CHAPTER II

REVIEW OF RELATED RESEARCH

2.01 Meaning of Related Studies

2.02 Importance of Review of Related Studies

2.03 Research Studies

2.03.1 Studies on Environmental Attitudes

2.03.2 Studies on Environmental Perceptions

2.03.3 Studies on Environmental Knowledge

2.03.4 Studies on Environmental Education Needs

2.03.5 Studies on Noise Levels

2.03.6 Studies on Energy Education

2.03.7 Studies on the Status of Environmental Education
In the present chapter, *Meaning of Related Studies, Importance of Review and Research Studies under different divisions* are detailed.

2.01 *Meaning of Related Studies:*

According to Aggarwal (1975) study of related literature implies locating, reading and evaluating reports of research as well as reports of casual observation and opinion that are related to individuals planned research project. A documentary study may remain data gleaned from a great variety of published sources, the scholar must be familiar both with the standard reference guides in his own field and with general guides and listings.

2.02 *Importance of Review of Related Studies:*

Aggarwal (1975) has listed eleven important reasons for which review of related studies should be made.

1. The review of the literature is the basis of most of the research projects in the physical sciences, natural sciences, social sciences and humanities.

2. A review of the related literature gives the scholar an understanding of the precious work that has been done.
3. The results of the review actually provide the data used in the research.

4. It enables us to know the means of getting to the frontier in the field of our problem, until we have learnt what others have done and what still remains to be done in our area, we cannot develop a research project that will contribute to furthering knowledge in our field.

5. A review of the literature would develop the insight of the investigator. The information thus gained will save the researcher much time.

6. The importance of the review is quite obvious in delimiting the research problem and defining it better.

7. The review of literature will give the student the insight he needs to convert his tentative research problem to a specific and concise one.

8. A review of the literature can help the research worker in making him alert to research possibilities that have been over-looked.

9. In the process of reviewing the literature the student is on the alert for finding out research approaches in his area for that have proved to sterile.
10. The review of the literature provides with an opportunity of gaining insight into the methods, measures, subjects and approaches employed by other research workers. This in turn will lead to significant improvement of our research design.

11. A careful consideration of the chapter entitled 'recommendations for further research' in various research studies guides us regarding the suitability of a problem and in assisting us delimiting our research problems.

In the words of Walter, R. Bolg (1965), "the literature in any field forms the foundation upon which all future work will be built."

Eater V. Good (1959) said, "The keys to the vast store-house of published literature may open doors to sources of significant problems and explanatory hypothesis, and provide helpful orientation for definition of the problem, background for the selection of procedure, and comparative data for interpretation of results. In order to be truly creative and original, one must read extensively, critically as a stimulus to think".
2.03 Research Studies:

Environmental Education is of recent origin in India and adequate and relevant research studies are not available. A few studies available are presented under the following headings:

2.03.1 Studies on Environmental attitudes
2.03.2 Studies on Environmental perceptions
2.03.3 Studies on Environmental knowledge
2.03.4 Studies on Environmental Education Needs
2.03.5 Studies on Noise levels
2.03.6 Studies on Energy Education
2.03.7 Studies on the Status of Environmental Education.

2.03.1 Studies on Environmental Attitudes:

Andrews, David Michael (1978, pp.3493-A to 3494A) conducted a study to examine the relationships among cognitive, affective and behavioural domains in a six week long series of out-door activities concerned with investigating several ecological principles. The research sample consisted of 58, 6th grade students (25 males, 33 females). The results indicate that there is an apparent relationship between involvement in out-door environmental education activities and attitudes toward concepts related to these activities. There is also some relationship between
knowledge of environmental concepts and attitude towards those concepts. In both cases, the attitudinal change is in positive direction. These appears to be no relationship between sex and level of involvement or socio-economic level and level of involvement.

