CHAPTER 4
SAMPLE DESIGN AND METHODOLOGY

This chapter will delineate the sample and methodology used in this study.

4.1 Sample Design

Samples were selected from two pools: companies that provide environmental information; and the users of information including investors, government agencies, creditors, communities, and intermediaries.

4.1.1 Information Providers

The survey identified listed companies as information providers. This study assumed that top level management and the accountant play important roles in making decisions about disclosures. The details of selection are presented below.

- The managing director or a member of the board of directors or top-level management within listed companies (or their representatives, if necessary) were surveyed. These persons have the authority and have influence to make decisions regarding the disclosure of environmental information in their annual reports.

- Accounting managers were also surveyed to understand their attitude toward the environmental issues. Accounting managers may play the role of consultant in disclosure information. It is necessary that accountants understand the issues well to help lead the company to the right direction in this regard.

The samples were limited to companies listed in the Stock Exchange of Thailand [SET]. These companies were considered to be firms that disclosed the highest amount of information due to the following factors:

       - the companies were public companies;

       - at least two government organizations oversee the companies: the

         Stock Exchange Commission [SEC] and the Ministry of Commerce;

       - their auditors were more qualified; and

       - a full set of reports were available.

The samples were limited to the firms in the industries faced environmental impacts. The selection based on the belief that such industries were particularly likely to have environmental information to report, since the types of raw materials they consumed, the production processes they employed or the nature of their end product could have significant impact upon the environment. The selection was also similar to what had been used in the UK Environmental Reporting Survey 1994 (KPMG, 1994). Followings are the selected industry sector classification used by the SET.

Industry Sector	Whole Population (number of firms)
1. Property Development	44
2. Pharmaceutical Products and Cosmetics	2
3. Printing and Publishing	9
4. Pulp and Paper	5
5. Textiles, Clothing and Footwear	29
6. Vehicles and Parts	10
7. Chemicals and Plastics	14
8. Food and Beverage	29
9. Health Care Services	11
10. Agribusiness	29
11. Building and Furnishing Materials	35
12. Hotels and Travel Services	13
13. Electrical Products and Computer	13
14. Electronic Components	8
15. Energy	9
16. Household Goods	11
17. Jewelry and Ornaments	5
18. Mining	3
19 Packaging	17
Total	296

The questionnaire were distributed to all the companies in the above population. To ensure that the responses were distributed proportionately among their size and economic performance, all the above population were stratified into nine strata, according to total assets and return on investment [ROI] of the firms. Size was separated into three groups: big, medium, and small following the Cumulative Square Root F method. Economic performance was also separated into three groups: good, fair, and poor. The sample from each stratum was proportion to the size of the stratum. Larger stratum had more sample and each stratum contained at least two samples.

In order to effectively obtain a response, the names of persons who contacted with the SET were given during the mid of March 1997. Telephone calls together with the information from the listed companies helped create the lists of persons to address to and initial introduction to the target companies. In general each company provided both persons who were responsible for accounting or finance and those who were in top management level. However, in some companies which refused to provide both names, either top management or accounting/ finance manager was provided. The following reasons why they refused to provide both names were included : no one was available to answer; no one provided can represent the firm; and top management was a foreigner. Also, unfortunately, some firms denied to answer the questionnaire due to the following reasons : no one was available to answer; they were not willing to cooperate. And therefore, 231 firms and 445 persons were selected and sent a questionnaire.

