<h1>CHAPTER–III</h1>
<h1>RESEARCH METHODOLOGY</h1>

Research refers to quest for knowledge, organized in a structured, scientific and systematic manner to reveal new facts or suggest evidence in favour of or against an existing theory, conducted on a specific topic of interest. The Merriam-Webster online dictionary suggests the meaning of research as "a careful search", "studious inquiry or examination'. The meaning of 'methodology' is the methods or tools used for investigation by the researcher. A research methodology, thus, describes the systematic procedure adopted in the collection and analysis of data.

This chapter interlinks the background described in the earlier chapter and the results presented in the subsequent chapters. The aim of this chapter is to provide a description of the research design and methods used for achieving the set objectives of the research. The chapter begins with a brief introduction, followed by the methodology in terms of research tools chosen for the study. The chapter ends with a brief summary.

3.1 Introduction

The overarching aim of the thesis was to study Environmental Accountability through the lens of Indian corporate and environmental non-government organisations. The study assumed corporate managers as principal actors and identified them as 'preparers' of environmental reports; the members of ENGOs (Environmental Non-Governmental Organizations) were identified as 'users' of environmental reports. The study began with the premise that opinions of outsiders would be less biased towards the subject matter of the study and is necessary to counter validate various variables of study such as response time of queries upon which response of both the 'preparers' and 'users' groups were solicited. Questionnaire method was selected to collect data from both the parties. The study was conducted in India and exclusively corporate sector fell in red and orange category as described by Ministry of Environment and Forests, India; and Non-Governmental Organization members dealt with environmental issues. The red category denotes most polluting companies, followed by orange category which also refers to polluting industries but little less than red category. Nevertheless, a green category is also

present and it denotes the companies which are non polluting. Since, the objective was to study environmental variables it was considered appropriate to select companies from red and orange category as environmental pollution would be conspicuous in these companies and respondents from these companies would be more conscious of environmental pollution and rich data could be gathered from them. Similarly, NGOs were selected dealing with environmental concerns as one of their primary motive or coexisting with other motives but equally important.

The study was conducted in India. Therefore it can be called as the study of corporate in India.

Owing to the reason that the study focuses on understanding the transition of corporate primary as well as secondary data sources were tapped as well as qualitative and quantitative methods were employed to analyse the collected data.

3.2   Three approaches to research

A quantitative research method is one in which the investigator conducts experiments and surveys. The data is majorly numerical and collected through methods such as polls, questionnaires and surveys. The data collected can be statistically examined to test hypothesis and determine causality, measure the extent of problem under study. The data collection is more or less objective and the main aim to arrive at a generalization of results across population. *A qualitative approach,* on the other hand, is the one in which the researcher gathers data about an emerging problem with the primary aim to develop themes from the data. The data is usually collected in the form of case studies, narratives, study of phenomenon, observation of happenings etc (Creswell, 2013).

In *qualitative inquiry* the emphasis is on qualities of entities and processes under observation and to derive meanings that cannot be measured in terms of quantity, amount, intensity, or frequency. In contrast, quantitative studies analyses and measures the existence of casual relationship between variables under study and not about processes. The overarching aim of a quantitative research study is to classify features, count them, and construct statistical models in an attempt to explain what is observed (Greener, 2008). *Mixed research* is the research that involves the mixing of quantitative and qualitative methods or paradigm characteristics.

According to Denzin & Lincoln, 2009, qualitative methods are very significant for the study. In the words of Greener (2008) qualitative methods are different from quantitative study as they explore issues which cannot be expressed by number for instance, the degree of satisfaction as measured by likert scale.

The researchers used both the methods (mixed approach) for the study as one method simply cannot be used in its entirety in practical sense.

3.3 Data collection methods

The term methods refer to the tools used for the study whereas methodology encompasses the procedures adopted for collecting and analysing data. Data may be collected from primary or secondary sources. Primary sources involve original materials on which a research is based. They are the first publication of any investigation and present information in its original form. Additionally, they are neither interpreted by other writers. Primary sources are original experimental research, reports, interviews, letters etc.

A secondary source modifies the primary information for a specific purpose of the study and presents a summarized or reorganized version of the original information.

However, the same source can be primary, secondary or tertiary as well depending upon the content. For instance, a newspaper article is a primary source when it reports a news event, a secondary source when it analyses or comments on those events. For example, dictionaries, handbooks, dissertations, history etc are a few examples of secondary sources.

Tertiary sources consist of information which a mixture of both primary and secondary sources. For example, textbooks can be considered as tertiary source as they present data relating to both primary and secondary sources. Other examples include encyclopedias, almanacs, guides and handbooks. (Source: http://libguides.jcu.edu.au/primary)

The primary source was mainly used in the present study by the researcher to collect data. However, a part of objectives demanded use of secondary sources such as annual reports, stand alone reports. Other sources such as Prowess database, Internet were also employed for the purpose of the study.

3.4 Objectives of the study

The objectives are crucial part of the study as they enable the researcher to move forward in a directed manner. They present the classification of overall goal into minor goals that enable the achievement of purpose of study. The overall focus of the present study was to examine the environment accountability of Indian firms. The various objectives that were framed are as under:-

1. To study the transition of Indian Corporate towards environmental accountability
2. To understand the state-of-the-art of the adoption of voluntary standards relating to environment information disclosure in Indian corporate sector
3. To measure and compare the expectations of the preparers (companies) and the users of environmental reports (Environmental NGOs)
4. To examine the status of environment audit practices in India
5. To establish an environment disclosure index to assess accountability in Indian context

3.5 Research schema

The schema of analysis is presented in Figure 5 which provides a birds' eye view of various objectives which formed the key aims of the study. It also becomes easier for the researcher to understand the course of activities undertaken.

A look at the schema suggests that the overall topic was 'Environmental Accountability'. It was studied from two angles namely, historical study in brief as catering to the first objective and empirical study. The first objective demanded to study the change in corporate attitude towards environmental accountability. This change in attitude is termed as 'Transition' for the purpose of the study. The term transition indicates the presence of positive approach (non-negative) towards various issues discussed. The study also demanded incorporation of external views of ENGOs for the purpose of validating and comparing the results. Hence, the empirical landscape shows that it is applied on internal participants ie corporate managers and external to organisation participants i.e., environmental non-governmental organisations (ENGOs).

