched and more valuable to company. On the basis of previous literature it is assumed that there is a relationship between environmental disclosures and age of the firm.

5.5.3 Industry Type

The relationship between industry membership and the extent of the environmental disclosure has been investigated by many theoretical and empirical studies due to the fact that each sector has some distinctive characteristics that may relate to risks to society, potential growth, employment, competition and government interference (Ahmad et al., 2003). Normally Companies operating in environmentally sensitive

industries disclose more environmental information than companies operating in non-environmentally sensitive industries (Akbas, 2014). The extent of environmental disclosure in annual reports may differ from industry to industry. It is due to a number of reasons. Firstly, the fear that the disclosure of information could possibly aid the company's competitors varies among industries and thereby, may lead to industry difference in the extent of disclosure. Hence, the temptation may exist for companies within that industry to conceal certain sensitive information from their competitors. Secondly, to maintain a healthy relationship between the company and investing community, each company within an industry may try to ensure that its annual report is as informative as those of its rivals. Consequently, this may cause industry difference in environmental disclosure (Pahuja, 2009). Meek et.al(1995), claimed that proprietary costs vary across industries. Chemical companies are likely to be more sensitive about disclosures to competitors and the public than companies in certain other industries. Research and development is more relevant for companies in high tech industries.

The relevance of selected items of disclosure can also vary across industries. Therefore, industry membership may exert an influence on voluntary disclosure. Industries with high public visibility, or having less favorable public images were found to disclose more social responsibility information than their counterparts (Adams et al., 1998). Hassan and Ibrahim (2012), argued that different industrial sectors show significant variability in the type and level of environmental activity reporting. It is noted that sectors have diverse polluting potentials and are therefore subject to different levels of stakeholder expectation. Companies from carbon-intensive industries tend to disclose more environmental information than companies from non-carbon-intensive industries.(Cormier and Gordon, 2000; Cho and Patten, 2007; Brammer and Pavelin, 2008, Cho and Patten, 2007; Clarkson et al., 2008; Branco and Rodrigues, 2008). Oil & petroleum, chemical, power, paper and pulp, cement and steel industries as generating significant environmental hazards, thereby requiring substantial environmental disclosure (Branco and Rodrigues,2008). Salama et.al (2012) and Prasad et.al (2016) and Hartikayanti (2016) found positive relationships between high-profile industries and the amount of social disclosures.

Joshi et al (2011), has observed that voluntary disclosures are influenced by industry membership, the nature of their products and their research and development.

The relevance of selected items of disclosure can also vary across industries. Environmental sensitivity Companies in industries that have a larger potential impact on the environment (Meek et.al 1996). It is an expectation that the level of disclosure on environmental activities will be higher in companies belonging to carbon intensive industries and therefore, industry sector will influence the environmental disclosure. The above table reported the number of environmentally sensitive industries and environmentally non sensitive industries. The sample of this research includes 41(24 %) non- sensitive and 129 companies (75%) are environmentally sensitive industries.

5.5.4 Profitability

Corporate performance refers to the financial performance and operating performance, which is associated with a company's operating activities. Concretely, organizational performance is suggested to be measured by profitability. Profit and profitability may be used interchangeably. While profit is an absolute value which describes the difference between revenue and costs, profitability is a relative concept which measures the level of profit in relation to the volume of activities. Profit is synonymous with income, earnings, and margin and returns even though in principle, a difference exists among the concepts (Zhang, 2013).The relationship between profitability and the level of environmental disclosure has been discussed in many studies. Many researchers believe that firms with higher financial performance are more likely to have a more environmental disclosure.

Further good economic performance influences the firm's capability to undertake costly programs related to social and environmental demand thus resulting into higher disclosure. Previous studies on the relationship, however, have produced mixed results. Singhvi and Desai (1971) argues that when profitability is high and the company achieves a high margin of profit, the managerial groups are motivated to disclose more information in order to show off good reputation to the consumers, shareholders. On the reverse side, when the financial performance of the company is not good, the management of the company in order to conceal the reasons of its poor

performance may avoid disclosure of extra information. Therefore, it is interesting to study the impact of profitability on the depth of environmental disclosures. Well-run firms have incentives to distinguish themselves from less profitable firms in order to raise capital on the best available firms. Thus, more profitable firms can be expected to disclose more voluntary accounting information (Meek et al., 1995). When the earnings margin of a company is more than that of its industry, the public will have greater confidence in the company.

The company would then prefer to disclose more information to better inform the public about social/environmental activities undertaken by it. The position of the company thereby, would become stable and strong to face the competition in the market (Pahuja, 2009). From a legitimacy theory perspective, profitability can be considered to be related positively or negatively to social disclosures. On the other hand, from a stakeholder perspective economic performance is expected to be associated positively with social responsibility activities and disclosure (Branco and Rodrigues 2008). Jhumani (2014) specified about legitimacy theory hypothesize that companies are bound to an unwritten social contract within the society where they operate. Failure to comply with their legitimacy will threaten companies' performances and survival. Therefore, more profitable companies can be expected to disclose more voluntary social and environmental information than non-profitable companies. Cowen et al. (1987) cite profitability as a factor that allows management; profitability can be measured employing different indicators to provide more extensive social responsibility information.

The relationship between corporate financial performance and corporate environmental disclosure is arguably one of the most controversial issues yet to be solved (Choi, 1998). Prior research studies have used earnings per share [EPS], return on assets [ROA], return on equity [ROE], return on investment [ROI], return on capital employed [ROCE], gross profit to sales [GPS], net profit margin [NPM], dividend per share [DPS], earnings before interest, tax, depreciation and amortization [EBITDA], total assets, sales growth, asset growth, and operating income growth as a measure of profitability. (Makori & Jagongo 2013).

Author	Impact
Singhvi (1967), Pahuja, (2009), Gray et al.,(2001), Liu and Anbumozhi(2009), Al-Tuwaijri et al.,(2004),Makori and Jagongo (2013), Rajnikant and Rima (2014) Galani et.al (2011).	Positive Relationship.
Akbas (2014), Huang and Kung (2010), Kathyayini et al., (2012), Salama et.al(2012), Joshi et.al(2011), Cohen et.al (1997).	Negative relationship.
Zeng et al., (2012) Sun et al.,(2010), Ahmad et al. (2003), Cho et al.,(2010) Galani et al.(2012), Brammer and Pavelin(2006), Clarkson et al.(2011) and Malarvizhi and Matta (2016).	No relationship

Despite these contradictory empirical results, the present study expects a positive relation between profitability and the extent of environmental disclosure based on the argument that more profitable companies may have sufficient funds for compensating costs of environmental disclosures. It is also argued that companies with high profitability ratios may disclose more information in order to prevent negative attention stems from excess profitability. The present study analysed the impact on environmental disclosure by profitability using three indicators namely net profit margin, PBITDA and total income.

5.5.5 Net Profit Margin (NPM)

Net profit is the most popular profitability ratio that evaluates the overall profitability of a business. It is computed by dividing net profit after tax by net sales revenue achieved during the year. A high NPM indicates overall efficient management of business. However it measures profitability in percentage terms. Profitability has been defined as the ratio of net profits to net sales. The ratio indicates net profit margin on sales. It is the overall measure of management's ability to turn each rupee of sales into profit. It provides an indication of the ability of management to operate the business successfully, to recover the costs of goods or services, operating expenses, interest and a reasonable compensation to the owners. The higher the ratio more will be the profitability of the organization. If the profitability is high, the company will have additional capacity to absorb rising costs (pahuja, 2009). Firm may obtain a higher profit margin by increasing sales prices, decreasing costs or doing both.

5.5.6 Total Income

The sum of all money received by an organization by providing services, revenue from sales, payments from pension plans, income from dividends or other sources.

Total income may be calculated for the purposes of assessing taxes, evaluating the net worth of a company, or determining an organization's ability to make payments on a debt. Larger companies could involve in efficient business dealings and it will be reflected in its total income of the year.

5.5.7 Profit before Interest, Tax, Depreciation and Amortization (PBITDA)

Profit before interest, taxes, depreciation and amortization (PBITDA) is also referred as earnings before interest, taxes, depreciation and amortization (EBITDA). Profit before interest, taxes, depreciation and amortization (PBITDA) can be obtained by adding back expenses for interest, taxes, depreciation and amortization into net profit. Normally, profit before interest, taxes, depreciation and amortization (PBITDA) are used by corporations with high depreciation and amortization to reflect the actual profit for the corporations. Essentially, it's a way to evaluate a company's performance without having to factor in financing decisions, accounting decisions or tax environments.

An Earnings before interest, taxes, and amortization (EBITA) is a measure of company profitability used by investors. It is helpful for comparison of one company to another in the same line of business. It indicates how much cash flow a company has on hand to reinvest in the business or pay dividends. It also is seen as an indicator of the efficiency of a company's operations. Profit before interest, taxes, depreciation and amortization is calculated (PBITDA) $\text{Net Profit} + \text{Interest} + \text{Taxes} + \text{Depreciation} + \text{Amortization}$ Earnings before interest, tax, depreciation and amortization (EBITDA) is a measure of a company's operating performance .

5.5.8 Amount spent on corporate social activities (CSR)

CSR is seen as a concept in which companies voluntarily integrate social and environmental concerns into their business operations and into the interaction with their stakeholders. The voluntary compliance of social and ecological responsibility of companies is called Corporate Social Responsibility. Nowadays, India has been named among the top ten Asian countries paying increasing importance towards Corporate Social Responsibility (CSR) disclosure norms. Besides the public sector companies, it is the private sector companies that played dominant role in CSR

activities Companies have responsibility towards shareholders, investors, creditors. *So, there is a need to study what is the impact of CSR practices on reporting practices of the business.* Companies have become more transparent in accounting and display “public reporting” due to pressures from various stakeholders.

Social responsibility related to environmental aims to reduce any damaging effects on the environment from the business' processes. Activities may focus on energy use, water use, waste management, recycling, emissions, eco-friendly office and business travel policies. The concept of CSR influence the reporting practices of the company when they spend more on environmental and other social activities or tried to reduce the adverse impact of business activities on environment. Hence, the present study assumed that there may a significant positive relationship between environmental disclosure and amount spent on CSR.

CHAPTER 6

ENVIRONMENTAL ACCOUNTING AND REPORTING PRACTICES

In the present study, environmental reporting has been defined as the disclosure of information by a company regarding environmental risks, impacts, policies, strategies, targets, costs and liabilities to those who have an interest in such information. Previous chapter explained about the construction of index of environmental disclosure, the content analysis of annual reports and the rating system employed. In order to analyse the extent of environmental reporting practices of sample companies, the disclosure scores obtained by the companies have been calculated as percentages in different dimensions. The percentage analysis and the result have been presented in this chapter. The extent of environmental disclosure calculated for India, USA and UK has been presented in a comparison table.

6.1 Environmental Disclosure - Company wise

The disclosure for each company has been presented in this table. It shows the total score obtained by individual companies and percentage values. There are 62 statements included in the Index of Environmental Disclosure (**IED**). Total disclosure score column depicts the score obtained by each sample company.

Table 6.1: Environmental Disclosures-Company wise score

S.NO	COMPANY NAME	SCORE	%
1	A C C LTD.	50	80.6
2	AARTI INDUSTRIES LTD.	39	62.9
3	ADANI ENTERPRISES LTD.	36	58.1
4	ASAHI INDIA GLASS LTD.	33	53.2
5	A I A ENGINEERING LTD.	37	59.7
6	AKZO NOBEL INDIA LTD.	41	66.1
7	ALEMBIC PHARMACEUTICALS LTD	35	56.5
8	AMARA RAJA BATTERIES LTD.	38	61.3
9	AMBUJA CEMENTS LTD.	55	88.7
10	APAR INDUSTRIES LTD.	40	64.5

S.NO	COMPANY NAME	SCORE	%
11	APOLLO TYRES LTD.	42	67.7
12	ARVIND LTD.	39	62.9
13	ASHOK LEYLAND	52	83.9
14	ASIAN PAINTS LTD.	50	80.6
15	ATUL LTD.	49	79
16	AUROBINDO PHARMA LTD.	50	80.6
17	AVANTI FEEDS LTD.	34	54.8
18	BAJAJ AUTO LTD.	35	56.5
19	BAJAJ ELECTRICALS	38	61.3
20	BAJAJ HINDUSTAN SUGARS	45	72.6
21	BALRAMPUR CHINI MILLS LTD	45	72.6
22	BATA INDIA LTD.	35	56.5
23	BRITANNIA INDUSTRIES LTD.	30	48.4
24	BAYER CROPSCIENCE LTD.	42	67.7
25	BERGER PAINTS INDIA LTD.	38	61.3
26	BHARAT ELECTRONICS LTD.	51	82.3
27	BHARAT FORGE LTD.	46	74.2
28	BHARAT PETROLEUM CORP LTD.	53	85.5
29	BIRLA CORPORATION LTD.	40	64.5
30	BLUE STAR LTD.	39	62.9
31	BOSCH LTD.	43	69.4
32	C E S C LTD.	40	64.5
33	CASTROL INDIA LTD.	37	59.7
34	CEAT LTD.	36	58.1
35	CENTURY PLYBOARDS (INDIA) ltd	33	53.2
36	CENTURY TEXTILES & INDUS LTD	39	62.9
37	CHAMBAL FERTILIZERS LTD.	47	75.8
38	CHENNAI PETROLEUM CORP LTD	43	69.4
39	CIPLA LTD.	46	74.2
40	COAL INDIA LTD.	54	87.1
41	COLGATE-PALMOLIVE (INDIA) .	47	75.8
42	COROMANDEL INTERNATIONAL	42	67.7
43	CROMPTON GREAVES ELECTRI	34	54.8
44	CUMMINS INDIA LTD.	49	79
45	D C M SHRIRAM INDUSTRIES LTD	38	61.3

S.NO	COMPANY NAME	SCORE	%
46	DABUR INDIA LTD.	50	80.6
47	DALMIA BHARAT LTD.	43	69.4
48	DEEPAK FERTILIZERS .PET LTD.	26	41.9
49	DIVI'S LABORATORIES LTD.	49	79
50	DR. REDDY'S LABORATORIES LTD	48	77.4
51	EICHER MOTORS LTD.	40	64.5
52	EID PARRY LTD.	41	66.1
53	ELECTROSTEEL CASTINGS LTD.	31	50
54	ESSEL PROPACKLTD.	33	53.2
55	EMAMI LTD.	32	51.6
56	EXIDE INDUSTRIES LTD.	43	69.4
57	FINOLEX CABLES LTD.	23	37.1
58	FORCE MOTORS LTD.	27	43.5
59	G A I L (INDIA) LTD.	45	72.6
60	GLAXO SMITH PHARMA LTD.	49	79
61	GLENMARKTICALS LTD.	42	67.7
62	G H C L LTD.	49	79
63	GAYATRI PROJECTS LTD.	23	37.1
64	GODREJ PRODUCTS LTD.	51	82.3
65	GRASIM INDUSTRIES LTD.	48	77.4
66	GUJARAT FLUORO CHEMICALS	30	48.4
67	GUJARAT NARMADHA VALLEY	29	46.8
68	GUJARAT STAT & CHEMICALS	49	79
69	HATSUN AGRO PRODUCTS LTD.	34	54.8
70	HAVELLS INDIA LTD.	44	71
71	HERO MOTOCORP LTD.	46	74.2
72	HINDALCO INDUSTRIES LTD.	54	87.1
73	HINDUSTP ETROLEUM CORPN LTD	53	85.5
74	HINDUSTAN UNILEVER LTD.	40	64.5
75	HINDUSTAN ZINC LTD.	56	90.3
76	INDIA CEMENTS LTD.	35	56.5
77	INDIAN OIL CORPN. LTD.	54	87.1
78	INDO COUNT INDS. LTD.	45	72.6
79	INOX WIND COMPANY LTD	32	51.6
80	IPCA LABORATORIES LTD.	45	72.6

S.NO	COMPANY NAME	SCORE	%
81	J B F INDUSTRIES LTD.	42	67.7
82	J B M AUTO LTD.	32	51.6
83	JINDAL STAINLESS (HISAR)	41	66.1
84	J K CEMENT LTD.	40	64.5
85	J K LAKSHMI CEMENT LTD.	46	74.2
86	JK PAPER COMPANY LTD	48	77.4
87	J K TYRE & INDS. LTD.	48	77.4
88	J S W ENERGY LTD.	48	77.4
89	JAIN IRRIGATION SYSTEMS LTD.	41	66.1
90	JINDAL POLY FILMS LTD.	34	54.8
91	JINDAL SAW LTD.	48	77.4
92	KAJARIA CERAMICS LTD.	35	56.5
93	KALPATARU POWERSION LTD.	45	72.6
94	KANSAI NEROLAC PAINTS LTD.	36	58.1
95	KEI INDUSTRIES LTD.	27	43.5
96	KIRLOSKAR BROTHERS LTD.	46	74.2
97	KIRLOSKAR OIL ENGINES LTD.	49	79
98	KWALITY LTD.	42	67.7
99	LAKSHMI MACHINE WORKS LTD.	40	64.5
100	LARSEN & TOUBRO LTD.	48	77.4
101	LEEL ELECTRICALS LTD.	33	53.2
102	LUPIN LTD.	41	66.1
103	M R F LTD.	27	43.5
104	MAHINDRA & MAHINDRA LTD.	55	88.7
105	MARICO LTD.	45	72.6
106	MINDA INDUSTRIES LTD.	32	51.6
107	N M D C LTD.	53	85.5
108	NATIONAL ALUMINIUM CO. LTD.	55	88.7
109	NATIONAL FERTILIZERS	42	67.7
110	NATIONAL STEEL AGRO INDS.	32	51.6
111	N T P C LTD.	38	61.3
112	O C L INDIA LTD.	49	79
113	OIL & NATURAL GAS CORPN.	52	83.9
114	OIL INDIA LTD.	45	72.6
115	ORIENT CEMENT LTD.	46	74.2

S.NO	COMPANY NAME	SCORE	%
116	ORIENT PRESS LTD.	33	53.2
117	P I INDUSTRIES LTD.	43	69.4
118	PHILLIPS CARBON BLACK LTD.	36	58.1
119	PRAKASH INDUSTRIES LTD.	41	66.1
120	PROCTER NE & HEALTH CARE	39	62.9
121	PETRONET L N G LTD.	41	66.1
122	PIDILITE INDUSTRIES LTD.	30	48.4
123	PIRAMAL ENTERPRISES LTD.	47	75.8
124	POLYPLEX CORPORATION LTD.	35	56.5
125	POWER GRID CORPN. OF INDIA	49	79
126	PRISM JOHNSON LTD.	45	72.6
127	RAMCO CEMENTS LTD.	48	77.4
128	RASHTRIYA CHE FERTILIZERS	51	82.3
129	RALLIS INDIA LTD.	44	71
130	RELIANCE POWER LTD.	38	61.3
131	RAYMOND LTD.	40	64.5
132	RELIANCE INDUSTRIES LTD.	57	91.9
133	SIEMENS	47	75.8
134	S J V N LTD.	43	69.4
135	S K F INDIA LTD.	37	59.7
136	S R F LTD.	51	82.3
137	SHREE CEMENT LTD.	50	80.6
138	SINTEX INDUSTRIES LTD.	27	43.5
139	SOMANY CERAMICS LTD.	32	51.6
140	SUTLEJ TEXTILES & INDS. LTD.	45	72.6
141	SUPREME INDUSTRIES LTD.	36	58.1
142	SUPREME PETROCHEM LTD.	51	82.3
143	SUZLON ENERGY	46	74.2
144	T V S ELECTRONICS LTD.	33	53.2
145	T V S MOTOR CO. LTD.	37	59.7
146	T T K PRESTIGE LTD.	33	53.2
147	T V S SRICHAKRA LTD.	36	58.1
148	TAMIL NEWSPRINT & PAPERS	54	87.1
149	TATA CHEMICALS LTD.	53	85.5
150	TATA GLOBAL BEVERAGES LTD.	49	79

S.NO	COMPANY NAME	SCORE	%
151	TATA POWER COMPANY	51	82.3
152	TATA STEEL LTD.	56	90.3
153	THERMAX LTD.	43	69.4
154	TIME TECHNOPLAST LTD.	37	59.7
155	TITAN COMPANY LTD.	46	74.2
156	TORRENT PHARMACEUTICAL ltd	49	79
157	TORRENT POWER LTD.	49	79
158	TRIDENT LTD.	46	74.2
159	TRIVENI ENGINEERING INDU	32	51.6
160	UFLEX LTD.	46	74.2
161	ULTRATECH CEMENT LTD.	49	79
162	VARDHMAN TEXTILES LTD.	47	75.8
163	VEDANTA LTD.	50	80.6
164	VOLTAS LTD.	43	69.4
165	WELSPUN CORPN LTD	36	58.1
166	WELSPUN INDIA LTD.	47	75.8
167	WHIRLPOOL OF INDIA LTD.	34	54.8
168	WOCKHARDT LTD.	36	58.1
169	WEST COAST PAPER MILLS LTD.	44	71
170	ZUARI AGRO CHEMICALS	37	59.7

The above table displays ACC ltd, Ashok Leyland, Asian Paints ltd, Aurobindo pharmacy ltd, Mahindra & Mahindra, ONGC, Bharat Petroleum have made 50 and more items of information out of total number of 62 items considered in the Index of environmental disclosure. It means they have disclosed around 85% environmental information in their annual reports. Reliance Industries, Tata steel and Hindustan Zinc companies have provided 90 % and above environmental information in their annual report. Very few companies like Britannia, Finolex, Gayathri Projects, KEI and Syntax were disclosed less than 30 items of environmental disclosure index. There are 11 companies disclosed less than 30 items, 58 companies have disclosed 31 to 40 items of disclosures, 78 companies have provided 41 to 50 items of information and 23 companies have reported more number of 51- 60 disclosures. More than 50% of sample companies environmental reporting was found good. They have reported both quality and quantity of environmental reporting.

6.2 Environmental Disclosures Aggregate – Company wise

The scores obtained by the companies have been grouped according to their percentages and presented in the following table. Actual or disclosed score measures the amount of information actually found to be disclosed in the annual report. Disclosure percentage depicts the amount of information found to be reported in the annual reported as a percentage of the maximum amount of information that could have been presented.

Table 6.2: Aggregate Environmental Disclosures

Percentage of disclosure	Number of Companies
Less than 25%	0
25%-50%	12
50%-75%	103
above 75%	55
Total	170

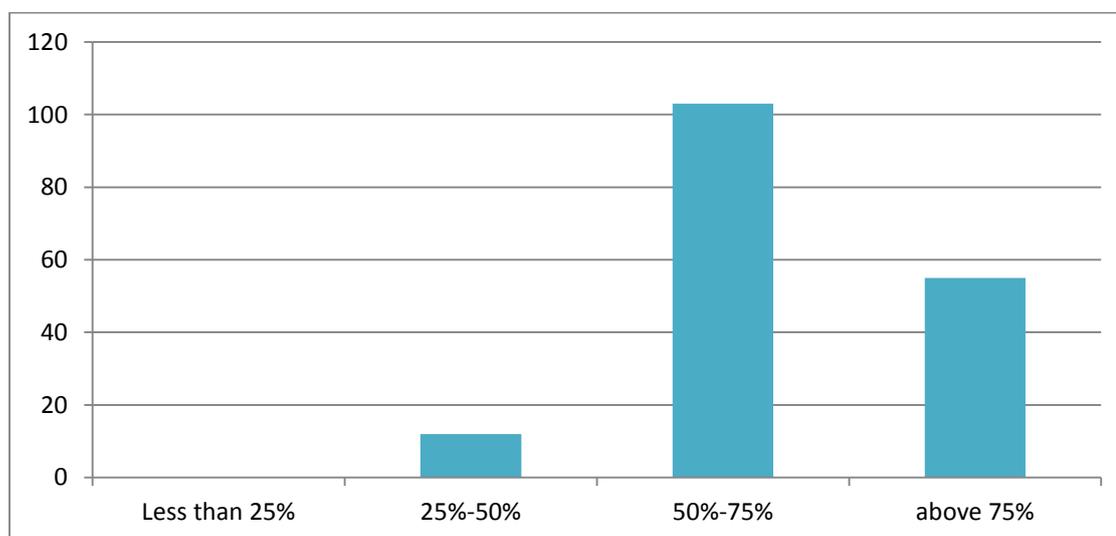


Figure 6.1: Environmental Disclosures - Aggregate

Table 6.2 explains that 12 companies have given minimum level of 25% to 50% environmental information in their annual reports. The percentage of scores indicate the fact that minimum level disclosure made by only 12 companies and it is 7% of total sample companies of 170. Majority number of companies, 103 has provided 50% - 75% and 55 companies have given above 75 % of environmental disclosure, and it is 32 % of

total sample companies. We can understand that Indian manufacturing companies have started reporting environmental matters and other related activities. Indian companies are more aware of the importance of social disclosure in serving the needs of various stakeholders. Since the sample companies are ranked in famous business magazine, it is anticipated they can perform well in environmental activities. Prior studies have argued that an increasing quantity of environmental disclosures means that a company is becoming increasingly environmentally proactive. Indian companies were providing their environmental information both on their web sites as well as in their annual reports (Chatterjee and Mir, 2008). Sonia kundra (2013), reported that, companies are serious about this issue and are reporting their green practices. Sen e.t al, 2011 revealed positive or neutral news, but none of them disclosed any negative news, Malik and Mittal,(2015) concluded that environment information in descriptive manner, Indian companies followed diverse reporting practices on the internet viz., stand-alone environmental reporting or reporting along with the Annual/Financial Reports, or Sustainability Reporting Malarvizhi and Yadhav(2008). Overall, increase in the quantity of environmental disclosures indicates that the practice of reporting on environmental information has become more important for all Indian manufacturing companies.

6.3 Environmental Disclosure – Category wise Score

The present study would analyse the relationship between each category disclosures and selected independent variables. The spread of disclosures reported by the individual companies across categories is a valid measurement for the study. The five major categories included in the index are the indicators of overall disclosure of a company. The following table would explain the disclosure made by sample companies for 18 items related to environmental policies and Initiatives. Table shows the number of companies disclosed and the % of companies disclosed each item of checklist.

Table 6.3: Environmental Policy and Initiatives Disclosure

Item No	No. of Companies	%	Item No	No. of Companies	%
1	170	100	10	146	85.9
2	166	97.6	11	120	70.6
3	164	96.5	12	138	81.2
4	25	14.7	13	154	90.6

Item No	No. of Companies	%	Item No	No. of Companies	%
5	142	83.5	14	151	88.8
6	27	15.9	15	105	61.8
7	113	66.5	16	106	62.4
8	78	45.9	17	112	65.9
9	60	35.3	18	163	95.9

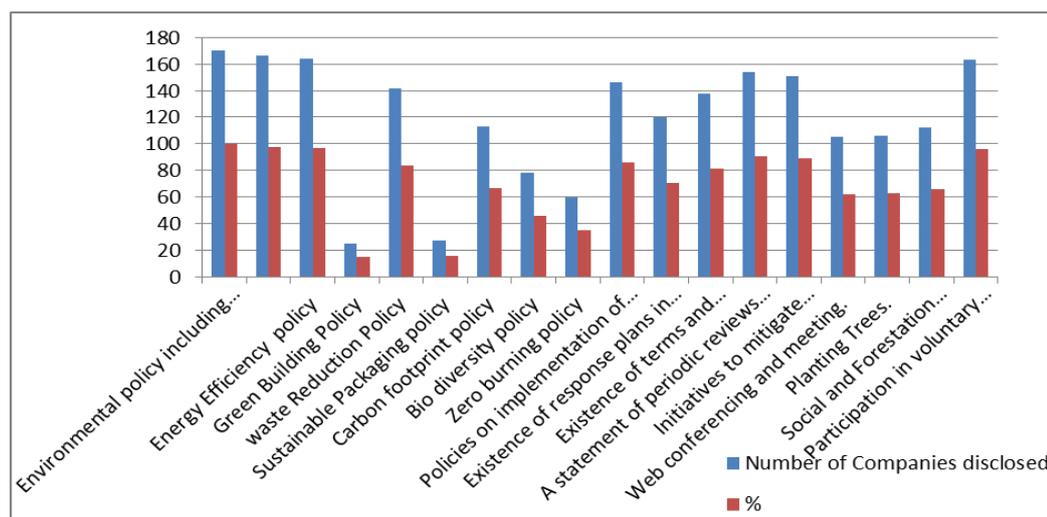


Figure 6.2: Environmental Policy and Initiatives

The above fig 6.2 provides the detail about the number of companies have responded to each statement given in category 1 of IED. The chart also shows the % values disclosure of each item about environmental policy and Initiatives.