The first lot of questionnaires were distributed to all names mentioned earlier during the third week of March 1997. For those persons whose names were not identified, the title was used instead. The questionnaires had a cover letter and a small note to indicate the deadline and to refer to the early conversation. April 15th was the first deadline for this lot. After that deadline, the response rate was still low at less than 10 percent of all samples. The reasons why the response rate was low at this stage were analyzed as: the time when the respondents received the mails was near deadline; the companies were busy due to quarterly reports needed to be submitted

during that time; there were many holidays during that period; and some companies did not receive the mail at all. Then, the second calls were conducted to those non-respondents. At this stage, the questionnaires were adjusted their deadline to April 30th. Faxed responses were acceptable. And the second mails were sent to those who had yet received the questionnaire. After April 30th, the second deadline, the response rate was increased to more than 20 percent of all samples. The follow-up calls were made to the non-responses with emphasizing on the groups of industry and the nine strata as mentioned earlier which were still received lower rate of response. At this stage, the deadline was postponed to May 15th. And finally, after May 15th, the response rate was around 30 percent of all samples. The mails were still received in the diminishing rate after May 15th until May 31st. There were some companies that disclosed environmental information in their annual reports of 1996 and did not answer the questionnaire. Final attempt was emphasized on that group by calling them and asked for cooperation. Five out of forty firms in that group later responded the questionnaires. In summary, total of 101 companies and 123 persons returned the questionnaires.

It is obvious that some industry groups contain only one or two respondents. This could limit the ability to draw conclusions from the survey results in this study. There are four arguments for using few respondents to represent their own industry groups. First, the total number of firms in those industry groups were very few. Second, the idea to present the results in accordance with each individual industry group is to observe whether it reacts differently from other groups, and the industry groups are used solely to present the survey results. Third, disclosure of environmental information is homogeneous within their groups. Finally, the characteristics and types of business of these respondents were checked with other non-responding firms to ensure that they can represent their industry groups.

Tables 4-1 a and b show the industries and nine strata. Total responses from each industry and each stratum are presented in the separated column.

Table 4-1 a) Provider Group by Industry (by Questionnaires and Firms)

No	NAME	Number of #				Percentage (100%)	
		Questionnaire		Firms			
		Sent	Received	Sent	Received	Quest.	Firms
1	Property Development	62	21	32	17	33.87	53.13
2	Pharmaceutical Products and Cosmetics	4	1	2	1	25.00	50.00
3	Printing and Publishing	13	5	9	3	38.46	33.33
4	Pulp and paper	8	2	4	2	25.00	5.00
5	Textiles, Clothing and Footwear	41	15	21	12	36.59	57.14
6	Vehicles and Parts	13	3	7	2	23.08	28.57
7	Chemicals and Plastics	24	4	13	4	16.67	30.77
8	Food and Beverage	36	6	18	6	16.67	33.33
9	Health Care Services	18	9	9	7	50.00	77.78
10	Agribusiness	48	12	25	9	25.00	36.00
11	Building and Furnishing Materials	45	12	23	10	26.67	43.43
12	Hotels and Travel Services	20	5	11	5	25.00	45.45
13	Electrical Products and Computer	20	4	10	4	20.00	40.00
14	Electronic Components	9	4	5	3	44.44	60.00
15	Energy	18	2	9	2	11.11	22.22
16	Household Goods	16	7	8	5	43.75	62.50
17	Jewelry and Ornaments	10	2	5	1	20.00	20.00
18	Mining	6	3	3	2	50.00	67.67
19	Packaging	34	6	17	6	17.65	35.29
	Total	445	123	231	101	27.64	43.72
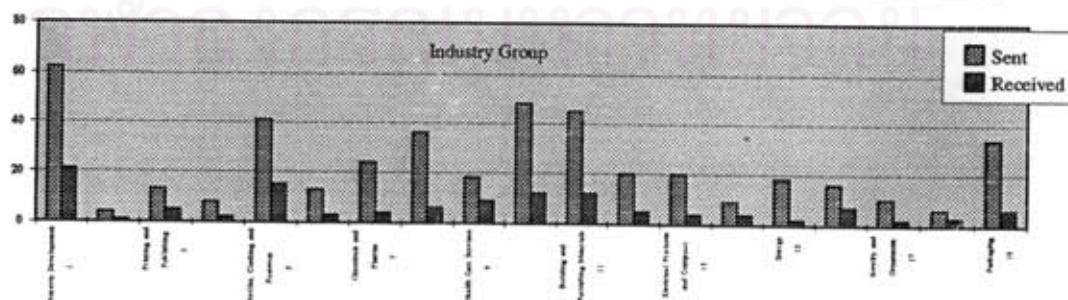
Table 4 - 1 b) Provider Group (Grouped by Total Asset and ROI)