The entire research covering the five objectives cruised through the following path and accordingly the questionnaire was shaped:
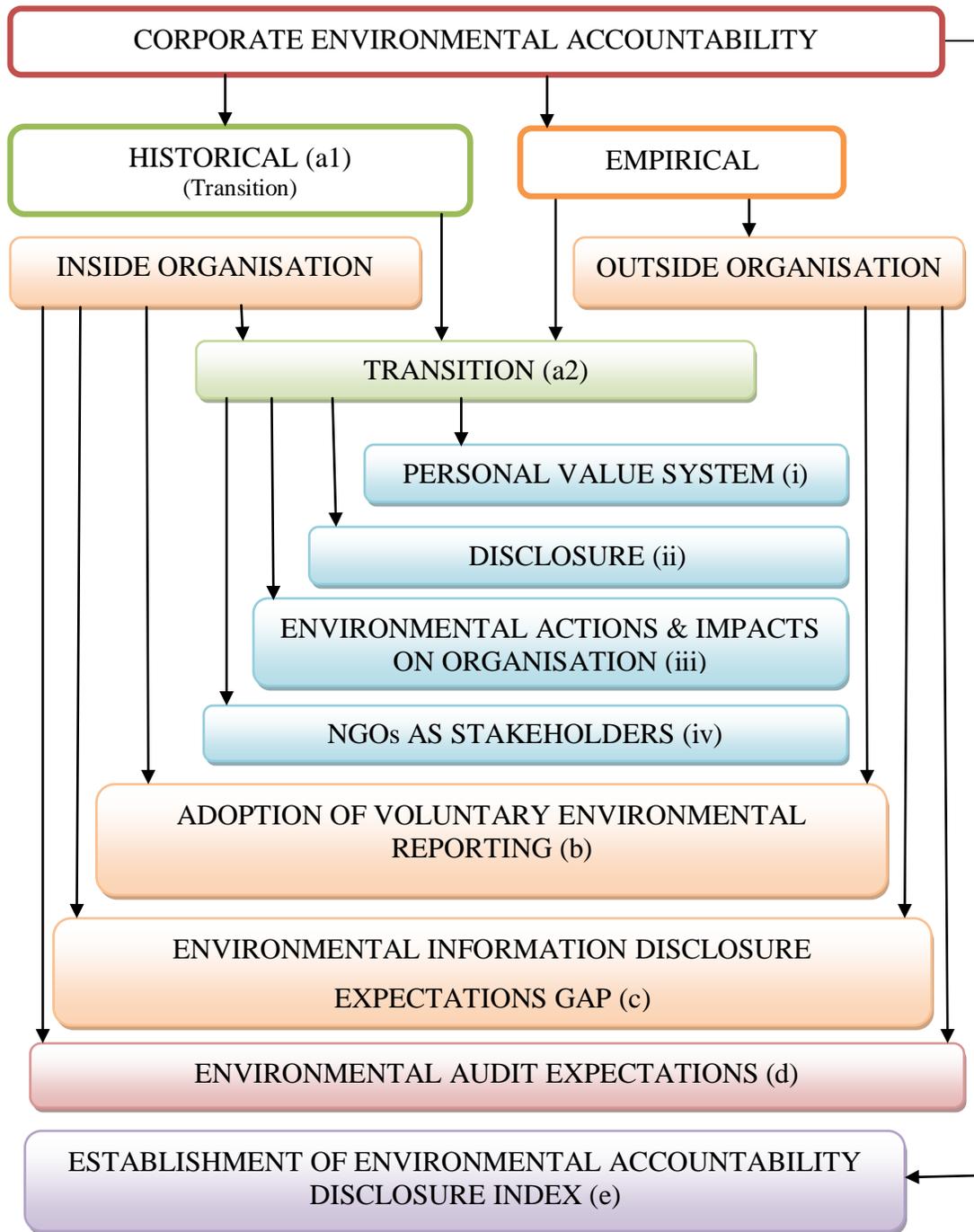
Figure 5: Schema of Proposed Five Objectives of Present Study

Where, in the above figure;

'a(1)' represents historical study as part of first objective;

'a(2)' represents empirical study as part of first objective; under this head;

      (i)   Represents first dimension studied under first objective

(ii)   Represents second dimension studied under first objective

(iii)   Represents third dimension studied under first objective

(iv)   Represents fourth dimension studied under first objective

'b' represents second objective

'c' represents third objective

'd' represents fourth objective

'e' represents fifth objective

Empirical study

a(ii) *Empiricals study* of present behaviour of corporate towards environmental concerns nicknamed as 'Transition'. It was subdivided under four heads, namely;

(i) Personal Value System – measuring the presence of environmental concerns in beliefs as virtue of corporate managers

(ii) Disclosure – measuring the general positive attitude of managers towards environmental disclosures

(iii)Impacts of voluntary adoption and disclosures – meant to measure the attitude of corporate managers towards assessing the benefits of risks of environmental activities

(iv)NGOs as environmental stakeholders – measuring the attitude of managers towards external stakeholders

(b) *Empirical study* measuring the perception of managers towards current status of voluntary adoption and environmental information reporting

(c) Empirical study measuring the difference in opinions of two sampled groups, namely; Corporate Managers and members of ENGOs over the relevancy and sufficiency of environmental information provided.

(d) Empirical study to examine the views of corporate managers regarding the conduct of environmental audit and the views of members of ENGOs regarding the prospective role of environmental audit

(e) The last objective pertains to establishment of environmental accountability disclosure index. Since, the fulfilment of objective requires laying out the crucial factors to determine disclosure index hence, it does not require empirical analysis.

3.6 Research questions

Research questions are very important to pinpoint the direction of effort. It guides the researcher in conducting the research as well as in reporting of analysis.