Table 6.4: Environmental Expenditure Disclosure

Environmental Expenditure		
Item No	Number of Companies	%
1	158	92.9
2	103	60.6
3	4	2.4
4	0	0
5	152	89.4
6	139	81.8
7	98	57.6
8	15	8.8
9	10	5.9
10	152	89.4

Table 6.3.3 given above explains the disclosure made by sample companies for 10 items related to environmental expenditure. It also provides the detail about the number of companies disclosed and the % of companies disclosed for each item selected in the Index. From the above table, we can understand that companies have reported about description on expenditure, future estimates, amount spent on research and development, allocation of budgetary amount. They did not give more disclosure on environmental financial assistance Loans, Grants, provisions and reserves etc.

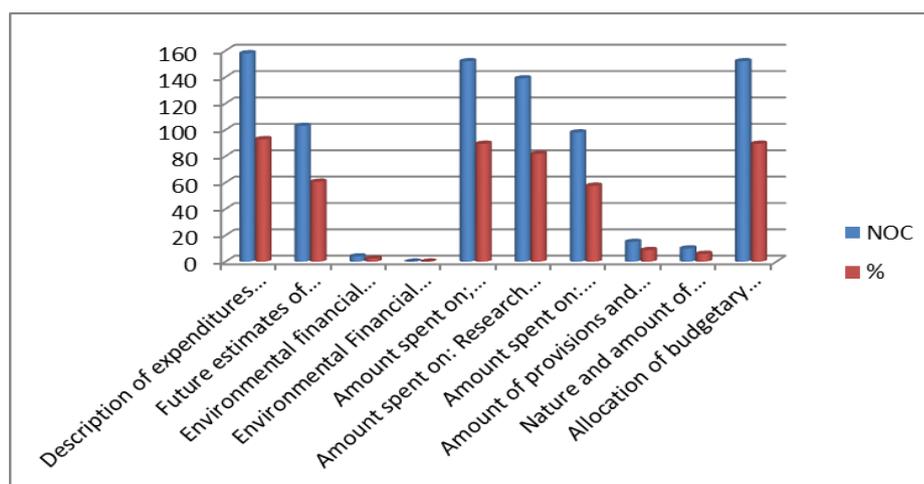


Figure 6.3: Environmental Expenditure

The following table would explain the disclosure made by sample companies for 16 items related to environmental pollution. It also gives information about the number of companies disclosed and the % of companies disclosed each item of checklist. We can understand that companies have responded well for the disclosure practices on environmental pollution. Minimum 40% of companies have reported on item number 5, and maximum 91% companies have reported on 10th item if index.

Table 6.5: Environmental Pollution Disclosure

Item No	No .of .Companies	%	Item No	No. of. Companies	%
1	90	52.9	9	101	59.4
2	87	51.2	10	154	90.6
3	128	75.3	11	140	82.4
4	120	70.6	12	105	61.8
5	68	40	13	136	80
6	101	59.4	14	138	81.2
7	114	67.1	15	128	75.3
8	147	86.5	16	150	88.2

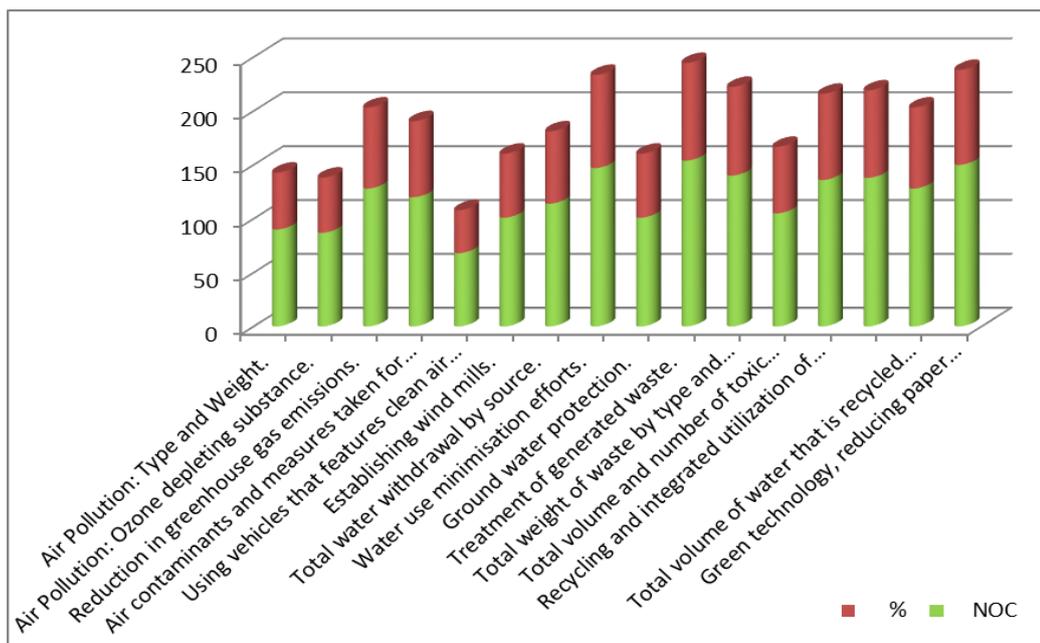


Figure 6.4: Environmental Pollution Disclosure

The figure shows the details of both percentage values and number of companies disclosed on environmental pollution.

Table 6.6: Environmental Reporting Elements Disclosure

Item Number	Number of Companies	%
1	167	98.2
2	162	95.3
3	95	55.9
4	158	92.9
5	97	57.1
6	99	58.2
7	146	85.9
8	3	1.8
9	124	72.9
10	148	87.1
11	165	97.1

Above table provides disclosure practices of sample companies for the fourth category environmental reporting elements disclosure. There are 11 disclosure statements about environmental reporting elements included in the index. All sample companies have reported for all items in their annual report except few items related to environmental loss disclosure. Only 2 % companies given the information.

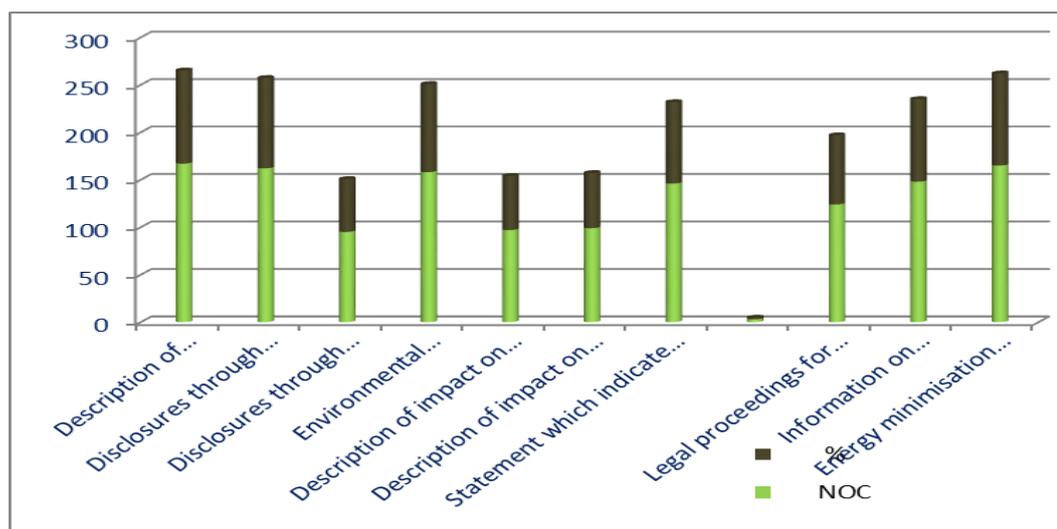


Figure 6.5: Environmental Reporting Elements

Figure 6.3.8 shows the number of companies disclosed on the items included in environmental reporting elements, category IV. All the 11 items have been reported by many companies, but information about environmental loss disclosed by very few companies.

Table 6. 7: Environmental Compliance Disclosure

Item No	Number of Companies	%
1	149	87.6
2	149	87.6
3	153	90
4	108	63.5
5	105	61.8
6	144	84.7
7	110	64.7

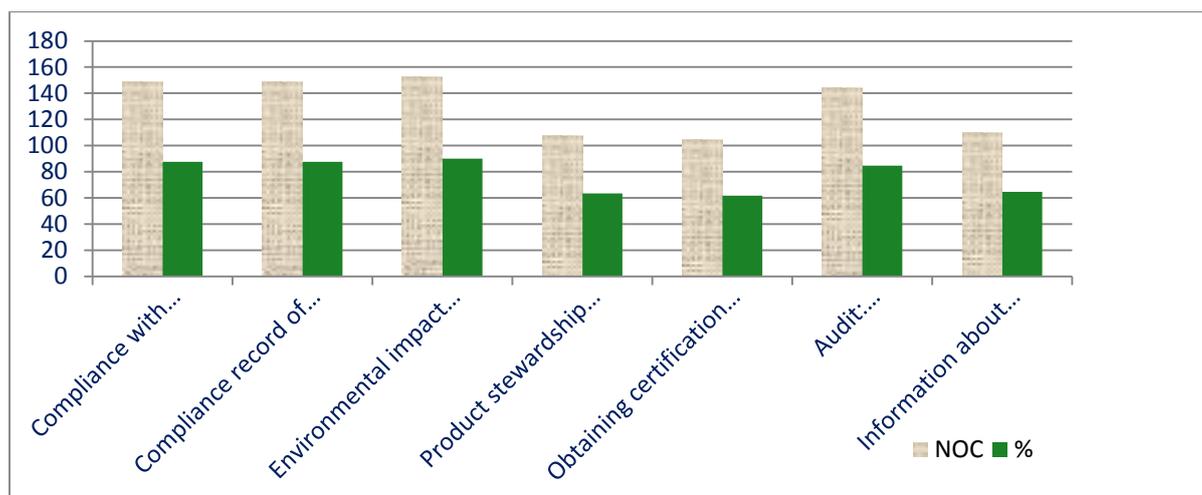


Figure 6.6: Environmental Compliance Disclosure

The above table 6.3.9 would explain the disclosure made by sample companies for 7 items related to environmental compliance. Table shows the number of companies disclosed and the % of companies disclosed each item of checklist. It also explains the response of the sample companies given for the items included in environmental compliance category. All the companies have responded fairly for all statements. Both the percentage values and number of companies reported is given in the table.

6.4 All Categories Environmental Disclosure

Index of environmental disclosure has been prepared with five major categories i.e., Environmental policies, Environmental expenditure, Environmental pollution, Environmental Reporting Elements and Environmental audit and compliance. From the table it is clear that most of the companies have provided Information for category I, which consisting 18 disclosure items. Total disclosure 3060 represents 18 statements in environmental policies and initiatives multiplied by 170 companies. ($170 \times 18 = 3060$). Score obtained is 2140 represents that 70 % ($2140/3060 \times 100$) disclosure or 119 companies ($2140/18 = 119$) have disclosed on category I i.e., Environmental policy and Initiatives. Category II includes 10 statements about environmental expenditure, the total score 1700 means that 10×170 companies = 1700. But actual score obtained by sample companies is 831. That is 49% ($831/1700 \times 100$) of disclosure have been made on category II. Out of the total sample, 83 companies ($831/10$) were reported the environment related expenditure in their annual

report. Category III contains the items related with pollution, recycling, water conservation waste disposal etc with 16 statements. Sample companies have provided 1907 disclosure, in category III and it reveals that 70% ($1907/2720 * 100$) information has been given by the companies. 11 statements are included in category IV, and 73% of disclosure or 124 ($1364/11 = 124$) companies have reported. Category V depicts 918 disclosure have given out of 1190, on environmental audit and compliance. This implies that 77 % of environmental information made on category V. Total column indicates that the overall score obtained by all 170 companies in all five major groups. The present study would analyse all 5 categories as 5 dependent variables. So, it is important to understand the spread of disclosure for all five categories .The following table provides the score obtained by sample companies for each category or classification along with % values.

Table 6.8: All Categories Disclosure score

s.no	Categories	Total	Score obtained	%
I	Environmental policy and Initiatives	3060	2140	70%
II	Environmental Expenditure	1700	831	49%
III	Environmental Pollution	2720	1907	70%
IV	Environmental reporting Elements	1870	1364	73%
V	Environmental audit and Compliance	1190	918	77%
	Total	10540	7160	68 %

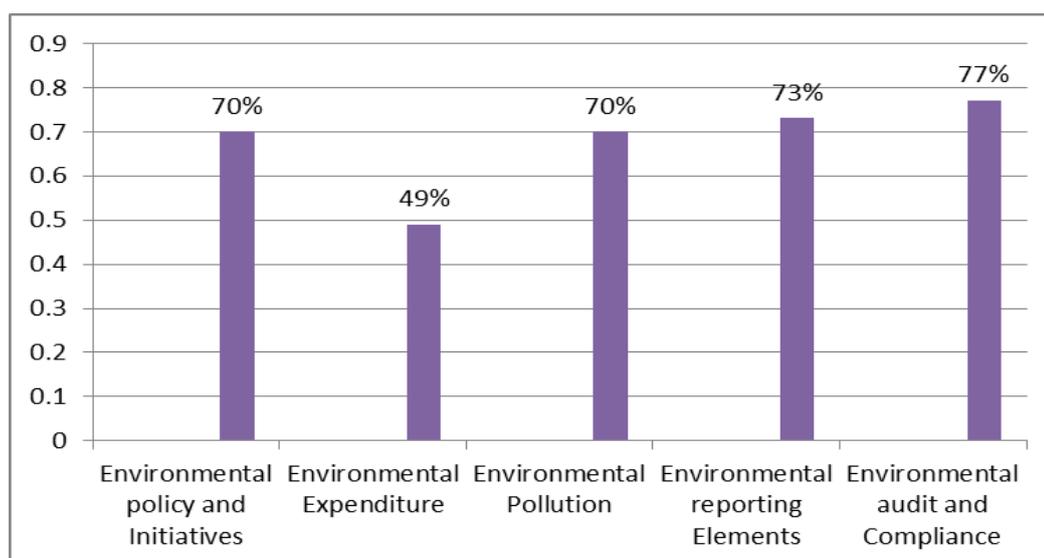


Figure 6.7: All Categories disclosure score

6.5 Environmental Disclosure - Individual Item wise

The following table has prepared to find the number of companies have disclosed a particular item in their annual report. This table shows the result of item wise disclosure by sample companies and the proportionate percentage values. This is the analysis of finding total number of companies have done report on each statement given in the index. It shows the individual item's score. For example, there is an item "Energy efficiency policy" is given in the index and 164 companies have reported out of sample 170 companies. In terms of percentage, 96.5 % of sample companies have been disclosed about energy policy.

Table 6.9: Individual Item - Wise Environmental Disclosure

S.NO	Index of Environment Disclosure	Number of Companies disclosed	%
1	Environmental policy including description of environmental objectives, environmental issues of concern.	170	100
2	Establishment of environmental management systems, environmental department, public issue committee.	166	97.6
3	Energy Efficiency policy	164	96.5
4	Green Building Policy	25	14.7
5	waste Reduction Policy	142	83.5
6	Sustainable Packaging policy	27	15.9
7	Carbon footprint policy	113	66.5
8	Bio diversity policy	78	45.9
9	Zero burning policy	60	35.3
10	Policies on implementation of ISO 140001,ISO 8000 etc.,at the plant and firm level	146	85.9
11	Existence of response plans in case of accidents.	120	70.6
12	Existence of terms and conditions applicable to suppliers and/or customers regarding environmental practices.	138	81.2
13	A statement of periodic reviews and evaluations of its environmental performance.	154	90.6
14	Initiatives to mitigate environmental impacts of products & services	151	88.8
15	Web conferencing and meeting.	105	61.8
16	Planting Trees.	106	62.4
17	Social and Forestation Programmes.	112	65.9
18	Participation in voluntary initiatives.	163	95.9
19	Description of expenditures for pollution control equipment and facilities, environmental friendly machines.	158	92.9

S.NO	Index of Environment Disclosure	Number of Companies disclosed	%
20	Future estimates of expenditures for pollution control facilities.	103	60.6
21	Environmental financial assistance: Grants.	4	2.4
22	Environmental Financial assistance: Loans.	0	0
23	Amount spent on; Technologies.	152	89.4
24	Amount spent on: Research and Development	139	81.8
25	Amount spent on: Innovation to enhance the environmental performance and efficiency.	98	57.6
26	Amount of provisions and reserves.	15	8.8
27	Nature and amount of environmental fines.	10	5.9
28	Allocation of budgetary funds to environmental projects or Initiatives.	152	89.4
29	Air Pollution: Type and Weight.	90	52.9
30	Air Pollution: Ozone depleting substance.	87	51.2
31	Reduction in greenhouse gas emissions.	128	75.3
32	Air contaminants and measures taken for this reduction.	120	70.6
33	Using vehicles that features clean air technology and travel emissions.	68	40.0
34	Establishing wind mills.	101	59.4
35	Total water withdrawal by source.	114	67.1
36	Water use minimisation efforts.	147	86.5
37	Ground water protection.	101	59.4
38	Treatment of generated waste.	154	90.6
39	Total weight of waste by type and disposal method.	140	82.4
40	Total volume and number of toxic chemical release/spills and gas flaring.	105	61.8
41	Recycling and integrated utilization of waste products for energy conservation	136	80.0
42	Percentage of materials that is recycled and reused.	138	81.2
43	Total volume of water that is recycled and reused.	128	75.3
44	Green technology, reducing paper consumption and bio fuel used.	150	88.2
45	Description of environmental indicators and its disclosures.	167	98.2
46	Disclosures through Annual report.	162	95.3
47	Disclosures through sustainability report.	95	55.9
48	Environmental information to be disclosed through the Media, brochures, internet etc.,	158	92.9
49	Description of impact on biodiversity in Protected areas or high bio diversity value.	97	57.1

S.NO	Index of Environment Disclosure	Number of Companies disclosed	%
50	Description of impact on biodiversity in outside Protected area.	99	58.2
51	Statement which indicate that the company's operations do not cause pollution.	146	85.9
52	Loss disclosure with respect to particular environmental sites and activities.	3	1.8
53	Legal proceedings for violating environmental laws.	124	72.9
54	Information on use/development/exploration of new resources, insulation etc.,	148	87.1
55	Energy minimisation efforts/energy saved.	165	97.1
56	Compliance with government regulations, standards including benchmarks.	149	87.6
57	Compliance record of air, water and waste permits.	149	87.6
58	Environmental impact assessment.	153	90.0
59	Product stewardship including life cycle analysis, product certification and eco labelling.	108	63.5
60	Obtaining certification for environmental management systems/ISO 14001	105	61.8
61	Audit: Internal/External/ Independent periodic verification of documents.	144	84.7
62	Information about Awards for environmental performance or activities.	110	64.7
	TOTAL	7160	

There has been a consistent practice of disclosing Environmental policy including description of environmental objectives, environmental issues of concern, establishment of environmental management systems, environmental department/ public issue committee, Energy efficiency policy, Participation in voluntary initiatives, Description of environmental indicators and its disclosures, Disclosures through Annual report, Energy minimisation efforts/energy saved reported by 160 to 170 companies in their annual report. It implies that mostly all companies have disclosed about environmentally important matters. Securities Exchange board of India (SEBI), has given direction to all listed companies to disclose environmental and other social information in the segment called “ Business social responsibility” on energy policy, Environmental management system etc..

A statement of periodic reviews and evaluations of its environmental performance, Initiatives to mitigate environmental impacts of products & services, Description of expenditures for pollution control equipment and facilities/environmental friendly machines, Amount spent on technologies, Allocation of budgetary funds to environmental projects or Initiatives, Treatment of generated waste, Green technology, reducing paper consumption and bio fuel used, environmental information to be disclosed through the Media, brochures, internet etc., all these items have been disclosed by 150 – 160 companies. All companies have given information about Energy conservation, technology absorption and research and development matters in their annual report. Very few companies have given descriptive statements. Almost all the companies have reported the above information. Items related to Waste Reduction Policy, Policies on implementation of ISO 140001, ISO 8000 etc., at the plant and firm level, Water use minimisation efforts,

Total weight of waste by type and disposal method, Statement which indicate that the company's operations do not cause pollution, Audit: Internal/External/ Independent periodic verification of documents, Information on use/development/exploration of new resources, insulation etc. and Compliance record of air, water and waste permits have been reported by 140 – 150 companies. Further, regarding information on Existence of terms and conditions applicable to suppliers and/or customers regarding environmental practices, Amount spent on: Research and Development, Recycling and integrated utilization of waste products for energy conservation and Percentage of materials that is recycled and reused are provided in the annual report by 130 – 140 companies. Existence of response plans in case of accidents, Reduction in greenhouse gas emissions, Air contaminants and measures taken for this reduction, Total volume of water that is recycled and reused, legal proceedings for violating environmental laws have been disclosed by 120 – 130 companies. The number of companies disclosing the Information about Awards for environmental performance or activities, Total water withdrawal by source, Social and Forestation Programmes and Carbon footprint policy are 110 – 120 companies. Web conferencing and meeting, Future estimates of expenditures for pollution control facilities, Establishing wind mills, Ground water protection, Product stewardship including life cycle analysis, product

certification and eco labelling and obtaining certification for environmental management systems/ISO 140001 are reported by 100 – 110 companies. It is found from the above table that items like, Bio diversity policy, Amount spent on: Innovation to enhance the environmental performance and efficiency, Air Pollution: Type and Weight, Air Pollution: Ozone depleting substance, Disclosures through sustainability report, Description of impact on biodiversity in Protected areas or high bio diversity value, Description of impact on biodiversity in outside Protected area have been provided in 80 -100 companies.

Some information like Zero burning policy, using vehicles that features clean air technology and travel emissions items are given in annual report of 60 – 80 companies.. There are few items neither are nor reported in many annual reports. Sustainable Packaging policy, Environmental financial assistance: Grants, Amount of provisions and reserves, Nature and amount of environmental fines, Loss disclosure with respect to particular environmental sites and activities have been reported by less than 30 companies. No company has disclosed about an item related with Environmental Financial assistance: Loans given to companies' for environmental protection.

6.6 Environmental Disclosure Aggregate – Item wise

The individual item disclosure has been summarized to understand the table easily. Here, all 62 items of environmental information selected in the index have been grouped in to percentage of companies disclosed the items in Table: 6.6. The above table indicates that the percentage score of an item reported by number of companies. In order to understand the content of table easily, item wise disclosures have been grouped in percentages and shown in the sub table number 6.6.1 It is observed that 5 items given in the index have been reported by 0 - 10% of total sample companies. Almost all companies have reported some basic environmental information and these 11 items are grouped in to 91-100%. And 17 items have been provided by 81% to 90 % companies. Out of the total 62 items stated in the index, 10 items of environmental information included in index have been disclosed by 61 % - 70 % companies, 8 items have been reported in 51% - 60 % of companies. Some items are reported by few companies ie., less than 21 % and information disclosed by the majority of sample companies ie., more than 30% .

Further, about 2 items have been disclosed by nearly 40% of companies. It shows the awareness and concern on environmental disclosure practices among Indian companies has increased. Loss disclosure with respect to particular environmental sites and activities 3 %, Environmental financial assistance: Grants.4% and loan 0%, Amount of provisions and reserves 8.8%, Nature and amount of environmental fines 5.9%. Indian companies are following voluntary disclosure practices, so there is no legal compulsion to maintain reserves and provision for environmental expenses. Green building policy and sustainable packaging policy are the two items disclosed by few companies that is 11 to 20 %.The trend for giving more environmental matters is being increased and it is expected that, Indian manufacturing companies' reporting practices would be more transparent and useful for various stakeholders.

Table 6.10: Environmental disclosure Aggregate -Items wise

S.NO	% of companies	Number of disclosure	S.NO	% of companies	Number of disclosure
1.	0 – 10 %	5	6.	51 – 60 %	8
2.	11 – 20 %	2	7.	61 – 70 %	10
3.	21 – 30 %	0	8.	71 – 80 %	6
4.	31 - 40 %	2	9.	81 – 90 %	17
5.	41 – 50%	1	10.	91 – 100 %	11
	Total				62

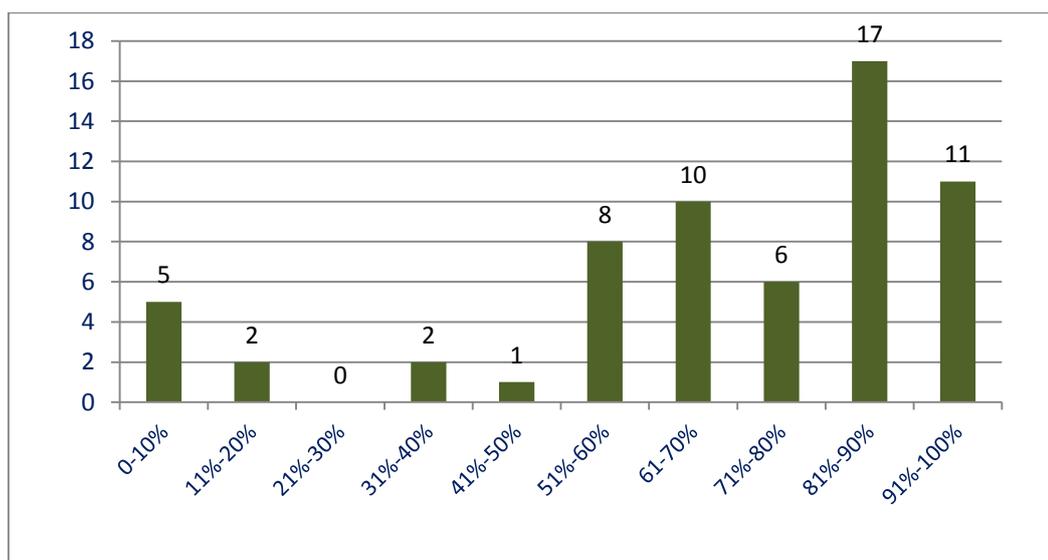


Figure 6.8: Number of Items disclosed by companies(in %)

6.7 Environmental Reporting Practices: Comparative Analysis of INDIA, USA and UK.

The present study attempted to evaluate the extent of environmental reporting practices of manufacturing companies of three countries viz., India, US and UK. This section presented the total environmental disclosure score of US and UK companies, Comparative Disclosure percentage table, Comparative category wise disclosure score, Individual items of environmental score comparisons (disclosure % of companies). All these tables are revealing the percentage analysis result. The purpose of the analysis is to understand the extent of environmental reporting practices of both developing country like India and developed countries like America and United Kingdom. In developed countries, there are mandatory reporting guidelines for social disclosure. Environmental concern, awareness and realizing the responsibility towards environment, pressure from different stakeholders are influencing the companies to enhance the reporting practices. USA While environmental reporting has become so widespread because of the international spread of activities of MNCs, their visibility and the pressure exerted on them through international forums, insight into the extent to which this is a real 'global' phenomenon . Some companies are becoming more transparent and are adopting best practice in sustainability reporting. That is, they disclose high-quality and relevant information about their environmental (social, and economic) footprint. Large size Latin American companies operating in high-impact sectors are more likely to report environmental information than smaller and cleaner firms. The results indicated that environmental accounting and reporting is positively related to sustainable development.

