CHAPTER II

THE PROBLEM
2-1 THEORETICAL RATIONALE

A number of researches have been carried out in the field of environmental education in both Western and Eastern countries. Generally, it is significant to note that the research priorities in the field of environmental education have mostly concentrated on environmental protection and its awareness.

Midling (1996) reported that environmental protection emerged as a subject of a global discourse in the early 1970s, coinciding with the beginning of China's gradual re-opening to the outside world. By the 1980s, global discussion of sustainable development had emerged, focusing on the need to integrate economic and environmental considerations in formulating environmental policy. During these decades, models of environmental education were developed and diffuse by international organizations and elements of these models were adopted in China in planning for environmental education. By the early 1990s, a decision was made to "infuse" environmentally related materials throughout the curricular in Chinese schools with the help of research studies. These studies used classroom observation and teacher interviews in schools, which had been early pilot EE sites. Several themes in their teaching of environmental studies emerged at these pilot EE schools: (1) attempts were made to make environmental education relevant to the lives of students; (2) EE was tailored to the specific circumstances of the surrounding area which the school served; (3) student- directed "action" research was encouraged; (4) a global view of environmental protection was promoted; and (5) attempts were made to bridge environmental materials across the curriculum.

Data from an environmental questionnaire collected in fifteen high schools in the Chengu region of Sichuan province was analyzed. Students in six pilot EE schools had significantly higher total mean scores on an environmental knowledge scale than the students from the nine non-pilot EE schools in the sample. Differences in attitudes towards environmental protection, while statistically significant, were weaker than the differences in environmental knowledge.
Lindenmeier (1996) conducted a study on an investigation of the congruency of outdoor education components: Environmental education and adventure education. This research project was undertaken to determine to what degree environmental education and adventure education are interdependent components of outdoor education. It was hoped that the determinations made can give direction to the decision-makers of Texas who have the power and ability to propel environmental education, adventure education and outdoor education in the directions most desirable and useful to the participants and programmes. In 1985, Simon, Priest presented a model with environmental education and adventure education as two parts of a singular whole, outdoor education. Then in 1991, Senate Bill Number 1340 was passed giving directives to instill environmental education in all curriculum, where appropriate, thus pushing forward the movement for environmental education in Texas. With these developments, it has become increasingly important for decision-makers to determine the relationship between environmental education and adventure education, and the programme implications of this determination. Use of the Delphi technique was chosen as the process of interaction between the researcher and the panel of experts.

The panelists were chosen from outdoor education, environmental education, adventure education, education, recreation, and leisure professionals in Texas. Two rounds of data gathering instruments were used, collecting data consisting mainly of nominal variables. Statistical analysis included use of descriptive statistics and cross-tabulations with chi-square values to determine panel agreement, trends of agreement, and significant differences between groups. In general, consensus was noted on several variables categorizing environmental education and adventure education separately including associated themes, concepts, goals and philosophies, and necessary areas of staff training. Also, the panelists were asked to categorize the relationship between environmental education and adventure education as interdependent, related, complementary independent, or independent and not related. Overall, the panelists determined that environmental education and adventure education are
sufficiently dissimilar in several key respects to warrant formulation of a different model showing the relationship of these two components to each other and to outdoor education. A new model is presented in the concluding chapter of the document.

Orzulak (1996) conducted a study on the study of participant satisfaction of enrollees in non-credit environmental courses at the university of Kansas.

The study is a participant satisfaction assessment of over 1,400 enrollees in non-credit environmental education and training programmes. The programmes were conducted over a one year period by the Centre for Environmental Education and Training, Division of Continuing Education at the University of Kansas. The period of the study was from September 1, 1994, to August 31, 1995.

Survey questionnaires were mailed to all participants, and 377 or 26 per cent were returned. Information on the survey was related to three Key Performance Indicator (KPI) questions extracted from the organization's strategic plan. The responses to these questions were evaluated against the organization's internally set standards for programme quality.

The study used both descriptive and analytical statistical techniques to evaluate the responses of the participants. The organization failed to meet its performance goal on one of the KPI questions. The courses that caused this short fall are identified by the study.

A set of mid-range correlations between responses and educational level of respondents is found using non-parametric statistical tests. A demographic profile of the respondents is included. The study contains two Appendices, a strategic plan and a marketing plan. A model is presented to represent the combination of these elements with an evaluation plan.

Brookes (1997) conducted study on an approach to providing professional development with an environmental education component to agriculture teachers in Costa Rica. In 1993 the University of Costa Rica carried out a need assessment survey which indicated a widespread need for in-service professional development for high school agriculture teachers. Information was also collected that indicated areas of interest and concern to
teachers and the Ministry of Public Education. Subsequently, the University of Costa Rica's Atlantic Regional Center elected to undertake the development and implementation of professional development programmes for agriculture teachers. It was determined that the areas to be addressed would include agriculturally oriented environmental education, sustainable agriculture, pedagogy, and methodology useful for information transfer.

The objective of this developmental study was the development, implementation, and evaluation of an approach for the University of Costa Rica's Atlantic Regional Center to provide professional development opportunities for agriculture teachers working in Costa Rica's Professional Technical High Schools.

The research examines the approach developed through the university of Costa Rica's Atlantic Regional Centre working in collaboration with the Costa Rican Ministry of Public Education, the World Wildlife Fund, and Iowa State University, and describes the following: (1) Development of an approach to provide professional development opportunities for secondary agriculture teachers in Costa Rica; (2) Implementation of the professional development programmes provided the teachers; (3) Evaluation of the programmes provided the teachers including follow-up research after teachers had returned to their school sites; (4) Analysis of the approach developed with a model and summary of steps taken to develop and implement the programmes.