The overall research questions were derived from the objectives. They are as follows:

1. Is there significant positive transition of corporate towards environmental issues

2. Is there a significant positive adoption of voluntary standards of environmental information disclosure; and perception of contribution of voluntary efforts

3. Is there a significant difference in the expectations of companies as preparers and environmental NGOs as users towards environmental information disclosure

4. What is the status of environmental audit and the opinion of preparers and users regarding its role towards environmental accountability?

5. What disclosure index variables can assess accountability in real sense?

3.6.1 Alternate hypothesis formulated and analysed

To understand the perception towards environmental accountability, following hypothesis were formulated:

H_{11} There is significant transition in corporate perception towards environment in personal value system

H_{12} There is significant transition in corporate perception towards disclosure of environmental information

H_{13} There is significant transition in corporate perception towards interrelationships/impacts of adoption of environmental accountability on corporate image, share prices etc.

H_{14} There is significant transition in corporate perception towards role of Environmental NGOs

H_{15} There is significant relationship between corporate Personal Value system and knowledge of the concept

H_{16} There is significant difference in corporate managers and members of ENGOs perception about relevancy of environmental disclosure variables

H$_{17}$ There is significant difference in corporate managers and members of ENGOs perception about sufficiency of environmental disclosure variables

3.7 Universe of the study

Given the fact that scant research is available on the selected topic exploring the qualitative aspects of the environmental accountability and disclosure phenomena of corporate, selection of a suitable sampling plan was necessary that would enable the collection of data to fulfill our desired objectives. It dovetailed the selection of those companies that have:

- Adequate market presence for assuming voluntary activities (for this context the basis of market capitalization was considered appropriate),

- Conform to mandatory environmental regulations (for this purpose, environmentally sensitive industries could be targeted)

PROWESS database was considered reliable and authentic database for selection of companies on the basis of market capitalization. The database is maintained by CMIE – Centre for Monitoring Indian Economy Pvt. Ltd., and maintains the data relating to listed and unlisted companies from 1989-90. Hence, the PROWESS database generated a frame of top 500 companies based on market capitalization.

These top 500 companies selected on the basis of market capitalization as on 31st March, 2009 comprised the universe of the study.

The population of the study comprised all the companies falling under environment sensitive industry groups (Red and Orange Categories as identified by Ministry of Environment and Forests, India) in the top 500 companies selected on the basis of market capitalization.

3.8 Sampling method selection and respondents

The next step was drafting of sampling method. Sampling is that part of research process in which selection is made of 'number of persons or respondents' that are representative of the population. As indicated in the introduction that two groups were identified, namely, 'preparers' and 'users' of environmental information. The following sections will further elaborate the sampling method adopted for the two groups.

3.8.1 Preparers

The sampling process began with preparation of list of companies falling in the six environmentally sensitive industries-fertilizers, drugs and pharmaceuticals, paper, chemicals, refinery, and cement from the universe of top 500 companies based on market capitalization. This constituted the 'preparers' section of the study. We found 72 companies falling in the selected sectors as shown in Table 1 below:

Table 1: Sector wise Distribution of Companies

SN	Sector	Percentage	SN	Sector	Percentage
a.	Cement	22	d.	Paper	3
b.	Drugs and Pharmaceutical	42	e.	Chemicals	12
c.	Refinery	10	f.	Fertilizers	11

(Total 72)
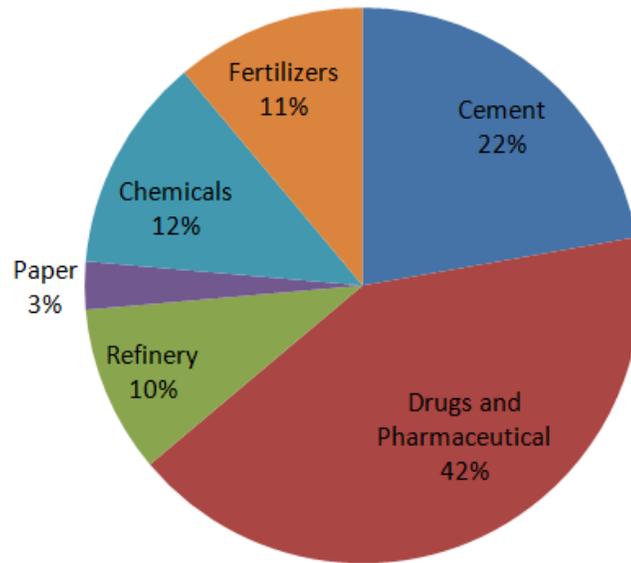
Figure 6: Sectorwise Distribution of Total Companies

A view of the distribution of various companies across identified sectors (Figure 6) revealed that it was non uniform. Some sectors like Drugs and Pharmaceuticals showed high presence of companies (42%) against sectors like Paper which had just 3% companies falling in the top 500 list. So, it was considered not possible to select companies in equal proportions from all the sectors.

It was followed by the process of selection of companies on *judgemental* basis. So sectors having companies fewer than 10, the proportion of companies included in the sample was taken as 100%. For sectors having more companies than 10, a minimum of 40% companies were taken. The proportions in which companies were selected is

presented in Table 2 below. Therefore, the Sampling plan was *judgemental-non-random* sampling instead of a fully convenient sampling. The following (Table 2 and Figure 7) presents the break-up of companies across six identified sectors.