American companies report environmental information voluntarily while others do not having a global orientation in sales, finance or both affects companies in the region to modernize their practices. Jaffe and Palmer(1997) attempted a study, how environmental reporting differs among MNCs from the major economic regions at 2 periods 1998 and 2001. They found, UK multinationals were most eager to publish an environmental report, 5.6 times more likely than US firms in 1998. In 2001, the UK and other European countries were again the most likely to have published an environmental report, with even greater gaps between them and US multi nationals. In 2001, the European Commission published a Recommendation to stimulate voluntary

disclosure on environmental and social issues in annual reports reflecting societal concerns in this direction. The UK government also strongly pressures firms to report on environmental and social issues. Multinationals from the UK and especially 'other European countries were the most likely to publish an environmental report in both years. The UK's policy included suggestions on sustainable development, raising awareness, institutional framework, climate change, tropical forests, ozone layer, waste management, energy, industrial development, transport, agriculture, the North Sea, countryside and wildlife conservation, water resources, global population, international debt and international conservation of species and their habitats.

Accounting for the environment in the US has had a much higher profile (than in the UK. This is due in part to the US practice of directing issues and concerns towards the general public rather than towards employees, as in the UK [Gray et al, 1987]. J. Yahvah et.al,(1981) comparing the United States with Western Europe and the United Kingdom, presented justifications of the issue including social accountability. In the U.S., disclosures on environmental and energy matters were widely reported. The surveys showed the trend towards a greater coverage of green issues while at the same time they illustrated the diversity of reporting practice. Governmental initiatives have been designed to promote greater industry participation in environmental matters. Current trends of accounting for the environment include an increase in disclosures in annual reports. However, the type of information being reported varies among corporations and countries.

6.8 Environmental Disclosure Score: United States of America (USA) and United Kingdom (UK).

The following table explains the total disclosure score obtained by US companies. The sample companies selected from Fortune Global survey ranking list of the year 2017. Environmental score (Sum of number of items disclosed in annual report) and the percentage value (number of items actually disclosed/ total items in the index *100) obtained by the individual company have been presented in this table. All 25 companies have made environmental disclosure through their annual report, separate sustainability or environmental report provided on their official websites. Most of the companies have given compliance record, environmental initiatives, waste disposal methods, water and bio

diversity conservation information and pollution measurements with diagrams, pictures and videos and other kinds in their websites. There are 5 companies have disclosed 33 to 37 items of information in the checklist, and 14 companies disclosed 40 to 50 items. There are 6 companies reported 50 to 57 items of environmental activities. In percentage terms, US companies have disclosed minimum 55% of environmental matters and maximum 92% information in their annual report. From the table, the reporting practices in American companies proved the responsibility towards society and environment.

Table 6.11: Environmental Disclosure Score of US Companies

S. No	Company Name	Total Score (out of 62)	%
1	GENERAL MOTORSCOMPANY	54	87.1
2	FORD MOTOR COMPANY	57	92.0
3	THE BOEING COMPANY	50	81.0
4	LOCKHEED MARTIN CORPORATION	37	69.0
5	UNITED TECHNOLOGIES CORPN	34	55.0
6	EXXONMOBIL	40	65.0
7	CHEVRON	42	68.0
8	PHILLIPS66	33	53.2
9	VALEROENERGY CORPORATION	43	69.4
10	MARATHON PETROLEUM CORPORN	46	74.2
11	CATERPILLAR	42	68.0
12	APPLE INC	57	91.9
13	MICROSOFT CORPORATION	52	84.0
14	INTEL CORPORATION	44	71.0
15	IBM	48	77.4
16	CISCO	37	60.0
17	HP INC	44	71.0
18	JOHNSON & JOHNSON	45	73.0
19	THE DOW CHEMICAL COMPANY	47	76.0
20	HONEYWELL	44	71.0
21	THE COCA COLA COMPANY	43	69.4
22	PFIZER.INC	47	76.0
23	PEPSICO	36	58.1
24	ARCHER DANIELS MIDLAND COMP	44	71.0
25	THE PROCTOR & GAMBLE COMPANY	50	81.0

Table 6.8.1 shows the number of environmental statements reported by the US sample companies selected for the study. It is found that minimum number of 33 statements and maximum of 57 statements have been disclosed. Nearly 14 companies have explained the environmental related information in detail. They provided 40 – 50 items.

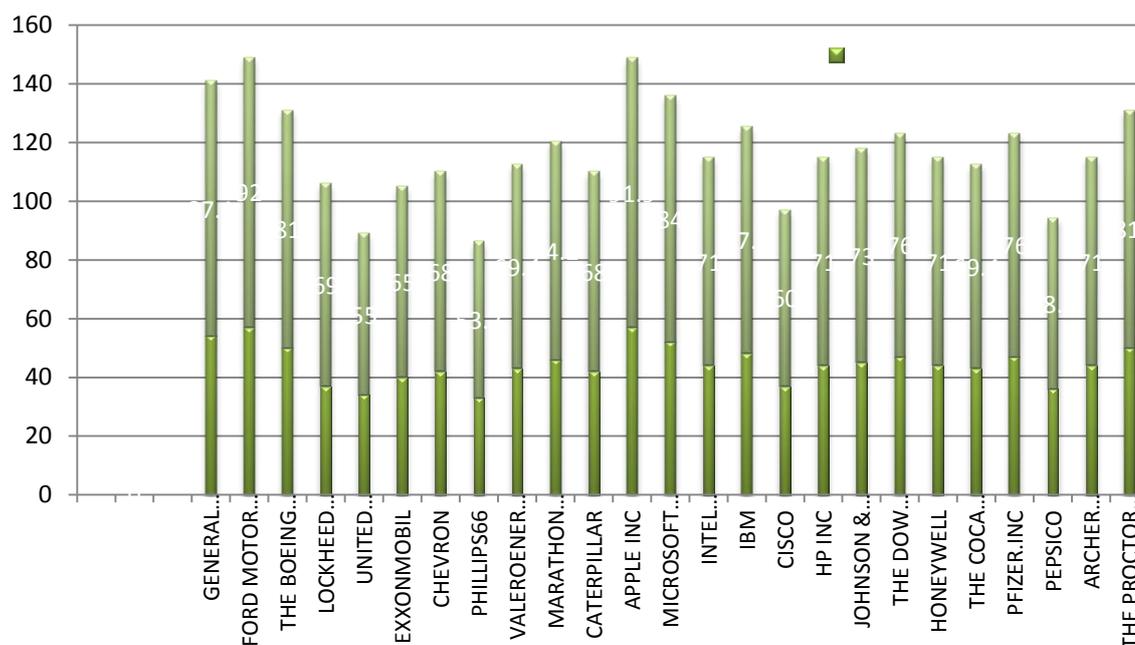


Figure 6.9: Environmental Disclosure score: US companies

6.9 Environmental Disclosure Score: UK

The present study attempted to calculate Environmental score (Sum of number of items disclosed in annual report) and the percentage value (number of items actually disclosed/ total items in the index *100) obtained by the UK companies' have been presented in this table. All 25 companies have made environmental disclosure through their annual report, separate sustainability or environmental report provided on their official websites. Most of the companies have given compliance record, environmental initiatives, waste disposal methods, water and bio diversity conservation information and pollution measurements with pictures and videos in their websites. There are 5 companies have disclosed 32 to 38 items of information in the checklist, and 16 companies disclosed 40 to 50 items. There are 4 companies reported 50 to 57 items of environmental activities. In percentage terms, UK

companies have disclosed minimum 52% of environmental matters and maximum 94 % information in their annual report. From the table, the reporting practices in UK companies proved the responsibility towards society and environment.

Table 6.12: Environmental Disclosure Score: UK

S.NO	Company	Total Score	%	S.NO	Company	Total Score	%
1	BP ENERGY	45	73.0	13	AFC ENERGY	35	57.0
2	SSE PLC	42	68.0	14	BCSA	36	58.1
3	GLAXCO SMITHKLINE	47	76.0	15	NATIONAL GRID	50	81.0
4	CENTRICA PLC	44	71.0	16	ANGLO AMERICAN PLC	46	74.2
5	RIO TINTO	48	77.4	17	GLENCORE	46	74.2
6	BAE SYSTEMS	50	81.0	18	MCLAREN AUTOMOTIVE	45	73.0
7	ASTRAZENECA	58	94.0	19	SSP ENERGY	40	65.0
8	NATIONAL GRID	40	65.0	20	ALLIANCE PHARMA PLC	35	57.0
9	UNILEVER	51	82.3	21	AGGREKO	40	65.0
10	FIAT CHRYSLER AUTO	49	79.0	22	LINPAC PLASTICS LTD	32	52.0
11	LIBERTY GLOBAL PLC	43	69.4	23	BOWMER&KIRKLAND	38	61.3
12	AEON	48	77.4	24	SIR Robert ALPINE	41	66.1
				25	BHP BILLITON LTD	43	69.4

The above table explains the total disclosure score obtained by UK companies. All the UK companies have provided environmental disclosure for all the 62 items given in the index. Reporting practices in UK for all five categories was found good. Many companies disclosed more than half of the total items given in the index.

6.10 Comparative Analysis of Environmental Disclosure

To understand the status of environmental reporting practices of companies in developed economy and developing economy, it is necessary to compare the scores

obtained by Indian companies, UK companies and US companies. There are differences in the reporting practices between the countries due to tradition, culture, valuation system and accounting standards. Operational efficiency and size of the companies have played a significant role in environmental reporting.

Table 6.13: Comparative Environmental disclosure score in Percentage

Disclosure %	India %Comp	USA %Comp	UK %Com
0-10%	0	0	0
11-20%	0	0	0
21-30%	0	0	0
31-40%	1	0	0
41-50 %	6	0	0
51-60%	23	16	16
61-70%	24	24	32
71-80%	29	36	36
81-90%	15	16	12
91-100%	2	8	4
Total	100	100	100

Above table depict the comparative environmental disclosure score in percentage obtained by number of companies located in USA, UK and INDIA. Minimum 1 % Indian companies disclosed 31 to 40% of disclosure. Maximum 2 % companies have disclosed 91-100% disclosure. Maximum number of companies that is 29 % has reported 71 – 80% disclosure. 24 % of sample companies have disclosed 61 – 70% level of disclosure. It is visible that 16 % of USA sample companies have provided environmental information at 51- 60% of items, 24 % of companies disclosed 61- 70% disclosure, 36% companies 71 – 80% level of disclosure and 91 – 100 % level of disclosure has been provided by 8 % companies. In UK, minimum level of 12 % UK entities have reported environmental disclosure 81% -v90% disclosure and minimum disclosure level of 51 % - 60 % has been reported by 16 of UK entities.

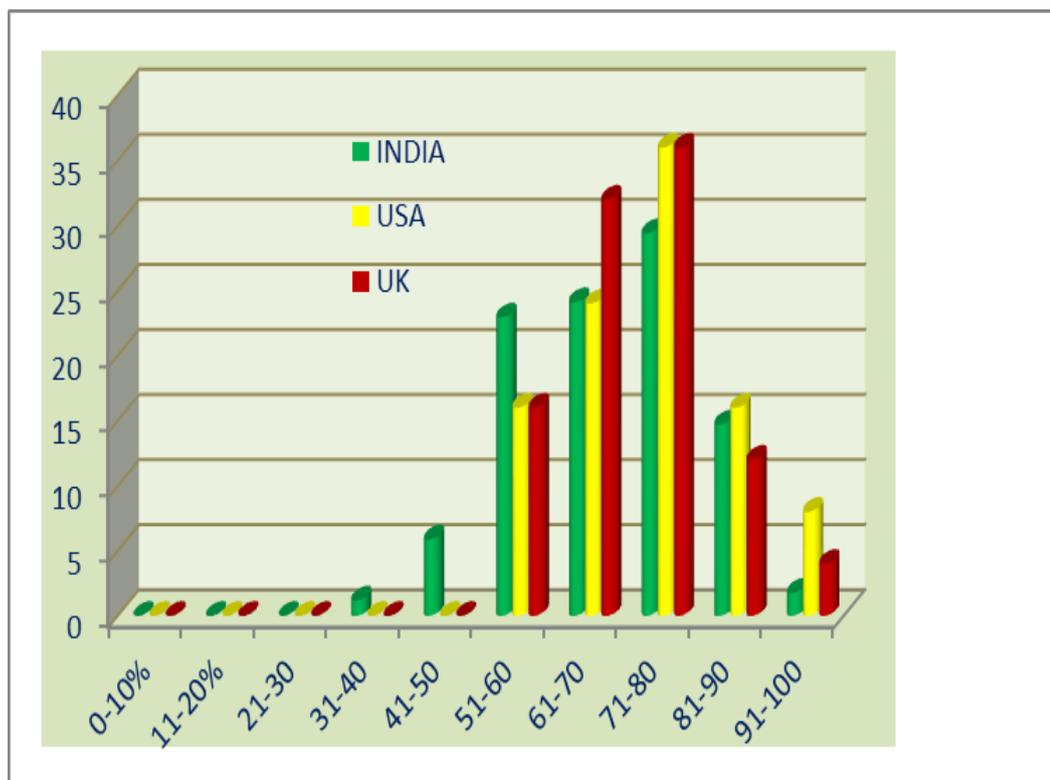


Figure 6.10: Comparative Environmental Disclosure Score (in %)

6.11 Comparison of Environmental Disclosure by Category wise - USA, UK and INDIA

From the table given below we can understand the category wise disclosure of companies in three countries analysed in this study. The index of environmental disclosure has been grouped in to five major categories. Environmental policy and initiatives related matters disclosed by USA companies 72%, UK 74% and India 70%. American and UK companies have disclosed more than Indian entities. Since environmental reporting practices are increasing trend in India, Almost all the sample companies have provided the information about the sub items in the Environmental policy and Initiatives. Environmental expenditure included 10 sub items and 55% disclosure made by US, 54% reported by UK and 49 % disclosure given by Indian corporates. Description of expenditures viz., pollution control equipment and facilities, environmental friendly machines, future estimates of expenditures for pollution control facilities were disclosed by companies. Budget allocation amount, loans and grants etc., are disclosed by high profile companies and they are keen to the

environmental protection performance. Environmental pollution category is reported 80%, 76% and 70% by companies in all three countries respectively. Items related with 4th category, environmental reporting elements was found indifferent. For category IV, Indian companies have disclosed more information (73%) than UK (69%) and US (66%) business organizations.

There may be reasons like accounting and reporting practices existing in different countries, availability of standards, pressure from government, stock exchanges, stakeholders and other authorities. The last category, environmental audit and compliance information have been disclosed by USA-83%, UK-79% and India 77%.

Table 6.14: Category Wise Disclosure – Comparison of USA, UK and INDIA

S.NO	CATEGORY	USA			UK		INDIA	
		Total Disclosure	Score Obtained	%	Score Obtained	%	Score Obtained	%
I	Environmental policy and Initiatives	450	323	72%	333	74%	2140	70%
II	Environmental Expenditure	250	138	55%	134	54%	831	49%
III	Environmental Pollution	400	320	80%	304	76%	1907	70%
IV	Environmental Reporting Elements	275	189	69%	182	66%	1364	73%
V	Environmental audit and Compliance	175	145	83%	139	79%	918	77%
	Total Score	1550	1115	---	1092	---	10540	---

6.12 Disclosure by Item wise – Comparison

In order to understand the preference of disclosure by companies, a comparative item wise disclosure analysis has been prepared. It was found that Indian companies have reported on the selected items in the Index of environmental disclosure, because they follow voluntary disclosure style. US and UK companies would have reported many items in IED as their environmental performance was good. They followed standards and guidance applicable to their accounting procedure. Comparative analysis would

offer new insight in to the environmental reporting practices. Prior studies have pointed that soft and qualitative disclosure was found in annual reports.

Table 6.15: Item - wise Disclosure by Companies - Comparison

Percentage of companies disclosed Items selected in Index of environmental disclosure Comparative table		IND	USA	UK
	Index of Environment Disclosure	%	%	%
1	Environmental policy including description of environmental objectives, environmental issues of concern.	100	100	100
2	Establishment of environmental management systems, environmental department, public issue committee.	98	100	100
3	Energy Efficiency policy	97	100	100
4	Green Building Policy	15	20	24
5	waste Reduction Policy	84	88	92
6	Sustainable Packaging policy	16	48	32
7	Carbon footprint policy	67	96	96
8	Bio diversity policy	46	64	60
9	Zero burning policy	35	40	56
10	Policies on implementation of ISO 140001,ISO 8000 etc...,at the plant and firm level	86	56	44
11	Existence of response plans in case of accidents.	71	100	100
12	Existence of terms and conditions applicable to suppliers and/or customers regarding environmental practices.	81	80	88
13	A statement of periodic reviews and evaluations of its environmental performance.	91	100	100
14	Initiatives to mitigate environmental impacts of products &services	89	96	100
15	Web conferencing and meeting.	62	24	88
16	Planting Trees.	62	40	32
17	Social and Forestation Programmes.	66	48	28
18	Participation in voluntary initiatives.	96	92	92
19	Description of expenditures for pollution control equipment and facilities, environmental friendly machines.	93	100	96
20	Future estimates of expenditures for pollution control facilities.	61	80	68
21	Environmental financial assistance: Grants.	2	8	0
22	Environmental Financial assistance: Loans.	0	4	0
23	Amount spent on: Technologies.	89	84	92

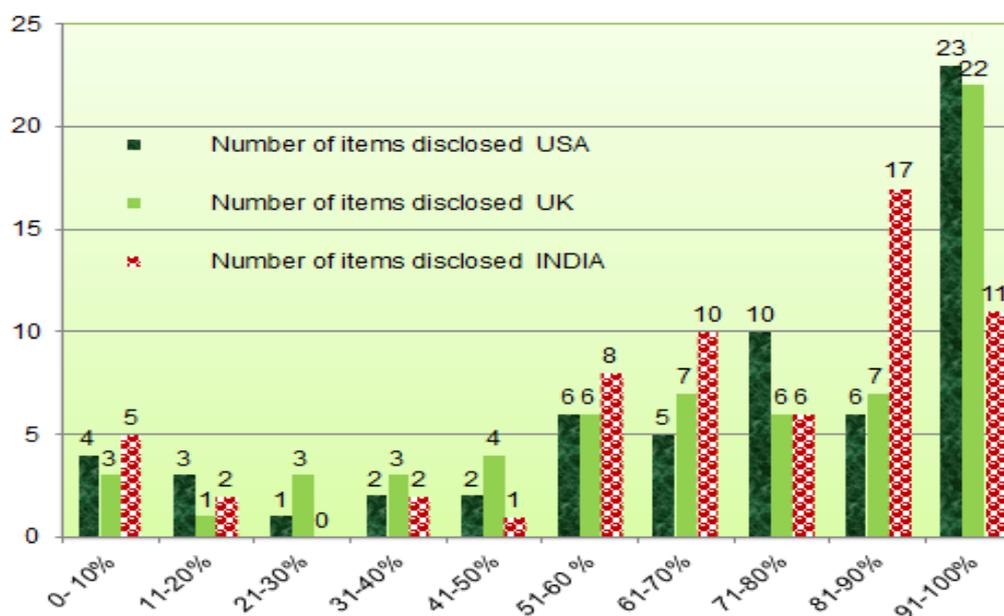
Percentage of companies disclosed Items selected in Index of environmental disclosure Comparative table		IND	USA	UK
	Index of Environment Disclosure	%	%	%
24	Amount spent on: Research and Development	82	92	92
25	Amount spent on: Innovation to enhance the environmental performance and efficiency.	58	76	52
26	Amount of provisions and reserves.	9	8	32
27	Nature and amount of environmental fines.	6	4	12
28	Allocation of budgetary funds to environmental projects or Initiatives.	89	96	92
29	Air Pollution: Type and Weight.	53	64	64
30	Air Pollution: Ozone depleting substance.	51	56	56
31	Reduction in greenhouse gas emissions.	75	100	92
32	Air contaminants and measures taken for this reduction.	71	80	80
33	Using vehicles that features clean air technology and travel emissions.	40	68	64
34	Establishing wind mills.	59	52	64
35	Total water withdrawal by source.	67	88	76
36	Water use minimisation efforts.	87	92	76
37	Ground water protection.	59	80	68
38	Treatment of generated waste.	91	100	100
39	Total weight of waste by type and disposal method.	82	88	88
40	Total volume and number of toxic chemical release/spills and gas flaring.	62	60	48
41	Recycling and integrated utilization of waste products for energy conservation	80	80	92
42	Percentage of materials that is recycled and reused.	81	84	80
43	Total volume of water that is recycled and reused.	75	92	80
44	Green technology, reducing paper consumption and bio fuel used.	88	96	88
45	Description of environmental indicators and its disclosures.	98	100	96
46	Disclosures through Annual report.	95	52	64
47	Disclosures through sustainability report.	56	80	84
48	Environmental information to be disclosed through the Media, brochures, internet etc.,	93	100	96
49	Description of impact on biodiversity in Protected areas or high bio diversity value.	57	64	44
50	Description of impact on biodiversity in outside Protected area.	58	64	44

Percentage of companies disclosed Items selected in Index of environmental disclosure Comparative table		IND	USA	UK
	Index of Environment Disclosure	%	%	%
51	Statement which indicate that the company's operations do not cause pollution.	86	100	96
52	Loss disclosure with respect to particular environmental sites and activities.	2	16	28
53	Legal proceedings for violating environmental laws.	73	12	8
54	Information on use/development/exploration of new resources, insulation etc.,	87	72	72
55	Energy minimisation efforts/energy saved.	97	96	96
56	Compliance with government regulations, standards including benchmarks.	88	96	100
57	Compliance record of air, water and waste permits.	88	88	88
58	Environmental impact assessment.	90	92	84
59	Product stewardship including life cycle analysis, product certification and eco labelling.	64	76	60
60	Obtaining certification for environmental management systems/ISO 140001	62	52	60
61	Audit: Internal/External/ Independent periodic verification of documents.	85	96	96
62	Information about Awards for environmental performance or activities.	65	80	68

The present study has analysed the data by comparing the environmental disclosure percentage of individual items selected in the Index of Environmental Disclosure (IED) among three countries. Out of total number of 62 items, 4 items in US, 3 statements in UK and 5 items in India have been reported by zero to ten percentage disclosures. This is the minimum amount of disclosure made by business entities of these 3 countries. There are 6 items have been reported nearly 60% in US annual reports and another 5 information disclosed by 61% to 70% of US companies. Most of the US organizations, ie., 71% - 80% have provided environmental information for 10 items. 6 statements were disclosed by 81-90% companies and 23 items have been highly reported by 91 – 100 % of companies.

Table 6.16: Items - Wise Disclosure Comparison

S.NO	Percentage of Companies	Number of items disclosed		
		USA	UK	INDIA
1	0- 10%	4	3	5
2	11-20%	3	1	2
3	21-30%	1	3	0
4	31-40%	2	3	2
5	41-50%	2	4	1
6	51-60 %	6	6	8
7	61-70%	5	7	10
8	71-80%	10	6	6
9	81-90%	6	7	17
10	91-100%	23	22	11
	Total	62	62	62



- Figure 6.11: Item - Wise Disclosure by Companies- Comparison(Aggregate)

6.13 Industry wise disclosure score

In the present research work, the total sample of 170 Indian manufacturing companies has been selected from different sectors. Central pollution control board of India has identified 17 sectors as environmentally sensitive industries. Companies' products, process and operational activities would be the criteria to classify industries as

sensitive and non- sensitive sectors. Environmental reporting practices followed by different sectors are significant to evaluate the status or extent of disclosure level in India. Social commitment and responsibility toward environment would motivate the sensitive companies to focus on the quality and quantity of disclosure information. Table given below shows the environmental disclosure % of different industries. Minerals and Mining industry disclosed 82%, petrol, oil industries 78%, Iron and steel industries 72% and cement and construction industry has disclosed 71%. The pie chart would provide the industry wise disclosure in percentage values.

Table 6.17: Industry wise disclosure score

Industry wise disclosure score

Industry	%	Score obtained	NOC
Automobile	63	582	15
Cement & Construction	71	702	16
Chemical	66	863	21
Consumer Durables	64	473	12
Electricals & Electronics	63	466	12
Engineering	70	305	7
Food and Agriculture	65	523	13
Garment & Textiles	69	554	13
Iron & Steel	72	267	6
Minerals & Mining	82	304	6
Petrol, Oil, Gas and Refinery	78	531	11
Pharmaceuticals	72	537	12
Power & Energy	68	587	14
Plastics & Packings	63	466	12

Industry Wise %Scores

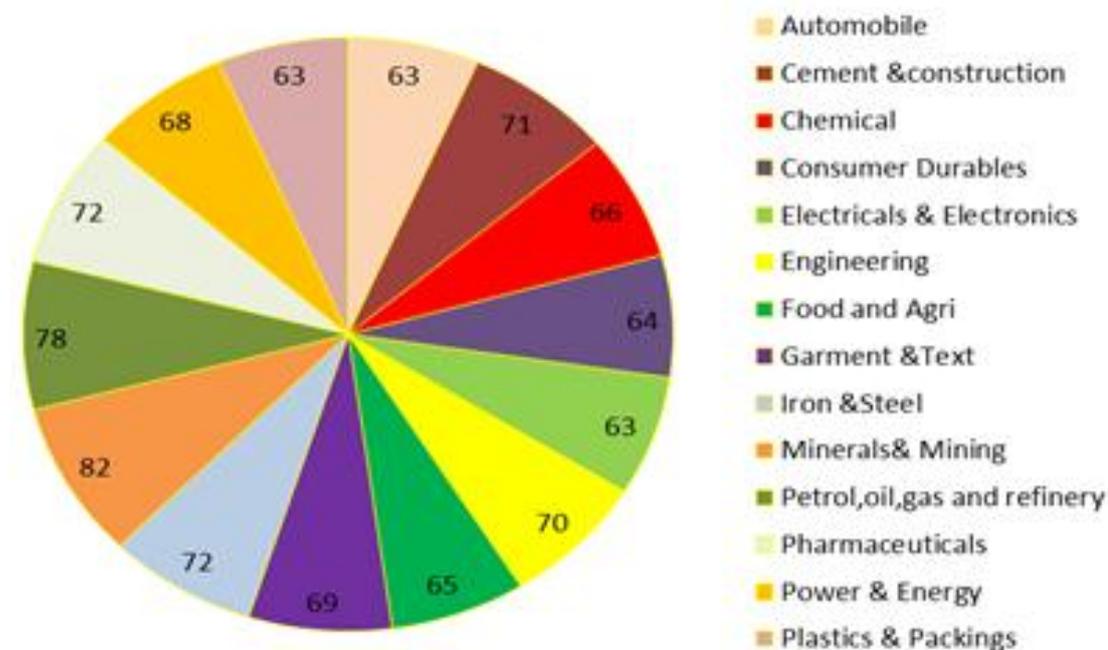


Figure 6.12: Pie Chart.

6.14 Mean Disclosure Score of All Industries

The table given below explained the Average disclosure made by different industries in all the five Categories. The total sample of 170 Indian companies has been divided into 14 Industry groups.