The research findings present and discuss data related to the resultant successful approach that was used for the university of Costa Rica's Atlantic Regional Center to provide two groups of agriculture teachers with in-service professional development in 1994 and 1995.

Recommendations were made for more professional development opportunities to be provided by the University of Costa Rica's Atlantic Regional Center following the approach developed. The approach model and description of the steps involved are recommended as guidelines for providing similar professional development programmes for Costa Rican high school agriculture teachers. Suggestions for future teachers in-service programmes and recommendations for further study were also presented.
Wagenet (1997) conducted a study on the impact of a focused environmental education programme on adults: A study of knowledge, attitudes and behaviours in the New York City watersheds. It investigated the relationships between adult education and environmental issues, specifically in the context of an environmental conflict. An educational programme on key environmental concepts was delivered to selected adults residing in the watershed areas for New York City. Subsequently, a brief written survey was sent to these individuals as well as residents of the watersheds who had not received the educational materials.

Results were analyzed to determine if there were significant differences in knowledge, attitudes or behaviour among the survey groups. Respondents were grouped according to their readership level: Readers fully utilized all the educational materials; non-readers received the educational package but did not fully utilize the materials; and non-WCP did not receive the educational package.

Statistical analyses illustrated the readers displayed a higher level of fact recall and confidence in environmental knowledge than the non-readers or non-WCP. Application and evaluation of the knowledge was not, however, significantly different among the three readership groups. In addition, results indicated that non-readers displayed a somewhat hostile attitude toward environmental issues. Finally, although residents behaviour changed over time in terms of a specific environmental behaviour (Septic system maintenance), results did not indicate that the educational programme was responsible for the behaviour change.

The findings in this dissertation support continued environmental education efforts in the New York City watersheds. Results should assist educational organisations such as Cooperative Extension in developing environmental programming for adults.

Plevyak (1997) conducted a study on the level of teacher preparation in environmental education (EE) and level of implementation of EE in the elementary classroom within a mandated EE teacher preparation state (Wisconsin) and a non-mandated EE teacher preparation state (Ohio).
The main purpose of this descriptive, correlational study is to determine the association between level of teacher preparation in environmental education (EE) and the level of implementation of EE in elementary classrooms within Ohio and Wisconsin. Wisconsin mandates competencies be acquired by K-12 pre-service teachers in EE as of 1985; Ohio does not require such EE competencies be taught to pre-service teachers. The attitude of elementary teachers toward EE were also measured.

Of the 760 randomly sampled Ohio and Wisconsin elementary teachers, 503 (66% return rate) questionnaires were returned. The usable surveys included teachers who received their first teaching certificate between 1985 and 1996. Non-respondents were found to be similar to respondents, so they were found to be similar to respondents, so the results are generalizable to the population. In all hypothesis testing, the 0.5 level of probability was used. Ohio and Wisconsin elementary teachers who received their first teaching certificate between 1985 and 1996 were found to be statistically different in their attitudes toward EE, their pre-service environmental teacher preparation and their implementation of EE in the elementary classroom. No statistical difference was found in Ohio and Wisconsin elementary teachers’ in-service environmental teacher preparation.

Using regression analysis, within Ohio, teacher attitudes and in-service environmental teacher preparation accounted for 30% variance in the implementation of EE topics. For Wisconsin, regression analysis showed teacher attitudes, in-service and pre-service environmental teacher preparation accounted for 35% variance in the implementation of EE topics.

Based on the findings from this study, Wisconsin elementary teachers receive more pre-service environmental teacher preparation and implement more EE than Ohio teachers. Attitudes toward EE seem similar for Ohio and Wisconsin teachers, yet, Wisconsin teachers appear to be more confident in their abilities to teach EE. Wisconsin and Ohio elementary teachers’ implementation of EE is higher than their environmental teacher preparation.
The findings from this study suggest that environmental education instruction expected of elementary teachers should be reflected in pre-service and in-service environmental teacher preparation. Within any grade level, K-16, successful implementation of environmental education includes environmental teacher preparation and emphasis on teacher attitude toward environmental education.

Rivera and Carmen M. (1997) conducted a study on 'environmental education: A hands-on-approach to explore environmental issues in Puerto Rico with emphasis on endangered species'. The purpose of this work was to create a framework for the design of a hands-on approach to explore environmental issues in Puerto Rico with emphasis on endangered species. The product of the action research is a curriculum for children, ages seven to eleven consisting of fourteen formal lessons and twenty-three informal lessons that focus on ten chosen endangered species of Puerto Rico. The framework created in this study is based on the Environmental Education Goal developed in the Belgrade workshop that took place in Yugoslavia in 1975.

A theoretical framework for the curriculum design was presented as chapter III of the dissertation. It included a description of the historical background of the island of Puerto Rico. It also presents a general historical review that identified specific moments in the history of education in Puerto Rico and general information about the science curriculum on the Island.

The hands-on curriculum in Spanish for Puerto Rican children, ages seven to eleven, was developed as part of the study. It addresses environmental issues pertaining to ten specific endangered species from Puerto Rico and included fourteen formal lessons and twenty-three informal.

Sharp (1997) conducted a study on "In search of a preservation ethic: William Temple Hornaday and American environmental education." William Temple Hornaday (1854-1937) a leading taxidermist and field collector of large mammals in the 1880s, eventually became a prominent advocate for the preservation of live animals in Zoos (he was chiefly responsible for the foundation of the National Zoological Park in Washington, D.C., and was later the first Director of the New York Zoological Park), through the passage
of several federal and state bag limits on endangered animal species, and through public education.

