CHAPTER II

REVIEW OF RELATED STUDIES
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The investigator made all the necessary efforts required to present this review of related literature. The investigator left no stone unturned and made a comprehensive and elaborate search of all the sources and material available in his purview.

The investigator consulted an exhaustive list of Journals, newspapers, magazines and a host of list of websites. The various Journals and websites which the investigator searched for his thesis work are as following:-

a) Indian Journal of Environmental Education.
b) Journal of Perspectives of Education
c) Anweshika Journal of Teacher Education.
d) Quest in Education
e) Indian Journal of Education.
f) Journal of Educational Review
g) Journal of Community Guidance & Research
h) Journal of School Science
i) University News Magazine

A careful and thorough review of the research journals, magazines, books, dissertations, theses and other sources of information available on the present problem were made.

The researcher has exhausted his efforts to study/go through the literature, informations, findings which have been done by the earlier scholars in this particular field. The review of literature is done so as to add up current knowledge and information available to the work which has been done previously and to fill the gaps left over by the previous researches.
The investigator through the present research has tried to contribute some new findings, informations and knowledge on the basis of the earlier information, work available, to contribute something new findings to this great ocean of knowledge.

It is a well known fact that the later researches should not give those informations and findings which has been given earlier. But it expected that every research must contribute something new to raise the scope of that particular subject under study. Keeping in view of this fact the researcher has tried his best to contribute to the present subject under study.

This chapter consists of only those studies which were found by the researcher to be considerably related to the present investigation.

2.1. Studies Based on the Environmental Awareness:

Nagra, Vipinder & Dhillon, J.S. (2007), conducted a study to examine whether sex differences have any effect on the Environmental Education awareness of school teachers along with their level. Thus a study was conducted to see the Environmental Education awareness among elementary & secondary school teachers in relation to level and Gender.

For the purpose of the study, a total sample of 3600 school primary and secondary teachers were selected from five districts of Punjab viz; Amritsar, Jalandhar, Kapurthala, Nawanshahar and Gurdaspur, using Stratified Random Sampling technique.

The sample consisted of 1800 elementary and 1800 secondary school teachers which were further divided as 900 male & 900 female teachers.

The investigator conducted the study with the help of a self-made questionnaire whose reliability and validity were tested. The reliability coefficient of the questionnaire by the test-retest method was found to be +0.99. After standardizing the tool, the final draft of the questionnaire consisted of 100 multiple choice items.
Statistical techniques used were 2 way (2 x2) ANOVA design & ‘t’ tests for the analysis and interpretation of data & testing the hypothesis. Means, standard deviations, maximum scores, minimum scores were calculated. Scores were arranged into various quartiles (0-25, 26-50, 51-75 & 75-100) to know about the number and percentage of respondents who have low, moderate, high and very high Environmental Education awareness. The data was analyzed to find answers to the hypotheses set for the study.

The study revealed that secondary school teachers showed significant variation so that it was found that secondary school teachers had a higher level of Environmental Education awareness than elementary school teachers.

The ANOVA results showed that F-value for gender of school teachers in the mean Environmental Education awareness test scores to be 1.24, which is statistically not significant at any level (P< .01). Thus it was found that gender of School teachers did not affect their Environmental Education awareness.

The investigator also found that male and female secondary school teachers showed insignificant variation in Environmental Education awareness highlighting that gender was not a factor affecting Environmental Education awareness among them school teachers.

The F-value for the interaction of variable, level & gender of school teachers (AxB), is 8.40, which is significant at both the level (P<0.1) and (P<.05). This shows that there exists an interaction affect between the variables, i.e.; the level of school teachers along with their sex affects their Environmental Education awareness.


The investigator undertook the study so as to know the level of knowledge related to environment in urban and rural upper primary class students and to know more specifically about their knowledge related to environmental problems like pollution and its types, population increase, Nature’s imbalances, Depletion of Ozone etc.
The investigator also investigated the views and knowledge of teachers, of how to protect the environment and how much importance they attached to the Environmental Education.

The investigator also tried to learn about the reasons, impacting the differences in the knowledge and awareness of the students about the environment.

The sample consisted of five upper primary schools, randomly selected from both rural as well as urban area of district Allahabad. Out of these ten schools, the 60 students of class VIII\textsuperscript{th} were selected as sample.

The survey method was selected in order to collect data. The investigator constructed two tools for the collection of the data. These tools were "Environment Awareness Scale" (EAS) and "Teacher's Attitude Scale" (TAS) towards teaching environment. After the collection of the data, Statistical analysis was done in the form of t'-test, 2way and 3 way ANOVA, correlation, SD and Mean.