Table 6.18: Mean and Standard Deviation - Industry wise

INDUSTRY		Environmental .Policy & Initiatives	Environmental Expenditure	Pollution	Environmental Accounting & Disclosure	Environmental Audit and Compliance	Disclosure Score
Automobile	Mean	11.27	5.27	9.80	7.33	5.13	38.80
	Std. Deviation	3.195	.961	3.932	1.175	1.506	8.419
Cement & con	Mean	12.81	4.63	12.31	8.56	5.56	43.88
	Std. Deviation	2.401	1.204	3.301	1.590	1.031	7.830
Chemical	Mean	12.05	5.14	10.90	7.62	5.38	41.10
	Std. Deviation	2.355	1.459	3.375	1.658	1.359	7.968
Consumer	Mean	12.75	5.00	10.33	7.33	5.58	41.00

INDUSTRY		Environmental .Policy & Initiatives	Environmental Expenditure	Pollution	Environmental Accounting & Disclosure	Environmental Audit and Compliance	Disclosure Score
durables	Std. Deviation	2.261	1.414	3.200	1.497	1.240	7.687
	Mean	11.17	5.42	9.92	8.08	4.83	39.42
Electricals & Electronics	Std. Deviation	2.167	1.084	3.988	1.621	1.850	8.826
	Mean	12.29	5.14	12.57	7.43	6.14	43.57
Engineering	Std. Deviation	1.799	1.069	1.718	1.512	.690	3.910
	Mean	12.00	4.62	10.08	7.31	5.46	39.46
Food and Agri	Std. Deviation	2.000	1.609	3.278	1.494	1.761	6.912
	Mean	11.92	4.46	11.46	8.31	5.62	41.77
Garment &Text	Std. Deviation	2.216	1.450	3.045	1.032	.961	5.988
	Mean	14.17	4.33	12.17	8.67	5.17	44.50
Iron &Steel	Std. Deviation	2.483	1.506	3.312	1.033	1.835	8.735
	Mean	13.67	6.33	13.33	8.83	5.83	48.00
Minerals& Mining	Std. Deviation	2.582	1.366	4.274	1.835	.983	9.654
	Mean	14.64	5.09	13.45	8.82	6.27	48.27
Petrol,oil,gas and refinery	Std. Deviation	2.111	1.640	3.142	1.537	.786	6.358
	Mean	13.33	4.75	12.83	8.50	5.33	44.75
pharmaceuticals	Std. Deviation	1.557	1.357	2.368	1.243	.888	5.154
	Mean	13.57	4.14	10.93	8.71	5.29	42.71
power & energy	Std. Deviation	2.027	1.292	3.050	1.204	1.326	5.993
	Mean	12.50	4.67	9.58	7.58	4.50	38.83
plastics & Packings	Std. Deviation	1.508	1.303	3.777	1.564	1.679	7.247
	Mean	12.58	4.89	11.22	8.02	5.40	42.12
Total	Std. Deviation	2.365	1.374	3.441	1.507	1.356	7.574

Automobile Sector, Plastics and Packing sector and Food and agriculture sector and electrical and electronics industries have mean disclosure of 39, Cement sector 43, Chemical, Garment and Textile, Consumer Durables have 41, Power sector 43, Iron and Steel and Pharmaceutical industries scored 45.

The oil and Petroleum sector and Minerals and Mining sectors have highest mean disclosure score 48.

Overall all the industries have made sound environmental disclosures.

6.15 Environmental Disclosure – Individual sectors

Table 6.19: Environmental disclosure score; Automobile Industry.

S.N	Automobile	18		10		16		11		7		62	
		score	%	score	%	score	%	score	%	score	%	score	%
1	APOLLO TYRES LTD.	12	66.7	3	30	12	75	9	81.8	6	85.7	42	67.7
2	ASHOKLEYLAND	16	88.8	6	60	15	94	9	82	6	85.7	52	84
3	BAJAJ AUTO LTD.	11	61.1	5	50	9	56.3	7	63.6	3	42.9	35	56.5
4	CEAT LTD.	11	61.1	6	60	6	37.5	7	63.6	6	85.7	36	58.1
5	EICHER MOTORS LTD.	12	66.7	5	50	11	68.8	7	63.6	5	71.4	40	64.5
6	FORCE MOTORS LTD.	9	50.0	4	40	4	25	7	63.6	3	42.9	27	43.5
7	HERO MOTOCORP LTD.	15	83.3	6	60	12	75	8	72.7	5	71.4	46	74.2
8	J B M AUTO LTD.	9	50.0	6	60	8	50	5	45.5	4	57.1	32	51.6
9	J K TYRE & INDS. LTD.	13	72.2	6	60	14	87.5	8	72.7	7	100.0	48	77.4
10	MR FLTD.	6	33.3	4	40	4	25	7	63.6	6	85.7	27	43.5
11	MAHINDRA & MAHINDRA	18	100.0	5	50	16	100	9	81.8	7	100.0	55	88.7
12	MINDA INDUSTRIES LTD.	10	55.6	6	60	4	25	6	54.5	6	85.7	32	51.6
13	S K F INDIA LTD.	9	50.0	5	50	11	68.8	7	63.6	5	71.4	37	59.7
14	T V S MOTOR CO. LTD.	8	44.4	6	60	11	68.8	6	54.5	6	85.7	37	59.7
15	T V S SRICHAKRA LTD.	10	55.6	6	60	10	62.5	8	72.7	2	28.6	36	58.1
	TOTAL	169		79		147		110		77		582	
	AVERAGE	11		5		10		7		5		39	

Table 6.19 displays the environmental score obtained by 15 automobile manufacturing companies. The minimum disclosure is 27 reported by two companies. The maximum disclosure 55 is reported by one company. Average disclosure of environmental information in category I (environmental policy and Initiative...) is 11 items, category II is 5, category III 10 items of information, category IV 7 and category V 5 items have been reported. The total score obtained of all five categories for all 15 companies are 582 for automobile industry. Average disclosure score of automobile sector is 39.

Table 6.20: Environmental disclosure score; Cement & Construction

S.N	CEMENT & CONSTRUCTION	18		10		16		11		7		62	
		score	%	score	%	score	%	score	%	score	%	score	%
1	ACCLTD.	17	94.4	4	40	15	93.8	9	81.8	5	71.4	50	80.6
2	AMBUJA CEMENTS LTD.	15	83.3	7	70	15	93.8	11	100.0	7	100	55	88.7
3	BIRLA CORPORATION LTD.	11	61.1	5	50	10	62.5	9	81.8	5	71.4	40	64.5
4	DALMIA BHARAT LTD.	14	77.8	4	40	12	75.0	8	72.7	5	71.4	43	69.4
5	GAYATRI PROJECTS LTD.	10	55.6	2	20	3	18.8	4	36.4	4	57.1	23	37.1
6	INDIA CEMENTS LTD.	8	44.4	4	40	11	68.8	7	63.6	5	71.4	35	56.5
7	JK CEMENT LTD.	12	66.7	6	60	9	56.3	8	72.7	5	71.4	40	64.5
8	JK LAKSHMI CEMENT LTD.	13	72.2	5	50	14	87.5	8	72.7	6	85.7	46	74.2
9	KAJARIA CERAMICS LTD.	9	50.0	4	40	9	56.3	9	81.8	4	57.1	35	56.5
10	LARSEN & TOUBRO LTD.	15	83.3	5	50	14	87.5	9	81.8	5	71.4	48	77.4
11	OCL INDIA LTD.	13	72.2	5	50	14	87.5	10	90.9	7	100	49	79.0
12	ORIENT CEMENT LTD.	15	83.3	4	40	14	87.5	8	72.7	5	71.4	46	74.2
13	PRISM JOHNSON LTD.	14	77.8	3	30	12	75.0	10	90.9	6	85.7	45	72.6
14	RAMCO CEMENTS LTD.	12	66.7	6	60	15	93.8	8	72.7	7	100	48	77.4
15	SHREE CEMENT LTD.	14	77.8	5	50	15	93.8	10	90.9	6	85.7	50	80.6
16	ULTRATECH CEMENT LTD.	13	72.2	5	50	15	93.8	9	81.8	7	100	49	79.0
	TOTAL	205		74		197		137		89		702	
	AVERAGE	13		5		12		9		6		44	

Table 6.20 displays the environmental score obtained by 16 Cement manufacturing companies. The minimum environmental disclosure score is 23 and the maximum disclosure 55 is reported by companies. Average disclosure of environmental information provided in category I is 13 items, category II is 5, category III 12 items

of information, category IV 9 and category V 5 6 items have been reported. The total score obtained of all five categories for all 16 companies are 702 for cement industry. Cement manufacturing companies provide 44 items of environmental information on an average.

Table 6.21: Environmental disclosure score; Chemical Industry

S/N	CHEMICAL INDUSTRY	18		10		16		11		7		62	
	COMPANY NAME	score	%	score	%	score	%	score	%	score	%	score	%
1	AARTI INDUSTRIES LTD.	11	61.1	6	60	10	62.5	8	72.7	4	57.1	39	62.9
2	ASIAN PAINTS LTD.	13	72.2	6	60	14	87.5	10	90.9	7	100	50	80.6
3	AKZO NOBEL INDIA LTD.	13	72.2	4	40	11	68.8	7	63.6	6	85.7	41	66.1
4	ATUL LTD.	14	77.8	7	70	14	87.5	9	81.8	5	71.4	49	79.0
5	BERGER PAINTS INDIA LTD.	10	55.6	5	50	9	56.3	7	63.6	7	100.0	38	61.3
6	BAYER CROPSCIENCE LTD.	14	77.8	6	60	9	56.3	7	63.6	6	85.7	42	67.7
7	CHAMBAL FERTILIZERS	15	83.3	4	40	13	81.3	9	81.8	6	85.7	47	75.8
8	COROMANDEL INTERNATIONAL LTD.	14	77.8	6	60	7	43.8	8	72.7	7	100	42	67.7
9	DC M SHRIRAM INDS. LTD.	10	55.6	2	20	12	75.0	9	81.8	5	71.4	38	61.3
10	DEEPAK FERT. PET LTD.	8	44.4	6	60	5	31.3	5	45.5	2	28.6	26	41.9
11	GUJARAT FLUORO CHEMICALS LTD.	9	50.0	2	20	7	43.8	6	54.5	6	85.7	30	48.4
12	GUJARAT NARMADHA VALLEY	7	38.9	5	50	7	43.8	5	45.5	5	71.4	29	46.8
13	GUJARAT STAT & CHEMICALS LTD.	13	72.2	6	60	15	93.8	9	81.8	6	85.7	49	79.0
14	KANSAINEROLAC PAINTS LTD.	12	66.7	4	40	7	43.8	8	72.7	5	71.4	36	58.1
15	NATIONAL FERTILIZERS	12	66.7	5	50	13	81.3	6	54.5	6	85.7	42	67.7
16	PIDILITE INDUSTRIES LTD.	10	55.6	5	50	7	43.8	6	54.5	2	28.6	30	48.4
17	P I INDUSTRIES LTD.	13	72.2	6	60	12	75.0	6	54.5	6	85.7	43	69.4
18	RASHTRIYA CHE FERTILIZERS LTD.	15	83.3	6	60	14	87.5	10	90.9	6	85.7	51	82.3
19	SR FLTD.	15	83.3	5	50	16	100	10	90.9	5	71.4	51	82.3
20	TATA CHEMICALS LTD.	14	77.8	8	80	16	100	9	81.8	6	85.7	53	85.5
21	ZUARI AGRO CHEMICALS	11	61.1	4	40	11	68.8	6	54.5	5	71.4	37	59.7
	TOTAL	253		108		229		160		113		863	
	AVERAGE	12		5		11		8		5		41	

Table 6.21 displays the environmental score obtained by 21 chemical manufacturing companies. The minimum disclosure score is 26 and the maximum disclosure 53 is reported by one company. Average disclosure of environmental information in category I is 12 items, category II is 5, category III 11 items of information, category

IV 8 and category V 5 items have been reported. The total score obtained of all five categories for all 21 companies are 863 for chemical industry .Average disclosure score of chemical industry is 41.

Table 6.22: Environmental disclosure score: Consumer Durables

SN	CHEMICAL INDUSTRY	18		10		16		11		7		62	
	COMPANY NAME	score	%	score	%	score	%	score	%	score	%	score	%
1	BLUESTAR LTD.	11	61.1	6	60	9	56.3	6	54.5	7	100	39	62.9
2	BATA INDIA LTD.	11	61.1	6	60	9	56.3	5	45.5	4	57.1	35	56.5
3	COLGATE-PALMOLIVE (INDIA) LTD.	14	77.8	6	60	11	68.8	9	81.8	7	100	47	75.8
4	CROMPTON GREAVES ELECTRI	11	61.1	2	20	10	62.5	6	54.5	5	71.4	34	54.8
5	EMAMILTD.	10	55.6	4	40	7	43.8	6	54.5	5	71.4	32	51.6
6	GODREJ PRODUCTS LTD.	15	83.3	6	60	14	87.5	9	81.8	7	100	51	82.3
7	HINDUSTAN UNILEVER LTD.	10	55.6	6	60	13	81.3	7	63.6	4	57.1	40	64.5
8	PROCTER NE & HEALTH CARE LTD.	14	77.8	4	40	11	68.8	7	63.6	3	42.9	39	62.9
9	T T K PRESTIGE LTD.	13	72.2	6	60	4	25.0	6	54.5	4	57.1	33	53.2
10	TITAN COMPANY LTD.	15	83.3	6	60	13	81.3	6	54.5	6	85.7	46	74.2
11	VOLTAS LTD.	12	66.7	5	50	11	68.8	9	81.8	6	85.7	43	69.4
12	WHIRLPOOL OF INDIA LTD.	10	55.6	4	40	8	50.0	7	63.6	5	71.4	34	54.8
	TOTAL	146		61		120		83		63		473	
	AVERAGE	12		5		10		7		5		39	

Table 6.22 reveals the environmental disclosure score of 12 companies' manufacturers of consumer durable goods. They have disclosed total disclosure of 473 and averagely 39 items of environmental matters reported by consumer durable companies. Average disclosure in category I 12, II 5, III 10, IV 7 and Category V 5 items have been reported by consumer durable industry. Minimum environmental score is 32 and maximum score is 51. Godrej products ltd has made 82 % of environmental disclosure in their annual report. Emami ltd has provided minimum level of 52% environmental information in their annual report .

Table 6.23: Environmental disclosure score; Electricals & Electronics

SN	ELECTRICALS & ELECTRONIC	18		10		16		11		7		62	
		score	%	score	%	score	%	score	%	score	%	score	%
1	AMARA RAJA BATTERIES LTD.	10	55.6	5	50	7	43.8	10	90.9	6	85.7	38	61.3
2	APAR INDUSTRIES LTD.	11	61.1	6	60	10	62.5	8	72.7	5	71.4	40	64.5
3	BAJAJ ELECTRICALS	11	61.1	4	40	10	62.5	7	63.6	6	85.7	38	61.3
4	BHARAT ELECTRONICS LTD.	15	83.3	5	50	15	93.8	10	90.9	6	85.7	51	82.3
5	CUMMINS INDIA LTD.	14	77.8	8	80	13	81.3	9	81.8	5	71.4	49	79.0
6	EXIDE INDUSTRIES LTD.	9	50.0	5	50	13	81.3	9	81.8	7	100.0	43	69.4
7	FINOLEX CABLES LTD.	8	44.4	4	40	4	25.0	5	45.5	2	28.6	23	37.1
8	HAVELLS INDIA LTD.	10	55.6	6	60	14	87.5	8	72.7	6	85.7	44	71.0
9	KEI INDUSTRIES LTD.	10	55.6	6	60	4	25.0	5	45.5	2	28.6	27	43.5
10	LEEL ELECTRICALS LTD.	11	61.1	4	40	7	43.8	8	72.7	3	42.9	33	53.2
11	SIEMENS	14	77.8	5	50	14	87.5	8	72.7	6	85.7	47	75.8
12	T V S ELECTRONICS LTD.	10	55.6	5	50	7	43.8	8	72.7	3	42.9	33	53.2
	TOTAL	133		63		118		95		57		466	
	AVERAGE	11		5		10		8		5		39	

The minimum disclosure score of this industry is 23 and the maximum score is 51. Total of all 5 categories for 12 companies summed up and disclosed as 466. Average score of category I to V are 11, 5, 10, 8 and 5. On an average, Electrical and Electronics industry companies disclosed 39 items in their annual report. Disclosure score in terms of percentage is also given in this table.

Table 6.24: Environmental disclosure score; Engineering

SN	ENGINEERING	18		10		16		11		7		62	
		score	%	score	%	score	%	score	%	score	%	score	%
1	ATA ENGINEERING LTD.	9	50	6	60	12	75	5	45	5	71	37	42.6
2	BHARAT FORGE LTD.	13	72.2	6	60	11	68.7	9	81.8	7	100	46	74.2
3	BOSCH LTD.	11	61.1	5	50	13	81.3	7	63.6	7	100	43	69.4
4	JAIN IRRIGATION SYSTEMS LTD.	14	77.8	3	30	10	62.5	8	72.7	6	85.7	41	66.1
5	KIRLOSKAR BROTHERS LTD.	13	72.2	6	60	13	81.3	8	72.7	6	85.7	46	74.2
6	KIRLOSKAR OIL ENGINES LTD.	14	77.8	5	50	15	93.8	9	81.8	6	85.7	49	79.0
7	THERMAX LTD.	12	66.7	5	50	14	87.5	6	54.5	6	85.7	43	69.4
	TOTAL	86		36		88		52		43		305	
	AVERAGE	12		5		13		7		6		43	

Table 6.24 shows the environmental disclosure score of 7 engineering companies. The total score obtained in category I - 86, II-36, III-88, IV-52 and V-43. Total disclosure

score of all 7 companies for all 5 categories reported as 305. Minimum environmental disclosure score is 37 and maximum is 49 in engineering industry. Average disclosure score of engineering sector is 43.

Table 6.25: Environmental Disclosure Score : Food, Fast moving goods and Agriculture.

S.N	FOOD AND AGRICULTURE	18		10		16		11		7		62	
	COMPANY NAME	score	%	score	%	score	%	score	%	score	%	score	%
1	AVANTI FEEDS LTD.	12	66.7	2	20	7	43.8	9	81.8	4	57.1	34	54.8
2	BAJAJ HINDUSTAN SUGARS	12	66.7	6	60	11	68.8	9	81.8	7	100	45	72.6
3	BALRAMPUR CHINI MILLS LTD	14	77.8	4	40	15	93.8	7	63.6	5	71.4	45	72.6
4	BRITANNIA INDUSTRIES LTD.	10	55.6	5	50	4	25.0	6	54.5	5	71.4	30	48.4
5	DABUR INDIA LTD.	15	83.3	6	60	15	93.8	8	72.7	6	85.7	50	80.6
6	EID PARRY LTD	11	61.1	4	40	12	75.0	7	63.6	7	100	41	66.1
7	HATSUN AGRO PRODUCTS LTD.	10	55.6	1	10	8	50.0	8	72.7	7	100	34	54.8
8	KWALITY LTD.	13	72.2	5	50	9	56.3	8	72.7	7	100	42	67.7
9	MARICO LTD.	11	61.1	6	60	11	68.8	10	90.9	7	100	45	72.6
10	NATIONAL STEEL AGRO INDS. LTD.	11	61.1	5	50	7	43.8	6	54.5	3	42.9	32	51.6
11	RALLIS INDIA LTD.	14	77.8	6	60	9	56.3	8	72.7	7	100	44	71.0
12	TATA GLOBAL BEVERAGES LTD.	15	83.3	6	60	13	81.3	8	72.7	7	100	49	79.0
13	TRIVENI ENGG INDUSTRY.	9	50.0	4	40	12	75.0	5	45.5	2	28.6	32	51.6
	TOTAL	157		60		133		99		74		523	
	AVERAGE	12		5		10		8		5		40	

Table 6.25 displays the environmental score obtained by 13 Food, Fast moving goods and agriculture companies. The minimum disclosure score is 30 and the maximum disclosure 50 is reported by one company. Average disclosure of environmental information in category I is 12 items, category II is 5, category III 10 items of information, category IV 8 and category V 5 items have been reported. The total score obtained of all five categories for all 13 companies are 523 for Food, Fast moving goods and agriculture industry. Average disclosure score of a company belongs to this industry is 40.

Table 6.26: Environmental disclosure score; Garment & Textiles Industry.

S.NO	GARMENT & TEXTILES	18		10		16		11		7		62	
		score	%	score	%	score	%	score	%	score	%	score	%
1	ARVINDH	10	56	4	40	11	68.8	8	73	6	86	39	63
2	CENTURY TEXTILE LTD.	11	61	3	30	12	75	8	73	5	71	39	63
3	GRASIM INDUSTRIES LTD.	13	72.2	3	30	16	100	9	90.9	7	100	48	77
4	G H C LTD.	13	72.2	6	60	15	93.8	10	72.7	5	71.4	49	79
5	INDOCOUNT INDS. LTD.	14	77.8	6	60	12	75	8	72.7	5	71.4	45	73
6	J B F INDUSTRIES LTD.	14	77.8	2	20	11	68.8	8	72.7	7	100	42	68
7	LAKSHMI MACHINE WORKS LTD.	12	66.7	5	50	9	56.3	8	63.6	6	85.7	40	65
8	RAYMOND LTD.	9	50.0	6	60	11	68.8	7	63.6	7	100	40	65
9	SINTEX INDUSTRIES LTD.	7	38.9	4	40	4	25	7	81.8	5	71.4	27	44
10	SUTLEJ TEXTILES & INDS. LTD.	12	66.7	6	60	14	87.5	9	81.8	4	57.1	45	73
11	TRIDENT LTD.	13	72.2	6	60	13	81.3	9	90.9	5	71.4	46	74
12	VARDHMAN TEXTILES LTD.	15	83.3	4	40	12	75	10	81.8	6	85.7	47	76
13	WELSPUN INDIA LTD.	15	83.3	4	40	13	81.3	9	90.9	6	85.7	47	76
	TOTAL	158		59		153		110		74		554	
	AVERAGE	12		5		12		8		6		43	

It shows the environmental disclosure score of 13 Garment and textile companies. The total score obtained in category I -158, II- 59, III -153, IV-110 and V- 74. Total disclosure score of all 13 companies for all 5 categories reported as 554. Minimum environmental disclosure score is 27 and maximum is 49. Garment and Textile industry has mean score is 43.

Table 6.27: Environmental disclosure score: Iron & Steel

S.NO	IRON & STEEL	18		10		16		11		7		62	
		score	%	score	%	score	%	score	%	score	%	score	%
1	ELECTROSTEEL CASTINGS LTD.	11	61.1	3	30	8	50	7	63.63	2	28.5	31	50
2	JINDAL SAW LTD.	16	88.8	3	30	14	87.5	9	81.81	6	85.71	48	77.4
3	JINDAL STAINLESS (HISAR)	13	72.2	5	50	8	50	9	81.8	6	85.7	41	66
4	PRAKASH INDUSTRIES LTD.	12	66.7	4	40	13	81.3	8	72.7	4	57.1	41	66
5	TATA STEEL LTD.	17	94.4	7	70	15	93.8	10	90.9	7	100	56	90
6	VEDANTA LTD.	16	88.9	4	40	15	93.8	9	81.8	6	85.7	50	81
	TOTAL	85		26		73		52		31		267	
	AVERAGE	14		4		12		9		5		44	

Table shows the environmental disclosure score of 6 Iron and Steel companies. The total score obtained in category I - 85, II - 26, III - 73, IV - 52 and V- 31. Total disclosure score of all 6 companies for all 5 categories reported as 267 .Minimum environmental disclosure score is 31 and maximum is 56 in Iron & Steel industry. Average disclosure score of Iron and Steel Industry is 44.

Table 6.28: Environmental disclosure score: Minerals and Mining

S.NO	MINERALS AND MINING	18		10		16		11		7		62	
		score	%	score	%	score	%	score	%	score	%	score	%
1	COAL INDIA LTD	16	88.9	6	60	16	100	10	90.90	6	85.71	54	87
2	HINDALCO IND TD	14	77.7	8	80	16	100	10	90.90	6	85.71	54	87
3	HINDUSTAN ZINCLTD.	17	94.4	7	70	16	100	10	90.9	6	85.7	56	90
4	N M D C LTD.	15	83.3	7	70	14	87.5	10	90.9	7	100.0	53	85
5	NATIONAL ALUMINIUM CO. LTD.	16	88.9	7	70	16	100	10	90.9	6	85.7	55	89
6	SOMANY CERAMICS LTD.	11	61.1	4	40	5	31.3	6	54.5	6	85.7	32	52
	TOTAL	89		39		83		56		37		304	
	AVERAGE	15		7		14		9		6		51	

Table 6.28 displays the environmental score obtained by 6 Minerals and Mining companies. The minimum disclosure score is 32 and the maximum disclosure 56 is reported by one company. Average disclosure of environmental information in category I is 15 items, category II is 7, category III 14 items of information, category IV 9 and category V 6 items have been reported. The total score obtained of all five categories for all 6 companies are 304 for mining industry Average disclosure score of a company belongs to this industry is 51.

Table 6.29: Environmental disclosure score: Petrol, oil , Gas and Refinery

S.NO	PETROL, OIL, GAS & REFINERY	18		10		16		11		7		62	
		score	%	score	%	score	%	score	%	score	%	score	%
1	BHARAT PETROLEUM CORPN. LTD.	15	83.3	5	50	16	100	10	90.9	7	100	53	85
2	CASTROL INDIA LTD.	14	77.8	5	50	6	37.5	7	63.6	5	71.4	37	60
3	CHENNAI PETROLEUM CORPN	10	55.6	5	50	16	100	6	54.5	6	85.7	43	69
4	G A I L (INDIA) LTD.	13	72.2	4	40	12	75	10	90.9	6	85.7	45	73
5	HINDUST PETROLEUM CO	16	88.9	5	50	16	100	9	81.8	7	100	53	85
6	INDIAN OIL CORPN. LTD.	16	88.9	7	70	15	93.8	10	90.9	6	85.7	54	87
7	OIL INDIA LTD.	13	72.2	6	60	13	81.3	7	63.6	6	85.7	45	73
8	OIL & NATURAL GAS CORPN LD	16	88.9	7	70	14	87.5	10	90.9	5	71.4	52	84
9	PETRONET L N G LTD.	15	83.3	1	10	10	62.5	8	72.7	7	100	41	66
10	RELIANCE INDUSTRIES LTD.	18	100.0	6	60	16	100	10	90.9	7	100	57	92
11	SUPREME PETROCHEM LTD.	15	83.3	5	50	14	87.5	10	90.9	7	100	51	82
	TOTAL	161		56		148		97		69		531	
	AVERAGE	15		5		13		9		6		48	

Table 6.29 shows the result of Petrol, oil, Gas and Refinery companies. The minimum disclosure score of this industry is 37 and the maximum score is 57. Total of all 5 categories for 11 companies summed up and disclosed as 531. Average score of category I to V are 15, 5, 13, 9, and 6. Petrol, oil, gas and refinery industry companies have disclosed average 48 items in their annual report. In this sector all the companies have provided more than 65 % environmental information.

Table 6.30: Environmental disclosure score: Pharmaceutical Industry.