Giuliano (1997) conducted a study on "Teaching as if your life depends on it: Environmental studies as a vehicle for societal and educational transformation." This work presents a process for teaching environmental studies that is based on active engagement and participation with the world around us. In particular, the importance of recognizing our intimate connection to the natural world is stressed as an effective tool to learn about human’s role in the environment. Understanding our place in the natural world may be a pivotal awareness that must be developed if we are to heal the many wounds we are experiencing today. This work contains approaches to teaching that are based on critical thinking, problem solving, and nonlinear, non-patriarchal approaches to thinking, reasoning, and learning. With these tools, a learner is challenged to think and to understand diverse cultural, social, and intellectual perspectives and to perceive the natural world as an intimate and integral part of our lives. To develop this Deep Teaching Process principles were drawn from many elements including deep ecology, ecofeminism, despair—work, spiritual ecology, bioregionalism, critical thinking, movement therapy, and the author's own teaching experience with learners of all ages. The need for a deep teaching process is demonstrated through a discussion of a number of the environmental challenges we face today and how they affect a learner’s perceptions. Two key items are vital to this process. First, 54 experimental learning experiences are presented that the author has developed or adapted to enhance the teaching of our relationship to the natural world. These experiences move the body and activate the creative impulses. Secondly, the author has developed workbooks for each class he has designed that provide foundational notes for each course. These workbooks insure that the student is present for the experience and not immersed in taking notes. The deep teaching process is a process to reawaken our senses. A reawakening of the senses and an intimate awareness of our connections to the natural world and the web of life may be the primary goal of any deep environmental studies educator.
The research in environmental awareness in India gained momentum in the late eighties. Vashisht (1995) and Singh and Bala (1996) have reviewed the researches done in the field of environmental education in India. As these reviews are quite extensive and scholarly, it is not sense repeating them. However, studies that reflect upon the various aspects and considered important from the point of view of understanding the environmental awareness and environmental education in India are reviewed here.

- The environmental awareness of university students in respect of the following components:
  a) Environment and Environmental Education.
  b) Pollution; Air pollution, Water pollution, Noise pollution, Soil pollution, Industrial pollution.
  c) Forest and Environment
  d) Miscellaneous
- The comparison the overall environmental awareness of university boys and girls and to compare the environmental awareness of boys and girls in respect of the each of the components.
- The comparison environmental awareness among: Urban and rural students, Boys and girls, Government and private school students.
- The determination of the difference in interest towards environmental education among: Urban and rural students, Boys and girls, Government and private school students.
- The development of an environmental awareness test for measuring awareness among students towards environment.
- The construction of an interest inventory for measuring the interest of students towards environmental education.
- The finding out the level of environmental awareness among students.
- The finding out the level of interest towards environmental education among students.
- The environmental awareness of adolescent students in respect of the following components:
  a) Forest and Environment.
  b) Air pollution, Water pollution, Soil pollution, Noise pollution.
  c) Miscellaneous.
- The comparison of the overall environmental awareness of adolescent boys and girls, and the environmental awareness of boys and girls in respect of the components.

A review of the research studies conducted on various aspects of environmental awareness and environmental education reveals that whereas some research work has been done on some aspects of environmental education in India, very few researches have been conducted in the field of environmental awareness and environmental education in general and in the study of efficacy of environmental awareness in particular.

Few studies related to some important aspects of environmental education have been reviewed here.

Gahir (1987) conduct a study of the attitude of scheduled castes towards population education and environmental education in relation to their family size and educational level. This study provides the attitude towards environmental education, while no significant difference was noted amongst the male parents, when primary pass group was compared with middle pass group, middle with matric and graduates with post-graduates, the attitudes of female parents in all these comparisons were distinct apart from one another. There was no significant difference between the attitude towards environmental education of male scheduled castes parents splits up in small, moderate and large size families and compared with each others. However, in case of female parents, whose husbands had the same educational background, the attitude towards environmental education of smaller size familied group, was more developed than the attitude of the moderate familied group and similarly that of moderate familied group more developed than that of large familied group. This difference in the more developed attitude of female parents, might be attributed to the equal
educational background of both the male and female parents and that of
male parents only.

Vashisht (1995) conducted a study on 'A Study of Environmental
Awareness among Adolescent Students'. The findings of the study are as
follows: (i) The group of boys is hardly aware about 50% of the items
pertaining to the component, "Forest and Environment". The situation in
respect of girls and the total group is still worse. It can therefore be
concluded that the boys and girls do not get the required exposure this
component. In a hilly state like Himachal Pradesh where forests constitute
an important component to maintain the ecological balance this awareness
in essential. (ii) With regard to the component of air pollution also the
awareness of boys, girls and the total group is poor. Most of the students
seem to be unaware of the ill effect, of certain activities like stone mining etc.
in this hilly region. (iii) Water pollution has evolved another area where
awareness of students is very poor. This component should be properly
attended to in the schools as water pollution is the major cause of serious
intestinal disorders. (iv) Although a very limited coverage was possible to
this component of soil pollution keeping in view the level of the students, the
results however indicate that students lack awareness in this component.
(v) From the percentage of correct responses on the component of noise
pollution it can be concluded that the group seems to be aware of harmful
effects of noise pollution. However, total awareness of the group is not
satisfactory. (vi) Regarding the issues like population and environment,
education and environment, preservation for wildlife and environment etc.,
the awareness of students is much below than needed. These are very
important issues affecting the environment and should be provided due
coverage in the schools. (vii) Comparison of boys and girls on overall
environmental awareness reveals that boys are more aware than girls. This
implies that we have failed to provide proper exposure to girls on
environmental issues. Girls have to play an important role in the preservation
of environment as housewives, member of community and in the capacity of
decision maker. (viii) In the component of Forest and Environment also, the
boys appear to be more aware than girls. (ix) In the component of air
pollution the awareness level of boys and girls do not differ significantly. Both the group have low awareness of this component and require equal efforts. (x) In case of water pollution again boys are more aware than girls. (xi) The awareness level in respect of the component of soil pollution does not vary significantly in both the groups. Both need exposure in the form of some curricular activities in the school. (xii) The awareness level in respect of the component of noise pollution does not vary significantly in both the groups. Both need exposure in the form of some curricular activities in the school. (xiii) Awareness of girls on certain other important issues like population and environment, wildlife and environment, literacy and environment, etc. is significantly lower as compared to that of boys therefore, due care should be given through educational strategies to enhance their level of awareness.