The investigator through his study found that majority of the students did not appear to have much knowledge of the environment related issues and problems and were not aware of the importance of the content and the environment issues. They did not have any idea of the basic terms related to the environment like Natural resources, Nature’s Balance, Ecosystem, Biotic and Non-biotic Environment

The results also revealed that students from rural areas were having much less knowledge about the problems related to the Environment than their urban area counterparts.

The investigator also found that children from the urban areas were well acquainted with the problems of environment and it depletion on the other hand, rural children were not even conscious about the population explosion and its disadvantages. The investigator also revealed that both urban and rural teachers were aware of the environment and its protection and preservation. Thus the teachers of both, in urban and the rural areas are aware of the importance and the need to know about environment and consider it as an
important component of school curriculum. But the knowledge of the subject matter differs among urban and rural children from area to area. The study also found mass communication to play an important role in enhancing and focusing the attention of its clientele on the importance and need to protect the environment.

The study also stressed that children should be made aware and sensitized towards protecting and preserving environment and being aware of its importance for the survival of mankind.

The investigator found greater degree of sensitivity towards both knowing and protecting the environment that is needed in case of rural people. Community work and material aids should be employed for making children aware about the problem, people may face in degrading the environment and therefore teaching would be fruitful if they were shown the reality in action.

Thus the present study reflects on the need for creating awareness through environment study, which needs to be made part of the school curriculum.

Nagra, V and Dhillon, J.S. (2006), conducted a study to know about the environmental education awareness of secondary school teachers in relation to place of work (regional/ residential background), subject specialization and sex.

A total sample of 1800 secondary school teachers were selected using the Stratified Random Sampling technique from five districts of Punjab, namely; Amritsar, Jalandhar, Kapurthala and Gurdaspur.

The study was conducted with the help of a self made questionnaire whose reliability and validity were tested. The reliability coefficient of the questionnaire by test-retest method was found to be +0.99 and the final draft of the questionnaire consisted of 100 multiple choice items.

The 3 way factorial (2x2x3) ANOVA design and t-tests were employed for the analysis and interpretation of data and testing of the hypotheses. Means, SD’s, maximum scores, minimum scores, and medians were calculated. Scores were arranged into various quartiles (0-25, 26-50, 51-75, and 76-100) to know
about the number and percentage of respondents who have low, moderate, high and very high Environmental Education Awareness.

The study revealed that teachers in urban schools were more aware about environment and its related problems than their rural counterparts.

The study also revealed that Male secondary school teachers showed significant and higher Environmental Education Awareness than female secondary school teachers, thereby highlighting sex as an important factor affecting Environmental Education Awareness among secondary school teachers.

The investigator also found that Science secondary school teachers showed a higher Environmental Education Awareness than their Social Science and Language counterparts.

Significant difference was also found among the Social Science and Language teachers in Environmental Education Awareness. The Environmental Education Awareness of Social Science teachers were also higher than that of Language subject teachers.

Thus, from the above study it was concluded that more attention should be paid towards the teachers with rural background, female teachers and the teachers with Social Science and Language subject specializations. 

Vijayan, K (2006), carried out a survey based study to check the level of Environmental awareness among secondary school boys and girls.

The investigator has tried to find out the Environmental awareness of secondary school students. The investigator have also tried to find out that if there is any significant difference between boys and girls, government school and Private school students and any difference between students undergoing State syllabus and those undergoing CBSE syllabus, in their Environmental awareness.

The sample of the study consisted of 150 VIII\textsuperscript{th} standard students drawn from different secondary school students of Kozhikode district using purposive sampling technique.
The investigator developed a Standardized **Environmental Awareness Test (EAT)**. The test has a high internal consistency ($r = 0.73$) and high stability ($r = 0.84$). The Statistical techniques that are used were Mean, S.D. & Two tailed Test of significance.

The study revealed that secondary school students were having a good Environmental Awareness. From the mean Environmental Awareness score of entire sample, $M = 12.11$ and $SD = 3.91$, it was found that the majority of students had Environmental Awareness.

The study also found that there exists no significant difference in students Environmental Awareness in relation to their gender, and it was found that there exists no significant difference on students Environmental Awareness in relation to the type of schools.

The study also revealed that there exists no significant difference on students Environmental Awareness in relation to the stream of school. It was found that students following State syllabus and CBSE syllabus have different levels of Environmental Awareness. From the mean value of CBSE students it was found that they are having high Environmental Awareness than those from State stream.