Hughes, Stuart William (pp.6674-A, 1979) conducted a study on comparison of the relative effectiveness of a student directed versus teacher directed programme of high school environmental science in changing student attitude towards environment. This research was defined student directed (SD) as allowing students to choose their own study goals within the broad frame-work of environment, which was defined as anything around them and affected them. The teacher directed treatment as used in this study was considered to be conventional approach in which the teacher, nor students, choose study goals, methods, texts sequence produced the tests and determined the grades. He found out in this study as the traditional or teacher directed course in environmental science is more likely to change environmental attitudes and knowledge of above average IQ, male, 10th and 12th grade students than is a student directed programme.
Hart, Earl Paul, conducted his doctoral dissertation study on "Environmental Education: Identification of key characteristics and a design for a curriculum organization". Environmental Education, a relatively new educational interest area is undergoing developments in theoretical formulation and practical application. A desire to examine the substantive structure of environmental education, which could be useful in curriculum work, initiated a study of the major characteristics of environmental education theory and practice.

The study was designed to identify key characteristics of environmental education and to develop a meaningful organizational framework for examination of possible inter-relationships among these key characteristics.

An extensive search of literature according to predetermined criteria revealed several major elements which may be said to characterise environmental education. It is proposed that these characteristics may be more meaningful if organized in terms of a framework which facilitates understanding of their inter-relationships. Examination of theory in curriculum development and cognitive psychology suggested an organizational framework based on curriculum design.
The proposed organizational scheme for environmental education - Curriculum components intended to improve understanding of the substantive structure of the curriculum of environmental education and to facilitate work in curriculum development, evaluation and research in environmental education, ways in which these can be accomplished are explored.

The study concluded that there are both, educational programme and programme support systems elements which appear to characterise environmental education. Relationships among these characteristics, when examined as components of educational curricula, appear to enhance understanding of environmental education as a generic concept.

The purpose of the study "Environmentalism: Implications for environmental education" conducted by Wintz, Mildred Mory (1987) was to describe environmentalism as a basis for driving implications for environmental education.

A review of the field of environmentalism revealed that it was not constrained. If there is a lack of agreement concerning the job matter area of environmentalism, then a distinct area for environmental education cannot be specified nor can agreement be reached concerning the appropriate preparation of environmental educators. Environmental education - even though deemed critical by environmentalist - becomes opportunistic, i.e., whatever the
current "focus" contained in an issue may be. If constraints for the field of environmentalism can be identified from past issues considered critical by environmentalists, then it becomes possible to describe the possible, relationship between environmentalism and environmental education. Examples of such issues in the past included pollution, desertification, acid rain, population and control of nuclear energy.

A further implication of the present study was that environmentalists, as they attempt to delimit the field, must be concerned with the various perspectives of the field and enfranchised decision-makers. Despite the difficulties associated with conflicting values and orientations, co-ordinated and systematic efforts must be made to delimit the field of environmentalism in order that environmental education must be addressed as a factor in assuring continuance of a society's resource flow.

The purpose of the study "Development of a k-12 environmental education program and an evaluation instrument to measure environmental education knowledge and attitudes of Yemen Arab Republic High School students", was to propose and an environmental education program rationale, key concepts, goals, general objectives and intended learning outcomes (ILOs) for Yemen Arab Republic
students in grades k-12; and develop and validate an instrument to be used for long-term measurement of high school students attainment of cognitive and affective objectives in the proposed environmental education program.

The study was conducted in two phases:

1. Phase one developed and validated a curriculum plan.

   The validation process included four steps:

   i. The proposed curriculum was reviewed by educators at Kansas State University,

   ii. The programme was sent to professional environmental educators in U.S.A.,

   iii. The revisions were sent to Yemeni graduate students at various universities in U.S.A.

   iv. Finally professional educators at Sana's University and the Yemen Ministry education validated the curriculum.

2. Phase two developed the environmental education instrument.

   The instrument was given to sample high school students in the United States. Cronbach Alpha analysis was conducted for the purpose of increasing reliability and validity of the instrument. After translating the instrument into
Arabic language, further validity and reliability were established by testing the instrument on 50 high school students in Yemen.

The curriculum has been developed to fulfil the need for environmental education in Yemeni schools. The intended learning outcomes were determined to be specific enough for building a curriculum which incorporates a wide range of issues and problems suitable for study in Yemen.