Bala (1996) conducted a study on "A Study of Environmental Awareness among University Students". The findings of the study are as follows: (i) The university students appear to be aware about the concept of 'environment' and 'environmental education' as more than 80% of the students included in the sample responded correctly to 90% of the items included in this component. (ii) The awareness of university students about the items included under the component 'pollution' is unexpectedly very low as only 20% of the items were responded correctly by 80% students. This implies that there should be more exposure of the students to the concept and problems of pollution. (iii) Awareness of the students on the concept of 'air pollution' is satisfactory particularly in respect of the boys as more than 80% of boys have responded correctly 75% of the items. However, in case of girls it needs to be improved as only 63% of items were correctly responded by them. The low awareness among girls about the environmental concepts may be attributed to their comparatively less exposure to such issues. (iv) The awareness of the students in the area of 'water pollution' is again low. However, the position of the girls in this component is slightly better than boys. Whereas, boys are aware about 44% of the component, girls are aware about 55% of the component. (v) ‘Noise pollution’ is another hazard affecting our health therefore acquisition of
adequate knowledge and development of desirable attitudes about noise pollution are important. However, the awareness of girls is not adequate in this area as only 50% of items were correctly responded by them. It is therefore suggested that more information about the factors causing noise pollution and remedial measures should be made available to the students. (vi) The awareness of boys with regard to 'soil pollution' was found to be much higher (80%) than the girls (44%). This implies that more information and activities available should be made to girl students. (vii) The students are quite aware about the utility of forests in cleaning and preserving our environment as 72% items have been correctly responded by them. (viii) Pollution caused by industries is another area where students do not have adequate awareness. However, they were aware of the threat posed by cement industries in Himachal Pradesh. (ix) Awareness of the students on issues like population explosion, destruction of wildlife, illiteracy, poverty and degeneration of values in relation to environment, is also low as only 36.4% items were responded correctly by the group. (x) The ‘t’ Tests applied to find the significance of the difference between the group of boys and girls on nine components indicates that except two components namely noise pollution and miscellaneous items, the boys and girls do not differ significantly on any other component.

Singh (1996) conducted a study on 'Environmental Awareness among Upper-primary students and their Interest Towards Environmental Education'. The findings of the study are classified in two categories:

A. Findings related to environmental awareness test:
   i) The level of awareness among students come out to be good i.e. students possess enough knowledge about various aspects of environment.
   ii) Urban students have shown good and at far better level of environmental awareness while rural students have shown average awareness regarding environmental issues.
   iii) It has been found that private school students possess better environmental knowledge than the government school students.
   iv) The girls are better than the boys in respect of environmental issues.
v) The urban private school students possess much better environmental awareness than the urban government school students.

vi) Urban boys possess higher level of awareness than the urban girls.

vii) The rural private school students possess much better awareness as compared to rural government school students.

viii) The rural girls have shown better performance on environmental awareness test than rural boys. The rural girls of private schools are at much higher cognitive level of environmental awareness than the rural girls of government schools.

B. Findings related to environmental education interest inventory:

i) The performance of students in general come under the category of good interest towards environmental education.

ii) The rural students have shown better performance than the urban students.

iii) The performance of boys and girls does not differ much. Both come under the category of good performance on interest inventory.

iv) The performance of government and private school students on interest inventory come out to be 'Good'. But the performance of private school students is better than the government school students.

v) The total urban students have shown good performance.

vi) There is no much difference between boys and girls on interest inventory. Both have shown 'good' performance.

vii) The urban boys of private schools have shown better performance than boys of government schools. But both come in the category of 'good' performance. Among girls, the girls of government schools have shown 'average' performance while girls of private schools have shown 'good' performance. Hence, the girls of private schools are better in performance on interest inventory.

viii) The rural students have shown good performance on environmental education interest inventory. The rural government school students have shown much better performance than rural private school students. But both come in the category of 'good' performance.
ix) The rural boys and girls have shown almost the same level of performance on interest inventory. Both come under the category of 'good' performance.

x) The rural boys of government schools have shown much better performance than the boys of private schools. Among girls, the girls of government schools are in the category of 'excellent' performance, while girls of private schools have shown 'good' performance. Hence, the girls of government schools are much better on interest inventory than the girls of private schools.