Thus the study shows that with respect to Gender, Boys and Girls do not differ from each other in their Environmental Awareness. But a significant difference in the Environmental Awareness is in favour of students studying CBSE Syllabus which shows that they are more aware of their environment than students studying State Syllabus.

**Panda, S.K. & Thakur, Bala K Ram (2006)**[^1], made a study to find out the level of awareness of Environmental Education among the PG students. The major objectives of the study were to study the difference in Environmental awareness among PG students of Science, Arts and Commerce streams. The study was done in order to know the interaction between sex and subjects, if any, in Environmental awareness among PG students and to make some suggestions based on the findings for awareness of Environmental Education among students.
The sample of the study consists of 300 students from PG students (100 each in the three academic streams) of Kurukshetra University, Kurukshetra, which were selected through Random Sampling technique. From each stream, 50 students were female and 50 students were male.

The tool used was Environmental awareness Test (EAT) prepared by the investigator himself. The statistical techniques used were 2 way ANOVA and t-test.

The investigator found that Science PG students were more inclined towards Environmental Education than the PG students of Arts and Commerce streams. The main reason behind this is the inclusion of environmental issues in the curriculum of science students. The study revealed that the PG students of Commerce stream had lowest awareness towards Environmental Education as compared to the PG students of Science and Arts.

The study also found that there is no significant difference between male and female PG students regarding awareness of Environmental Education. However, referring to different streams, it was found that, in science and commerce streams, female students were more aware than the male students towards Environmental Education and in Arts stream, male students were more aware than female students towards Environmental Education.

Therefore, in the end, the study concluded that female science and commerce students were more conscious about their environment as compared to their male counterparts and on the other hand, the male Arts students were having more consciousness about their environment as compared to their female counterparts.

The study found no Interaction between Sex and Subjects towards Environmental Awareness among Post Graduate students.

Verma, Snehlata (2006), conducted a study to find out the effect of discipline, qualification and their various interaction on the awareness of and attitude towards Environmental pollution problem among pre-service, in-service teachers and teacher educators.
The study aimed to compare the awareness of Environmental problem and attitude towards Environmental pollution problem among pre-service and in-service teachers with respect to interaction between group, discipline and qualification and with respect to qualification, discipline and group.

The study also aimed to determine the awareness of and attitude towards environmental pollution problem among teacher educators with respect to interaction between group, discipline and qualification and with respect to qualification, and discipline.

The investigator also studied the relationship between awareness and attitude towards environmental pollution problem.

Through Random Purposive sampling, a sample of 300 pre-service teachers and teacher educators of one year full time B.Ed programme were selected from the teacher training institution of DU, JMI & GGSIP University. The investigator in order to carry out her studies used the Environmental Pollution Attitude Scale (EPAS) developed, designed, validated by Dr. M. Rajamanicam and published by the Institute of Community Guidance and Research, Chennai, India in 1998.

The investigator, herself developed, the Environmental Pollution Awareness Test (EPAT). The test has got content validity and Reliability value of 0.68 calculated by Split Half method using Spearman-Brown formula. The analysis of data was done by using the statistical techniques such as Mean, SD, t-test, F-test (2 & 3 ANOVA), coefficient of correlation.

The findings of the study revealed that the pre-service teachers (M=16.94), in-service teachers with their M= 15.36 & teacher educators (M=11.21) were below average in their awareness towards environmental problem. The study found that the pre-service teachers (M=100.31), in-service teachers (M=97.95), & teacher educators, with their M= 92.28 were neutral in their attitude towards Environmental problem.

The study also found that there is no interaction between discipline and qualification, so to have a significant effect on the awareness of environmental problem among pre-service and in-service teachers and the discipline had no
significant effect on the awareness of environmental problem among pre-service and in-service teachers. It was found that the mean value of Science teachers, M=17.28 was higher than Social Science teachers, M = 15.75, followed by Humanities teachers, M = 15.49, but not statistically significant. The study found that there was a significant effect of qualification on the awareness of environmental problem among pre-service and in-service teachers.

The discipline and qualification does not interact with each other to have a significant effect on the attitude towards Environmental problem among pre-service and in-service teachers.

It was also found by the author that discipline had no significant effect on the attitude towards Environmental problem among pre-service and in-service teachers and there was a significant effect of qualification on the attitude towards Environmental problem among pre-service and in-service teachers. The pre-service PG teachers surpassed pre-service Graduate teachers in their attitude towards Environmental problem but the in-service PG teachers, & in-service Graduate teachers, pre-service PG teachers and in-service PG teachers do no differ in their attitude towards Environmental problem.