Table 2: Sector wise Distribution of Revised Sample

SN	Sector	Percentage	SN	Sector	Percentage
a.	Cement	75(n=12)	d.	Paper	100(n=2)
b.	Drugs and Pharmaceutical	40(n=12)	e.	Chemicals	100(n=9)
c.	Refinery	100(n=7)	f.	Fertilizers	100(n=8)

(Total 50 companies)
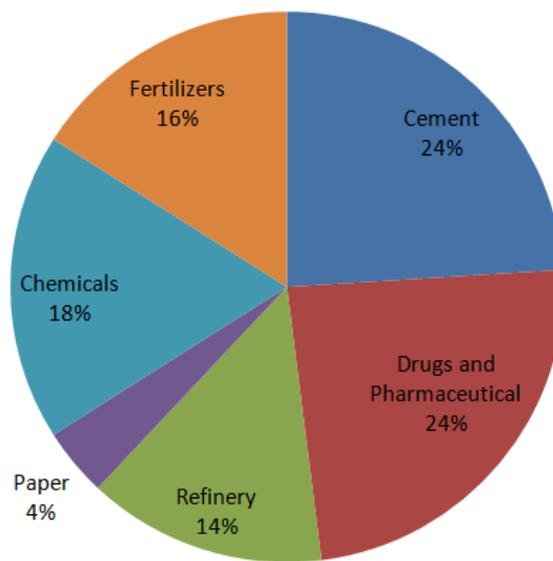
Figure 7: Sector wise Distribution of Revised Sample

After finalizing the number of companies, the next step involved selection of target respondents from whom data will be collected. For this purpose, discussion with corporate managers belonging to strategic level and operational level were conducted on a small scale. The questionnaire was also discussed with the managers so that they can assess the type of information to be gathered and help us to identify the right designation to contact as respondent. This exercise resulted in finalizing the respondents into following five categories who could be contacted, namely:

Strategic level respondents:

1. Managing Directors;
2. General Managers/CSR executives; and

Operational Level respondents:

3. CFOs/financial directors;

4. Chartered Accountants/Auditors; and

5. Quality Control Managers or any other designation dealing with environmental affairs

It was decided that managers belonging to above categories would be contacted over telephone or email to get their consent for participation. The next step then involved sending the questionnaire to the consenting respondents. It was kept in mind that only one valid questionnaire response per company (i.e., 50 in total) would be retained for final analysis. The above discussed methodology was duly followed at the data collection and analysis stage.

3.8.2 Users

The users could represent entire Indian population. Users of Environment Information include NGOs, environment activists, amongst others like investors, financial intermediaries which constitute the diverse stakeholder groups. The present study focuses specifically on the user groups actively involved in environment protection (Environmental NGOs). Fifty Indian NGOs members in the field of environment conservation and ecology is selected on *Judgemental basis* from the list prepared from various sources such as certified environmental NGOs given by Ministry of Environment and Forests and internet as search engine. The judgement was based on the rationale that since locations of corporate demonstrated cross country visibility, the NGOs should also belong to different areas of the country.

In the case of users also, the respondents were finalized to fall in two categories from each non-governmental organization. The two categories of respondents were namely; (a) President/Vice President, (b) Person representing environmental cause, for example, Environmental reporter associated with NGOs etc. It was decided that members of NGOs belonging to above categories would be contacted over telephone or email to get their consent for participation. The next step then involved sending the questionnaire to the consenting respondents. However, in the case of NGOs, responses of both the respondents were retained in majority of NGOs, because of the nature of NGOs. The

nature of NGOs revealed that some organizations were only supporting environment cause whereas majority of NGOs included environment as one among the various supported causes. Hence, in those organizations both the respondents offered significant contributions as the response of president was general purpose response and response of environmental reporter for instance, was a specific response. The above discussed methodology was duly followed at the data collection and analysis stage.

3.9 Rationale behind the selection of respondents

The population frame for the survey involved selecting corporate respondents having knowledge of environmental activities of the organisation. Within companies, specific criteria were considered as *a priori* for the selection of the respondents. The respondents were chosen on the knowledge that they are closely involved with environmental practices, or are responsible for accounting and auditing aspects, have a vital perception of broader environmental accountability and its impact on them as well as the society. This enabled them to respond as per the requirements of the chosen topic and eliminate chances of reliability bias.

As already stated, fifty survey responses were planned to be obtained from two stakeholder groups each namely, corporate managers and ENGOs. Selection of these groups of stakeholders was made on the basis that the former is the primary stakeholders playing a key role in the formulation or implementation of environmental strategies of information production and disclosures and the latter group represents a third force unaffected by returns bias on investment and hence can directly influence the environmental accountability and disclosure behaviour of corporate.

Again, the rationale behind inclusion of organisation included in Red and Orange category was that these companies were subject to mandatory environmental reporting regulations. The OECD Rapid Assessment report on Asian environmental compliance (2006) also documents that the type or category of industry affects its consent validity period, inspection requirements and guidelines with respect to self reporting and monitoring.   According to the report, the frequency of onsite visits to verify the compliance depends upon pollution potential (red/orange/green) and size (based on the value of capital investment) of the industry as shown in the table 3.

Table 3: Minimum Frequency of Inspections based on Industry Category and Size

Size of Industry	Category of Pollution Potential	Inspection Frequency
Large and medium-sized	Red	Once every 3 months
	Orange	Once a year
	Green	Once in two years
Small scale (*capital investment below 10,000 rupees*)	Red	Once a year
	Orange	Once in 3 years
	Green	Once in five years

Source: Environmental Compliance and Enforcement in India: Rapid Assessment report by OECD (2006)

Further, as per the requirements of National Environmental Protection Rules, 1986, each polluting facility must submit an Environmental Statement at the end of each financial year i.e., from April through March.

The survey of Environment NGOs is undertaken with the objective of highlighting the problems of insufficient environmental data, difference between the levels of disclosure 'expected' by the users and the actual level of details provided by the preparers of reports. It is based upon the fact that Corporate entities now-a-days disclose a wide variety of information related to the environmental performances and influences of their operations in their annual reports or standalone reports or on the web. But studies report glaring differences between the quantity and quality of information provided.

3.10 Measurement instruments and development of questionnaire

According to Bui (2013) the choice of measurement instrument is suggested by the research design and the research questions. For qualitative studies though multiple measurement instruments are plausible for collection of data. For instance, observation, interviews, focus group, questionnaire method etc. The questionnaire method is largely used for evaluating the perception of managers in corporate setting. (for instance, see Bebbington et al.,1994; Tilt, 1994; Deegan & Gordon, 1996; Jaggi & Zhao, 1996; Deegan & Rankin, 1997; Deegan & Rankin, 1999; De Villiers, 1999; Wilmshurst & Frost, 2000; Milne & Patten, 2002; Solomon & Lewis, 2002; Al-Khater & Naser, 2003; De Villiers, 2003; Cormier et al., 2004; Mitchell & Quinn, 2005; Norberg et al., 2007; Elsayed & Hoque, 2010; Bhattacharyya, 2011).