No	Number of Questionnaire		Percentage
	Sent	Received	100%
1	10	2	20.00
2	56	18	32.14
3	68	24	35.29
4	17	4	23.53
5	32	12	37.50
6	33	9	27.27
7	56	15	26.79
8	86	20	23.26
9	87	19	21.84
Total	445	123	27.64

Provider Group by Total Asset and ROI
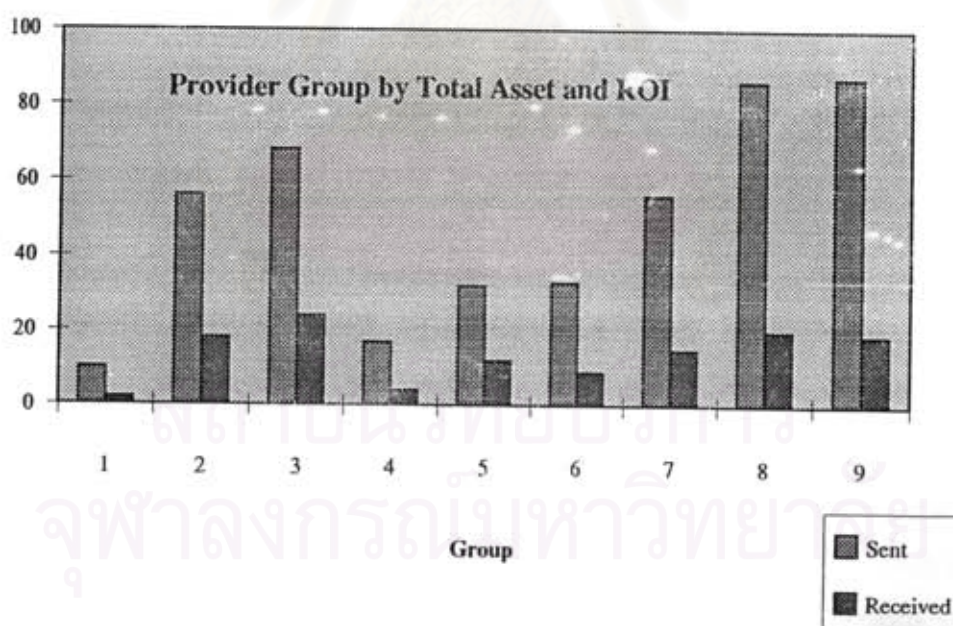
4.1.2 Users of Information

This study identified users of information as institutional investors, government agencies, creditors, communities, and intermediaries. The details of selection are shown below.

- Institutional investors represented the investing public and this study used brokers and fund managers as institutional investor representation. Management in each firm were surveyed.

- Government agencies directly involved with environment issues were selected. These organizations included the SET, the SEC, the Ministry of Industry, and the Ministry of Science, Technology, and Environment. Heads of Departments were surveyed.

- The banks represented creditors. Credit managers were the survey respondents.

- Communities included environmental activists such as NGOs. Management levels were selected.

- Intermediaries included the parties which were considered to be unbiased group. Researchers, university professors, and auditors authorized by the SEC were sample of this group.

The questionnaire were issued giving more emphasis on institutional investors and government agencies. For institutional investors, the lists of mutual funds and finance companies listed in the SET were summarized. Total of 485 persons were included in the distribution lists.

Telephone calls and the information from the listed companies were used to identified persons to address to. Fund managers were targeted for mutual fund while

investment, banking managers or analyst/research managers were targeted for financial institutes.