The author also found in his findings that the discipline and qualification did not interact with each other to have a significant effect on the awareness of Environmental problem among teacher educator and the discipline did not have a significant effect on the awareness of Environmental problem among teacher educators.

Other findings of the author in his studies were that there was a significant effect on qualification on the awareness of Environmental problem among teacher educators. The teacher educators holding PhD degree surpassed PG teacher educators in their awareness of Environmental problem.

The discipline and qualification did not interact with each other to have a significant effect on the attitude towards Environmental problem among teacher educators. The discipline did not have a significant effect on the attitude towards Environmental problem among teacher educators. The mean
value of teacher educators belonging to science discipline (M= 95.26) was
greater than teacher educators of Social Science discipline (M = 92.63)
followed by teacher educators from Humanities discipline (M= 90.96) but not
significant statistically.

There was no significant effect of qualification on the attitude towards
Environmental problem among teacher educators. The mean value of teacher
educators holding PhD degree (M = 94.33) was greater than post Graduate
teacher educators (M = 90.38) but, not significant statistically. The pre-service
teachers (M = 16.94) were higher in their awareness towards environment than
in-service teachers (M = 15.36). The pre-service teachers (M = 99.24) do not
differed from in-service teacher (M = 97.40) in their attitude towards
environmental problem.

The type of teachers (pre-service and in-service), their discipline and
qualification did not interact with each other to make a significant effect on the
awareness of environmental problem.

The type of (pre-service and in-service), their discipline and qualification
did not interact with each other to make a significant effect on the attitude
towards environmental problem.

There was a positive and significant relationship (r = 0.37) between
awareness and attitude towards environmental problem among pre-service
teachers. There was a positive and significant relationship (r = 0.17) between
awareness and attitude towards environmental problem among in-service
teachers. There was no significant relationship (r = 0.16) between awareness
and attitude towards environmental problem among teacher educators. However there was a significant and positive relationship (r= 0.29) between
awareness and attitude towards environmental problem when pre-service, in-
service teachers and teacher educators were studied together.

Das (2006)^7, studied the development of Environmental awareness through the
study of Life Sciences in the secondary schools of West Bengal with the help
of three sets of questionnaires. Curriculum analysis, apart from the survey was
also made.
The study found heterogeneity among the groups in terms of their perception of Environmental awareness; it was also found that several approaches related to Life Science helped in enhancing Environmental awareness among the students.

A study was conducted by Dhawan, Seema and Rawat, L (2006)*, on awareness and knowledge of Environmental Education in Pre-service teacher education on pupil teachers of Garhwal University.

The authors found that Knowledge, awareness and attitude towards environment played a crucial role in the development of a child's personality.

The main objectives of the study were to compare the Environmental knowledge, awareness and attitude of B.Ed students of Garhwal University before and after training and to investigate the effectiveness of syllabus of Environmental Education in the B.Ed course of Garhwal University.

A normative survey method was used for the comparison of Environmental Knowledge, awareness and attitudes of pupil teachers of Garhwal University before and after training.

The samples were the pupil teachers of Garhwal University. Three tools, namely Environmental Knowledge Scale for teachers (EKST), Environmental Awareness Test for teachers (EATT) and Environmental Attitude Scale for teachers (EAST) were developed for the collection of required data.

These tools were administered before and after the training to study the effectiveness of Environmental Education of the B.Ed course. For the statistical analysis of the collected data, mean value, SD, t-tests and percentage of the raw scores were computed. Correlation was also used to study the relationship between Environmental Knowledge, awareness and attitude of pupil teachers.

The findings of the study revealed that the Environmental Education aspects of B.Ed course is sufficient for developing cognitive objectives but is insufficient to touch the Affective and Psychometric level or develop the positive attitudes skills and values towards environment.
Thus it was also concluded that EE is essential to develop insight and skills needed to influence not only Environmental attitudes and behaviour in the students but also to stimulate their reorientation of values regarding the importance of EE.

The study found a significant positive relationship between Environmental knowledge and attitude as well as between Environmental awareness and Environmental attitude of pupil teachers.

Thus the study found that pupil teachers having good knowledge reflect better awareness towards environment, but despite of good knowledge, they do not show positive attitudes towards environment. The study found that pupil teachers, after training have more Environmental knowledge, awareness and attitudes as compared to before training. The study also found that the Environmental knowledge and awareness of pupil teachers after the training showed a significant positive correlation and there was moderate correlation between Environmental knowledge and Environmental attitude before as well as after training.