In the present study also the questionnaire instrument is used by the researcher to cover the empirical part of the study.

3.10.1 Instrument development and measurement techniques

As stated earlier, questionnaire instrument was used in collection of data. A questionnaire is vital part of research which enables a researcher in collection of desired data from the respondents. Without the collection of data it is unlikely that the researcher can conduct the analysis. Therefore, the questionnaire was drafted with great care so that the host of questions included in the questionnaire is just sufficient to extract maximum possible information so that no important questions are left out. Besides, for wording of the questions it was kept in mind that they should not be confusing and too lengthy as short questions retain the interest of the respondents. The language of the survey questionnaire was English. Respondents were provided with background information about the importance of the questionnaire, the relevancy of various individual questions and any queries were answered either directly or via email.

Mostly, variables were measured against a Likert scale into five categories which are as follows:

- To measure positive response (transition) related to
  a) Personal values held by corporate managers,
  b) Attitude towards disclosure,
  c) Attitude towards impacts of environmental activities on corporate,
  d) Attitude towards stakeholders,
  e) Conceptual clarity,
  f) Remedies for enhancement of voluntary adoption of environmental standards and disclosure:

Scale	Score	Statistical Technique used
SA=Strongly Agree	*5*	Descriptive – percentage, mean, Standard Deviation
PA=Probably Agree	*4*	
N=Neutral	*3*	Graphs – horizontal bar chart
PD= Probably Disagree	*2*	Inferential – t-test (one sample) against hypothesized mean of 2.8
SD=Strongly Disagree	*1*	

- To measure the perception of corporate managers regarding the type of information readers are interested in, the scale and the statistical tests used are:

Scale	Score	Statistical Technique used
To a Large Extent	5	Descriptive – percentage, mean, Standard Deviation
To Some Extent	4	Inferential – t-test (one sample) against hypothesized mean of 2.8
Somewhat	3	
To a Lesser Extent	2	
No	1	

- To measure frequency of environmental audit, the scale and the tests used are:

Categories	Score	Statistical Technique used
More than Once a year	3	Descriptive – Percentage, Mean, Standard Deviation
Annually	2	Graphs – bar chart
Sometimes	1	

- To measure conduct of environmental audit, the scale and the tests used are:

Categories	Score	Statistical Technique used
Both Internal and External Person	3	Descriptive – Percentage, Mean, Standard Deviation
Only External Person	2	
Only Internal Person	1	Graphs – Bar char

- To measure the responses to the role of audit in environmental disclosure, the scale and the tests used are:

Categories	Score	Statistical Technique used
Yes	3	Descriptive – Percentage, Mean, Standard Deviation
Sometimes	2	
No	1	Graphs – Bar chart

To compare the responses of two sampled groups namely: Corporate Managers, members of ENGOs, the following scale description is provided:

- To measure motives of voluntary adoption of environmental standards and disclosure, the scale and the tests used are:

Scale	Score	Statistical Technique used
Definitely Near Motive	5	Descriptive – percentage, mean, Standard Deviation
Probably Near Motive	4	

Intermediate	*3*	Graphs – Radar Chart
Probably Distant Motive	*2*	Inferential – t-test (one sample) against hypothesized mean of 2.8
Definitely Distant Motive	*1*	

- To measure difficulties faced in voluntary adoption of environmental standards and disclosure, the scale and the tests used are:

Scale	*Score*	*Statistical Technique used*
DY=*Definitely Yes*	*5*	Descriptive –percentage, mean, Standard Deviation
PY=*Probably Yes*	*4*	Graphs – Radar Chart
N=*Neutral*	*3*	Inferential – t-test (one-sample) against hypothesized mean of 2.8
PN= *Probably No*	*2*	
DN=*Definitely No*	*1*	

- To measure difference in opinions of corporate managers and members of ENGOs regarding relevancy of environmental disclosure variables, the scale and the tests used are:

Scale	*Score*	*Statistical Technique used*
HR=*Highly Relevant*	*5*	Descriptive – percentage, mean, Standard Deviation
PR=*Probably Relevant*	*4*	Inferential – t-test (independent sample for comparison of responses of both the selected groups on various variables of environmental disclosures)
N=*Neutral*	*3*	
PIR= *Probably Irrelevant*	*2*	
HIR=*Highly Irrelevant*	*1*	

- To measure difference in opinions of corporate managers and members of ENGOs regarding sufficiency of environmental disclosure variables, the scale and the tests used are:

Scale	*Score*	*Statistical Technique used*
HS=*Highly Sufficient*	*5*	Descriptive –percentage, mean, Standard Deviation
PS=*Probably Sufficient*	*4*	
N=*Neutral*	*3*	Inferential – t-test (independent sample for comparison of responses of both the selected groups on various variables of environmental disclosures)
PIS= *Probably Insufficient*	*2*	
HIS=*Highly Insufficient*	*1*	

- To measure the frequency of request for environmental information from corporate, the scale and the tests used are:

Categories	Score	Statistical Technique used
Frequently	*3*	Descriptive – Percentage, Mean, Standard Deviation
Occasionally	*2*	
Never	*1*	

- To measure the rapidity of receipt of response to request for environmental information from corporate, the scale and the tests used are:

Categories	Score	Statistical Technique used
On the same day	*5*	Descriptive – Percentage, Mean, Standard Deviation
Within a few days	*4*	
Within a month	*3*	
After some time	*2*	
Never	*1*	

- To measure support given by ENGOs to corporate and involvement of ENGOs in corporate decision making, the scale and tests used are:

Categories	Score	Statistical Technique used
Yes	*1*	Descriptive -mean, Standard Deviation
No	*0*	

Scales used for Environmental NGOs questionnaire development

- To measure the reasons for lack of disclosure, the scale used was rank scale and the statistics used was percentage to find overall rank from 1-6, one being the prime reason and 6 being the least probable reason.