It is worth highlighting that among many serious questions, which are needed to be replied by all the concerned groups, there is precise question towards the cost effectiveness of environmental education in each country. In Thailand, a large number of researches reflected this view, for instance, Thanuthamcharern (1997), Sukchitt (1997), Primanee (1996), Adisornsakunvong (1994), Santipapwiwatana (1991), Pasuk (1991), Pooploy (1990), Meenoi (1990), Changplaikaew (1990), and Veeravatnanond (1984). The results gain from these researches indicated that even through Thai social and economic growth was steady in those years, Thailand's economic growth over the past decade has been very rapid. This has contributed to a drastic decline of natural resource stock and environmental quality. Forest land has declined continuously to a critically low level, while competition for water resources has intensified. Air and water quality in Bangkok and its vicinity, have deteriorated. Thus, Thailand must set up the strategies to balance a more equitable social and economic development with resource and environmental stability. This is the challenge for Thailand towards the sustainable development in next century. Unfortunately, in the late 1997 until now, the Baht (Thai currency) was devalued in several times resulted from the mismanagement of the economy which may lead to the slow down of economy and the GDP was also moved down. However, the studies in those years that reflected upon the various aspects and considered important from the point of view of understanding the environmental awareness and environmental education in Thailand are reviewed here.
Thanuthamcharern (1997) conducted a study on "Community Environmental Education and Changes in Highland Resources Management in Thailand." This research aimed at studying the process of community environmental education, and relationships between such process and resource management in highland areas. This qualitative research employed informal interviews, observations and focus group discussions to collect data. Then, the obtained data were grouped, checked analysed and presented descriptively. The results of this study were as follows:

1. The native ways of living of the community were found as productive means for earning a living of the villagers based on their belief system and local wisdom. Since the community had more social contacts with people from outside, its production pattern was gradually changed into the direction of trading increasingly.

2.1 The community environmental education was found as a measure to create and develop the villagers' behaviours, values, ethics and justice towards natural resources including soil, water and forest. Such educational process could be identified into 2 categories.

2.2 A learning process was derived from the community's local wisdom. The family institute played a vital role to transfer knowledge to its younger generations by telling and practical guiding as a direct learning way, and also through some ritual rites as an indirect way.

Learning process, which was encouraged from outside the community, was generated by the community leaders, new experiencing members and organizations' officers. They functioned as transferers of knowledge and experiences from outside to the villagers by means of organizing meetings, trainings, demonstrations, study tours, and campaigns.

3. The community was found as managing natural resources, including soil, water and forest, with close relations to the villagers' beliefs, norms, and production patterns for earning their living. The relationships between environmental education process and resource management could be classified into 3 categories. Those were the relationships at an ideal level toward natural resources; at a belief level
towards the resources' values; and at an operational level towards any action that was no harm to the resources.

Sukchitt (1997) conducted a study on "The Situation and Problems of Teaching Environmental Education in Secondary Schools under the Supervision of the General Education Department, Ministry of Education in Lampang province." The objectives of this study were to study the situation and the problems of learning and teaching about the environmental education in lower secondary level of the school under the supervision of the General Education Department in Lampang Province, the northern part of Thailand.

The sample under study consisted of 135 administrators and 216 teachers of the lower secondary level during the academic year of 1997. This study included the assistant directors of the schools, heads of the department and teachers of science, social studies, physical education, vocational studies and home economics. The research tools used in this study were the questionnaires constructed by the researcher. Data were analysed through the applications of percentage. The findings were as follows:

1. The situation of learning and teaching the environmental education programmes.

1.1 Personnel: Most of the personnel have been experienced and/or have had knowledge about environmental education on different media. Most of teachers have had experienced in connection with environmental education less than 5 years, and they require to be developed in terms of information about environment mostly their educational try.

1.2 Classroom activities: The most strategies were to assign the learners to learn from real situation both in classroom and outdoors. Before starting to learn in period, the learners should be informed on advance of the objectives of material.

1.3 Teaching aids and medias: The most practice used the local materials in making teaching aids and medias.
1.4 Evaluation: The most practice were to evaluate by observing the learner's behaviour in the classroom and their participation in the group activity, checking their works and their quiz.

2. The problems of learning and teaching the environmental education programmes.

2.1 Personnel: The worst problem was the teachers had to take the responsibility of too many other subjects to teach the environmental study.

2.2 Classroom activities: The worst problem was difficult to join the activities among the subjects of the same field.

2.3 Teaching aids and medias: The worst problem was the lack of modern teaching aids and media.

2.4 Evaluation: The worst problem was the teachers did not have enough knowledge and skill to construct the efficient evaluation's instrument for their subjects.

Primanee (1996) conducted study on "State and Problems on Environmental Education Camps Organization of Secondary Education Students, Bangkok Metropolis." The purposes of this research were to investigate the problems of environmental education camp organization for secondary education students, Bangkok Metropolis'. Three sets of questionnaire were used in the research. The population and samples were 21 teachers who were camps project leaders, 105 staff teachers and 210 students who used to join the camps. The obtained data were analysed by means of percentage, arithmetic mean, and standard deviation. The results of this research were as follows:

1. In the aspect of the state of environmental education camps organization, it was found that most schools used information concerning the condition of the site of camp and trends of environmental problems is setting up the objectives; camping plans were cooperatively set up by teachers who were camps project leaders, staff teachers and the student committee; most schools used activities in operational guideline and nature trail for camps activities; most environmental education camps scheduled for 3 day length; the major group of camp staff was science teachers; their
reasons for joining the camp were volunteering and interest working for the environment. The students paid for joining the camp; a questionnaire was used for evaluation and the results were used to improve their next camp.

2. In the aspect of problems of environmental education camps for secondary education students, the teachers who were camp staff opined that problems in all of aspects were moderate except the problem of time length, which was high. The students who used to join camping viewed problems of camp planning, activities, length of time, and camp site as moderate.