2.03.2 Studies on Environmental Perceptions:

Johnson, Warren Dale (1980) conducted a study to know the teachers' perceptions and circumstances that influence willingness to teach environmental studies. The study addressed five key questions:

1. What are teachers' perceptions of environmental studies?

2. Do teachers perceive that what they are teaching in their curriculum in environmental studies?

3. What kind of materials do teachers present when they teach environmental studies?

4. What experiences do the teachers believe influenced their interest, in environmental studies?
The results have indicated the following issues:

1. Teachers definitions of environmental studies are similar to definitions given by environmental educators.

2. All teachers were teaching environmental studies in one form or other, usually within science, social studies or reading.

3. Environmental studies sources often used by teachers are taken from science and social studies texts, student news magazines, nature publication and newsmedia.

Leftridge, Leonard Alan (1977, pp.5377-A), conducted a study on rural and urban secondary students' perceptions on environmental issues, relevant to the environmental education curriculum development. 43 classes were selected for gathering the data. The study identified, measured and compared environmental perceptions upon the literature and results of the study. After getting results, the researcher suggests the following, relative to environmental education curriculum development:

1. All students should be surveyed relative to the environmental issues which are relevant to their lives before attempting to embark on any activities
which are cognitive in nature.

2. A concerted effort needs to be made in the secondary schools to implement environmental awareness activities into all disciplines.

Dr. Michael (1987) has conducted a study of the effects of issue investigation and action training on characteristics associated with environmental behaviour in 7th grade students. The purpose of this research was to examine the effects of issue investigation and action training (IIAT) on variables associated with environmental behaviour in seventh grade students. IIAT is an environmental education methodology designed to promote environmental literacy by teaching middle school students

1. how to investigate environmental issues, and
2. how to apply environmental action methods to help solve environmental issues.

A pre-test, post-test design was used with four experimental seventh grade groups (n=64) receiving IIAT instruction and four control groups (n=85) for eighteen weeks. Pre-test data were collected on overt environmental behaviour, individual locus of control, and group locus of control. Analysis indicated that the groups did not differ significantly. Post-test data were collected on original variables, as well as knowledge of
environmental action, environmental sensitivity, perceived knowledge of environmental action, and perceived skill in the use of environmental action.

The following variables achieved at least 0.05 statistical significance: 1) individual locus of control, 2) group locus of control, 3) overt environmental behaviour, 4) environmental action knowledge, 5) perceived knowledge of environmental action, and 6) perceived skill in the use of environmental action. Environmental sensitivity was not significantly different. These findings suggest that formal educational strategies such as issue investigation and action training can successfully address the cognitive components of environmental literacy.

Brown, M. Arnell (1989) conducted a study on "A status study of environmental education in the upper elementary grades of the public schools of Pennsylvania". The general purposes of this study were:

1. To determine to what extent Environmental Education is incorporated into the fourth, fifth and sixth grade public school curriculum in Pennsylvania as indicated through the opinions of teachers responding to a mailed questionnaire.

2. To obtain general demographic information of the teachers of these environmental education courses,
schools and methods of instruction.

3. To see what common factors exemplary elementary environmental education programmes across Pennsylvania possesses to see if identifiable differences exists between them and the study sample and

4. To identify staff development practices that could be effective in helping teachers expand their environmental education expertise.

A questionnaire mailed to 114 principals and teachers was utilised to gather data. The results of the survey were reported using percentages, frequencies and chi-square statistics.

Results indicated that 78.6 per cent of the respondents felt that they were not adequately prepared to teach environmental education and inservice was not available in 73.9 per cent of the schools. Lack of time to develop environmental education programme was the item most respondents indicated as inhibitive to Environmental Education curriculum development. Teacher interest was the element most influential in implementing Environmental Education into the elementary curriculum in the study sample but state mandate was the most influential element in the exemplary school. While food chains and ecology were the
most often taught concepts in the study sample, environmental stewardship was the most important concept taught in the exemplary school.

2.03.3 Studies on Environmental Knowledge:

Noibi, Abayomi Serifi (1981) conducted a study on relationships between moral reasoning levels and selected environmental variable among teachers in Nigeria. The purpose of this study is three-fold:

1. to assess preservice and inservice teachers actual knowledge of environmental action skills;

2. to ascertain preservice and inservice teachers use of defined criteria in the selection and implementation of environmental action skills;

3. to determine the relationships between kohlbergain principled level of moral reasoning of four variables of environment related behaviour knowledge of environmental concepts, affect (feelings), verbal commitment and actual commitment (action).