- To measure expectancy of ENGOs from environmental audit of corporate disclosure report, the scale and tests used are:

Scale	Score	Statistical Technique used
SA=*Strongly Agree*	*5*	Descriptive –Percentage, Mean, Standard Deviation
PA=*Probably Agree*	*4*	
N=*Neutral,*	*3*	Inferential – t-test (one sample) against hypothesized mean of 2.8
PD= *Probably Disagree*	*2*	
SD=*Strongly Disagree*	*1*	

For the ease of obtaining an idea of strength of opinion wherever possible; for instance, describing the positive transition in corporate perception towards environmental issues the data collected, the data was reclassified into three categories ie., agree (completely agree + probably agree), neutral and disagree (completely disagree + probably disagree). Difference in agree and disagree was computed to know the net difference. It reflected the true strength of opinion.

3.10.2 Statistical tools used in the study

Data analysis is that phase of research in which data is coded, tabulated, categorized, evaluated and examined to draw meaningful conclusions. It is pertinent to mention here that though our data collected is primarily on a likert scale. It belongs to qualitative group of study with ordinal variables yet various researchers have shown that the t-test inferential technique yields equally valid results as other non parametric tests. Non parametric test are those which do not assume normal distribution of data. For the purpose of study, the data collected was checked in SPSS and the distribution was found to be normal distribution.

Descriptive statistics

It describes the techniques used by the researcher in organizing, tabulating and summarizing the data. It presents the results in a simple manner which is easy to understand and meaningful for the reader of report.

Measures of central tendency

It is a key measure of central tendency which gives the average score or mean of the data under study. It can be applied over both qualitative as well as quantitative data to draw meaningful conclusions. It is very important because when analyzing data, it is easier to draw conclusions and by looking at one value instead of many values. It is the arithmetic average of data values which is calculated by the sum of scores divided by number of scores.

Measures of variability

Though knowing about mean of values is important, yet it does not shed any light on the spread of the distribution. In other words, how close or far were all the scores from the mean. A close cluster towards the mean would indicate how similar were the performance of different respondents. However, a scattered data far away from the mean shows how dissimilar different scores were. Hence, measure of variability is used in the present study through the technique of standard deviation. It indicates how much scores are close or apart from the mean of the data distribution so that the results of mean does not mislead.

Inferential statistics

Inferential statistics refer to techniques used to draw inferences from a representative sample to give an idea of the population. Under the inferential statistics, one of the most common measure is to determine if the observed mean differences between groups or events represent a real difference or due to chance. It is known as 'test of significance'. One of the common measure applicable to both qualitative and quantitative data without any violation of data considerations is t-test which is described as follows under two heads:

One sample t-test used in the study

This test is used to when there is only one sample and the researcher wants to determine whether the sample comes from a population with a hypothesized mean (2.8 in the present study on a likert scale ranging from 1 to5). In other words, whether the observed mean of the sampled data is truly different from hypothesized mean or it is due to chance.

Independent sample t-test used in the study

This t-test procedure is used to determine if the mean scores between groups (Corporate and ENGOs in the present study) is true indicator of real difference or due to chance.

Paired samples t test

This t-test procedure is used to determine if the mean scores between related scores is a real difference or due to chance.

Chi square test

A Chi-square test, also known as χ^2 test, is used to determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more data categories. In other words, it helps in ascertaining whether the difference between the expected and observed frequencies is a real difference or due to chance i.e., sample variation.

Binomial distribution model test

The binomial distribution model is used in situations in which the outcome is dichotomous for example, tossing of a coin where outcome can be either head or tail. One of the outcome would be called as 'success' and the other would be called as 'failure'. In the present study, binomial distribution test is applied where the responses were dichotomous i.e., either 'yes' or 'no'. The binomial distribution model computes the probability of observing a specified number of "yes" against expected distribution (which in the present study was taken as 0.50 i.e., 50%). It helps in ascertaining whether the difference between observed number of successes against expected number of successes is due to real difference or due to chance. This test is specifically useful as it is more exact test than the chi-square which is only an approximation.

3.11 Data collection

As previously stated, the research instrument involved collection of data through questionnaire method to measure the expectations regarding the significance, format and contents of environment reporting. The steps undertaken for the purpose of data collection are enumerated as follows:

The steps of data collection

1. Drafting two sets of questionnaire
   a. For the environmental NGOs (ENGOs)
   b. For the corporate sector
2. Pilot testing the questionnaires
   a. From academicians
   b. From active members of ENGOs

c. From managing directors/managers dealing with environmental issues of companies

3. Drafting final questionnaire based on the pilot study

4. Filling up of final questionnaire

3.11.1 Pilot implementation

A pilot study is conducted before the main study. It is the first phase of the study. A pilot study helps in avoiding any mistakes of leaving any important question or query which would lead to later regrets of deficient results. Also, this would help to understand whether required responses could be achieved easily, whether questions are understandable and whether they elicit the right response or not. This pilot study would lessen the number of loopholes and increase the quality of the final questionnaire. Besides, eliminating or reducing any potential problem later on it also ensures that the selected research instrument is suitable for the purpose thereby guaranteeing its partial validity for the intended objective.

　　According to van Teijlingen & Hundley (2002), a pilot study is a small version of full fledged main study undertaken prior to it to assess feasibility and to pre-test the selected research instrument. The advantages are also numerous. Firstly, it increases the chances or likelihood of success of main study, secondly, it points out at any redundancy or omission of some indispensible question, next, it allows the researcher with some familiarity with the respondents and assess their understanding of various questions.

　　Additionally, it enhances the confidence of the researcher in the instrument, the average time required to fill in the questionnaire. A repetition in itself, yet, it provides invaluable insights for further research and enhances the validity of questions posed before finalizing the detailed questions. Therefore, in a nutshell, it can be stated that usage of pilot study is crucial and invaluable to be ignored or ruled out.