SN	PHARMACEUTICALS COMPANY NAME	18		10		16		11		7		62	
		score	%	score	%	score	%	score	%	score	%	score	%
1	ALEMBIC PHARMACEUTICALS LTD.	12	66.7	2	20	10	62.5	7	63.6	4	57.1	35	56
2	AUROBINDO PHARMA LTD.	14	77.8	6	60	14	87.5	9	81.8	7	100	50	81
3	CIPLA LTD.	13	72.2	6	60	14	87.5	8	72.7	5	71.4	46	74
4	DIVIS LABORATORIES LTD.	15	83.3	4	40	15	93.8	9	81.8	6	85.7	49	79
5	DR. REDDY'S LABORATORIES LTD.	14	77.8	5	50	16	100	7	63.6	6	85.7	48	77
6	GLAXO SMITH PHARMA LTD.	15	83.3	4	40	14	87.5	10	90.9	6	85.7	49	79
7	GLENMARKTICALS LTD.	12	66.7	6	60	13	81.3	7	63.6	4	57.1	42	68
8	IPCA LABORATORIES LTD.	12	66.7	6	60	12	75	10	90.9	5	71.4	45	73
9	LUPIN LTD.	12	66.7	6	60	9	56.3	9	81.8	5	71.4	41	66
10	PIRAMAL ENTERPRISES	14	77.8	4	40	15	93.8	9	81.8	5	71.4	47	76
11	TORRENT PHARMACEUTICALS LTD.	11	61.1	3	30	9	56.3	7	63.6	6	85.7	36	58
12	WOCKHARDT LTD.	16	88.9	5	50	13	81.3	10	90.9	5	71.4	49	79
	TOTAL	160		57		154		102		64		537	
	AVERAGE	13		5		13		9		5		45	

Table 6.30 displays the environmental score obtained by 12 Pharmaceutical companies. The minimum disclosure score is 35 and the maximum disclosure 50 is reported by one company. Average disclosure of environmental information in category I is 13 items, category II is 5, category III 13 items of information, category IV 9 and category V 5 items have been reported. The total score obtained of all five categories for all 6 companies are 537 for Pharmaceutical industry. Average disclosure score of a company belongs to this industry is 45.

Table 6.31: Environmental Disclosure Score: Power and Energy.

SNO	Power and Energy	18		10		16		11		7		62	
		score	%	score	%	score	%	score	%	score	%	score	%
1	ADANI ENTERPRISES LTD.	11	61.1	3	30	7	43.8	8	72.7	7	100	36	58
2	CESCLTD.	13	72.2	3	30	9	56.3	8	72.7	7	100	40	65
3	INOX WIND COMPANY LTD	10	55.6	2	20	9	56.3	7	63.6	4	57.1	32	52
4	J S W ENERGY LTD.	15	83.3	4	40	15	93.8	9	81.8	5	71.4	48	77
45	KALPATARU POWER TRAN LTD.	15	83.3	5	50	9	56.3	10	90.9	6	85.7	45	73
6	NTPCLTD.	14	77.8	5	50	5	31.3	9	81.8	5	71.4	38	61
7	POWER GRID CORPN. OF INDIA LTD.	16	88.9	6	60	12	75	10	90.9	5	71.4	49	79
8	PHILLIPS CARBON BLACK LTD.	11	61.1	6	60	10	62.5	6	54.5	3	42.9	36	58
9	RELIANCE POWER LTD.	13	72.2	2	20	12	75	8	72.7	3	42.9	38	61
10	S J V N LTD.	14	77.8	4	40	10	62.5	10	90.9	5	71.4	43	69
11	SUZLON ENERGY	13	72.2	5	50	13	81.3	9	81.8	6	85.7	46	74
12	TATA POWER COMPANY	16	88.9	5	50	13	81.3	10	90.9	7	100	51	82
13	TORRENT POWER LTD.	15	83.3	4	40	16	100	9	81.8	5	71.4	49	79
14	WELSPUN CORPN LTD	12	66.7	3	30	9	56.3	7	63.6	5	71.4	36	58
	TOTAL	188		57		149		120		73		587	
	AVERAGE	13		4		11		9		5		42	

Above table reveals that minimum score of Power and Energy industry is 32 and maximum score is 51 items disclosed by a company. Average disclosure of category I - 13, II - 4, III - 11, IV - 9 and V- 5. Total score for all 14 companies in all five categories is 587 and on an average power and energy company has reported 42 items in their annual report.

Table 6.32: Environmental disclosure score: Plastics and Packaging

SNO	Plastics & Packaging	18		10		16		11		7		62	
		score	%	score	%	score	%	score	%	score	%	score	%
1	ASAHI INDIA GLASS LTD.	13	72.2	6	60	5	31.3	5	45.5	4	57.1	33	53
2	CENTURY PLYBOARDS (INDIA) LTD.	10	55.6	5	50	7	43.8	6	54.5	5	71.4	33	53
3	ESSEL PROPAC LTD.	11	61.1	5	50	8	50	6	54.5	3	42.9	33	53
4	JINDAL POLY FILMS LTD.	11	61.1	5	50	6	37.5	6	54.5	6	85.7	34	54.8
5	JK PAPER COMPANY LTD	14	77.8	5	50	15	93.8	8	72.7	6	85.7	48	77

S.NO	Plastics & Packaging	18		10		16		11		7		62	
	Company name	score	%	score	%	score	%	score	%	score	%	score	%
6	ORIENT PRESS LTD.	13	72.2	3	30	7	43.8	9	81.8	1	14.3	33	53
7	POLYPLEX LTD.	11	61.1	3	30	10	62.5	8	72.7	3	42.9	35	56
8	SUPREME INDUSTRIES LTD.	14	77.8	3	30	6	37.5	7	63.6	6	85.7	36	58
9	TAMIL NEWSPRINT & PAPERS LTD.	15	83.3	6	60	16	100	10	90.9	7	100	54	87
10	TIME TECHNOPLAST LTD.	13	72.2	3	30	9	56.3	8	72.7	4	57.1	37	60
11	UFLEX LTD.	13	72.2	6	60	13	81.3	9	81.8	5	71.4	46	74
12	WEST COAST PAPER MILLS LTD.	12	66.7	6	60	13	81.3	9	81.8	4	57.1	44	71
	TOTAL	150		56		115		91		54		466	
	AVERAGE	14		5		10		8		4		40	

Table provided the environmental disclosure score of plastic and packaging industry. Total score for all 12 companies have been reported as 466 and the average disclosure is 40 items of environmental information reported by this sector.. Almost all companies have presented 33 to 50 items in their annual report except one company which has provided 54 items information.

CHAPTER 7

Environmental Reporting Practices and Corporate Characteristics

The primary function of accounting is to collect relevant business activities and communicate information to the ultimate user. Statutory reporting is that which is to be done as per the provision of law. Non – statutory reporting may not be required legally but a company may be voluntarily reporting to shareholders on some matters which may be important to them and other members of the public. The task of prioritizing social and environmental issues for strategic planning and reporting purposes can be discouraging for any company. The key is to identify and illustrate issues that are highly material , those that have the greatest potential to impact the company's long - term success and that matter to its most relevant stakeholders. Social and environmental disclosure is stimulated by the corporate attributes. In chapter V, independent variables which would have impact on environmental reporting were discussed and there are evidences of many empirical researches supporting the effect of association between the variables. The association between selected corporate characters and environmental disclosure would be analysed empirically with pertinent statistical tool in this chapter.

7.1 Discriminant Analysis

The objective of a discriminant analysis is to classify objects, by a set of independent variables, into one of two or more mutually exclusive and exhaustive categories. Discriminant analysis is used primarily to predict membership in two or more mutually exclusive groups. Discriminant Analysis is a statistical technique that is used by the researcher to analyze the research data when the **dependent variable is categorical** and the **predictor variable is interval in nature**. It is quite similar to regression analysis. It can be used to determine predictor variables are related to the dependent variable and to predict the value of dependent variable. It builds a predictive model for group membership. The model is composed of a discriminant function based on linear combinations of predictor variables. Those predictor variables provide the best discrimination between groups.

A discriminant score can be calculated based on the weighted combination of the independent variables

$$D_i = a + b_1x_1 + b_2x_2 + \dots + b_nx_n$$

D_i is predicted score (discriminant score)

x is predictor and b is discriminant coefficient

Assumptions

- Cases should be independent.
- Predictor variables should have a multivariate normal distribution, and within-group variance-covariance matrices should be equal across groups.
- Group membership is assumed to be mutually exclusive.
- The procedure is most effective when group membership is a truly categorical variable.

Five Dependent variables

1. Environmental policies and initiatives
2. Environmental Expenditure
3. Environmental Pollution
4. Environmental Reporting Elements
5. Environmental compliance.

Independent Variables

The present study measures the size of the firm by the value of total assets held in the business and the number of employees worked in the accounting period 1-4-2016 – 31-03 2017. Age of the firm is considered as the total number of years of existence from the year of incorporation. Financial performance of a firm is measured by profitability indicators. The present study has used Net profit margin, total income and Profit before interest, tax and depreciation PBITDA. The amount spent for corporate social responsibility activities for the accounting year has been considered for the variable amount spent on CSR. The Dummy variable industry type is a classified in to environmentally sensitive and environmentally non –sensitive.

- Corporate size - Ln Assets and Ln Number of employees.
- Age of the firm – Ln Age
- Industry Type - Sensitive and Non – Sensitive.
- Profitability - Ln Net profit Margin, LnPBITDA and Ln Total income.
- Ln CSR.

Table 7.1 Dependent Variables – Descriptive Statistics

	Environ. policy	Environ. Expenditure	Environmental pollution	Environmental Reporting Elements	Environmental compliance
Valid	170	170	170	170	170
Missing	0	0	0	0	0
Median	13	5	12	8	6

Minimum	6	1	3	4	1
Maximum	18	8	16	11	7

7.2 Dependent Variables – Descriptive Statistics

The above table shows the minimum disclosure, maximum disclosure and median level disclosure for each dependent variable. Companies have disclosed minimum of 6 statements, maximum of 18 statements and median level of 13 statements about environmental policy and initiatives. On environmental expenditure category, median level disclosure was 5 items; minimum disclosed 1 item and maximum 8 items reported by sample companies. Third dependent variable environmental pollution was reported 12 items at median level, maximum disclosure 16 items and minimum disclosure 3 items. In fourth dependent variable, the median disclosure was 8 items, minimum and maximum items reported were 4 and 11. Environmental compliance information was disclosed 6 statements at median point, one statement at minimum level and maximum 7 items.

Table : 7.2 Independent Variables- Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
LN Assets (Rs, milln)	170	7.45	15.52	11.1177	1.30374
LN Number of Employees (number)	170	6	13	8.67	1.108
LN Age(number)	170	.00	2.08	1.8329	.22226
LN Net profit Margin(%)	170	-2.53	4.53	1.8551	.99370

LN PBITDA (Rs)	170	1.63	2.58	2.2064	.14136
LN Total Income(Rs)	170	3.31	6.66	4.7593	.49785
LN CSR (Rs)	170	-2.30	8.79	3.5864	2.61112

7.3 Independent Variables- Descriptive Statistics

The above table 7.2, shows the mean values and standard deviation values for all independent variables. Minimum and maximum values are given in this table. The mean value of assets 11.1177 million, the mean value number of employees 8.67, mean value of age factor 1.8329, Net profit margin has mean 1.8551, the mean of PBITDA 2.2064, total income has mean at 4.7593 and the mean value for the variable amount spent on CSR is 3,5864. The empirical study to find out the relationship between corporate characters and environmental disclosure reporting practices involves the process of setting assumptions and checking with the statistical results. The following hypotheses would be tested by using a statistical tool selected from SPSS software. Discriminant analysis of all dependent and independent variables would be helpful to understand the relationship between the disclosure practices and corporate characters.

In the present study, discriminant analysis has provided the results about case summary, group statistics, test of equality of group means, test of homogeneity of variance, summary of canonical correlation, standardized co- efficient and structure matrix values. The results for the first case ie., the relationship between environmental policy and initiatives with corporate characters have been displayed in separate tables. In order to understand the full analysis of five dependent and 7 independent variables, the combined table would give the results of various tests in later pages.

Environmental policy and Initiatives and Corporate Characters

Major Hypothesis

H0: There is no significant association between environmental policy & Initiatives and size of a firm.

H1: There is a significant association between environmental policy & Initiatives and size of a firm.

Sub Hypotheses.

H0: There is no association between environmental policy & Initiatives and total assets.

H1.1 There is an association between environmental policy & Initiatives and total assets.

H0: There is no association between environmental policy & Initiatives and number of employees.

H1.2 There is an association between environmental policy & Initiatives and number of employees.

H0: There is no significant association between environmental policy & initiatives and age of the firm.

H1.3: There is significant association between environmental policy & initiatives and age of the firm.

Major Hypothesis

H0: There is no significant association between environmental policy & initiatives and financial

Performance of a company.

H1.4: There is significant association between environmental policy & initiatives and financial

Performance of a company.

Sub Hypotheses

H0: There is no a significant association between environmental policy initiatives and Net Profit Margin.

H 1.4.1: There is a significant association between environmental policy initiatives Net Profit margin.

H0: There is no significant association between environmental policy initiatives and PBITDA.

H1.4.2: There is a significant association between environmental policy initiatives and PBITDA.

H0: There is no significant association between environmental policy initiatives and total income.

H1.4.3: There is significant association between environmental policy initiatives and total income.

H0: There is no significant association between environmental policy initiatives and amount spent on CSR.

H1.4: There is a significant association between environmental policy initiatives and amount spent on CSR.

Table 7.3 : Group statistics – Environmental policy and Initiatives

Group statistics		Mean	Std. Deviation	Weighted
1.00	LN Assets	10.6801	.98410	104.000
	LN Number of Employees	8.4656	.94695	104.000
	LN Age	1.8276	.24879	104.000

	LN Net profit margin	1.7264	.93310	104.000
	LNPBITDA	2.1598	.12436	104.000
	LN Total Income	4.6183	.37355	104.000
	LN CSR	3.0078	2.43629	104.000
2.00	LN Assets	11.8072	1.44761	66.000
	LN Number of Employees	9.0028	1.26108	66.000
	LN Age	1.8413	.17391	66.000
	LN Net profit Margin	2.0579	1.05801	66.000
	LNPBITDA	2.2797	.13606	66.000
	LN Total Income	4.9814	.58430	66.000
	LNCSR	4.4983	2.63458	66.000
Total	LN Assets	11.1177	1.30374	170.000
	LN number of Employees	8.6742	1.10775	170.000
	LN Age	1.8329	.22226	170.000
	LN Net profit Margin	1.8551	.99370	170.000
	LNPBITDA	2.2064	.14136	170.000
	LN Total Income	4.7593	.49785	170.000
	LNCSR	3.5864	2.61112	170.000

7.4 Group Statistics - Environmental policy and Initiatives

The above table presents the distribution of observation of the independent variables. In discriminating function first dependent variable, Environmental policy and Initiatives has been divided in to two groups on the basis of level of disclosure made by companies.

Group 1: Environmental disclosure made by companies at \leq the median point.

Group 2: disclosure made by companies above the level of median point.

The above table shows the two groups of dependent variable, *environmental policy*. Group 1 denotes that **104** companies have disclosed about environmental policy at \leq to the median point. Remaining **66** companies have given disclosure at above the median level, and they are grouped as 2. The mean value of all independent variables given in group two is greater than the mean values given in group one.

Table 7.4 Test of Equality of Group Means

	Wilks' Lambda	F	Sig.
LN Assets	.821	36.518	.000
LN Number Employees	.944	9.999	.002
LN Age	.999	.152	.697
LN Net profit Margin	.973	4.589	.034
LN PBITDA	.828	34.903	.000
LN Total Income	.873	24.457	.000
LN CSR	.922	14.184	.000

The above table shows p value less than 0.05, according to the result, every variable in the discriminant model except the variable *age* is significant and it means the discrimination function explains the group cases in well manner. It shows that significant independent variables are more important to the discriminant function. In the ANOVA table, the smaller the Wilks's lambda, the more important the independent variable to the discriminant function. Wilks's lambda is significant by the F test for all independent variables. Wilk's lambda is used to test significant

differences between the groups on the individual predictor variables. It tells which variables contribute a significant amount of prediction to separate the groups.

Box's M		95.935
F	Approx.	3.264
	df1	28
	df2	67344.060
	Sig.	.000

Box's M test tests the assumption of homogeneity of covariance matrices. On the basis of Box's M insignificant result $P=.000 < .01$, the null hypothesis of equal population variance has to be rejected and the alternate hypothesis of the variances in

dependent variables are not equal has to be accepted. When n is large, small deviations from homogeneity will be found significant, which is why Box's M must be interpreted in conjunction with inspection of the log determinants. Box's M test shows the insignificant result, Table 7 (5a), provides the similar log determinant values in groups, which enables the discriminant function to proceed further. Discriminant function analysis is robust even when the homogeneity of variances assumption is not met, provided the data do not contain important outliers. For our data, we conclude the groups do differ in their covariance matrices, violating an assumption of discrimination analysis.

Table 7. 5.1 Log Determinants		
Environmental Policy	Rank	Log Determinant
1.00	7	-12.224
2.00	7	-11.266
Pooled within-groups	7	-11.282

Table 7. 6 Summary of Canonical Discriminant Functions

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.256 ^a	100.0	100.0	.451

The canonical correlation is the measure of association between the discriminant function and the dependent variable. The present canonical correlation .451 indicates the discriminant function at medium level. The **square of canonical correlation coefficient is the percentage of variance explained in the dependent variable.** Eigen values explain the proportion of variance in dependent variable by the discriminant function. The larger the eigenvalue, the more of the variance in the dependent variable is explained by that function. Dependent variables have two categories; there is only one discriminant function.

Table 7 .6.1 Lambda				
Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.796	37.471	7	.000

The associated chi-square statistic tests the hypothesis that the means of the functions listed are equal across groups. The small significance value $P = .000$ indicates that the discriminant function does better than chance at separating the groups.

Table 7.7 Environmental policy and Initiatives (DV1) Result

Independent variables	Equality of Mean Test		Co -Efficient	Structure matrix
	F	Sig		
LN Assets	36.518	.000	.691	.922
LN Number of Employ	9.999	.002	-.273	.901
LN Age	.152	.697	.183	.754
LN NP margin	4.589	.034	-.163	.574
LN PBITDA	34.903	.000	.611	.482
LN Tot. Income	24.457	.000	-.202	.327
LNCSR	14.184	.000	.241	.060
Canonical Correlation R	.451	--	--	--
R2	20.34%	---	--	--
Wilks Lambda	.000	--	--	--

7.5 Environmental policy and Initiatives (DV1) Result

The standardized coefficients in the table serve the same purpose as beta weights in multiple regression, they indicate the relative importance of the independent variables in predicting the relationship. Coefficients with large absolute values correspond to variables with greater discriminating ability. It was found in the discriminant analysis the Assets ($P=.000$, $\beta = .691$), PBITDA ($P = .000$, $\beta = .611$) and CSR ($.000, .241$) variables are having positive significant relationship with environmental policy and initiatives. Net profit margin ($P = .034$, $\beta = -.163$) and total income ($P = .000$, $\beta = -.202$) shows the significant negative association. This significant association of assets implies that a unit change in value of assets would increase the reporting on environmental policy and initiatives at .691 times. Number of employees of the company has significant negative association with dependent variable. It denotes an increase in number of employees in an organization would lead to a fall in environmental reporting practices. The structure matrix value shows the correlations of each variable with each discriminant function. In the above table size of the firm was found as good parameter to explain the discriminant function. Hence, all independent variables like size, age, profitability and amount spent on CSR have significant influences on environmental policy and initiatives. Canonical correlation .451 is the strength of the relationship between discrimination function and dependent variable² value = 20.35 % , explains the variance in dependent variable by independent variables. The mean value of age was found insignificant, but the structure matrix value is higher than profitability indicators and amount spent on CSR.

Major Hypothesis

H0: There is no significant association between environmental expenditure and size of the firm.

H 2: There is significant association between environmental expenditure and size of the firm.

Sub Hypotheses

H 0 : There is no significant association between environmental expenditure and total assets.

H 2.1: There is an association between environmental expenditure and total assets.

H 0 : There is no association between environmental expenditure and number of employees.

H 2.2: There is an association between environmental expenditure and number of employees.

H0 : There is no association between environmental expenditure and age of the firm.

H 2.3 : There is an association between environmental expenditure and age of the firm.

Major Hypothesis

H0: There is no association between environmental expenditure and financial performance of the company.

H 2.4 There is an association between environmental expenditure and financial performance of the company.

Sub Hypotheses

H0: There is no association between environmental expenditure and net profit Margin.

H2.4.1: There is an association between environmental expenditure and net profit Margin.

H0: There is no association between environmental expenditure and PBITDA.

H2.4.2; There is an association between environmental expenditure and PBITDA.

H0: There is no association between environmental expenditure and total income.

H 2.4.3: There is an association between environmental expenditure and total income.

H0; There is no relationship between environmental expenditure and amount spent on CSR.

H 2.4 There is a relationship between environmental expenditure and amount spent on CSR.

Table 7.8 Environmental Expenditure Group Statistics

Group Independent Variables		Mean	Std. Deviation	Weighted
1.00	LN Assets	11.0304	1.24338	104
	LN Num. Employees	8.5791	1.17386	104
	LN Age	1.8328	.25081	104
	LN Net profit margin	1.6991	1.07493	104
	LN PBITDA	2.1923	.13909	104
	LN Total Income	4.7216	.48722	104
	LNCSR	3.1346	2.77646	104
2.00	LN Assets	11.2553	1.39215	66

	LN Num .Employees	8.8239	.98477	66
	LN Age	1.8331	.16958	66
	LN Net profit margin	2.1010	.79749	66
	LN PBITDA	2.2285	.14314	66
	LN Total . Income	4.8187	.51225	66
	LN CSR	4.2984	2.16101	66
Total	LN Assets	11.1177	1.30374	170
	LN Num .Employees	8.6742	1.10775	170
	LN Age	1.8329	.22226	17
	LN Net profit Margin	1.8551	.99370	170
	LNPBITDA	2.2064	.14136	170
	LN Total Income	4.7593	.49785	170

7.6 Group Statistics - Environmental Expenditure

The above table presents the distribution of observation of the independent variables. In discriminating function, environmental expenditure has been divided in to two groups on the basis of level of disclosure made by companies.

Group 1: Environmental disclosure made by companies at \leq to the median point.

Group 2: Environmental disclosure made by companies above the level of median point.

The above table shows the two groups of dependent variable, *environmental Expenditure*. Group 1 denotes that **104** companies have disclosed about environmental expenditure at \leq to the median point. Remaining **66** companies have given disclosure at above the median level, and they are grouped as 2. The mean value

of all independent variables in group two is greater than the mean values of group one.

Table 7.9 - Environmental Expenditure (DV 2) Result

Independent variables	Equality of Mean Test		Co-efficient	Structure matrix
	F	Sig		
LN Assets	1.203	.274	-.219	.866
LN Number Employees	1.982	.161	.191	.783
LN Age	.000	.994	-.056	.488
LN NP margin	6.835	.010	.713	.421
LN PBITDA	2.660	.105	-.693	.371
LN Tot. Income	1.539	.216	.697	.328
LNCSR	8.370	.004	.593	.002
Canonical Correlation	.250			
R				
R2	.063%			

7.7 Environmental Expenditure (DV 2) Result

The second dependent variable is environmental expenditure. The above table displayed the results of equality of mean test, Co-efficient or beta values and variable weights or loadings. Equality of mean test is significant for only two independent variables, namely Net profit margin and amount spent on CSR. Other variables are

not effective to classify the observations between the two groups of dependent variable. Beta coefficient of amount spent on CSR ($P = .004$, $\beta = .593$), Number of employees, total income and net profit margin ($P = .010$, $\beta = .713$) has positive influence on the reporting practices about environmental expenditure. Value of assets, age of the firm and PBITDA are having negative association with the dependent variable. Structure matrix shows highest value for assets and then next higher value for number of employees. These two variables are considered for measuring size of the firm. It is concluded that they are the good predictors in this discrimination function. The canonical correlation value (.250) explains the relationship between discriminant function and the environmental expenditure. $R^2 = 6\%$ variance in environmental expenditure is explained. There may be other predictor variables could be added to get the better result of the discriminant function with regard to environmental expenditure.

For measuring environmental disclosure practices of a company through the indicator environmental expenditure is not highly useful for analyse the relationship in this research work. The result denotes environmental disclosure practices related with environmental expenditure was not influenced by variables such as Assets, Number of employees, Age, PBITDA and Total Income.

Environmental Pollution and Corporate Characteristics

Major Hypothesis

H0 : There is no relationship between environmental pollution and size of the firm.

H3: There is a relationship between environmental pollution and size of the firm.

Sub Hypothesis

H0: There is no relationship between environmental pollution and total assets of the firm.

H3.1: There is a relationship between environmental pollution and total assets of the firm.

H0: There is no relationship between environmental pollution and number of employees.

H3.2: There is a relationship between environmental pollution and number of employees.

H0: There is no relationship between environmental pollution and age of the firm.

H3.3: There is a relationship between environmental pollution and age of the firm.

Major Hypothesis

H0: There is no relationship between environmental pollution and financial performance of a company.

H 3.4: There is relationship between environmental pollution and financial performance of a company.

Sub Hypotheses

H0: There is no relationship between environmental pollution and net profit margin

H 3.4.1 : There is a relationship between environmental pollution and net profit margin.

H0: There is no relationship between environmental pollution and PBITDA.

H3.4.2: There is a relationship between environmental pollution and PBITDA.

H0: There is no relationship between environmental pollution and total income.

H3.4.3; There is a relationship between environmental pollution and total income.

H0: There is no relationship between environmental pollution and amount spent on CSR.

H3.4: There is no relationship between environmental pollution and amount spent on CSR.

Table 7.10 Group Statistics - Environmental Pollution

Independent Variables		Mean	Std. Deviation	Weighted
1.00	LN Assets	10.6088	1.09541	97
	LN Num .Employees	8.3445	1.00212	97
	LN Age	1.8442	.25034	97
	LN Net . profit margin	1.7247	1.03946	97
	LNPBITDA	2.1556	.13041	97
	LN Total Income	4.5855	.39822	97
	LN CSR	2.9164	2.50032	97
2.00	LN Assets	11.7939	1.25590	73
	LN Num. Employees	9.1121	1.09565	73
	LN Age	1.8178	.17887	73
	LN Net profit margin	2.0284	.90760	73
	LNPBITDA	2.2738	.12712	73
	LN Total Income	4.9903	.52490	73
	LN CSR	4.4768	2.50184	73
Total	LN Assets	11.1177	1.30374	170
	LN Num. Employees	8.6742	1.10775	170
	LN Age	1.8329	.22226	170
	LN Net profit margin	1.8551	.99370	170
	LN PBITDA	2.2064	.14136	170

	LN Total Income	4.7593	.49785	170
	LN CSR	3.5864	2.61112	170

7.8 Group Statistics - Environmental Pollution

Above table 7.10 shows the two groups of environmental pollution divided as 97 companies (those have reported \leq to median point items regarding pollution and 73 companies (those companies have reported above the median point). All independent observations have distributed across the two groups. Mean values and standard deviation of all independent variables are given in the table.

Table 7.11 Environmental Pollution (DV3) Result.