The research design used in this study was an "ex-post facto" design for non-experimental study. The sample consisted of 110 pre-service and inservice teachers, obtained by a stratified random sampling procedure in the Lagos State of Nigeria. Data were obtained
through the administration of three instruments: "Environmental Action Inventory, Environmental Issues, Test Short Form and Ecological Attitude and Knowledge Scale".

The data collected were subjected to t-test in order to determine if there were statistically significant differences between groups mean scores on their knowledge of environmental action skills and their use of defined criteria. Pearson's product moment correlation co-efficients were computed to determine significant correlation between Kohlbergian principled level of moral reasoning and each of the environmental variables investigated.

It was clearly evident from the data presented that the sample of preservice and inservice teachers have - a) very little knowledge of environmental action skills, b) made little use of defined criteria in implementing environmental action, and c) no educational advantages from affiliation with environmental organisations.

The mean scores of the four sub-samples consisting of inservice graduate, Moslem and male teachers on knowledge of environmental action skills were significantly higher than their respective sub-sample counterparts pre-service, under-graduate, Christian and female teachers. Confounding variable associated with these
sub-samples may have affected these results. However, it was concluded that there are differences between these sub-samples.

Based on the results of the correlation analysis, it was concluded that principled level of moral reasoning was related to knowledge of environmental concepts and actual commitment to the environment. Furthermore a teacher's level of education correlated with his or her principled level of moral reasoning, knowledge of the environment and action taken to improve the environment.

The importance of education is re-emphasized by the results of the study. The results of the study should provide Nigerian educators with direction in designing and implementing preservice and inservice programmes to promote environmental education from a moral development point of view. Recommendation for the further research and measures to promote environmental education were made.

Cortes, Leticia Pojun (1986) surveyed environmental knowledge, comprehension, responsibility and interest of the secondary level students and teachers in the Philippines. The study also identified the independent variables that significantly affected the
dependent variables knowledge, comprehension, responsibility and interest correlated the dependent variables, and identified topics for inclusion in an environmental education curriculum for the secondary schools in the Philippines.

The findings of the study are:

1. The variables, community, section and school interaction significantly to explain the variance in environmental knowledge, comprehension, responsibility and interest in students' scores.

2. Based on the community, section and school interaction for four major groups of students were formed,
   i. special urban group composed of the private and public schools in the special community,
   ii. urban high group composed of high sections in the urban-industrialised communities,
   iii. urban low/rural high group composed of low sections in the urban industrialised communities and the high sections in the rural agricultural communities,
   iv. rural low group composed of the low sections in the rural agricultural communities,

3. The majority of the students were aware of pollution, pesticides, typhoons, dams and volcanic areas could
explain blast fishing and its environmental effects and age characteristics of the population in the Philippines.

Umelo, Anthony Nwosu (pp. 3281-A, 1982) conducted a study to assess the perceptions and knowledge of environmental issues possessed by science and non-science educators in Nigeria and to determine whether there is any relationships and difference existed in their perceptions and knowledge of environmental issues. The devised inventory was administered to a sample of (a) 21 college science educators, (b) 60 science oriented teacher trainees and (c) 45 non-science oriented teacher trainees from two institutions of higher education in Imo state of Nigeria. Results came from the study were:

1. The perceptions of environmental issues among educators, who were academically oriented, towards science did not depend on their knowledge of environmental issues.

2. That among educators, who were not academically oriented towards science, perceptions of environmental issues were related to their knowledge of environmental issues.

3. That educators responding to the survey generally possessed favourable perceptions and moderate knowledge of environmental issues.
2.03.4 Studies on Environmental Education Needs:

Nicholas, Carl Richard (1979) conducted a study to work with specific groups of individuals to assess what public perceives as needs as well as their attitudes, certain areas of curriculum. The sample consists of 88 adults. It is found that females more than males demonstrated a higher degree of concern regarding environmental issues, adults in the upper income brackets demonstrated a greater knowledge of environment.