The study also found that Environmental awareness and attitude of pupil teachers show very low positive correlation and there exists a moderate correlation between the Environmental awareness and attitude of pupil teachers after the B.Ed course.

Pardiwala (2005) revealed in his findings that, “unfortunately, the much needed bonding between people and nature cannot be taught or learned through a textbook within the four walls of a classroom. Human beings must be taught the art of living environmentally sustainable lives from early childhood”.

Fatima (2004) suggested that nearby cities and township special Environmental education centres should be established in which Environmental education might be given to people in natural conditions.

Ramakrishna, A (2003) made a study to find out Environmental awareness among high school students. The main aim of the study were to find out the adequacy of the content of High school Biology textbooks for Environmental awareness and to develop activities for the above
The study concluded that children exposed to these environmental related activities instill appropriate behaviours. Many significant activities are proposed in class IX\textsuperscript{th} because of the environmental biased content and also of the highly receptive nature of the cognitive stage of development i.e.; formal operations, where the child is capable of experimenting with the concepts learned in the previous stage.

These children as they grow develop sustainable lifestyle and participate in solving real life problems with a practical bias of ensuring a healthy environment all around.

James, Jeena (2003)\textsuperscript{12}, made a study on the “creating Environmental awareness among Primary school children through field trip”. The study aimed to find out if there is a change in awareness about Environmental pollution among primary school children through field trip and to know that if a significant difference is present between boys and girls in the awareness towards Environmental pollution.

The author also tried to find out that if there is any difference between Tamil and Malayalam medium children in the development of Environmental awareness. Statistical studies such as pre-test, post-test, single group design were used. The sample consisted of 24 children (11 girls and 13 boys) studying in V\textsuperscript{th} standard of Government T.V.P.S. Palukal district.

The investigator constructed a questionnaire of 20 items with the help of experts. The items were in the form of statements and a 3 point scale was given to respond, so the minimum mark was zero and maximum mark was 40. A pre-test was administered on the selected sample using the questionnaire so as to measure the awareness of the children and the same questionnaire was used for the post-test.

The study found that first hand experiences through field trip and innovative follow up works were found to be highly effective in boys, girls, Tamil medium and Malayalam medium and the entire sample is creating awareness about the environmental pollution.
The investigator also found that the impact of field trip experiences in acquiring awareness of Environmental problems to be same among boys and girls. No significant difference is found among Tamil medium and Malayalam medium children in the development of Environmental awareness. The study was conducted to see the effect of field trips and various activities on the awareness of Environmental pollution.

The results of the study showed an appreciable development in the awareness and attitudinal changes of the children in a desirable way.

The teachers must accept field trips as worth while as they provide opportunities to our children to enhance accurate observations and draw their own conclusions. The teacher must find time to plan and organize field trips since it was proved to be the most valuable, enriched and effective outdoor aid which widen the mental horizon of the children and make them aware of the disastrous results of pollution.

Pradhan, G.C. (2002)\(^{13}\), conducted a study to find out Environmental Awareness among secondary school teachers in relation to their background, sex and subject specialization. The investigator found that teachers in urban schools were more aware than their rural counterparts. He also found that male secondary school teachers were more aware than female secondary school teachers.

The study also found that secondary school teachers showed subject variation and science teachers showed higher environmental education awareness than their Social Science and Language counterparts. It was found that environmental education awareness among Social Science teachers was higher than that of Language subject teachers.

Another study was made by Mohansundaram and Kumaram (2002)\(^{14}\). In their studies they found that pupil teachers having good knowledge reflect better awareness towards environment, but in spite of good knowledge they do not show positive attitude towards environment.

Positive attitude is not reflected through their behaviour by the pupil teachers having better sensitivity for the environment. They concluded in their
studies that there is a significant relationship between the cognitive process and personality including aspects of behaviour of prospective teachers.  

**Sahoo, P.K. (May 2000)** conducted a study on measuring the effects of different components of environmental awareness, (viz; air pollution, water pollution, health and nutrition growth and total ecosystem) & to establish a relationship between Scientific attitude and Environmental awareness of +2 students of Rajasthan. Environmental Awareness Test (EAT) and Scientific Attitude Inventory was used on a sample of 350 male and 367 female students.

The study concluded that scientific attitude had significant and positive effect on most of the component of **Environmental Awareness Test (EAT)** and scientific attitude had significant and positive effect on most of the component of environmental awareness, health & nutrition, forest and agriculture, Population and growth. The study found that systematic way of living played an important role so as to influence most of the component of environmental awareness of students significantly and academically sound students were found more conscious of the environmental problems than the weaker ones.