Independent variables	Equality of Mean Test		Co – efficient	Structure matrix
	F	Sig		
LN Assets	42.962	.000	.914	.961
LN Num Employ	22.551	.000	.099	.867
LN Age	.586	.445	.000	.839
LN NP margin	3.959	.048	.154	.696
LN PBITDA	34.913	.000	-.447	.590
LN Tot. Income	32.706	.000	.324	.292

LNCSR	16.213	.000	.210	-.112
Canonical Correlation	0.466			
R				
R ²	22%			
Wilks Lambda	.000			

7.9 Environmental Pollution (DV3) Result

Table no 7.11 presents the results of equality of mean test, value of canonical correlation, co-efficient values and structure matrix. F statistic is not significant for the variable age of the firm. Assets, net profit margin, number of employees, PBITDA, total income and amount spent on CSR have significant values, that is less than .05. ($P < .05$). On the basis of results null hypothesis of equal means of independent variables would be rejected and the alternate hypothesis of mean values for the variables are not equal has to be accepted. This implies that all independent variables are potential enough to do the discrimination function between the groups. The canonical correlation value 0.47 shows the relationship between discrimination function and dependent variable. There is a positive association. Coefficient values are showing positive impact on environmental pollution by all the independent variables except PBITDA which has negative association with dependent variable. It was found there was no significant impact by age of the firm on the disclosure of environmental pollution.

The results are statistically significant for all the independent variables for the association with environmental pollution, Assets ($P = .000$, $\beta = .917$), Number of Employee ($P = .000$, $\beta = .099$), Net profit margin ($P = .048$, $\beta = .154$), PBITDA ($P = .000$, $\beta = -.447$), Total Income ($P = .000$, $\beta = .324$) and amount spent on CSR ($P = .000$, $\beta = .210$). The values given in the structural matrix columns have been displayed the

important wise predictors in discriminant function. It means that matrix value for assets .961, most effective variable in discriminant analysis, Second effective variable is number of employees, it has loaded value .867. On the basis of structural matrix size factor has more influence, and profitability indicators has secondly placed and so on. R^2 express that 22 % of variance in environmental pollution explained by independent variables. Wilks lambda is significant and the model is fit for discriminant analysis. The box m test values, log determinant value for the third dependent variable has been given in the combined table.

Environmental Reporting Elements and Corporate Characteristics

Major Hypothesis

H0 : There is no association between environmental reporting elements and size of the firm.

H4 : There is an association between environmental reporting elements and size of the firm.

Sub Hypothesis

H0: There is no association between environmental reporting elements and total assets of a firm.

H4.1: There is an association between environmental reporting elements and total assets of a firm.

H 0: There is no association between environmental reporting elements and number of employees.

H4.2: There is an association between environmental reporting elements and number of employees.

H0: There is no association between environmental reporting elements and age of the firm.

H4.3; There is an association between environmental reporting elements and age of the firm.

Major Hypothesis

H0: There is no association between environmental reporting elements and financial performance.

H4.4: There is an association between environmental reporting elements and financial performance.

Sub Hypothesis

H0: There is no association between environmental reporting elements and net profit margin.

H4.4.1: There is an association between environmental reporting elements and net profit margin.

H0: There is no association between environmental reporting elements and PBITDA.

H4.4.2: There is an association between environmental reporting elements and PBITDA.

H0: There is no association between environmental reporting elements and total income.

H4.4.3: There is an association between environmental reporting elements and total income.

H 0: There is no association between environmental reporting elements and amount spent on CSR.

H4.4: There is an association between environmental reporting elements and amount spent on CSR.

Table 7.12 Environmental Reporting Elements Group Statistics

Group Independent Variables		Mean	Std. Deviation	weighted
1.00	LN Assets	10.6674	.89611	97
	LN Number Employees	8.3588	.91525	97
	LN Age	1.8269	.25080	97
	LN Net profit margin	1.6557	1.06140	97
	LN PBITDA	2.1583	.11246	97
	LN Total Income	4.6044	.36622	97
	LN CSR	2.9504	2.47848	97
2.00	LN Assets	11.7160	1.51090	73
	LN Number Employees	9.0932	1.20475	73
	LN Age	1.8408	.17881	73
	LN Net profit Margin	2.1200	.83122	73
	LN PBITDA	2.2702	.15097	73
	LN Total Income	4.9651	.57243	73
	LN CSR	4.4315	2.55805	73
Total	LN Assets	11.1177	1.30374	170
	LN Number Employees	8.6742	1.10775	170
	LN Age	1.8329	.22226	170
	LN Net profit margin	1.8551	.99370	170
	LNPBITDA	2.2064	.14136	170
	LN Total Income	4.7593	.49785	170
	LN CSR	3.5864	2.61112	170

7.10 Group Statistics - Environmental Reporting Elements

The above table presents the distribution of observation of the independent variables. In discriminating function, the dependent variable, environmental reporting elements has been divided in to two groups on the basis of level of disclosure made by companies. 97 companies classified in to group one as their disclosure level is less than or equal to median level. Remaining 73 companies have reported disclosure above the median level and it is group 2. The mean value of all independent variables given in group two is greater than the mean values given in group one. All independent observations have distributed across the two groups.

Table 7 .13 Environmental Reporting Elements

Independent variables	Equality of Mean Test		Co –efficient	Structure matrix
	F	Sig		
LN Assets	31.870	.000	.756	.882
LN Number Employees	20.407	.000	.251	.866
LN Age	.162	.688	.194	.781
LN NP margin	9.554	.002	.457	.706
LN PBITDA	30.714	.000	-.487	.594
LN Tot. Income	24.964	.000	.407	.483
LNCSR	14.470	.000	.046	.063
Canonical Correlation R	.443			
R2	20%			
Wilks Lamda	.000			

7.11 Environmental Reporting Elements (DV 4) Result

In table 7.13, equality of mean test result shows significant values for all independent values except the variable age of the firm. Independent variables assets, number of employees, net profit margin, PBITDA, Total income and amount spent on CSR are having significant values, $P = .000 \leq .05$. It indicates that for discriminant analysis all significant variables are effective. The canonical correlation value .443 shows the positive association between dependent variable and discriminant function. Coefficient or beta values of this function found that, the dependent variable environmental reporting element is positively related with value of Assets ($P = .000$, $\beta = .756$), Number of Employees ($P = .000$, $\beta = .257$), Net profit margin ($P = .002$, $\beta = .4570$), Total income ($P = .000$, $\beta = .407$) and Amount spent on CSR ($P = .000$, $\beta = .046$).

The variable PBITDA ($.000$, $\beta = -.487$) has significant negative association with environmental reporting elements. Age of the firm ($P = .688$, $.195$) does not have significant association with dependent variable. Further, 20 % of variance in dependent variable has been explained by the independent variables. Size of the firm, profit and amount spent on CSR have positive association with environmental reporting elements. Wilks lambda is significant and it denotes that the model is fit for the analysis. Structure matrix values infer the most important predictor on the basis of their values. First important variable is size of the firm, and second important variable is profitability and third important variable is amount spent on CSR. All these variables are having direct impact on the reporting practices about environmental reporting elements.

Environmental Compliance and Corporate characters

Major Hypothesis

H0: There is no relationship between environmental compliance and size of the firm.

H5: There is a relationship between environmental compliance and size of the firm.

Sub Hypothesis

H0 ; There is no relationship between environmental compliance and total assets.

H5.1 : There is a relationship between environmental compliance and total assets.

H0: There is no relationship between environmental compliance and number of employees.

H5.2 : There is a relationship between environmental compliance and number of employees.

H0: There is no association between environmental compliance and age of the firm.

H5.3; There is an association between environmental compliance and age of the firm.

Major Hypothesis

H0: There is no relationship between environmental compliance and financial performance.

H5.4: There is a relationship between environmental compliance and financial performance.

Sub Hypothesis

H0: There is no relationship between environmental compliance and net profit margin.

H5.4.1: There is a relationship between environmental compliance and net profit margin.

H0: There is no relationship between environmental compliance and PBITDA.

H5.4.2: There is a relationship between environmental compliance and PBITDA.

H0: There is no relationship between environmental compliance and total income.

H5.4.3: There is a relationship between environmental compliance and total income.

H0: There is no relationship between environmental compliance and amount spent on CSR.

H5.4: There is a relationship between environmental compliance and amount spent on CSR.

Table : 7.14 Group Statistics - Environmental Compliance

Group Independent variables	Mean	Std. Deviation	weighted	
1.00	LN Assets	10.9933	1.27218	133
	LN Number Employee	8.6031	1.10540	133
	LN Age	1.8479	.22503	133
	LN Net profit margin	1.8391	1.04264	133
	LN PBITDA	2.1926	.14270	133
	LN Total Income	4.7004	.46994	133
	LN CSR	3.4058	2.59336	133
2.00	LN Assets	11.5650	1.33501	37
	LN Number Employee	8.9297	1.09294	37
	LN Age	1.7790	.20593	37
	LN Net profit margin	1.9128	.80319	37
	LN PBITDA	2.2558	.12620	37
	LN Total Income	4.9710	.54303	37
	LNCSR	4.2357	2.60623	37
Total	LN Assets	11.1177	1.30374	170
	LN Number Employee	8.6742	1.10775	170
	LN Age	1.8329	.22226	170
	LN Net profit margin	1.8551	.99370	170
	LN PBITDA	2.2064	.14136	170

	LN Total Income	4.7593	.49785	170
	LNCSR	3.5864	2.61112	170

7.12 Group Statistics - Environmental Compliance

The above table shows the group details, the observations of all independent variables have been distributed across two group. The mean values can be compared between the groups. Standard deviations of all variables are given in the table. There are 133 companies were identified that their disclosure on environmental compliance is less than or equal to median level called group 1 and 37 companies have reported about environmental compliance above the median level, which is group two.

Table 7.15 Environmental Compliance (DV5) Result

Independent variables	Equality of Mean Test		Co – efficient	Structure matrix
	F	Sig		
LN Assets	5.721	.018	.057	.846
LN Number Employees	2.539	.113	-.395	.690
LN Age	2.815	.095	-.476	.676
LN NP margin	.158	.691	.142	.486
LN PBITDA	5.964	.016	-.433	-.474
LN Tot. Income	8.955	.003	1.266	.450
LNCSR	2.958	.087	.258	.112

Canonical Correlation R	.263			
R ²	0.07			

7.13 Environmental Compliance (DV 5) Result

Table 7.15 displayed the F value for all independent variables. The variables assets, PBITDA and total income were significant at .05, p values are <.05. Number of employees, net profit margin are showing insignificant values. Age of the firm and amount spent on CSR are significant at 10% alpha level of significance. On the basis of F score, the efficient independent variables for this discriminant function could be identified. It is also clear that they can do the discriminant function in well manner. Beta values explain the magnitude of the association between dependent and independent variables. According to the result, the predictor variables Asset (P= .018, $\beta = .057$) and Total Income (P=.003, $\beta = 1.26$) have statistically significant and positive relationship with environmental compliance disclosures. Age of the firm has been statistically significant at the alpha level 10% (P = .09, $\beta = -.476$) and negative association with dependent variable. PBITDA (P = .016, $\beta = -.433$) has significant positive impact on the environmental compliance reporting practices. It was also found that amount spent on CSR is statistically significant at 10% alpha level (P= .08, .258) and has positive association.

The canonical correlation value .263 implies the strength of relationship between discriminant function and dependent variable. R^2 denotes that 7% of variance in environmental compliance explained through discriminant analysis. Structure matrix is like factor loadings in factor analysis; it shows which variable is most important or most useful to predict the relationship in the function. Assets of the firm stands first, number of employees has second highest value, age factor has next and so on.

The following tables give the summary of all test results for all five dependent variables.

Table :7.15 a – Group statistics of five dependent variables (Combined)

Group	Independent variables	DV 1		DV 2		DV 3		DV 4		DV 5	
		Mean	Noc	Mean	NOC	Mean	NO C	Mean	NO C	Mean	NOC
1	LN Assets	10.680	104	11.0304	104	10.6088	97	10.6674	97	10.993	133
	LN Num Employ	8.4656	104	8.5791	104	8.3445	97	8.3588	97	8.6031	133
	LN Age	1.8276	104	1.8328	104	1.8442	97	1.8269	97	1.8479	133
	LN NP margin	1.7264	104	1.6991	104	1.7247	97	1.6557	97	1.8391	133
	LN PBITDA	2.1598	104	2.1923	104	2.1556	97	2.1583	97	2.1926	133
	LN Tot. Income	4.6183	104	4.7216	104	4.5855	97	4.6044	97	4.7004	133
	LNCSR	3.0078	104	3.1346	104	2.9164	97	2.9504	97	3.4058	133
2.	LN Assets	11.807	66	11.2553	66	11.7939	73	11.7160	73	11.565	37
	LN Num Employ	9.0028	66	8.8239	66	9.1121	73	9.0932	73	8.9297	37
	LN Age	1.8413	66	1.8331	66	1.8178	73	1.8408	73	1.7790	37
	LN NP margin	2.0579	66	2.1010	66	2.0284	73	2.1200	73	1.9128	37
	LN PBITDA	2.2797	66	2.2285	66	2.2738	73	2.2702	73	2.2558	37
	LN Tot. Income	4.9814	66	4.8187	66	4.9903	73	4.9651	73	4.9710	37
	LNCSR	4.4983	66	4.2984	66	4.4768	73	4.4315	73	4.2357	37
Tot	LN Assets	11.117	170	11.1177	170	11.1177	170	11.1177	170	11.117	170
	LN Num Employ	8.6742	170	8.6742	170	8.6742	170	8.6742	170	8.6742	170
	LN Age	1.8329	170	1.8329	170	1.8329	170	1.8329	170	1.8329	170
	LN NP margin	1.8551	170	1.8551	170	1.8551	170	1.8551	170	1.8551	170
	LN PBITDA	2.2064	170	2.2064	170	2.2064	170	2.2064	170	2.2064	170
	LN Tot. Income	4.7593	170	4.7593	170	4.7593	170	4.7593	170	4.7593	170

	LNCSR	3.5864	170	3.5864	170	3.5864	170	3.5864	170	3.5864	170
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Above table describes the group statistic summary for all five dependent variable and the observations of independent variables have been distributed across the groups. The following table displayed the F values and the test of equality of group means measure each independent variables potential before the model.

Table 7 .16 Tests of Equality of Group Means – Combined Table

Independent variables	DV 1		DV 2		DV 3		DV 4		DV 5	
	F	Sig	F	Sig	F	Sig	F	Sig	F	Sig
LN Assets	36.518	.000	1.203	.274	42.962	.000	31.870	.000	5.721	.018
LN Num Emp	9.999	.002	1.982	.161	22.551	.000	20.407	.000	2.539	.113
LN Age	.152	.697	.000	.994	.586	.445	.162	.688	2.815	.095
LN NP margin	4.589	.034	6.835	.010	3.959	.048	9.554	.002	.158	.691
LN PBITDA	34.903	.000	2.660	.105	34.913	.000	30.714	.000	5.964	.016
LN Tot. Incom	24.457	.000	1.539	.216	32.706	.000	24.964	.000	8.955	.003
LNCSR	14.184	.000	8.370	.004	16.213	.000	14.470	.000	2.958	.087

7.14 Test of homogeneity of covariance matrices

Box's M test is very sensitive to meeting the assumption of multivariate normality. Table 7 (19) shows P value is less than 0.05 for dependent variables. According to the result the null hypothesis of equal population covariance matrices has been rejected at

the alpha level of 0.05 and the alternate hypothesis of no equality of population covariance matrices has to be accepted. Since discriminant analysis assumes homogeneity of covariance matrices between groups, we would like to see the determinants be relatively equal. The "Rank" column indicates the number of independent variables in this case.

Table 7.18 Box's Test of Equality of Covariance Matrices

	DV 1	DV 2	DV 3	DV 4	DV 5
Box's M	95.935	115.112	56.181	99.477	54.783
Approx. F	3.264	3.916	1.915	3.391	1.812
Sig.	.000	.000	.002	.000	.005

Table 7.18.1 Log Determinants					
Log Determinant	Environment Policy	Environment Expenditure	Environment Pollution	Environment Reporting Elements	Environment Compliance
1.00	-12.224	-10.054	-11.181	-11.621	-10.834
2.00	-11.266	-14.577	-12.237	-12.190	-13.719
Pooled within Groups	-11.282	-11.119	-11.299	-11.273	-11.126

But on the basis of similar log determinants values, discrimination analysis could be proceeding further.

7.15 Canonical Correlation

The canonical correlation is the measure of association between the discriminant function and the dependent variable. The square of canonical correlation coefficient is the percentage of variance explained in the dependent variable.

Table 7 .19 Summary of Canonical Discriminant Functions – Combined Table

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation	R ²	
1	.256 ^a	100.0	100.0	.451	20.34	DV 1
1	.066 ^a	100.0	100.0	.250	0.063	DV 2
1	.277 ^a	100.0	100.0	.466	22	DV 3
1	.244 ^a	100.0	100.0	.443	20	DV 4
1	.075 ^a	100.0	100.0	.263	0.7	DV 5

7.16 Association between Environmental Disclosure and Industry Type

Central Pollution Board (CPCB) has identified 17 categories of most polluting industries which contribute to the environment in terms of suspended particulate matter, gases and effluents. About 77 per cent of the industries contribute to water pollution while 15 per cent to air pollution and the remaining eight per cent to both air and water pollution. The industries which are dependent on natural resources are the most polluting ones and are growing rapidly. Heavy metal pollution from industries is affecting human health in a significant way. On this basis sample companies have been classified in to sensitive and non-sensitive industries. Industry type is treated as dummy variable, zero value is given for non – sensitive and one value is given for sensitive industries. The present study would try to find the association between environmental disclosure and industry type. Following hypotheses have framed. As all five dependent variables and industry type are categorical variable, the relationship between has been analysed through test of independence using chi square test.

H0: There is no significant association between environmental policy & initiatives and Industry type.

H 1.5: There is significant association between environmental policy & initiatives and Industry type.

H0: There is no relation between industry type and environmental expenditure disclosures.

H2.5: There is no relation between industry type and environmental expenditure disclosures.

H 0: There is no relationship between environmental pollution and Industry type.

H3.5: There is a relationship between environmental pollution and Industry type.

H0: There is no association between environmental reporting elements and industry type.

H4.5: There is an association between environmental reporting elements and industry type.

H0: There is no relationship between environmental compliance and industry type.

H5.5: There is a relationship between environmental compliance and industry type.

Sensitive/Non sensitive	Frequency	%
Non - Sensitive	41	24.1
Sensitive	129	75.9
Total	170	100

Above table provides the information that 41 companies or 24% of companies belongs to non-sensitive

And 129 or 76% of companies belongs to environmentally sensitive Industries.

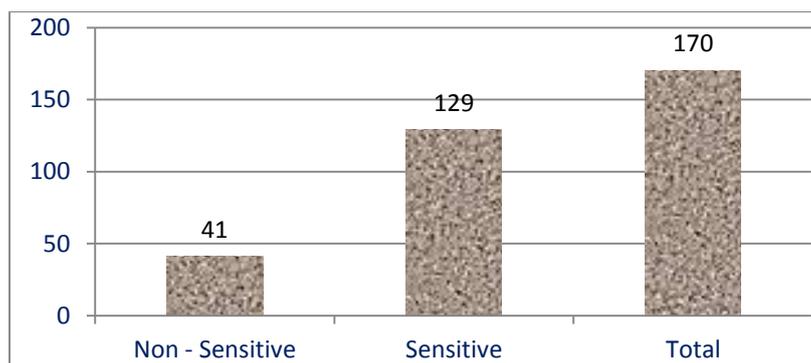


Figure 7.1 Industry Type

The chart shows 41 environmentally non sensitive companies and 129 sensitive companies.

7.17 Chi-Square Test of Independence

The Chi-Square Test of Independence determines whether there is an association between categorical variables (i.e., whether the variables are independent or related). This test utilizes a contingency table to analyse the data. A contingency table (also known as a cross-tabulation, crosstab, or two-way table) is an arrangement in which data is classified according to two categorical variables. The categories for one variable appear in the rows, and the categories for the other variable appear in columns. Each variable must have two or more categories. Each cell reflects the total count of cases for a specific pair of categories. The Chi-Square Test of Independence can only compare categorical variables. It cannot make comparisons between continuous variables or between categorical and continuous variables. Additionally, the Chi-Square Test of Independence only assesses associations between categorical variables, and cannot provide any inferences about causation.

Table 7.21 Cross Tab		Industry Type		Total
		Non sensitive	Sensitive	
1	Count	28	76	104

	% within Industry Type	68.3%	58.9%	61.2%
	% of Total	16.5%	44.7%	61.2%
2	Count	13	53	66
	% within Industry Type	31.7%	41.1%	38.8%
	% of Total	7.6%	31.2%	38.8%
Total	Count	41	129	170
	% within Industry Type	100.0%	100.0%	100.0%
	% of Total	24.1%	75.9%	100.0%

From the above table 7.21 we can understand that there are 104 companies identified in group1. 28 companies are identified as non - sensitive to the environment through their products and production process. This number is 68.3% of total non – sensitive companies ($41 \times 68.3/100$). 76 companies are found environmentally sensitive and in term of percentage 58.9% ($76/129 \times 100$). They have reported on environmental policy and initiatives below or equal to the median point. Other group has the proportion of 13 non – sensitive companies (31.7%) and sensitive companies 53 (41.1%).

Table7.22 Cross Tab Environmental Expenditure		Industry Type		Total
		Non - Sensitive	Sensitive	
1.00	Count	22	82	104
	% within Industry Type	53.7%	63.6%	61.2%
	% of Total	12.9%	48.2%	61.2%
2.00	Count	19	47	66
	% within Industry Type	46.3%	36.4%	38.8%

	% of Total	11.2%	27.6%	38.8%
Total	Count	41	129	170
	% within Industry Type	100.0%	100.0%	100.0%
	% of Total	24.1%	75.9%	100.0%

Cross tabulation 7.22 simply present the results of the entire group of respondents of dependent variable as well as results from sub-groups of survey respondents ,sensitive and non-sensitive companies in each group. It shows that in group one, 22 non sensitive companies and 82 sensitive companies. It also provides the percentage details, 12.9%on group total and 53.7% on industry type total number of companies. Second group has 19(46%) non –sensitive companies and 47(36%) sensitive companies and in total 66 companies identified as their disclosure level on environmental expenditure was above the median point.

Table 7.23 Cross Tab Environmental Pollution		Industry Type		Total
		Non - Sensitive	Sensitive	
1	Count	30	67	97
	% within Industry Type	73.2%	51.9%	57.1%
	% of Total	17.6%	39.4%	57.1%
2	Count	11	62	73
	% within Industry Type	26.8%	48.1%	42.9%
	% of Total	6.5%	36.5%	42.9%
	Count	41	129	170
	% within Industry Type	100.0%	100.0%	100.0%

	% of Total	24.1%	75.9%	100.0%
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The above table 7.23 presents 97 companies have given disclosure on environmental pollution at less than or equal to midpoint and grouped as one. Out of these total 30 companies were found non-sensitive and 67 were belongs to sensitive companies. 73(43%) companies were included in group 2 and their disclosure on environmental pollution was at the median level. 11 and 62 were classified as environmentally sensitive and non-sensitive companies.

Table 7.24 Cross Tab		Industry Type		Total	
		Non - Sensitive	Sensitive		
Environmental Reporting Elements					
1.00	Count	32	65	97	
	% within Industry Type	78.0%	50.4%	57.1%	
	% of Total	18.8%	38.2%	57.1%	
2.00	Count	9	64	73	
	% within Industry Type	22.0%	49.6%	42.9%	
	% of Total	5.3%	37.6%	42.9%	
		Count	41	129	170
		% within Industry Type	100.0%	100.0%	100.0%
		% of Total	24.1%	75.9%	100.0%

From the above table 7.24 it was found total non – sensitive companies were 41 (24%) on total sample of 170 and 32 companies were grouped in to first group and 9 companies were grouped in to second group. Total environmentally sensitive companies were 129, (76% of total sample 170 companies). The proportion among groups were 65 belongs to group 1 and 64 companies grouped in 2. The following table presents that, disclosure on environmental compliance by sample companies were divided in to 2 groups. There are 133 companies in group one and 37 companies in group 2. Out of this total 133, 18% companies were identified as non – sensitive and 60% (102 companies) found sensitive companies. In group two, there were totally 37(22%) companies and (6%) companies were non - sensitive. Remaining 27(16%) were found environmentally sensitive.

Table 7.25 Cross Tab Environmental Compliance		Industry Type		Total
		Non - Sensitive	Sensitive	
	Count	31	102	133

1.	% within Industry Type	75.6%	79.1%	78.2%
	% of Total	18.2%	60.0%	78.2%
2.	Count	10	27	37
	% within Industry Type	24.4%	20.9%	21.8%
	% of Total	5.9%	15.9%	21.8%
	Count	41	129	170
	% within Industry Type	100.0%	100.0%	100.0%
	% of Total	24.1%	75.9%	100.0%

Table 7.26 Chi square Test Result	Sig
(i) Environmental Policy and Initiatives	.285.
(ii) Environmental Expenditure	.274
(iii) Environmental pollution	.019
(iv) Environmental Reporting Elements	.002
(v) Environmental Compliance	.666

7.18 Chi – Square Test Result Discussion

(i) Since the p-value (.285) is greater than our chosen significance level ($\alpha = 0.05$), we do not reject the null hypothesis. Rather, we conclude that there is not enough evidence to suggest an association between industry type and environmental policy and initiatives reporting practices.

(ii) P value for the second case, independence of environmental expenditure and industry type is having insignificant value, $P = .274$, greater than alpha level .005 and the null hypothesis of no association between environmental expenditure and industry type has to be retained.

(iii) Regarding the association between industry type and environmental pollution, the chi – square test result showed P value = .019, $P < .05$, significant association with industry type. On the basis of result, null hypothesis of no relationship between industry type and environmental pollution has been rejected and the alternate hypothesis of there is an association between the industry type and environmental pollution has to be accepted.

(iv) The above table provided the significant P value, $P = .002 < .05$ implies that there is an association between environmental reporting elements and industry type. Hence null of no relationship between environmental reporting elements and industry type has to be rejected.

(v) Finally, an association between environmental compliance and industry type has p value which is greater than alpha level .05 ($P = 0.666$), denotes that we should accept the null hypothesis; there is no significant association between environmental compliance and industry type.

Based on the results, we can state the following: No association was found between industry type and environmental policy & initiatives, environmental expenditure and environmental compliance. It was found that there is a significant association between industry type and environmental pollution and environmental reporting elements.

Chapter 8

Summary and conclusion

Accounting has been defined as the process of identifying, measuring and communicating economic and social information to stakeholders. In recent years, environmental accounting has become a strong branch of accounting. The users of annual reports are interested not only in the economic information but also in the information regarding social activities of the organisation. The corporate financial reporting, however, has improved tremendously since the turn of 20th century. The concept of disclosure has grown and expanded considerably in diverse ways in response to the evolution of large size business organizations with new technology, the statutory requirements to prevent fraud and manipulation and to protect the interest of shareholders/investors. In recognition of the need, there has been a continuous growth in the form, style and pattern of corporate financial reporting all over the world with different degrees of success. Over the past few decades, a significant body of accounting and finance literature has witnessed an increase in the demand for company's environmental information. Review of relevant literature relating to the area of accounting and reporting reveals that in spite of the efforts on the part of company managements everywhere to improve the meaningfulness of the annual reports, there are many users of these published corporate annual reports who continue to show their dissatisfaction with the overall quality and quantity of

disclosure expressed therein. More specific criticisms include insufficient disclosure in social and environmental matters. Formal corporate environmental reporting is not directly regulated in India and companies in India enjoy significant freedom to choose which issues and aspects of environment to be disclosed to the public.

The level of environmental disclosure is highly explained by sector and nature of industry to which a company belongs. Moreover, it is significantly affected by environmental performance of a company. Companies that have better environmental performance are expected to provide more environmental information in the annual reports as compared to poor performers. Guidelines regarding disclosure of environmental information will guide the organization regarding the matter involved in environmental accounting and reporting and also will help in improving the skills of environmental disclosure. Environmental disclosure guidelines will also ensure uniformity in corporate environmental reporting practices. The present study however is mainly confined to the evaluation of environmental reporting practices in India, UK and USA and to determine whether there is influence of corporate characters on environmental reporting practices.