Mc. Gregar, Bruce A. (1979) has conducted a study on 'the use of survival programme in environmental education'. According to him, an adequate description of how students make decisions in environmental problem solving situations does not yet exist. Such a description, incorporating economic political, technological and ecological factors, has not been advanced far real world environmental problem solving where modern technology comes into play. As such, there is a pressing need in environmental education research for a unification of the many approaches to environmental problem solving into a single conceptual model useful in describing a real world situation where a complex set of conditions must be incorporated into environmental thinking.
This study proposes such a model through a field study approach called grounded theory development. High school and junior college classrooms were observed where students addressed problems in socio-environmental conflict and where a range of factors - political, social, technological and environmental were deliberately involved.

The synthesis of a wide range of data from these class-rooms - controlled students' responses to sample problems, opinion questionnaires and direct class-room observation - resulted in a descriptive model of student decision-making, the study called the "Core survival Paradigm". Basically the core survival paradigm was a means for students to reduce the complexity of the socio-environmental conflict under study. It set up a means for channeling relevant information to the problem into the hands of experts, scientists, institutions or law-makers - who helped to create policy, laws or guidelines for regulating the adverse impact of new technology on the environment. The core survival paradigm, almost universally, specified that the ultimate means of controlling adverse impact would be technical in nature.

In his study, the core survival paradigm exerted a powerful influence on student reactions to environmental problems, in spite of strong curricular emphasis their
instructors placed on the dangers of purely technical solutions to environmental problems. Although all instructors in the study advanced and supported environmental ethics and values, a majority of students continued to adopt "hard" technological solutions to the range of problems encountered in class.

Only one classroom observed during the study offered uniquely different alternative approaches in environmental problem solving. In this classroom, the instructor offered "soft" technological solutions to problems, by which he meant a means for decentralizing the controls of environmental impact away from experts, and into the hands of individuals. In this classroom scene, students occasionally cited "covert" means in controlling impact in their responses to problems - such as educational programmes or a reliance on individual conscience to limit the spread of adverse impact.

The study concludes that the core survival paradigm is a powerful and appealing recourse for approaching a broad range of problems students face in environmental education scenes, and that it persists in advocating "hard" advanced technological solutions to problems in spite of instructional emphasis on anti-technological environmental values and ethics. As such, the core
survival paradigm constitutes a hidden agenda in environmental education settings that frequently perpetuates a single "technological ethic" as a universal approach to complex socio-environmental problem-solving.

The study further concludes that alternative approaches to socio-environmental problem solving in the classroom can be fostered by deliberate instruction in "soft" technological approaches to problems, where decentralized, individual kinds of control mechanisms are viewed as both adequate, and appropriate to the task of reducing man's negative impact on his environment.

The purpose of the study "Nature's Class-room; It's short and long-term impact on students" conducted by Santos, John Gerald (1987) was to evaluate the effectiveness of nature's class-room programme and to provide needed research in the field of environmental education. The study was designed to determine whether significant relationships exist between levels of cognitive, affective and socio-moral development before and after the nature's classroom experience by comparing six participating schools with a non-participating school.

Sample groups taking part in this study consisted of sixth grade children attending nature's classroom in the fall of 1983 at one of five sites of New England, and
one group of sixth grade children who had not attended Nature’s classroom. Test instruments used were the Test of Divergent Thinking (Williams, 1980), the Test of Divergent Feeling (Williams, 1980), and the Adopted Ethical Reasoning Inventory (AERI) adopted from the original by Bode and Page (1978) and derived from work by Kohlberg. Pretesting took place one to two weeks before exposure to the nature’s classroom program; post-testing took place one to two weeks after exposure and again five months later. This statistical procedure used in evaluating the data was analysis of covariance (ANCOVA) for repeated measures using the pretest scores as the covariate, and the first and second post-test scores as the dependent variable.

The findings concluded that the Nature’s classroom experience positively affects both short-term and long-term divergent process of cognitive development and the short-term socio-moral reasoning level of participating sixth grade children. However, there is no evidence to suggest that the divergent processes of affective development are influenced by the Nature’s class-room program.