**Prateek, M (Nov 1998)** also measured Environmental awareness among the Secondary School students. He found out the level of Environmental awareness among rural and urban students. A sample of 1000 students both from rural and urban areas was selected and Environmental awareness test was administered to them. After Descriptive Statistics and T-test analysis the study revealed that the students possessed enough knowledge about various aspects of environment. Urban students showed higher cognitive level than rural ones and both boys and girls were at equal cognitive level of Environmental awareness. The above three studies revealed that urban students were more environmentally aware than rural ones and both boys and girls were conscious about the environment but all the students did not consider their moral responsibility towards environment. The studies also showed that students of Arts and Social Science groups were less environmentally conscious than Commerce and Science groups.
Neelamegam, R and Maria Inigo (1997), conducted a study on Environment protection and awareness and highlighted the need and importance of environment protection in India.

The study found that as a result of improvement in Science and technology, rapid industrialization and human lifestyle, pollution to airspace, outer-space, water, land, wildlife and plants has become most common today and which is now threatening the mere existence of human life in this world. Thus the study concluded that the people should be made aware of the danger and act upon self decisions.

Aleem Zeba (1997) conducted a research on the study of Environmental awareness among the male Undergraduates of AMU. She measured and compared Environmental awareness of male Undergraduates of Arts versus Science, Arts versus Social Science, Arts Versus Commerce, Science versus Social Science and Science versus Commerce. A sample of 140 male Undergraduates was taken. The results confirmed that there was a significant difference in Environmental awareness of Arts versus Science, Arts versus Social Science, Arts Versus Commerce, and Science versus Social Science but there was no significant difference in Environmental awareness of Science and Commerce.

Bhattacharya, G.C. (1997), attempted to study the Environmental awareness among higher secondary students of science and non-science streams. He tried to find out the difference between the students in relation to their Environmental awareness, Environmental orientation, Environmental attitude, Environmental responsibility and gender.

The sample consisted of 200 students of science and non-science subjects. The investigator used the tool to measure Environmental awareness which was developed by Singh and Rao. The results showed that there was no significant difference between the students in their Environmental awareness and Environmental attitude but students differed in their Environmental orientation and the Environmental responsibility. It also revealed that female
students were comparatively more aware than male towards Environmental issues.

**Gunavant, M.Oza (1996)**, presented his study in a paper based on Environmental awareness and problems among students. This paper actively supported Environmental conservation endeavors, campaigns and crusades, initially in his individual capacity and later on, on behalf of the International Society of Naturalists (INSONA). Conclusion is drawn after above studies that nowadays students are more concerned about their environment, they are equally aware of the prevailing Environmental problems and are in favour of finding suitable solutions to overcome these problems. Generally all students feel that Environmental Education should be included in the curriculum.

A study was done by **Pradhan, Gopal Chandra (1995)**, on Environmental awareness of topics related to the environmental problems such as Pollution, Population explosion, deforestation, energy crisis, land use and ecological disruption.

The sum total of points received by an individual teacher trainee on the “**Environmental Awareness Test**” developed by the investigator was considered his/her EAT score. The author studied the various variations present in EA among the three teaching methods (that is Humanities, Social Sciences and Physical Sciences) of teacher trainees and variation in Environmental awareness between the teacher trainees having Bachelor’s degree and Master’s degree. The author also studied interaction between all the four factors (teaching method, locality, sex and educational qualification) or variables.

The findings of the study revealed variation in Environmental awareness between the urban and rural teacher trainees, where the former group was significantly higher than the latter. The master’s degree holder exhibited higher Environmental awareness compared to the Bachelor’s degree holders. The subject background of the trainees also has its effect on the knowledge and understanding of facts and concepts relating to different aspects of Environmental problems.
Singh, Raj Kumar (1995), made a study of Environmental awareness of school children towards the environment in Aligarh district. A tool was developed by the investigator so as to find out the difference in environmental awareness if any in relation to Gender, Standard and area (rural/urban). A questionnaire was distributed among a sample of 350 children which included 128 male and 222 female and after t-test analysis it was confirmed that there was no significant difference between boys and girls and also no significant difference was observed between students of IVth and IXth standards regarding their Environmental awareness. The study also revealed that rural and urban children did not differ in their awareness about environment.