Thus, this study centres mainly on an investigation of the extent of environmental disclosure in company annual reports relating to manufacturing industries in India, USA and UK. To put it more explicitly, the prime objectives and scope of the present work, are:

- (I) To evaluate the environmental disclosure practices in published corporate annual reports of the manufacturing industries in India.
- (II) To examine the influence of selected company characteristics viz, Size of the firm (measured by Assets value and Number of Employees), Age of the firm, Industry type, profitability measured through (Net profit margin, total income and PBITDA), and Amount spent on CSR on environmental disclosure in published corporate annual reports.

Methodology

To achieve these objectives, an Index of Environmental Disclosure (IED) has been developed with 62 items after making extensive survey of literature in accounting and other related fields. The Index of Environmental Disclosure (IED) contained items of environmental information suggested for disclosure in company annual reports by many studies and researches. The items of information have been classified under 5 major groups (i) Environment policy,(ii) Environmental expenditure (iii) Pollution (iv) Environmental Reporting elements and (v) environmental audit and compliance.

Annual reports for period 1st April 2016 to 31st March 2017 were selected for Indian companies. For UK and US companies' annual reports for the fiscal year (1st January 2016 to 31st December) were selected for the purpose of analysing environmental reporting practices. The total selected sample of 220 manufacturing companies includes 170 Indian companies, 25 UK companies and 25 USA companies. All Indian companies were selected from "ET-Top 500 -2017" the rank list presented by the popular business magazine "Economics Time". "Fortune Global 500" list has been used to select UK and US companies. Since non availability of required data, few companies were selected through internet sources like global database and FTSE etc ., Selection has been made in a way as to represent different industries.

The IED developed in the present study was used as a checklist to evaluate disclosure practices and the extent of disclosure in the sample companies. Further, the disclosure practices obtained this way, of sample companies' applied to examine the relationship between disclosure practices and corporate variables selected in the study. The published annual report of each company was examined by employing percentage analysis to determine the extent to which the items of information have been revealed.

After examining annual reports of sample companies the following were determined. (1) The number of companies that have disclosed an item of information in annual reports (2) the total number of items disclosed by companies, and the percentage of disclosure made by companies. Each item of information was given a score 0 and 1. If

a particular item was disclosed in an annual report given a score of “1”. In case of non-disclosure of an item “0” score was given. A numerical measure of the extent of disclosure has been computed for each of the 220 companies in the sample.

8.1 Findings: Extent of Environmental Reporting Practices

The scope of the reports is expanding. While environmental issues are the dominant theme, today companies are also including social and economic information in their reports. It was observed that the concept of environmental disclosure has grown and expanded considerably in response to the evolution of large size business organizations with new technology, the statutory requirements to prevent fraud and manipulation and to protect the interest shareholders/investors. 12 companies have given minimum level of 25% to 50% environmental information in their annual reports companies and it is 7% of total sample companies of 170. Majority number of companies, 103 has provided 50% - 75% and 55 companies have given above 75 % of environmental disclosure, and it is 32 % of total sample companies. Reliance Industries, Tata steel and Hindustan Zinc companies have provided 90 % and above environmental information in their annual report. There are 11 companies disclosed less than 30 items, 58 companies have disclosed 31 to 40 items of disclosures, 78 companies have provided 41 to 50 items of information and 23 companies have reported more number of 51- 60 disclosures. More than 50% of sample companies environmental reporting was found good. They have reported both quality and quantity of environmental reporting. There are 5 broad categories in the index of environmental Disclosure.

It was observed that Indian companies have reported 70% information on environmental policy and initiatives, 49% about Environmental expenditure, 70 % disclosure on environmental pollution, 73 % reported on environmental reporting elements and 77% disclosure made on environmental compliance. The study revealed that although not mandatory, Indian companies are providing their environmental information both on their web sites as well as in their annual reports. It was also observed that most of the sample companies have provided the positive and neutral news. The level of disclosure in the high polluting industries was found to be high as

compared to the low polluting industries. Among the high polluting industries, the status of environmental disclosure in the annual reports of Oil, Gas and refineries, Cement, Chemical, Pharmaceutical, Mining and mineral, iron and steel group of industries was found better. Securities Exchange board of India (SEBI), has given direction to all listed companies to disclose environmental and other social information in the segment called “Business social responsibility”.

As a result of this, companies have given information about energy policy, environmental management system etc., energy conservation, technology absorption and research and development matters in their annual report. Items related to waste reduction policy, Policies on implementation of ISO 140001, ISO 8000 etc., at the plant and firm level, water use minimisation efforts, total weight of waste by type and disposal method, statement which indicate that the company's operations do not cause pollution, Internal/External audit and Independent periodic verification of documents, Information on use/development/exploration of new resources, insulation etc., have been widely reported by sample Indian companies. The present study attempted to evaluate the extent of environmental reporting practices of manufacturing companies of three countries viz., India, US and UK. Large size Latin American companies operating in high-impact sectors are more likely to report environmental information than smaller and cleaner firms. The results indicated that environmental accounting and reporting is positively related to sustainable development. The UK government also strongly pressures firms to report on environmental and social issues. In US, there are 5 companies have disclosed 33 to 37 items of information in the checklist, and 14 companies disclosed 40 to 50 items. There are 6 companies reported 50 to 57 items of environmental activities. In percentage terms, US companies have disclosed minimum 55% of environmental matters and maximum 92 % information in their annual report. From the result, the reporting practices in American companies proved the responsibility towards society and environment.

The status of environmental reporting in UK depicts, there are 5 companies have disclosed 32 to 38 items of information given in the index. Many UK companies

disclosed more than half of the total items given in the index, 16 companies have scored 40 and above, and 4 companies have given maximum amount of information (more than 50) in the annual report. In percentage terms, minimum 57% of disclosure score and maximum 94 % score has been recorded by UK companies. Environmental policy and initiatives related matters disclosed by USA companies 72%, UK 74%, Environmental expenditure included 10 sub items and 55% disclosure made by US, 54% reported by UK, 80%. Regarding Environmental pollution category was reported by US companies 76% and UK 70% and for category IV 66% of US companies have disclosed and 69% of UK and the environmental audit and compliance information have been disclosed by USA-83%, UK-79% . Automobile Sector, Plastics and Packing sector and Food and agriculture sector and electrical and electronics industries have mean disclosure of 39, Cement sector 43, Chemical, Garment and Textile, Consumer Durables have 41, Power sector 43 , Iron and Steel and Pharmaceutical industries scored 45. The oil and Petroleum sector and Minerals and Mining sectors have highest mean disclosure score 48.

Recent years have seen, not only an increasing passion for these new reporting approaches, but also energetic and transparent activities by far-sighted organisations, that has reached to the point where environmental and social accounting and reporting are not only crucially important but feasible and practicable as well. The present study is to provide a general understanding of the variation in and status of environmental information disclosure across diverse sectors.. Without any strict accounting pronouncements from the ICAI and disclosure norms by the regulatory authorities, the companies generally provide only statutorily required, qualitative, and positive information on environment. Environmental reporting is continuing to expand and evolve. Environmental reporting is no passing fad. It is here to stay.

8.2 Influence of Corporate Characteristics on Environmental Reporting

The present study attempted to find the relationship between environmental reporting and corporate characters. Discrimination analysis was carried out individually for all five dependent variables of environmental reporting and 8 independent variables. It

was observed that size of the company has significant impact on environmental policy and initiatives, environmental expenditure, environmental pollution, environmental reporting elements and environmental compliance. Structure matrix produced higher loadings or weights on value of assets and number of employees. The variable Age of the firm was found significant positive association with policy and initiatives. The mean value of age was found insignificant, but the structure matrix value is higher than profitability indicators and amount spent on CSR. It shows the relationship between environmental policies and age of the firm.

The second variable environmental expenditure has negative relationship with age, and the mean is insignificant. F statistic is not significant and found there was no significant impact by age of the firm on the disclosure of environmental pollution. Age has positive association with environmental reporting elements and negatively related with environmental compliance. The mean value of age was significant at 10 % alpha level for the last dependent variable environmental pollution. Financial performance of companies are predicted by profitability indicators, All five discrimination function, profitability variables have significant association with the environmental disclosure. Net profit margin ($P = .034$, $\beta = -.163$) and total income ($P = .000$, $\beta = -.202$) shows the significant negative association and PBITDA has positive association with environmental policies and initiatives. Environmental expenditure is influenced positively by total income and net profit margin ($P = .010$, $\beta = .713$) and PBITDA is having negative association on the reporting practices about environmental expenditure. The mean values for the profitability indicators were found significant for the variables environmental pollution and environmental reporting elements. Also, it was found that, on the basis of beta value total income and net profit margin have positive association and PBITDA has negative association with both the dependent variables environmental pollution and environmental reporting elements. In case of environmental compliance, it was found negative association with PBITDA and positive association with other indicators viz., PBITDA and total income. The discrimination analysis revealed that there is positive impact on profitability or financial performance of the companies. Chi square test result shows

the relationship between environmental disclosure and industry type. It was observed that industry type has positive impact on environmental pollution and environmental reporting elements. It was found that environmental policy and initiatives has no significant association with industry type. Environmental expenditure and environmental compliance have not influenced by industry type.

Another independent variable, amount spent on CSR has positive association with all five dependent variables. The test of equality of means shows significant for all five dependent variables and it implies that CSR amount is a potential variable in discrimination function. Next independent variable industry type has positive influence on environmental pollution and environmental reporting elements.

Recommendations:

Traditional accounting system has failed to identify, measure, and find the procedure of depreciation on environmental resources used in the business activities. It is an urgent requirement that Professional accounting bodies, government, regulatory authorities, accountants, companies, and various stakeholders have to frame guidelines or evaluation procedure to follow uniform procedure for preparing environmental reports by all kind of companies. The guidance for identification of environmental costs, capitalization of environmental costs, depreciation of environmental assets, recognition of environmental benefits and measurement in terms of money, recognition of environmental liabilities and contingencies would increase the status of environmental accounting and reporting. Environmental reporting in India is voluntary nature. Due to this there is no uniformity in the level of disclosure, place of disclosure and the number of items to be disclosed. Companies can choose the items to be disclosed in the annual report. It would facilitate the companies to make only soft environmental disclosure and avoiding more significant matters. To resolve this, environmental disclosure should be made mandatory at least for the high polluting industries. More taxation benefits should be given to industry for the expenditure incurred on the protection and development of natural and environmental resources. The study recommends proper measurement and separate

recognition of significant financial benefits of being eco-efficient in the financial statements. Environmental awareness and motivation in the form of tax benefits and incentives are necessary to improve the reporting practice of companies. Involvement in research and training activities in environmental resources would enhance the environmental reporting.

8.3 Implications of the study

The present study contributes to the literature in three different ways. First, it attempts to develop an Index of Environmental Disclosure (IED) instrument. The study uses a disclosure instrument to determine the level of environmental reporting practices by 170 listed Indian companies, 25 UK companies and 25 US companies for year 2016-2017. Second, it evaluated the extent of disclosure with selective voluntary disclosure requirements and the comparison of environmental disclosure practices between developed and developing countries also been done.. Third, this study examined the impact of company specific variables such as size, industry type, Age of the firm, economic performance and the amount spent on CSR. Considering that India is an emerging market, there is little evidence of how corporate characteristics may affect the level of environmental disclosure of Indian companies. The present study provides an insight in to the relationship of corporate characteristics that affect firm's environmental reporting trend in the digital era. India is a developing country should attract international investors. The success of capital markets depends significantly on the effective flow of information between member companies and its stakeholders. Providing social disclosure and environmental information would improve the foreign investment. Findings of the study may have public policy implications, which may be of interest to the Indian government, environmental accounting standard setting bodies and NGO's in India. In the wake of adopting IFRS in the near future, it would help authorities in India to understand the current level of disclosure such that they can better prepare themselves to plan and promote successful implementation and application of the environmental standards.

8.4 Scope for Future Research

Future research may be carried out covering a number of years to draw valid conclusions about the underlying trends and techniques of environmental reporting practices in India; It is believed that a comparative study of practices in South Asian developing countries like Bangladesh, India, Pakistan and Sri Lanka will shed more light on environmental reporting practices in this region; Another research covering environmental issues in non-manufacturing sectors (like banks, hotels and educational institutions) can be undertaken. However, this study can be extended to cover the development of environmental cost and benefit model for Industries. Comparative analysis of the environmental reporting systems of the public and private limited companies can also give us good understanding in this area. Further, future studies may examine the legitimacy strategy used by companies in the Indian context. Additionally, with the regulatory and reporting changes, the role of institutional pressure may be examined in detail using longitudinal data of future disclosures.

8.5 Limitations

- The present work is limited to large manufacturing companies situated in India, UK and US. The level and quality of environmental disclosure of small size companies are not considered in this research.
- Non - manufacturing companies have been excluded from the scope of work.
- Listed companies annual reports were taken for the study. Non- listed companies reporting practices are not being analyzed in this research.

- The relationship between corporate characters and environmental reporting has been studied with eight corporate characteristics, other characters have not been included, if additional corporate attributes included, we can develop a new insight in this area of study.

- Data collection, coding process involved in content analysis is a lengthy, time and energy consuming process. The present research work has used one year data only for evaluating environmental reporting practices for three countries.

The study illustrated intra-company dynamics of environmental reporting. The statistical analysis presented the impact of externally observable variables such as company size, industry type, age and profitability. American companies were found more committed to using best practices in sustainability reporting than UK and India. Environmental management obligation is the main determinant of high-quality corporate environmental disclosure. A commitment to sustainability starts with a philosophical perspective but it also requires proper evaluation accounting system that guide the path toward better and more transparent performance. In this context, a public reporting is both a management tool, and an opportunity for internal learning and transparency. It is also used as a communication tool that allows the company to deal with its stakeholders. Corporations presently need to achieve higher standards of transparency and accountability by way of good corporate governance. For developing countries like India, the concept of sustainable development is important and efficient policies are required for environmental evaluation.

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ANNEXTURE I

Environmental Disclosure Score and % for Sample of Indian Companies

(All 5 category disclosure for 170 companies)

1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Categories.	I		II		III		IV		V		Tota Disc losu res	
S.N o	COMPANY NAME	18	%	10	%	16	%	11	%	7	%	62	%
1	A C C LTD.	17	94.4	4	40	15	93.8	9	81.8	5	71.4	50	80.6
2	AARTI INDUSTRIES LTD.	11	61.1	6	60	10	62.5	8	72.7	4	57.1	39	62.9
3	ADANI ENTERPRISES LTD.	11	61.1	3	30	7	43.8	8	72.7	7	100	36	58.1
4	ASAHI INDIA GLASS LTD.	13	72.2	6	60	5	31.3	5	45.5	4	57.1	33	53.2
5	A I A ENGINEERING LTD.	9	50.0	6	60	12	75.0	5	45.5	5	71.4	37	59.7
6	AKZO NOBEL INDIA LTD.	13	72.2	4	40	11	68.8	7	63.6	6	85.7	41	66.1
7	ALEMBIC PHARMACEUTICALS LTD.	12	66.7	2	20	10	62.5	7	63.6	4	57.1	35	56.5
8	AMARA RAJA BATTERIES LTD.	10	55.6	5	50	7	43.8	10	90.9	6	85.7	38	61.3
9	AMBUJA CEMENTS LT	15	83.3	7	70	15	93.8	11	100	7	100	5.3	88.7
10	APAR INDUSTRIES LTD.	11	61.1	6	60	10	62.5	8	72.7	5	71.4	40	64.5
11	APOLLO TYRES LTD.	12	66.7	3	30	12	75.0	9	81.8	6	85.7	42	67.7

1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Categories	I		II		III		IV		V		TOT	
S.No	COMPANY NAME	18	%	10	%	16	%	11	%	7	%	62	%
12	ARVIND LTD.	10	55.6	4	40	11	68.8	8	72.7	6	85.7	39	62.9
13	ASHOK LEYLAND	16	88.9	6	60	15	93.8	9	81.8	6	85.7	52	83.9
14	ASIAN PAINTS LTD.	13	72.2	6	60	14	87.5	10	90.9	7	100	50	80.6
15	ATUL LTD.	14	77.8	7	70	14	87.5	9	81.8	5	71.4	49	79.0
16	AUROBINDO PHARMA LTD.	14	77.8	6	60	14	87.5	9	81.8	7	100	50	80.6
17	AVANTI FEEDS LTD.	12	66.7	2	20	7	43.8	9	81.8	4	57.1	34	54.8
18	BAJAJ AUTO LTD.	11	61.1	5	50	9	56.3	7	63.6	3	42.9	35	56.5
19	BAJAJ ELECTRICALS	11	61.1	4	40	10	62.5	7	63.6	6	85.7	38	61.3
20	BAJAJ HINDUSTAN SUGARS	12	66.7	6	60	11	68.8	9	81.8	7	100	45	72.6
21	BALRAMPUR CHINI MILLS LTD	14	77.8	4	40	15	93.8	7	63.6	5	71.4	45	72.6
22	BATA INDIA LTD.	11	61.1	6	60	9	56.3	5	45.5	4	57.1	35	56.5
23	BRITANNIA INDUSTRIES LTD.	10	55.6	5	50	4	25.0	6	54.5	5	71.4	30	48.4
24	BAYER CROPSCIENCE LTD.	14	77.8	6	60	9	56.3	7	63.6	6	85.7	42	67.7
25	BERGER PAINTS INDIA LTD.	10	55.6	5	50	9	56.3	7	63.6	7	100	38	61.3

26	BHARAT ELECTRONICS LTD.	15	83.3	5	50	15	93.8	10	90.9	6	85.7	51	82.3
27	BHARAT FORGE LTD.	13	72.2	6	60	11	68.8	9	81.8	7	100	46	74.2
28	BHARAT PETROLEUM CORPN. LTD.	15	83.3	5	50	16	100.	10	90.9	7	100	53	85.5
29	BIRLA CORPORATION	11	61.1	5	50	10	62.5	9	81.8	5	71.4	40	64.5
1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Categories	I		II		III		IV		V		TOT	
S.No	COMPANY NAME	18	%	10	%	16	%	11	%	7	%	62	%
30	BLUE STAR LTD.	11	61.1	6	60	9	56.3	6	54.5	7	100	39	62.9
31	BOSCH LTD.	11	61.1	5	50	13	81.3	7	63.6	7	100	43	69.4
32	C E S C LTD.	13	72.2	3	30	9	56.3	8	72.7	7	100	40	64.5
33	CASTROL INDIA LD	14	77.8	5	50	6	37.5	7	63.6	5	71.4	37	59.7
34	CEAT LTD.	11	61.1	6	60	6	37.5	7	63.6	6	85.7	36	58.1
35	CENTURY PLYBOARDS (INDIA) LTD.	10	55.6	5	50	7	43.8	6	54.5	5	71.4	33	53.2
36	CENTURY TEXTILES & INDUS LTD	11	61.1	3	30	12	75.0	8	72.7	5	71.4	39	62.9
37	CHAMBAL FERTILIZERS	15	83.3	4	40	13	81.3	9	81.8	6	85.7	47	75.8
38	CHENNAI PETROLEUM CORPN	10	55.6	5	50	16	100.	0	54.5	6	85.7	43	69.4
39	CIPLA LTD.	13	72.2	6	60	14	87.5	8	72.7	5	71.4	46	74.2

40	COAL INDIA LTD.	16	88.9	6	60	16	100.0	10	90.9	6	85.7	54	87.1
41	COLGATE-PALMOLIVE (INDIA) LTD.	14	77.8	6	60	11	68.8	9	81.8	7	100	47	75.8
42	COROMANDEL INTERNATIONAL LTD.	14	77.8	6	60	7	43.8	8	72.7	7	100	42	67.7
43	CROMPTON GREAVES ELECTRI	11	61.1	2	20	10	62.5	6	54.5	5	71.4	34	54.8
44	CUMMINS INDIA LTD.	14	77.8	8	80	13	81.3	9	81.8	5	71.4	49	79.0
45	D C M SHRIRAM INDS. LTD.	10	55.6	2	20	12	75.0	9	81.8	5	71.4	38	61.3
46	DABUR INDIA LTD.	15	83.3	6	60	15	93.8	8	72.7	6	85.7	50	80.6
47	DALMIA BHARAT LTD.	14	77.8	4	40	12	75.0	8	72.7	5	71.4	43	9.4
48	DEEPAK FERT.PET LTD.	8	44.4	6	60	5	31.3	5	45.5	2	28.6	26	41.9
49	DIVIS LABORATORIES LTD.	15	83.3	4	40	15	93.8	9	81.8	6	85.7	49	79.0
50	DR. REDDY'S LABORATORIES LTD.	14	77.8	5	50	16	100.0	7	63.6	6	85.7	48	77.4
51	EICHER MOTORS LTD.	12	66.7	5	50	11	68.8	7	63.6	5	71.4	40	64.5
52	EID PARRY LTD	11	61.1	4	40	12	75.0	7	63.6	7	100	41	66.1
53	ELECTROSTEEL CASTINGS LTD.	11	61.1	3	30	8	50.0	7	63.6	2	28.6	31	50.0
1	2	3	4	5	6	7	8	9	10	11	12	13	14
S.No	Categories	I		II		III		IV		V		TOT	
	Company Name	18	%	10	%	16	%	11	%	7	%	62	%
48	DEEPAK FERT.PET LTD.	8	44.4	6	60	5	31.3	5	45.5	2	28.6	26	41.9
49	DIVIS LABORATORIES LTD.	15	83.3	4	40	15	93.8	9	81.8	6	85.7	49	79.0
50	DR. REDDY'S LABORATORIES LTD.	14	77.8	5	50	16	100.0	7	63.6	6	85.7	48	77.4
51	EICHER MOTORS LTD.	12	66.7	5	50	11	68.8	7	63.6	5	71.4	40	64.5
52	EID PARRY LTD	11	61.1	4	40	12	75.0	7	63.6	7	100	41	66.1
53	ELECTROSTEEL CASTINGS LTD.	11	61.1	3	30	8	50.0	7	63.6	2	28.6	31	50.0

54	ESSEL PROPACK LTD.	11	61.1	5	50	8	50.0	6	54.5	3	42.9	33	53.2
55	EMAMI LTD.	10	55.6	4	40	7	43.8	6	54.5	5	71.4	32	51.6
56	EXIDE INDUSTRIES LTD.	9	50.0	5	50	13	81.3	9	81.8	7	100	43	69.4
57	FINOLEX CABLES LTD.	8	44.4	4	40	4	25.0	5	45.5	2	28.6	23	37.1
58	FORCE MOTORS LTD.	9	50.0	4	40	4	25.0	7	63.6	3	42.9	27	43.5
59	GAIL (INDIA) LTD.	13	72.2	4	40	12	75.0	10	90.9	6	85.7	45	72.6
60	GLAXO SMITH PHARMA LTD.	15	83.3	4	40	14	87.5	10	90.9	6	85.7	49	79.0
61	GLENMARKTICALS LTD.	12	66.7	6	60	13	81.3	7	63.6	4	57.1	42	67.7
62	GHCL LTD.	13	72.2	6	60	15	93.8	10	90.9	5	71.4	49	79.0
63	GAYATRI PROJECTS LTD.	10	55.6	2	20	3	18.8	4	36.4	4	57.1	23	37.1
64	GODREJ PRODUCTS LTD.	15	83.3	6	60	14	87.5	9	81.8	7	100	51	82.3
65	GRASIM INDUSTRIES LTD.	13	72.2	3	30	16	100.0	9	81.8	7	100	48	77.4
1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Categories	I		II		III		IV		V		TO	
	Company Name	18	%	10	%	16	%	9	%	7	%	62	
66	GUJARAT FLUOROCHEMICALS LTD.	9	50.0	2	20	7	43.8	6	54.5	6	85.7	30	48.4

67	GUJARAT NARMADHA VALLEY	7	38.9	5	50	7	43.8	5	45.5	5	71.4	29	46.8
68	GUJARAT STAT & CHEMICALS LTD.	13	72.2	6	60	15	93.8	9	81.8	6	85.7	49	79.0
69	HATSUN AGRO PRODUCTS LTD.	10	55.6	1	10	8	50.0	8	72.7	7	100	34	54.8
70	HAVELLS INDIA LT	10	55.6	6	60	14	87.5	8	72.7	6	85.7	44	71.0
71	HERO MOTOCORP LTD.	15	83.3	6	60	12	75.0	8	72.7	5	71.4	46	74.2
72	HINDALCO INDUSTRIES LTD.	14	77.8	8	80	16	100.0	10	90.9	6	85.7	54	87.1
73	HINDUSTP ETROLEUM CORPN LTD.	16	88.9	5	50	16	100.0	9	81.8	7	100	53	85.5
74	HINDUSTAN UNILEVER LTD.	10	55.6	6	60	13	81.3	7	63.6	4	57.1	40	64.5
75	HINDUSTAN ZINC LTD.	17	94.4	7	70	16	100.0	10	90.9	6	85.7	56	90.3
76	INDIA CEMENTS LTD.	8	44.4	4	40	11	68.8	7	63.6	5	71.4	35	56.5
77	INDIAN OIL CORPN. LTD.	16	88.9	7	70	15	93.8	10	90.9	6	85.7	54	87.1
78	INDO COUNT INDS. LTD.	14	77.8	6	60	12	75.0	8	72.7	5	71.4	45	72.6
79	INOX WIND COMPANY LTD	10	55.6	2	20	9	56.3	7	63.6	4	57.1	32	51.6
80	IPCA LABORATORIES LTD.	12	66.7	6	60	12	75.0	10	90.9	5	71.4	45	72.6
81	J B F INDUSTRIES LTD.	14	77.8	2	20	11	68.8	8	72.7	7	100	42	67.7
82	J B M AUTO LTD.	9	50.0	6	60	8	50.0	5	45.5	4	57.1	32	51.6
83	JINDAL STAINLESS (HISAR)	13	72.2	5	50	8	50.0	9	81.8	6	85.7	41	66.1

1	2	3	4	5	6	7	8	9	10	11	12	13	14
S.No	Categories	I		II		LL L		IV		V		TO T	
84	J K CEMENT LTD.	12	66.7	6	60	9	56.3	8	72.7	5	71.4	40	64.5
85	J K LAKSHMI CEMENT LTD.	13	72.2	5	50	14	87.5	8	72.7	6	85.7	46	74.2
86	JK PAPER COMPANY LTD	14	77.8	5	50	15	93.8	8	72.7	6	85.7	48	77.4
87	J K TYRE & INDS. LTD.	13	72.2	6	60	14	87.5	8	72.7	7	100	48	77.4
88	J S W ENERGY LTD.	15	83.3	4	40	15	93.8	9	81.8	5	71.4	48	77.4
89	JAIN IRRIGATION SYSTEMS LTD.	14	77.8	3	30	10	62.5	8	72.7	6	85.7	41	66.1
90	JINDAL POLY FILMS LTD.	11	61.1	5	50	6	37.5	6	54.5	6	85.7	34	54.8
91	JINDAL SAW LTD.	16	88.9	3	30	14	87.5	9	81.8	6	85.7	48	77.4
92	KAJARIA CERAMICS LTD.	9	50.0	4	40	9	56.3	9	81.8	4	57.1	35	56.5
93	KALPATARU POWERSION LTD.	15	83.3	5	50	9	56.3	10	90.9	6	85.7	45	72.6
94	KANSAI NEROLAC PAINTS LTD.	12	66.7	4	40	7	43.8	8	72.7	5	71.4	36	58.1
95	KEI INDUSTRIES LTD.	10	55.6	6	60	4	25.0	5	45.5	2	28.6	27	43.5
96	KIRLOSKAR BROTHERS LTD.	13	72.2	6	60	13	81.3	8	72.7	6	85.7	46	74.2
97	KIRLOSKAR OIL ENGINES LTD.	14	77.8	5	50	15	93.8	9	81.8	6	85.7	49	79.0
98	KWALITY LTD.	13	72.2	5	50	9	56.3	8	72.7	7	100	42	67.7
99	LAKSHMI MACHINE	12	66.7	5	50	9	56.3	8	72.7	6	85.7	40	64.5