Adisornsakunvong (1994) conducted study on "A Study on Learning and Teaching on the Environmental Education for the Diploma in Nursing Science Curricula, Ministry of Public Health." The purposes of the study were to study on learning and teaching on the environmental education for the Diploma in Nursing Science curricula, Ministry of Public Health. There were two kinds of method to study. First, analysis research of nursing science curriculum diploma in 1985. Second, the opinion survey in environment and natural resources, opinion about learning and teaching on the environmental education from instructors and students, study the opinion about policy, factors, instrument, condition, and problem in learning and teaching on the environmental education of the instructors and administrators. The result of research was as follow:

1. The objectives of nursing science curricula want to make all post graduate student who can do in service of nursing in all grade. The structure of curricula makes up of four subjects: basic general, basic professional, professional nursing, elective, which had 147 total credit. The contents of environmental education appeared in sociology and social problems, health anthropology, basic concepts and principles in nursing I, basic concepts and principles in nursing III, community health nursing I, community health nursing II.

2. Instructors and students showed low level in interest about environment and natural resource problems. Instructors, level of interest were significant difference in domicile, hold a part of administration (P0.05);
that is instructors who hold apart of administration had more interest than instructors who had not, and instructors who live in Bangkok had more interest than instructors who live in urban. There were no significant difference in ages, education level of instructors. There were no significant in domicile, grade points average of students.

3. Instructors and students had a positive opinions towards learning and teaching on the environmental education. The domicile, age, hold apart of administrator, education level had no significant at the 0.05 level regarding the instructors' opinion towards learning and teaching on the environmental education, no significant were found base on domicile, grade point average of students.

4. Instructors and administrators had an approving idea for learning and teaching on the environmental education.

Santipapwiwatana (1991) studied “Knowledge and Opinions Concerning Environmental Conservation of Prathom Suksa 6 students in Amphur Chiangkham, Phayao province, in the northern part of Thailand.” The purpose of this research was to study knowledge and opinions concerning environmental conservation, and to study the relationship between Prathom Suksa 6 students' knowledge and opinions concerning environmental conservation. The samples consisted of 408 Prathom Suksa 6 students in primary schools under the office of Chiangkham District Primary Education, Phayao Province in the 1991 academic year. Simple Random sampling was used. The research instruments employed were tests and opinionaires concerning the environmental conservation. Research findings were as follows:

1. The students' knowledge about soil was very good. Knowledge about forest and water was good. Knowledge about wildlife and air was medium. As a whole the five topics of contents were found at good level.

2. The students' opinions concerning environmental conservation was satisfactory.

3. The relationships between students' knowledge and opinions about soil, water, air, forest and wildlife were low correlated at a significant level of .05.
Pasuk (1991) conducted a study on "Activities of Border patrol police Teachers in developing Environmental Awareness of Youths in remote areas in Thailand." The purposes of this research were to study the activities of border patrol police teachers in developing environmental awareness of youths in remote areas in three following aspects: (1) the management of classroom instructional activities and co-curricula activities. (2) the management of co-community activities as being the leader and consultant and as being the participant and coordinator. (3) the problems and obstacles in the management of classroom instructional activities, co-curricula activities and co-community activities. The samples were 624 border patrol police teachers. The research instrument was a set of questionnaires constructed by the researcher. The obtained data were analyzed by means of percentage, arithmetic mean and standard deviation. The findings of the study were as follows:

1. The activities of the border patrol police teachers in developing environmental awareness of youths through the management of classroom instructional activities and co-curricula activities;
   1.1 The classroom instructional activities practiced very often were as follows: to organize the instructional objectives, the content, the instructional activities, and the measurement and evaluation in accordance with the curriculum of the Ministry of Education. The instructional material most often used was the textbook published by the Ministry of Education.
   1.2 The co-curricular activities practiced very often were the agricultural activities for school lunch project and school environment development, the meeting among teachers, parents and students for local natural resources conservation planning, and the evaluation of students' continuous behaviours concerning environmental awareness by scoring.

2. The activities of the border patrol police teachers in developing environmental awareness of youths through the management of co-community activities;
2.1 As the Leader and consultant, the co–community activity practiced very often was to stimulate youths and people in the local community to participate in Agricultural and Lunch Project.

2.2 As the participant and co-ordinary, the activities practiced very often were to cooperate with youths and people in environmental preservation and conservation, and in the quality of life development.

3. Problems and obstacles in the management of classroom instructional activities, co-curricula activities and co-community activities which the border patrol police teachers found to be most serious were a shortage of modern instructional media, a lack of budget for co-curricula activities management, and the environmental illiteracy of the people respectively.

Pooploy (1990) conducted a study on the comparison of environmental education concepts of upper secondary school students between science programme and language-social studies programme in Bangkok, Thailand. The objective of the study was to compare the environmental education concepts of upper–secondary school students between science programme and language social studies programme. The subjects were 468 Mathayom Suksa six students of which 235 were science programme students and 233 were language- social studies programme students, selected by multistage stratified random sampling. The findings were as follows:

1. Mathayom Suksa 6 students of both science and language-social studies programmes had environmental education concepts at the moderate level.

2. In comparison of the environmental education concepts of Mathayom Suksa 6 students between science programme and language-social studies programme, there was a significant difference at the 0.01 level. The environmental education concepts of science programme students were higher than those of language–social studies programme students.
Meenoi (1990) conducted a study on Environmental Education Concepts of Social Studies teachers at the Secondary education level in Thailand. The purpose of this research were to study and compare the environmental education concepts of social studies teachers at the secondary education level between social studies teachers in the central area and the provincial areas, among social studies teachers with different teaching experiences, and different environmental education backgrounds.