Singh, Ummed (1995), made a study to assess environmental awareness of secondary school children through video-instructional package, among the school going children of Gujarat, Rajasthan & U.P. A sample of 180 Hindi medium students studying in classes VIIth & VIIIth were administered a questionnaire & analysis was done by applying Mean, S.D. & t-test. It was found that majority of students of classes VIIth and VIIIth of Kendriya Vidyalaya Surat, Rajasthan and Bareilly and three other states enjoyed learning through the video-instructional package and found it knowledgeable, innovative, systematic and interesting.

Usmani, Qudsia (1994), conducted a research on the environmental awareness in primary school children at Shahjahanpur. The investigator developed a tool to measure the awareness of children about the Environment. A sample of 100 primary school children was taken and the study revealed that there was no difference in Environmental awareness of boys and girls at primary level. It was also found during the study, that there was a significant difference between class Vth and IIIrd students regarding their awareness about the environment.

Shahnawaj (1990) carried out study to find out the Environmental awareness and Environmental attitude of secondary and higher secondary school teachers and students. The study aimed to find out any if significant difference exists between teachers and students in their concern towards the environment.
The study was done through a survey and the application of a tool, developed by the investigator himself so as to test attitude and awareness. The findings of the study revealed that 95% teachers and 94% students possessed positive environmental attitudes. It was also found by the studies that teachers were having more awareness of the environment than the students.

The study also concluded that trained and untrained teachers did not differ on environmental awareness and girls were having significantly more awareness of the environment than the boys.

Martha, Cornwell, L. (1989), conducted a study to examine male/female differences in Environmental concerns.

The study was aimed to find out that if there is any concern over energy resources and energy issues, over the urgency of pollution problems and if there is any concern over whether science and technology can solve environmental problems and problem of nuclear power and nuclear energy.

It was found through this study that the male/female differences in concern vary by dimension of concerned, country and group. The greatest differences were found on the Science and technology dimension and the least differences on the resource dimension.

Gender differences were in general great among the general public groups and were generally more likely among American groups than European ones.

Diane, Z.L. (1986), carried out a study on the Environmental awareness in students of rural New York. The study revealed Environmental factors played an important role in the rural planning.

Thus from the above two studies, it is clear that students of this era whether from rural or urban background have a general tendency to show concern over Environmental problems.

A comparative study was undertaken by Gupta, V.P., Grewal, J.S. & Rajput, J.S. (1982), to test the environmental awareness among rural and urban schools and non-formal education centre.
In their study, they selected a sample of 115, in which 55 students were from formal stream and 60 from non-formal stream.

The study concluded that all groups have general awareness about environmental problems and poor awareness in certain other fields. A significant difference was found between formal rural and formal urban on Environmental awareness. The difference between non-formal rural and formal urban was also significant and in favour of non-formal rural.

A study was conducted by Pai, S.G. (1981), so as to help the students acquire an awareness of the interrelationships, interactions and interdependence existing between biological and physical aspects of the total environment and sensitivity towards the Environment. This study was done to see whether the students have got strong positive attitudes, sound environment and the necessary motivation for active participation in the protection and improvement of the environment.

The author tried to help the students to develop necessary skills for solving various environmental problems and taking preventive measures. The study was conducted on a sample of 152 students. Data was collected using the Environment Achievement Test (EAT), Unit Test, Environmental Attitude Inventory (EAI) and Environmental Activities Inventory (EAI). A significant difference was found on knowledge score and attitude scores of the experimental groups as compared with control group in the performance. The experimental groups have found to gain more than the control group in the Environmental activities inventory in the case of effectiveness of curriculum. When unit-wise analysis of the performance of the students in the experimental group was done, it was found that they had gained overall knowledge in environmental problems as a result of instruction for using the curriculum.
2.2. Studies based on the attitude of the teachers towards the Environmental Education:

In 2008, Mastrili, Thomas & McKeon-Ice, Rosalyn, reported in her paper, "EE in Pennsylvania's Elementary teacher preparation Program: The flight to legitimize Environmental Education", that the status of Environmental Education as a component of pre-service teacher education programs were unknown on a national level.

The significance of this study is that it reports specifically on Elementary Education preparation institutions. It was reasoned that examining elementary teacher programs would prove beneficial because the preparation of these prospective teachers would be instrumental in providing the foundational aspects of Environmental Education to approximately one million elementary-stage students in the state. The instrument used in the study was modification of the survey Environmental Education employed by McKeown-Ice & the Environmental Literacy Assessment Consortium (1995).