	WORKS LTD.												
100	LARSEN & TOUBRO LTD.	15	83.3	5	50	14	87.5	9	81.8	5	71.4	48	77.4
101	LEEL ELECTRICALS LTD.	11	61.1	4	40	7	43.8	8	72.7	3	42.9	33	53.2
102	LUPIN LTD.	12	66.7	6	60	9	56.3	9	81.8	5	71.4	41	66.1
103	M R F LTD.	6	33.3	4	40	4	25.0	7	63.6	6	85.7	27	43.5
1	2	3	4	5	6	7	8	9	10	11	12	13	14
S.No	Categories	I		II		III		IV		V		TOT	
104	MAHINDRA & MAHINDRA LTD.	18	100.0	5	50	16	100.0	9	81.8	7	100	55	88.7
105	MARICO LTD.	11	61.1	6	60	11	68.8	10	90.9	7	100	45	72.6
106	MINDA INDUSTRIES LTD.	10	55.6	6	60	4	25.0	6	54.5	6	85.7	32	51.6
107	N M D C LTD.	15	83.3	7	70	14	87.5	10	90.9	7	100	53	85.5
108	NATIONAL ALUMINIUM CO. LTD.	16	88.9	7	70	16	100.0	10	90.9	6	85.7	55	88.7
109	NATIONAL FERTILIZERS	12	66.7	5	50	13	81.3	6	54.5	6	85.7	42	67.7
110	NATIONAL STEEL AGRO INDS. LTD.	11	61.1	5	50	7	43.8	6	54.5	3	42.9	32	51.6
111	N T P C LTD.	14	77.8	5	50	5	31.3	9	81.8	5	71.4	38	61.3
112	O C L INDIA LTD.	13	72.2	5	50	14	87.5	10	90.9	7	100	49	79.0
113	OIL & NATURAL GAS CORPN. LTD.	16	88.9	7	70	14	87.5	10	90.9	5	71.4	52	83.9
114	OIL INDIA LTD.	13	72.2	6	60	13	81.3	7	63.6	6	85.7	45	72.6

115	ORIENT CEMENT LTD.	15	83.3	4	40	14	87.5	8	72.7	5	71.4	46	74.2
116	ORIENT PRESS LTD.	13	72.2	3	30	7	43.8	9	81.8	1	14.3	33	53.2
117	P I INDUSTRIES LTD.	13	72.2	6	60	12	75.0	6	54.5	6	85.7	43	69.4
118	PHILLIPS CARBON BLACK LTD.	11	61.1	6	60	10	62.5	6	54.5	3	42.9	36	58.1
119	PRAKASH INDUSTRIES LTD.	12	66.7	4	40	13	81.3	8	72.7	4	57.1	41	66.1
120	PROCTER NE & HEALTH CARE LTD.	14	77.8	4	40	11	68.8	7	63.6	3	42.9	39	62.9
121	PETRONET L N G LTD.	15	83.3	1	10	10	62.5	8	72.7	7	100	41	66.1
122	PIDILITE INDUSTRIES LTD.	10	55.6	5	50	7	43.8	6	54.5	2	28.6	30	48.4
123	PIRAMAL ENTERPRISES LTD.	14	77.8	4	40	15	93.8	9	81.8	5	71.4	47	75.8
1	2	3	4	5	6	7	8	9	10	11	12	13	14
S.N	Categories	I		II		III		IV		V		VI	TOTAL
124	POLYPLEX CORPORATION LTD.	11	61.1	3	30	10	62.5	8	72.7	3	42.9	35	56.5
125	POWER GRID CORPN. OF INDIA LTD.	16	88.9	6	60	12	75.0	10	90.9	5	71.4	49	79.0
126	PRISM JOHNSON LTD.	14	77.8	3	30	12	75.0	10	90.9	6	85.7	45	72.6
127	RAMCO CEMENTS LTD.	12	66.7	6	60	15	93.8	8	72.7	7	100	48	77.4
128	RASHTRIYA CHE FERTILIZERS LTD.	15	83.3	6	60	14	87.5	10	90.9	6	85.7	51	82.3
129	RALLIS INDIA LTD.	14	77.8	6	60	9	56.3	8	72.7	7	100	44	71.0
130	RELIANCE POWER LTD.	13	72.2	2	10	12	75.0	8	81.8	3	42.9	38	61.3

131	RAYMOND LTD.	9	50.0	6	60	11	68.8	7	63.6	7	100	40	64.5
132	RELIANCE INDUSTRIES LTD.	18	100.0	6	60	16	100.0	10	90.9	7	100	57	91.9
133	SIEMENS	14	77.8	5	50	14	87.5	8	72.7	6	85.7	47	75.8
134	S J V N LTD.	14	77.8	4	40	10	62.5	10	90.9	5	71.4	43	69.4
135	S K F INDIA LTD.	9	50.0	5	50	11	68.8	7	63.6	5	71.4	37	59.7
136	S R F LTD.	15	83.3	5	50	16	100.0	10	90.9	5	71.4	51	82.3
137	SHREE CEMENT LTD.	14	77.8	5	50	15	93.8	10	90.9	6	85.7	50	80.6
138	SINTEX INDUSTRIES LTD.	7	38.9	4	40	4	25.0	7	63.6	5	71.4	27	43.5
139	SOMANY CERAMICS LTD.	11	61.1	4	40	5	31.3	6	54.5	6	85.7	32	51.6
140	SUTLEJ TEXTILES & INDS. LTD.	12	66.7	6	60	14	87.5	9	81.8	4	57.1	45	72.6
141	SUPREME INDUSTRIES LTD.	14	77.8	3	30	6	37.5	7	63.6	6	85.7	36	58.1
142	SUPREME PETROCHEM LTD.	15	83.3	5	50	14	87.5	10	90.9	7	100	51	82.3
143	SUZLON ENERGY	13	72.2	5	50	13	81.3	9	81.8	6	85.7	46	74.2
1	2	3	4	5	6	7	8	9	10	11	12	13	14
S.N	Categories	I		II		III		IV		V		VI	TO T
144	T V S ELECTRONICS LTD.	10	55.6	5	50	7	43.8	8	72.7	3	42.9	33	53.2

145	T V S MOTOR CO. LTD.	8	44.4	6	60	11	68.8	6	54.5	6	85.7	37	59.7
146	T T K PRESTIGE LTD.	13	72.2	6	60	4	25.0	6	54.5	4	57.1	33	53.2
147	T V S SRICHAKRA LTD.	10	55.6	6	60	10	62.5	8	72.7	2	28.6	36	58.1
148	TAMIL NEWSPRINT & PAPERS LTD.	15	83.3	6	60	16	100. 0	10	90.9	7	100	54	87.1
149	TATA CHEMICALS LTD.	14	77.8	8	80	16	100. 0	9	81.8	6	85.7	53	85.5
150	TATA GLOBAL BEVERAGES LTD.	15	83.3	6	60	13	81.3	8	72.7	7	100	49	79.0
151	TATA POWER COMPANY	16	88.9	5	50	13	81.3	10	90.9	7	100	51	82.3
152	TATA STEEL LTD.	17	94.4	7	70	15	93.8	10	90.9	7	100	56	90.3
153	THERMAX LTD.	12	66.7	5	50	14	87.5	6	54.5	6	85.7	43	69.4
154	TIME TECHNOPLAST LTD.	13	72.2	3	30	9	56.3	8	72.7	4	57.1	37	59.7
155	TITAN COMPANY LTD.	15	83.3	6	60	13	81.3	6	54.5	6	85.7	46	74.2
156	TORRENT PHARMACEUTICALS LTD.	16	88.9	5	50	13	81.3	10	90.9	5	71.4	49	79.0
157	TORRENT POWER LTD.	15	83.3	4	40	16	100. 0	9	81.8	5	71.4	49	79.0
158	TRIDENT LTD.	13	72.2	6	60	13	81.3	9	81.8	5	71.4	46	74.2
159	TRIVENI ENGINEERING 7 INDU	9	50.0	4	40	12	75.0	5	45.5	2	28.6	32	51.6
160	UFLEX LTD.	13	72.2	6	60	13	81.3	9	81.8	5	71.4	46	74.2
161	ULTRATECH CEMENT LTD.	13	72.2	5	50	15	93.8	9	81.8	7	100	49	79.0
162	VARDHMAN TEXTILES	15	83.3	4	40	12	75.0	10	90.9	6	85.7	47	75.8

	LTD.												
163	VEDANTA LTD.	16	88.9	4	40	15	93.8	9	81.8	6	85.7	50	80.6
164	VOLTAS LTD.	12	66.7	5	50	11	68.8	9	81.8	6	85.7	43	69.4
165	WELSPUN CORPN LTD	12	66.7	3	30	9	56.3	7	63.6	5	71.4	36	58.1
166	WELSPUN INDIA LTD.	15	83.3	4	40	13	81.3	9	81.8	6	85.7	47	75.8
167	WHIRLPOOL OF INDIA LTD.	10	55.6	4	40	8	50.0	7	63.6	5	71.4	34	54.8
168	WOCKHARDT LTD.	11	61.1	3	30	9	56.3	7	63.6	6	85.7	36	58.1
169	WEST COAST PAPER MILLS LTD.	12	66.7	6	60	13	81.3	9	81.8	4	57.1	44	71.0
170	Zuari Agro Chemicals	11	61.1	4	40	11	68.8	6	54.5	5	71.4	37	59.7

SAMPLE COMPANIES - INDIA

1	A C C LTD.
2	AARTI INDUSTRIES LTD.
3	ADANI ENTERPRISES LTD.
4	ASAHI INDIA GLASS LTD.
5	A I A ENGINEERING LTD.
6	AKZO NOBEL INDIA LTD.
7	ALEMBIC PHARMACEUTICALS LTD.
8	AMARA RAJA BATTERIES LTD.
9	AMBUJA CEMENTS LTD.
10	APAR INDUSTRIES LTD.

11	APOLLO TYRES LTD.
12	ARVIND LTD.
13	ASHOK LEYLAND LTD.
14	ASIAN PAINTS LTD.
15	ATUL LTD.
16	AUROBINDO PHARMA LTD.
17	AVANTI FEEDS LTD.
18	BAJAJ AUTO LTD.
19	BATA INDIA LTD.
20	BAJAJ ELECTRICALS LTD.
21	BAJAJ HINDUSTHAN SUGAR LTD.
22	BALRAMPUR CHINI MILLS LTD.
23	BRITANNIA INDUSTRIES LTD.c
24	BAYER CROPSCIENCE LTD.
25	BERGER PAINTS INDIA LTD.
26	BHARAT ELECTRONICS LTD.
27	BHARAT FORGE LTD.
28	BHARAT PETROLEUM CORPN. LTD.
29	BIRLA CORPORATION LTD.
30	BLUE STAR LTD.
31	BOSCH LTD.
32	C E S C LTD.
33	CASTROL INDIA LTD.
34	CEAT LTD.
35	CENTURY PLYBOARDS (INDIA) LTD.
36	CENTURY TEXTILES & INDS. LTD.
37	CHAMBAL FERTILISERS & CHEMICALS LTD.

38	CHENNAI PETROLEUM CORPN. LTD.
39	CIPLA LTD.
40	COAL INDIA LTD.
41	COLGATE-PALMOLIVE (INDIA) LTD.
42	COROMANDEL INTERNATIONAL LTD.
43	CROMPTON GREAVES CONSUMER ELECTRICALS LTD.
44	CUMMINS INDIA LTD.
45	D C M SHRIRAM INDS. LTD.
46	DABUR INDIA LTD.
47	DALMIA BHARAT LTD.
48	DEEPAK FERTILISERS & PETROCHEMICALS CORPN. LTD.
49	DIV'S LABORATORIES LTD.
50	DR. REDDY'S LABORATORIES LTD.
51	EICHER MOTORS LTD.
52	E I D-PARRY (INDIA) LTD.
53	ELECTROSTEEL CASTINGS LTD.
54	ESSEL PROPACK LTD.
55	EMAMI LTD.
56	EXIDE INDUSTRIES LTD.
57	FINOLEX CABLES LTD.
58	FORCE MOTORS LTD.
59	G A I L (INDIA) LTD.
60	GLAXOSMITHKLINE PHARMACEUTICALS LTD.
61	GLENMARK PHARMACEUTICALS LTD.
62	G H C L LTD.
63	GAYATRI PROJECTS LTD.
64	GODREJ CONSUMER PRODUCTS LTD.

65	GRASIM INDUSTRIES LTD.
66	GUJARAT FLUOROCHEMICALS LTD.
67	GUJARAT NARMADA VALLEY FERTILIZERS & CHEMICALS LTD.
68	GUJARAT STATE FERTILIZERS & CHEMICALS LTD.
69	HATSUN AGRO PRODUCTS LTD.
70	HAVELLS INDIA LTD.
71	HERO MOTOCORP LTD.
72	HINDALCO INDUSTRIES LTD.
73	HINDUSTAN PETROLEUM CORPN. LTD.
74	HINDUSTAN UNILEVER LTD.
75	HINDUSTAN ZINC LTD.
76	INDIA CEMENTS LTD.
77	INDIAN OIL CORPN. LTD.
78	INDO COUNT INDS. LTD.
79	INOX WIND LTD.
80	IPCA LABORATORIES LTD.
81	J B F INDUSTRIES LTD.
82	J B M AUTO LTD.
83	JINDAL STAINLESS (HISAR) LTD.
84	J K CEMENT LTD.
85	J K LAKSHMI CEMENT LTD.
86	J K PAPER LTD.
87	J K TYRE & INDS. LTD.
88	J S W ENERGY LTD.
89	JAIN IRRIGATION SYSTEMS LTD.
90	JINDAL POLY FILMS LTD.
91	JINDAL SAW LTD.

92	KAJARIA CERAMICS LTD.
93	KALPATARU POWER TRANSMISSION LTD.
94	KANSAI NEROLAC PAINTS LTD.
95	KEI INDUSTRIES LTD.
96	KIRLOSKAR BROTHERS LTD.
97	KIRLOSKAR OIL ENGINES LTD.
98	KWALITY LTD.
99	LAKSHMI MACHINE WORKS LTD.
100	LARSEN & TOUBRO LTD.
101	LEEL ELECTRICALS LTD.
102	LUPIN LTD.
103	M R F LTD.
104	MAHINDRA & MAHINDRA LTD.
105	MARICO LTD.
106	MINDA INDUSTRIES LTD.
107	N M D C LTD.
108	NATIONAL ALUMINIUM CO. LTD.
109	NATIONAL FERTILIZERS LTD.
110	NATIONAL STEEL & AGRO INDS. LTD.
111	N T P C LTD.
112	O C L INDIA LTD.
113	OIL & NATURAL GAS CORPN. LTD.
114	OIL INDIA LTD.
115	ORIENT CEMENT LTD.
116	ORIENT PRESS LTD.
117	P I INDUSTRIES LTD.
118	PHILLIPS CARBON BLACK LTD.

119	PRAKASH INDUSTRIES LTD.
120	PROCTER & GAMBLE HYGIENE & HEALTH CARE LTD.
121	PETRONET L N G LTD.
122	PIDILITE INDUSTRIES LTD.
123	PIRAMAL ENTERPRISES LTD.
124	POLYPLEX CORPORATION LTD.
125	POWER GRID CORPN. OF INDIA LTD.
126	PRISM JOHNSON LTD.
127	RAMCO CEMENTS LTD.
128	RASHTRIYA CHEMICALS & FERTILIZERS LTD.
129	RALLIS INDIA LTD.
130	RELIANCE POWER LTD.
131	RAYMOND LTD.
132	RELIANCE INDUSTRIES LTD.
133	SIEMENS LTD.
134	S J V N LTD.
135	S K F INDIA LTD.
136	S R F LTD.
137	SHREE CEMENT LTD.
138	SINTEX INDUSTRIES LTD.
139	SOMANY CERAMICS LTD.
140	SUTLEJ TEXTILES & INDS. LTD.
141	SUPREME INDUSTRIES LTD.
142	SUPREME PETROCHEM LTD.
143	SUZLON ENERGY LTD.
144	T V S ELECTRONICS LTD.
145	T V S MOTOR CO. LTD.

146	T T K PRESTIGE LTD.
147	T V S SRICHAKRA LTD.
148	TAMIL NADU NEWSPRINT & PAPERS LTD.
149	TATA CHEMICALS LTD.
150	TATA GLOBAL BEVERAGES LTD.
151	TATA POWER CO. LTD.
152	TATA STEEL LTD.
153	THERMAX LTD.
154	TIME TECHNOPLAST LTD.
155	TITAN COMPANY LTD.
156	TORRENT PHARMACEUTICALS LTD.
157	TORRENT POWER LTD.
158	TRIDENT LTD.
159	TRIVENI ENGINEERING & INDS. LTD.
160	UFLEX LTD.
161	ULTRATECH CEMENT LTD.
162	VARDHMAN TEXTILES LTD.
163	VEDANTA LTD.
164	VOLTAS LTD.
165	WELSPUN CORP LTD.
166	WELSPUN INDIA LTD.
167	WHIRLPOOL OF INDIA LTD.
168	WOCKHARDT LTD.
169	WEST COAST PAPER MILLS LTD.
170	ZUARI AGRO CHEMICALS LTD.

SAMPLE COMPANIES : USA

S.NO	NAME
1	GENERAL MOTORSCOMPANY
2	FORD MOTOR COMPANY
3	THE BOEING COMPANY
4	LOCKHEED MARTIN CORPORATION
5	UNITED TECHNOLOGIES CORPN
6	EXXONMOBIL
7	CHEVRON
8	PHILLIPS66
9	VALERO ENERGY CORPORATION
10	MARATHON PETROLEUM CORPORN
11	CATERPILLAR
12	APPLE INC
13	MICROSOFT CORPORATION
14	INTEL CORPORATION
15	IBM
16	CISCO
17	HP INC
18	JOHNSON & JOHNSON

19	THE DOW CHEMICAL COMPANY
20	HONEYWELL
21	THE COCA COLA COMPANY
22	PFIZER.INC
23	PEPSICO
24	ARCHER DANIELS MIDLAND COMP
25	THE PROCTOR & GAMBLE COMPANY

S.NO	SAMPLE COMPANIES : UK
1	BP ENERGY
2	SSE PLC
3	GLAXCO SMITHKLINE GROUP OF CO
4	CENTRICA PLC
5	RIO TINTO
6	BAE SYSTEMS
7	ASTRAZENECA
8	NATIONAL GRID
9	UNILEVER
10	FIAT CHRYSLER AUTOMOBILES
11	LIBERTY GLOBAL PLC

12	AEON
13	AFC ENERGY
14	BCSA
15	NATIONAL GRID
16	ANGLO AMERICAN PLC
17	GLENCORE
18	MCLAREN AUTOMOTIVE
19	SSP ENERGY
20	ALLIANCE PHARMA PLC
21	AGGREKO
22	LINPAC PLASTICS LTD
23	BOWMER&KIRKLAND
24	SIR Robert ALPINE
25	BHP BILLITON LTD

Annexure III

Polluting Industries List

Pollution Control in Major Polluting Industries,

Programme and Developments

The situation had arisen which required immediate steps to be taken for industrial pollution control as the routine enforcement through penal provisions of the various legislations, which used to be a long drawn affair and the industries preferring to be drawn to courts rather than implementing pollution control systems, did not yield effective pollution control. Hence, the Central Pollution Control Board (CPCB) selected the following 18 categories of major polluting industries for priority action:

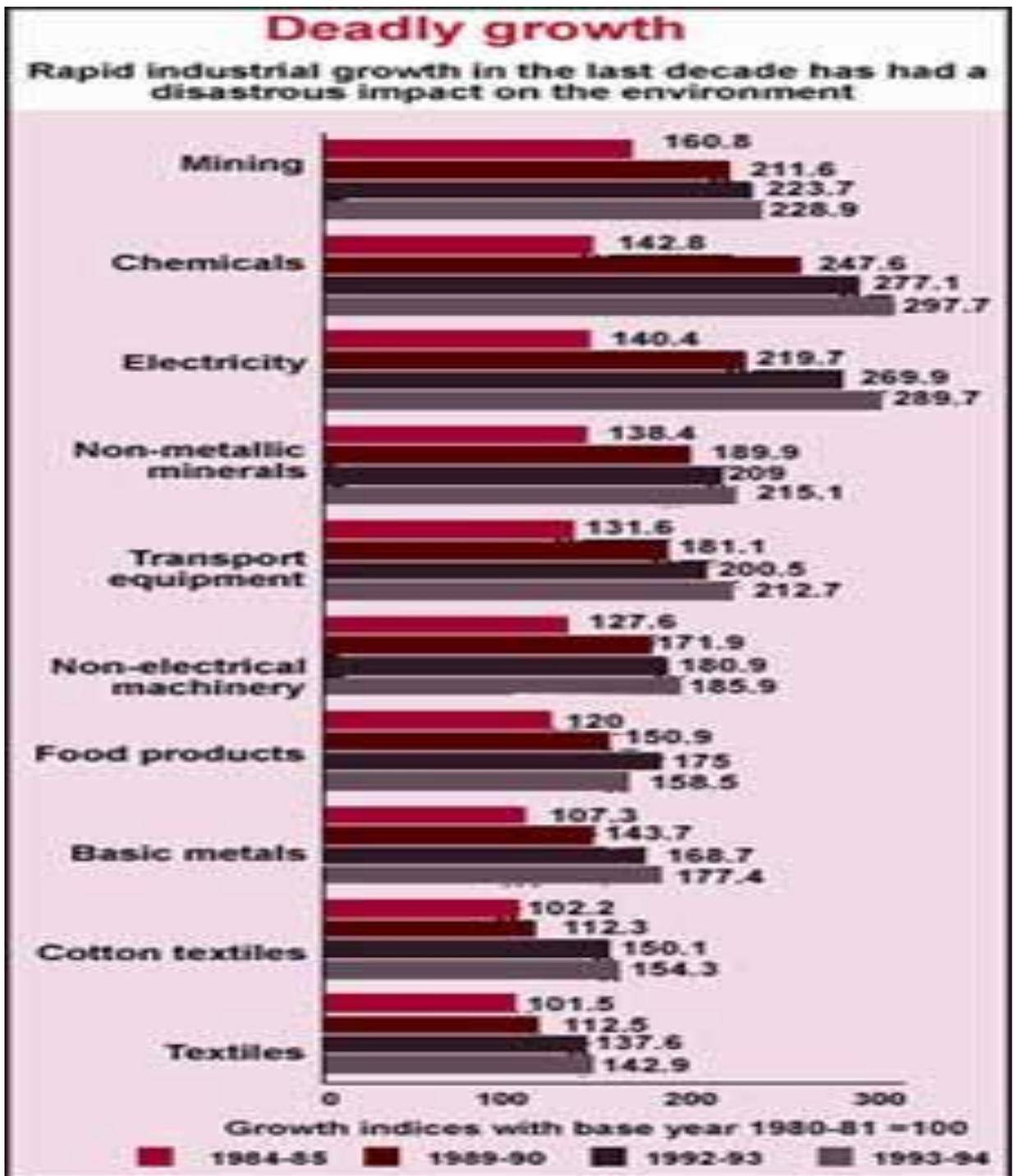
1. Aluminum smelting
2. Basic Drugs & Pharmaceuticals Manufacturing
3. Caustic Soda
4. Cement (200 TPD and above)
5. Copper Smelting
6. Dyes & Dye Intermediate
7. Fermentation (Distillery)
8. Fertiliser
9. Integrated Iron & Steel
10. Leather Processing including Tanneries
11. Oil Refinery
12. Pesticide Formulation & manufacturing
13. Pulp & Paper (30 TPD and above)
14. Petrochemical

15. Sugar

16. Sulphuric Acid

17. Thermal Power

18. Zinc Smelting



Environmental Reporting Practices: A study of select companies

Annexure IV

S.NO	Index of Environment Disclosure
I	Environmental Policy and Initiatives
1	Environmental policy including description of environmental objectives, Environmental issues of concern.
2	Establishment of environmental management systems, Environmental Department, Public Issue committee.
3	Energy efficiency policy
4	Green building policy
5	Waste reduction policy
6	Sustainable packaging policy
7	Carbon footprint policy
8	Bio diversity policy
9	Zero burning policy.
10	Policies on implementation of ISO 14001, ISO 8000 etc., at the plant and firm level.
11	Existence of Response Plans in case of accidents.
12	Existence of terms and conditions applicable to suppliers and/or customers regarding environmental practices.
13	A statement on periodic reviews and evaluations of its environmental performance
14	Initiatives to mitigate environmental impacts of products & services.
15	Web conferencing and meeting
16	Planting Trees

17	Social and forestation programmes
18	Participation in voluntary initiatives.
II	Environmental Expenditure
19	Description of expenditures for pollution control equipment and facilities, Environmental friendly machines.
20	Future estimates of expenditures for pollution control and facilities.
21	Environmental Grants.
22	Environmental Loans.
23	Adoption of new pollution control technologies.
24	Research and Development.
25	Innovations to enhance the environmental performance and efficiency.
26.	Amount of provisions and reserves.
27.	Nature and amount of environmental fines.
28.	Allocation of budgetary funds to environmental projects or initiatives.
III	Environmental Pollution
29.	Air Pollution: Type and Weight.
30.	Ozone depleting substance.
31.	Reduction in greenhouse gas emissions.
32.	Air contaminants and measures taken for this reduction.
33.	Using vehicles that features clean air technology and travel emissions.
34.	Establishing wind mills.

35.	Total water withdrawal by source.
36.	Water use minimization efforts.
37.	Ground water protection.
38.	Treatment of generated waste.
39.	Total weight of waste by type and disposal method.
40.	Total volume and number of toxic chemical release/spills and gas flaring.
41.	Recycling and integrated utilization of waste products for energy conservation.
42.	Percentage of materials that is recycled and reused.
43.	Total volume of water that is recycled and reused.
44.	Green technology, reducing paper consumption and bio fuel used.
IV.	Environmental Accounting and Disclosure.
45.	Description of environmental indicators and its disclosures.
46.	Disclosure in Annual report/ Business Responsibility Report (BRR).
47.	Disclosure in website /Sustainability report.
48.	Environmental information to be disclosed through the media, brochures, internet etc.,
49.	Description of impact on Bio diversity in Protected Areas.
50.	Description of impact on Bio diversity Outside protected area.
51.	Statement which indicate that the company's operations do not cause pollution.
52.	Loss disclosure with respect to particular environmental sites and activities.
53.	Legal proceedings for violating environmental laws.

54.	Information on use/development/exploration of new resources, insulation etc.,
55.	Energy minimization efforts/energy saved.
V	Environmental Compliance
56.	Compliance with government regulation, standards including benchmarks.
57.	Compliance record of air, water and waste permits.
58.	Environmental Impact Assessment (EIA).
59.	Product life cycle analysis, product certification and eco labelling.
60.	Obtaining certification for environmental management systems/ISO14001.
61.	Type of Audit Internal/external audit/Periodic verification
62.	Environmental Awards and Certificates Received.