2.03.5 Studies on Noise Levels:

Singh et al. (1986) have reported a comparative study of the psychological parameters of 75 normal healthy individuals exposed for 10-15 years to occupational noise
of 88-107 dB (A) of duration 6-8 hours per day with 36 normal non-exposed subjects. Blood pressure, both systolic and diastolic and heart-rate have been found to be significantly higher in the exposed subjects. They have also found irregularity in cardiac rhythm, both in amplitude and duration, in 18 per cent of the exposed subjects as against 6 per cent in the non-exposed groups.

Belgaumkar et al (1969) have reported studies of engine exhaust noise and silencer performance of a single cylinder two stroke scooter engine. Exhaust noise spectra of engine have been measured at various engine speeds with and without silencer and compared with theoretical predictions of frequency response made by setting up an electrical analogue. A reasonable amount of correlation with the experimental observations have been seen. To reduce engine noise appreciably, an additional section for the silencer has been designed to be connected in series with the existing silencer.

Shetye, Unny et al (1982) of the society for clean environment have conducted a survey of the noise levels in Bombay during Ganapathi and other festival activities like Navarathri and Virgin Mary Birth festival in Bandra Church. The noise level shoot up dangerous levels during
the festivities days mostly due to the blaring of the loudspeakers from early morning till mid-night in many of the congested localities of Bombay. During Ganapathi festivals for instance noise levels of 55-75 dB (A) during 5.00 p.m. and 70-90 dB (A) during 11.30 a.m. to 12.30 p.m. and 80-95 dB (A) during evening and late evening hours have been reported. Most of these places have a maximum noise level between 70-80 dB (A) on non-festival days during evening and the late evening hours.

Bhattacharya et al. (1981) have tested motor manual performance of twenty basic school educated persons of sedentary habits in both quiet and noisy environments. The results of the tests have been that motor manual performance, except motor co-ordination which remains unaffected, of the subjects improved in the noisy environments as compared to their performance in a quiet room. This performance is attributed to the theory that noise reinforces arousal effect in the subjects making them alert to cope with the situation.

Chattergy (1974) has reported survey of the otological and audiometric examination of factory workers of different age groups with different duration of exposure to noise. He has found different degrees of impairment of hearing. He has also enumerated the various steps
that need to be taken for noise control in factories.

2.03.6 Studies on Energy Education:

The purpose of the study "the status of the energy education at the secondary school level in the state of Alabama" done by Mr. McCarley, Judy Williams (1933) was to assess and evaluate the status of energy education in the state of Alabama. Specifically, the study dealt with personal characteristics of the secondary school science teachers along with school characteristics and whether or not these characteristics related to teaching energy education, topics, methods and procedures used in existing energy education programmes. The sample consisted of 400 randomly selected secondary school science teachers in the state of Alabama. Two hundred and forty-five questionnaires were returned.

An energy education questionnaire developed by the investigator was mailed to the randomly selected teachers. This instrument requested demographic information and information on the status of energy education as taught in the secondary school science classes in the State of Alabama.

Non-parametric techniques were employed throughout the analysis procedure. Chi-square was the statistical test used in the study.
The major findings were - a) the sex, age, number of years of teaching experience, level of certification and current enrolment in an advanced degree programme were not relating to the teaching of energy education, b) the academic major of the teacher and the subject taught related to the teaching of energy education, c) junior high science teachers used more varied teaching strategies than the senior high science teachers, d) the primary method of instruction was by integration into appropriate units, and e) energy education was taught from one to ninety nine days. The mean number of days was sixteen.

Carrie, Johanna conducted a study on "The growth of the concept of Energy - a longitudinal study in Scottish secondary schools"

The aims of this research were -

1. To measure understanding of energy concepts by first year pupils in Scottish schools (12 year old) at the end of a unit of work about energy.

2. To gain some insight into whether this understanding has been achieved through teaching in secondary school science lessons, or whether it is brought about by other influences.

3. To suggest strategies which may make the teaching of energy concepts more effective.
Pupils understanding of energy concepts were measured by twenty-eight questions in two picture tests. The results shown that

1. The pupils are best at recognising those forms of energy which can be directly experienced, and the example given is familiar. For example heat and movement.