The lists of government agencies related to environmental issues and disclosure were selected from the telephone directory and the lists of the SET and the SEC. Some calls were used to confirm the name of persons to address to. Others were distributed using their titles.

The lists of banks were obtained by the banks listed in the SET. Again, telephone calls and the information from the listed companies were conducted to obtain the credit managers who should be addressed to. Credit managers who were responsible for industrial zone were selected for the banks which had identified many credit managers.

The names of environmental activists and communities were obtained from the lists of NGOs in Thailand. In that list, private organizations including associations and foundations were selected. They were involved with environmental issues in business territory.

And finally, the unbiased groups included the following groups : members of the Institute of Certified Accountants and Auditors of Thailand [ICAAT], Auditors, researchers, professors, and environmental consultants. The list of members of ICAAT were obtained from the institute. Only the members of each committee including, for example, accounting standard subcommittee, auditing standard subcommittee, professional ethics subcommittee, etc. were selected. Certified Public Accountants who were authorized by the SEC to audit the listed companies were selected. Researchers from the Institute of Environment in Thailand and some writers who had published their articles related to environmental accounting in some journals were surveyed. The list of head of department in accounting of most of the universities in Thailand and the departments where environment was their main concern such as environmental engineer were obtained. Also most of the lecturers in department of accountancy, Chulalongkorn University were surveyed. And finally, the names of

environmental consultants were obtained from the lists provided by a survey from the Asia Foundation.

The questionnaires were distributed to selected persons starting from the third week of March to the beginning of week of April. The first deadline was set at April 15th and those distributed in April was set at April 30th. The response rate after April 15th was lower than 10 percent of all samples. During April 15th to April 30th, the second calls were made to those whose telephone numbers were available. After April 30th, the response rate was increased to a little more than 20 percent of all samples. The samples were increased and distributed in the beginning of May setting the deadline to May 15th. After May 15th, the response rate was increased to 30 percent of all samples. As same as the questionnaires received from the providers of information groups, the returned questionnaires were become diminishing after May 15th until May 31st the last date to collect the questionnaire. In summary, total of 173 persons returned the questionnaires.

Table 4-2 summarized the number of each group and their responses is illustrated as follows :

Table 4-2 : User Group

No	Name	Number of Questionnaire		Percentage
		Sent	Received	%
1	Institutional investor	126	45	35.71
	-Finance Companies	59	27	45.76
	-Funds	67	18	26.87
2	Government agency	67	29	43.28
	-Government Agencies	54	21	38.89
	-SET and SEC	13	8	61.54
3	Creditor	21	12	57.14
4	Community	41	11	26.83
5	Intermediary	230	76	33.04
	-Auditors and ICAAT Committees	168	56	33.33
	-Researcher	3	2	66.67
	-Instructors	52	15	28.85
	-Consultant	2	1	50.00
	-Environmental Engineers	5	2	40.00
	Total	485	173	35.67
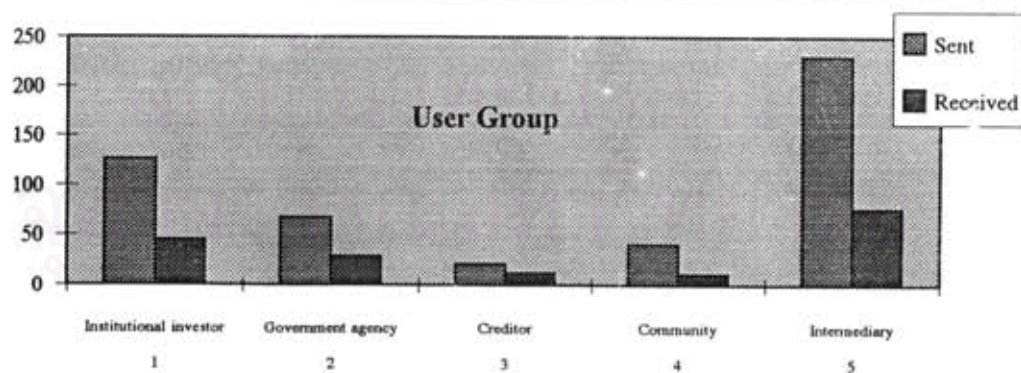
4.2 Methodology

This study used a questionnaire to survey the opinions from both provider groups and user groups. Other information related to specific companies' characteristics were obtained from the SET and interviewed the related agencies. The hypothesis were tested using univariate analysis.