　　For the present study, two sets of questionnaire were required; one for the environmental NGOs and the other for the Corporate sector. Once a pre-final draft of both was made, it was rendered to experts from industry and academia for soliciting their comments. Important improvements were suggested which were accordingly incorporated in the draft questionnaire and the questionnaires took the final form. A statistical verification was also made.

Respondents for both the type of questionnaires were then identified for the next phase of pilot study after academic evaluations, on the basis of their availability, personal acquaintances and as discussed earlier. The managing directors/ manager responsible for sustainability/environmental disclosures of the companies (identified as preparers in my objectives) were contacted. Personal visits were made to them as far as possible to make them understand each and every aspect of the questionnaire, its importance and the method of filling them up. Some of the respondents asked for the questionnaire to be emailed to them. They were also requested to provide comments on the wording, understandability and convenience of filling up the questionnaire. Similar exercise was undertaken with environmental NGOs.

The questionnaire relating to Environmental NGOs collected information on various aspects of environment issues, voluntary corporate practices relating to environmental issues, and the present state of affairs requiring improvements.

The questionnaire related to them addressed the question of sufficiency and relevancy of wide variety of environmental information disclosed by them in their reports from the perspective of users (restricting to Environmental NGOs as part of my study).

3.11.2 Final questionnaire implementation

The next phase involved incorporating the valuable comments received from the respondents without which the questionnaire would not have received its final shape. The questionnaire began with a brief introduction about the work, the relevant objectives that will be fulfilled by this study and the essentiality of their participation. They were further emphasized upon the norm of our university regarding maintenance of their anonymity.

3.12 Secondary sources

The data, required for this research study, was also gathered from Annual Reports, Sustainability Reports, Stand Alone Reports, other relevant disclosure report, and Websites to corroborate and support the framed questionnaire.

3.13 Reliability and validity

Reliability and Validity represent the ways of establishing the truthfulness of the study conducted. Reliability represents the extent to which results are consistent over time and Validity describes the extent to which the results are near to the real world situation that is how accurately the instruments measure what they were supposed to measure. In order to improve the reliability

- The respondents were selected having knowledge of the subject matter of the study
- The questionnaire was served on google drive which can be opened and finished at the convenience of the respondents to minimize fatigue and stress
- Majority of questions were literature driven and were based on discussions with academia and selected respondents to enhance their reliability
- The objectives were framed after going through extensive background study as presented in the first chapter and subsequent chapters devoted to various objectives, literature review and discussions with experts and academia
- The technique of Cronbach alpha was used to test the reliability of scales and the responses were high to medium. Lastly, Kolmogrov-Smirnov test used to check normalcy in the distribution of response

To increase validity, various statistical tests were used to eliminate any bias in response, besides

- During the pilot study the questionnaire was first administered to academicians to gain an insight into the language, content validity and completeness with reference to the intended aim. Next, it was served to NGOs working in the field to inspect the understandability of the questionnaire. After completing both the exercises the pilot study was completed and the input received was assessed statistically to enhance the statistical validity of the questionnaire as well.
- For comparative study, those respondents were selected that had one similar interest ie either dealing with environmental issues or standing for protecting the environment
- For ensuring the external validity of results, the observations were correlated with review of previous studies falling under the subject matter of the study

- Data triangulation was used where data was collected by both email and personal visit. Data triangulation is a technique where multiple methods of data collection are used to check on a conclusion.

3.14 Response rate

The following response rate was achieved by the administration of questionnaire to respondents of both the sampled groups of ENGOs and Corporate.
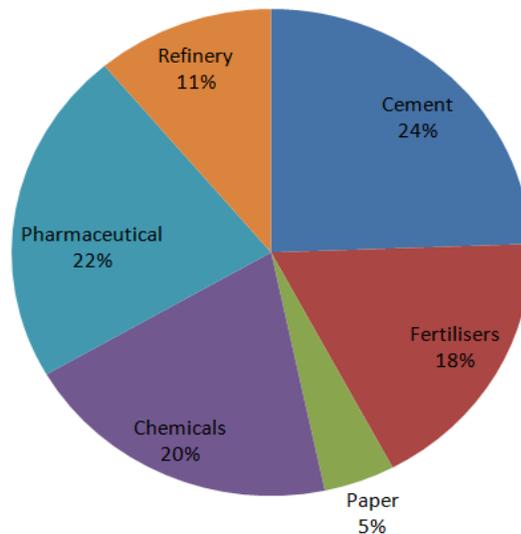
3.14.1 Final response received from corporate managers

Corporate Managers formed the primary respondents for the purpose of the study. Top fifty companies (out of top 500 companies based on market capitalization) in the six environmentally sensitive industries-fertilizers, drugs and pharmaceuticals, paper, chemicals, refinery, and cement, formed the sample of the study. The managers of these companies formed the respondents for the study. All the selected companies fell under environment sensitive industry groups (Red and Orange categories as identified by Ministry of Environment and Forests, India). The respondents are relevant officers having knowledge of environmental affairs or dealing with them directly or indirectly. The distribution of the original sample consisted 12 companies from Cement industry, 8 from Fertilizer industry, 2 from Paper, 9 from Chemicals, 12 from Pharmaceutical and 7 from Refinery industry. The annual turnover ranged 1000 – 5000 crs with the exception of one company having less than 100 crs. The number of employees ranged from 1000 – 5000+ with only 7 companies having less than1000 employees. Among the sample 43 companies fell in the private sector. The questionnaire instrument was used to gather data from corporate managers. Internet technology was utilised to collect data. The questionnaire was created in Google Docs whose link was sent to the sampled companies, it was also sent by email and personal visits were also made where possible. The companies were first contacted over telephone and through emails with the link to the questionnaire. The purpose was to acquaint the respondents with the purpose and specific information required to be filled in the questionnaire. The process of contacting the companies began in January 2013. Two months later in May 2013, follow-up calls and emails were sent to respondents for prompting responses. This exercise continued till

January 2014 and after the lapse of two months i.e., March 2014 the responses were no longer considered for valid inclusion. The reason for elongated time period was that majority of the companies consider environment related information as highly sensitive and it is handled with great confidentiality. Valid responses received are displayed in Table 4 and Figure 8 below. As indicated in Table 4 last row, the overall response rate was reached at 90%.