A test with the reliability of 0.75 on environmental education concepts of social studies teachers at the secondary education level, consisting of 60 items of multiple-choices was constructed by the researcher, and administered to the sample group of 481 social studies teachers in 23 government secondary schools from central areas and 29 government secondary schools from provincial areas selected by multi-stage stratified random sampling. The obtained data were then analyzed by means of percentage, arithmetic mean (X), standard deviation (S.D.), t-test and one way ANOVA. The findings were as follows:

1. The environmental education concepts of most social studies teachers at the secondary education level were at the moderate level.

2. The comparison of environmental education concepts of the social studies teachers at the secondary education level:

   2.1 The environmental educational concepts between social studies teachers at the secondary education level in the central area and provincial area were not inclusively different at the 0.05 level of significance which rejected the hypothesis.

   2.2 The environmental educational concepts among social studies teachers at the secondary education level with different teaching experiences were not inclusively different at the 0.05 level of significance, which rejected the hypothesis.

   2.3 The environmental education concepts of social studies teachers at the secondary education level with different environmental education backgrounds were inclusively different at the 0.01 level of significance, which accepted the hypothesis.
Changplaikaew (1990) conducted a study of Achievement and Attitude of Conservation of Natural Resources and Environment in Social Studies by using Forecasting techniques and Regular teaching method. The objectives of the study were:

1) to compare the achievement of conservation of natural resources and environment in social studies by using forecasting techniques and regular teaching method;

2) to compare the attitude of conservation of natural resources and environment in social studies by using forecasting techniques and regular teaching method and

3) to study the correlation between achievement and attitude of conservation of natural resources and environment in social studies using forecasting techniques.

The subjects used in the study were 87 selected students from Mathayomsumksa I at Bangpakong (Borwornwittayon School), in Chacherngsao province, during the academic year 1989. They were randomly divided into experimental and control groups. The experimental group was conducted by using the forecasting techniques while the control group was conducted by using the traditional approach. Each group was exposed to 8 periods (50 minutes each periods) of experimental treatment. The collected data were analysed by one-way analysis of variance and Pearson product-moment correlation coefficient.

The results of this research revealed that the achievement of the experimental group and the control group was found to be not significant difference at .05 level; the attitude of students to conservation of natural resources and environment of the experimental group and the control group was found to be not significant difference at .05 level; but the correlation between the achievement and attitude of students using forecasting techniques was found to be significant difference at the .05 level.

Veeravatnanond (1984) conducted a study on the Current status of Thai teacher Institutions in regard to Environmental problems and a proposed Environmental curriculum system for Teacher training Programmes.
The study investigated the current status of Thai teacher institutions in regard to environmental curriculum system for teacher training in Thailand. An interview questionnaire was designed to gather descriptive data about selected Thai teacher institutions, teaching strategies utilized in environmental-related courses, and the employment of ten selected environmental-related problems in three aspects:

1. courses offered at Thai teacher institutions;
2. environmental research conducted by faculty members of Thai teacher institutions and
3. environmental services provided to the public by faculty members of Thai teacher institutions. Of the seventeen Thai traditional teacher institutions considered, representatives from fifteen (88 per cent) were interviewed.

The data indicate that:

1. Most Thai teacher institutions offer study about environment and its related problems either in traditional courses or in new courses which deal directly with environmental problems;
2. Among the ten selected teaching strategies utilized in environmental courses, there were no statistically significant differences between (1) urban and rural Thai teacher institutions, (2) Thai teacher institutions which offered study through the graduate level and those which offered study at the undergraduate level, except the teaching strategy of "discussion";
3. The teaching strategy of "discussion" received a significant difference in utilization in environmental-related courses between teacher institutions which offered study on graduate level and those which offered study at undergraduate level with t value of 2.266 at p< .05 and degree of freedom 13;
4. Both environmental research areas conducted by faculty members and environmental service areas provided to the public by Thai faculty members of teacher institutions were less emphasized in all areas of concern; and
5. Research and service areas in environmental education at Thai teacher institutions had a higher correlation than teaching and research or teaching and service area:

The environmental curriculum system for Thai teacher education was proposed to cover several traditional subjects and was based on a natural reality, Thai society, and the modern knowledge of educational innovation.

Apart from the studies highlighted above, a number of studies were undertaken conducted on the policy implementation through the educational system in many countries in Asia and the Pacific.

2-2 STATEMENT OF THE PROBLEM

Thailand is a southeast Asian country. It is situated in the heart of southeast Asia and as a gateway to Indochina. The main important problems of environment in Thailand are:
1. Severe reduction of forest land. At present, there is only 25% of forest left in Thailand;
2. Deterioration of the quality of soil due to using toxic pesticides without knowing information about hazards;
3. Shortage of surface water resources due to a rapid increase of population, industrial growth, demand for agricultural irrigation and an increasing trend toward water pollution;
4. Serious conflicts of land-use due to the rapid urban and industrial expansion, construction works, such land use has reduced fertile agricultural land and degraded the quality and quantity on natural resources;
5. Air pollution due to industries and transportation;
6. Degradation of the quality of marine resources, e.g. encroachment of mangrove forests, toxic wastes and oil spill pollution, coastal recreation;
7. Waste problems from settlements, agriculture, commercial centres and industries;
8. Maldistribution of population, shortage of housing, and increase of slum areas, particularly to improper urban growth.