2. Questions involving electricity were found to be more difficult than those showing heat, movement, light or sound.

3. Questions about chemical energy and potential energy were the most difficult.

4. Questions in which the direction of an energy change had to be identified correctly were more difficult than those involving recognition only.

Suggestions were made for teaching strategies which might promote better understanding of energy concepts. The ideas include:

1. Making pupils consider if there are relationships between heat, light, movement, sound etc. before starting experimental investigation.

2. Introducing each form of energy individually.

3. Use of number of card games.
4. A way of recording observations which encourages pupils to discriminate between the form of energy involved and the appliance in which the changes occur.

Bitner, Betty Lorraine (pp. 2725-A, 1983) conducted a study to investigate the impact of two departments of Energy (DOE) summer energy education work-shops, conducted at the University of Maine at Orono (UMO) during the summers of 1980 and 1981 on the 67 DOE participants and the impact of the local inservice energy education work-shops conducted by DOE participants on the 67 peer teachers. The results of the study suggested that the UMO summer energy education work-shops has positive effects on the DOE participants. It was found that DOE participants included significantly more energy education topics in their 1982-83 school curriculum used significantly more business or industry proceed units or materials and utilized both the unit within a course and the separate course curricular designs significantly more than the teachers.

Bhali, Nelson J. (1978) conducted a study on teacher awareness concerning energy sources, use and conservation. An energy awareness questionnaire and attitude survey was administered to 287 Oklahoma teachers to
assess the level of awareness and attitudes concerning energy sources, use and conservation. Analysis were made of total group scores as well as of comparisons between responses of male and female teachers; and science and non-science teachers. The result of this study seemed to indicate the general attitude toward Government policies, energy production, use and conservation is favourable.

Quint, Walter Charles (pp.6676-A to 6677-A, 1978) studied the effects of students, school activities on their parents attitude toward energy conservation. The researcher has defined primary transfer of attitudes as the effect of the school on the students' attitudes toward energy conservation. Secondary transfer, the trust of this study was defined as the effect of the students' attitude on their parents' attitude toward energy conservation. This study was conducted at West Deptford High School during the 77-78 school year. Specifically, the study employed the physical students and their parents as the treatment group. The results showed that parents, whose children used the energy curriculum felt less capable of conserving in January 1978 than those parents, whose children had not used the energy curriculum. And also he found that housewives felt more capable of conserving energy while the other parents less capable. And also
he confined that only parents of "high ability" students respond in the manner for the interaction between the energy curriculum and time of repeated measures.

2.03.7 Studies on the Status of Environmental Education:

The study investigated by Biddle, Barbara Ann, "The Status of Environmental Education in Texas Public Schools" investigated the factors required to develop and implement an environmental education (EE) component in the Texas public school curriculum. Statutory decisions on curriculum planning with respect to EE, from federal to local governance units were reviewed. Survey methodology was used to determine the status of environmental education in Texas public schools. Results indicate that in Texas programmes have been implemented by placing selected environmental topics in existing curriculum offerings. Assistance most needed is the identification of available materials, trained personnel and clearly identified facilities and curricula. Moreover, the investigation of environmental education must be supported by policy commitments from school system personnel who recognise environmental education as basic academic information.

Biddle, Barbara Ann (1988) has conducted a study on "the state of environmental education in Texas public
schools". This study investigated those factors required to develop and implement an environmental education component in the Texas public school curriculum. Statutory decisions on curriculum planning with respect to environmental education from federal to local governance units were reviewed. Survey methodology was used to determine the status of environmental education in Texas public schools.

Results indicate that in Texas, programmes have been implemented by placing selected environmental topics in existing curriculum offerings. Assistance most needed is the identification of available materials, trained personnel and clearly identified facilities and curricula. Moreover, the integration of environmental education must be supported by policy commitments from school system personnel who recognise environmental education as basic academic information.

A perusal of the above researches indicate that most of the studies are related to foreign countries and studies relating to Indian situation are very few. Even these studies conducted in India do not adequately cover different components of environmental education. There is need to find out the knowledge and needs of rural adults with a view to design appropriate curriculum in
environmental education for launching environmental education programmes to different clientele in rural areas. Studies in this direction are needed and the present study is an attempt in this direction.

The details of the present study are given in the next chapter.