Table 4: Distribution of final Corporate Response Received

SN	Industry	Sample Companies	Responses Received	Response Rate (%)
	(1)	(2)	(3)	(4) (4= 3*100/2)
1	Cement	12	11	91.67%
2	Fertilisers	8	8	100.00%
3	Paper	2	2	100.00%
4	Chemicals	9	9	100.00%
5	Pharmaceutical	12	10	83.33%
6	Refinery	7	5	71.43%
	Total	50	45	90.00%

Figure 8: Industry wise distribution of final Corporate Response

3.14.2 Final response received from members of ENGOs

Data was collected by the administration of questionnaire through personal visits, by email as well as through courier to 50 organisation members (such as vice president and

principle environmental concerned official) whose list was prepared from published list of certified NGOs by Ministry of Environment and Forests, India and internet as a research tool. The participants NGOs were primarily involved in education, poverty alleviation, human rights, child, women empowerment, poverty alleviation and the environment. Given the diversity of the location, each organisation was first emailed for obtaining consent for the study. The organisations were first emailed the questionnaire as well. Upon receiving their consent they questionnaire were distributed by e-mailed or posted. The questionnaire first page composed of a detail covering letter explaining the purpose of the study and confidentiality that will be maintained. Questionnaires were sent out in the fourth week of March, 2013. A tentative date of one month was stated in the email for the receiving the reply. In April, 2013 first reminder was sent to non responding organisations and in May 2013 the second reminder was sent and after the lapse of one month of 2nd reminder, the responses were no longer considered for valid inclusion.

Valid responses were received from 46 respondent members of NGOs (92% response rate). Among the type of organizations, ten of them supported mainly environmental cause and eighteen supported environment as well as other causes. Hence, one response was taken from ten organizations and two responses were taken from eighteen organizations respectively as shown in Table 5.

Table 5: Final Response received (ENGOs)

SN	Main goal of organisation	Number of NGOs as organisations responded	Responses Received
	(1)	(2)	(3)
1	Primary goal is Environment	10	10x1=10
2	Environment goal exists with other goals	18	18x2=36
	Total	28	46

The following table 6 and figure 9 show the state-wise distribution of respondents.

Table 6: State-wise distribution of respondents

Distribution of Respondents	Number of members of NGOs	Percentage
Bhopal	3	6.52%
Chandigarh	4	8.70%
Himachal Pradesh	2	4.35%
Kerala	3	6.52%
Maharashtra	5	10.87%
New Delhi	11	23.91%
Odisha	2	4.35%
Punjab	13	28.26%
Uttarakhand	3	6.52%
Number of final responses	46	100.00%
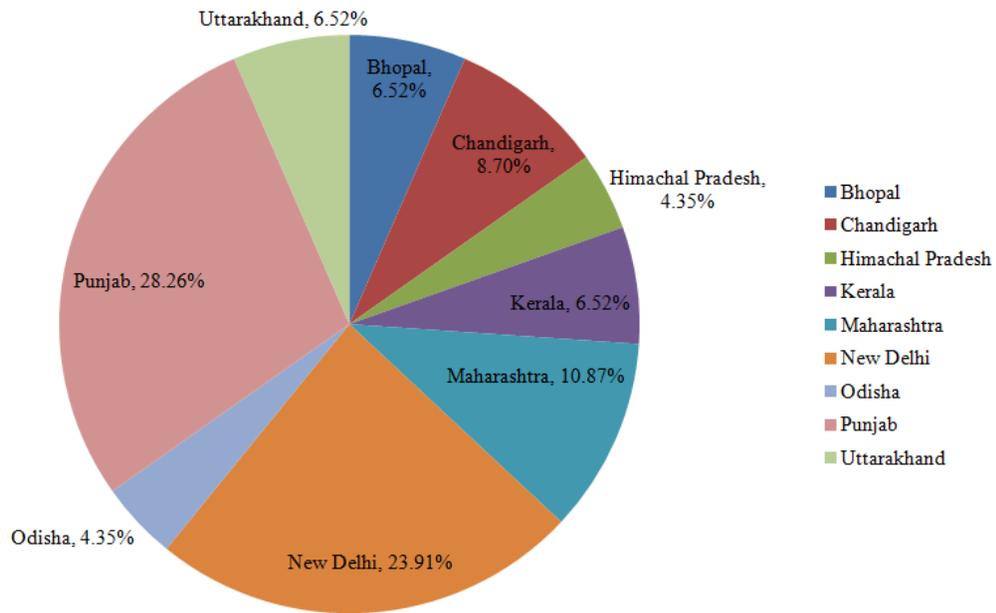
Figure 9: State-wise percentage response of members of NGOs

Their experience averaged out at 9.18 years. Again 21.7% respondents were personally interviewed whereas 78.3% were contacted on phone then the questionnaire was emailed to them.

3.15 Ethical consideration

Ethical considerations are very important for any researcher. Firstly, the call of ethics demands that the research is conducted honestly and industriously. Secondly, but equally important is that the respondents who have provided us valuable time and responses should be assured of confidentiality of their responses. Therefore, both the types of respondents were emphasized that the information filled in by them in these questionnaires would be kept confidential. For the purpose of maintaining the confidentiality and anonymity of the respondents, their names were removed and allocated codes in the SPSS database. They were however informed beforehand that the output of the survey in a condensed form would be submitted to the university and may be published and that the result could help in ironing out differences and in bridging the gap between what information is sought by NGOs and what is voluntarily presented by corporate. The output of the questionnaire would also determine the type of information that should be included in disclosure reports covering environmental concerns.

3.16 Summary

The present chapter is an essential part of the study. It narrowed the focus of the study to the attainment of key objectives. Further, it provides the action plan for the achievement of stated objectives. The research methodology provides an insight into the exact techniques to be applied for conducting proper analysis of the data gathered and for deriving relevant conclusions. The next chapter is devoted to understanding the concept of accountability and study of attitude of corporate towards the issue of environment.

3.17 References

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