The strategy for implementing environmental protection activities in Thailand is the establishment of standards for environmental conditions and
the introduction of regulation standard. Although these ideas have been introduced, the actual implementation is far below a satisfactory level.

There is a great need to have environmentally conscious citizens who are concerned for saving the environment from disaster. It might happen only when people are knowledgeable about their environment and problems occurred; are aware of the solutions to those problems and are motivated to work for that. This means change in the attitude and behaviour of people themselves.

Education in Thailand has played a crucial role in disseminating knowledge about environment and also in providing necessary skills and developing right attitudes for preventing and preserving environment. Both government organizations and NGOs provide environmental education. These organizations are, for instance, Ministry of Education, Ministry of University Affairs, Ministry of Science Technology and Environment. Various activities are carried out which include provision of environmental information through reading materials and training courses.

The Eighth National Education Development Plan (1997–2001) issued by the office of the National Education Commission, Government of Thailand has recommended that there should be increase and expansion of research activities in science and technology and social sciences relevant to economic, social and environmental development, both in quantity and quality.

Hence, it was thought worthwhile to conduct an evaluative study so as to ensure whether functioning of the environmental education programme under the Ministry of Education, Ministry of University Affair, Thailand are in line with policies regarding the environmental education programme set in by the National Scheme of Education 1992 as well as the Eighth National Education Development Plan (1997–2001). The Eighth National Economic and Social Development Plan (1997–2001) was prepared under a new era of increased global rather than national level development. Key elements include globalization, access to the information superhighway, trade liberalization, and global political developments as new challenges for the development of the country. In previous years, the economy grew so rapidly
that dislocations in the social structure became emphasized. It became clear
that social conditions had to be adjusted to fit the new economic conditions.
The rapid economic growth and the lack of social adjustment contributed not
only to ineffective resource and environmental conservation, but also to a
balance of global economic and social influences and the conservation of
Thai traditions and cultural heritage. Therefore, human resource
development has become the fundamental objective in the Eighth National
Plan. Human resources are perceived as the centre of all other related
development issues. The objectives for the Eighth National Plan are:

1. Strengthening quality of environmental and physical health of the people
   in the society to enable them to adjust to the rapid changes in the
   society;
2. Developing the social environment for families and communities to
   improve their quality of life;
3. Balancing economic growth and stability;
4. Ensuring the best use and management of resources and the
   environment to support a sustainable economy and society; and
5. Improving the administrative system by encouraging public participation
   in the development process.

Accordingly, to tackle the environmental problems in Thailand, there
is a need to evaluate the existing programme of environmental education
and also to determine its future trends in Thailand. To fulfil this purpose, the
following problem was selected for research:

ENVIRONMENTAL EDUCATION IN THAILAND:
AN EVALUATIVE STUDY

2–3 SIGNIFICANCE OF THE STUDY

It is expected that the findings of the present study will provide us a
clear and comprehensive perspective towards environmental education in
various aspects. Today’s students and people in Thailand are the
responsible citizens of tomorrow. Their attitudes, values and awareness are
going to affect the future environmental scenario significantly. It is this
generation that will be taking future policy decisions. It is therefore important
to know the concern of this generation with regard to important issues like environmental problems.

In the present study an attempt has been made to study the environmental education at the primary education, secondary education, and tertiary education levels as well as the role of non-formal education, including the appreciable spread of environmental awareness among the Thai people.

The findings of the study will also help to take some measures not only to study environmental awareness among students and people in Thailand in the Eighth National Education Development Plan (1997-2001), but also to upgrade their quality as well. The solutions can be solved effectively and efficiently only by the means gained from the evaluative study.

2-4 OBJECTIVES OF THE STUDY

The present study was undertaken with the following objectives:

1. To study the growth and development of environmental education in Thailand in historical perspective.

2. To study the problems of environmental education in Thailand with respect to the following components:

   - The level at which environmental education is imparted
   - Nature of the courses
   - Staffing pattern
   - Teaching strategies/methods
   - Orientation of teachers
   - Instructional and study materials
   - Evaluation
   - Dissemination of information
   - Management system
   - Counselling cell/Guidance bureau
   - Infrastructural facilities
   - Role of medias
   - Role of GOs and NGOs
   - Financial constraints
2-5 **DELIMITATION OF THE STUDY**

1. The study was delimited to the prominent primary schools, secondary schools, and higher educational institutions in the Central, the North, the Northeast and the South of Thailand.

2. The study was confined to the school boys/girls and students studying in undergraduate and post-graduate levels in the prominent educational institutions in the Central, the North, the Northeast and the South of Thailand.

3. The study was restricted to:
   
i) The administrators/heads of environmental education department in the prominent educational institutions in the Central, the North, the Northeast, and the South of Thailand.

   ii) The teachers/lecturers in the field of environmental education in the prominent educational institutions in the Central the North, the Northeast, and the South of Thailand.

   iii) The school boys/girls and students in the prominent primary schools, secondary schools and the higher educational institutions in the Central, the North, the Northeast, and the South of Thailand.

   iv) The experts of governmental organizations (GOs) and non-governmental organizations (NGOs) in the field of environmental education/environmental science/ecology and environment in the Central, the North, the Northeast, and the South of Thailand.

   v) The village people and local community people in the Central, the North, the Northeast, and the South of Thailand.

2-6 **OPERATIONAL DEFINITIONS OF TERMS USED**

**Environmental Education:** It refers to education through, about, and for environment.

**Evalitative Study:** It refers to the study of existing phenomenon in relation to certain aspects of the environmental education programme.