In conclusion of the guideline for environmental disclosures, this study used the survey type of research. Frequencies of the responses were summarized together with the comments and suggestions on the disclosure items and report. Then, in conclusion of hypotheses testing, univariate testing was applied. And finally, in conclusion of the model of the relationship between disclosures and firms' characteristics, multivariate analysis was applied. In order to fulfill the objectives, the questionnaire was prepared and distributed to the samples. The details are discussed in the following paragraph.

4.2.1 Questionnaire Preparation

Hierarchy of environment information was first determined in the construction of the questionnaire. Disclosure of information could be from recognition in the accounts or separated disclosure using financial data to disclosure by explanation or no disclosure at all.

Initial survey and in-depth interview Thai business were conducted to experience insight knowledge of current practices. Also the current practices and surveys by the developed countries were summarized. Then the questionnaire was prepared to ask the followings:

- Importance weight on information disclosed;
- Other information that should be disclosed;
- Opinion on the format to report presented in separate report apart from annual report;

- Importance weight according to providers and users of information;
- Importance weight according to the influence among accountant, manager,
and owner in making decision on providing information;
- Demographic information.

Questionnaires were separated into two types : form A and form B. Form A was used for the listed companies as information providers and form B was used for users of information. The only differences between two forms were the questions about the current practices and current disclosures which were included only in the form A.

Questionnaire was pre-tested to check its relevance and reliability using 10 samples. The questionnaire was modified as a result of the pretest. After that the modified questionnaire was sent to samples stated above. Sample of questionnaire and cover letter are presented in Appendix C.

- Test of Reliability

The responded questionnaires were tested for their reliability. For those responses from the providers of information, the reliability was tested for the answers about the facts of level the companies faced with environmental policies, plans, projects, contingent liabilities, and compliance with the regulation. The second test was prepared for the disclosure claimed by the companies.

All questionnaire were screened for those answers indicated that the disclosures in any form were existing. The companies that both top management and finance/ accountant returned the questionnaire were cross-checked for their accuracy in the area of the stated facts including their disclosures. Then, the 1996 annual reports of those companies were obtained from the library of the SET. They were reviewed to confirm their disclosures and their environmental facts. The companies whose annual reports did not apparently disclose the information as stated in the questionnaire were called for investigating the media they used. Finally, the opinions about disclosure in

environmental policy, plan, project, cost, expenses, benefit and compliance with the regulation were tested for their correlation with their real disclosures that was provided in the questionnaire. The correlation between opinion and real disclosure is high. Table 4-3 below shows the detail of correlation.

Table 4-3: Correlation between idea and real disclosure

	Correlation (r =)	(p =)
I-DISC VS DISCLOSURE in - Environmental Policies	.447	**.000
- Environmental Plans	.412	**.000
- Environmental Projects	.397	**.000
- Assets/Expenses	.125	.2
- Contingent Liabilities	.351	**.000
- Law Conformation	.528	**.000
- Benefits	.511	**.000
R-DISC VS DISCLOSE	.308	**.005
I-DISC1 VS DISCLOSE	.600	**.000
I-DISC VS DISCLOSE	.591	**.000

R-DISC = Real disclosure from annual report   I-DISC1 = Idea disclosure (Weighted)   ** Significant at 0.01

I-DISC = Idea disclosure (Unweighted)   DISCLOSURE = Disclosure from questionnaire

4.2.2 Framework in Reporting

In the analysis of data for the first issue, framework on reporting environmental information, the opinions provided by the survey formed numerical scores that measured the intention to disclose environmental information. This paper formulated

opinions about information to be disclosed by provider group, by user group and by overall. The importance weight according to the influence between accountant and manager in making decision on providing information was used to weight the opinions obtained from the firms which were identified as opinion from providers of information. Then the important weight according to providers and users of information was used to weight the opinions obtained from all respondents. The average scores pushed toward a consensus of desirable disclosure. Furthermore, the survey opinion on the pattern to report environmental information was summarized. Finally, the summarization of the conclusion on two approaches: voluntary disclosures and mandatory disclosures were also provided in the first issue of this study.

4.2.3 Hypothesis Testing

In the second issue of this paper, hypothesis testing on the association between level of intention to disclose obtained from respondents of all firms and the following variables: environmental performance, financial performance, and stakeholder influence was tested using univariate and multivariate approach. Univariate analysis (t-test) was applied to test on the association between level of intention to disclose obtained from respondents of all firms and the following variables:

- environmental performance
- financial performance
- stakeholder's influence
- firm's characteristics

4.2.4 Multivariate Analysis

In multivariate analysis, the model was established and analyzed using regression analysis.

- Model and Variables

Relative disclosure level using regression analysis method was calculated. Level was calculated based upon the model presented in the following paragraph. Next, the relationship between the relative disclosure level (obtained from disclosure variables) and the level of intention to disclose (obtained from the respondents) was checked to its correlation. The procedure of checking for relationships was controlled by industry. Finally, the conclusion of the results was confirmed with discussing to experts from the executives from SET and other researchers.

The model explaining relative levels environmental disclosure was drawn based on stakeholder theory and literature mentioned earlier. The variables included environmental performance, economic performance, and stakeholders' influence, using firm's characteristics as control variables. These variables were all expected to have a positive association with disclosure level except the potential pressure from shareholders which was expected to have a negative association.

$DISC_i = f(ENPERF_i, FIN_i, SHARE_i, GOV_i, CREDIT_i, SIZE_i, RISK_i, IND_i)$

Where:

$DISC_i$ = The relative disclosure level of each firm was calculated from the function of the following variables using the regression.

$ENPERF_i$ = The firm's environmental performance measured by the real practices obtained from the returned questionnaire. Criteria were established to give a score from 0 to 1. Then, the scores were multiplied with the weight provided by executives from the Ministry of Science, Technology, and Environment in relation to the importance of such practices to environment. The weight was ranked from 0 to 5.

FIN_i = The firm's financial performance measured by a three year average of return on investment (ROI), from 1994 to 1996.

$SHARE_i$ = The potential pressure from shareholders measured by the average shares a shareholder holding more than 10 percent of total capital in the studied period (December 1996).

GOV_i = The potential pressure from the government measured by the laws and regulations imposed on a particular firm. The opinions about whether each firm's operation was representative were obtained from the SET and the SEC executives. The laws and regulations were summarized into 4 main area: air, water, garbage, and noise. A Score of 0 was applied for a firm subject to the lowest pressure and 1 for a firm subject to the highest pressure in each area. Then, these four areas were discussed with an executive from law office in the Ministry of Science, Technology, and Environment to indicate the percentage of importance that area was considered by authority. The percentage was applied to score for each individual firm in each area.

$CREDIT_i$ = The potential pressure from creditors measured by the debt-to-equity ratio.

$SIZE_i$ = The size of a firm measured by total assets.

$RISK_i$ = The systematic risk of a firm measured by β calculated from the market model of all firms listed in the SET.

IND_i = The industrial group according to the classification in the SET.

In the next chapter, the results of the study are discussed in details. The results include the opinions on the disclosure model and the empirical results of the association between disclosure and firm's characteristics.