The three basic objectives of the study were: 1) To assess the current level of environment and ecology standards implementation in Pennsylvania, pre-service elementary education programs. 2) To assess the current level at which Environmental Education pedagogical methods and strategies are integrated into Pennsylvania's pre-service elementary education programs. 3) Identify positive factors that encourage Environmental Education inclusion as well as barriers.

In 2008, Goldman, Daphne; Yavetz, Bela, in their studies used drawings and sentence completions to investigate how 118 pre-service elementary teachers defined the environment. The authors also examined the influence of ethnicity and dominant residential experience on the pre-service teachers' perceptions of the environment.

The results of the study, suggested that these pre-service elementary teachers did not possess the knowledge necessary to be considered environmentally literate.
Bhuveneshwara, Lakshmi & Sailaja, V.V. (2007), conducted a study on the environmental attitude of prospective secondary school teachers.

The main objectives of their study were as following. The author in their research studied the levels of environmental attitude of prospective Secondary school teachers.

The author also studied the influence of sex difference on environmental attitude of prospective secondary school teachers. A sample of 118 teacher trainees from two colleges were selected through a Random Sampling procedure. Survey method was used.

The author adopted a standardized tool of Haseen Taj’s environmental attitude scale. The researcher collected information from prospective secondary school teachers of Gudiwada (A.N.R. College of Education) and Machilipatnam (A.J. College of Education). The independent variables selected were Sex & Social Status (OBC, SC & ST, OC etc) and the dependent variable is Environmental attitude.

The statistical techniques that were used were Mean and S.D of the whole Sample, Mean and S.D. for the groups formed and ‘t’- test to test the significance of difference.

The findings of the study revealed that the prospective secondary school teachers differ in their level of attitude towards environment. The findings of the study also revealed that sex and social status of the prospective secondary school teachers makes no difference in their attitude towards environment.

Thus from the present study it was found that sex and social status of prospective secondary school teachers did not effect their attitude towards environment, but they differ in their levels of attitude towards environment.

The study also concluded that better training programmes in environmental education among teacher trainees could improve their levels of attitude towards environment and the teachers can provide better learning environment to develop environmentally knowledgeable pupils for India of the future.
A study was conducted by Mrs Gupta, Karuna & Rodrigues, Fr. L (2007), in which they studied the perception of teachers towards environmental education as a subject in secondary school. During the study, the researcher has tried to identify the attitude of secondary school teachers towards environmental education and the effectiveness of environmental education as a school subject.

The researcher has also tried to determine the level of environmental awareness among secondary school teachers.

A sample of 50 teachers from 5 different schools was selected. There were 30 teachers from Arts stream and 20 from the Science stream and sampling was done in the form of purposive sampling. The author identified 3 parameters as representing perception of teachers towards environmental education. These were attitude towards environmental education as a separate subject, opinion about the effectiveness of environmental education for the students and awareness about the environment.

The researcher prepared a questionnaire which comprised of three parts. The first part had 20 statements with the option of agree, uncertain and disagree. The second part of the questionnaire dealt with awareness, consisting of 10 items of Multiple choice type and the third part of the tool consisted of 2 statements where in teachers were invited to give their subjective comments.

The various aspects which were considered under perception of teachers are: - attitude towards the subject, effectiveness of the subject and awareness about the subject. The aspects which were considered under the educational background of the teachers are: - belonging to science streams and belonging to Arts stream.

The findings of the study revealed that many teachers feel that environmental education should be introduced in schools from an early stage onwards. The teachers should be abreast of the latest happenings in the field of ecology and environment. This would then enable the teachers to correlate these issues with the teaching of other school subjects.
The researcher also found that teachers from both Arts and Science streams feel that they are competent to handle environmental education. The investigator also found in their investigations that an effective evaluation method for environmental education should be worked out.

The findings of the study revealed that basic environmental education awareness is very high among secondary school teachers and most of the teachers were aware of the basic environmental facts and concepts, as indicated by their high scores in this area. It was also found by the authors that advanced level of environmental awareness is poor among secondary school teachers and the authors felt that there is a need for more innovative approaches for imparting environmental education.

The authors in their study concluded that environmental education must continue being taught as a separate subject at the secondary school level and it should be introduced from class Vth itself and there is an urgent need for teachers to receive proper training in environmental education. The researchers also noticed in their studies that new and innovative methods of teaching must be employed while imparting environmental education and teacher themselves must make efforts so as to keep in touch with the latest environmental issues.

Kumar, Shiva & Mangala, S Patil (2007) conducted a study with the aim of studying the favourable attitude of the students towards environmental education.

The author attempted to study the impact of environmental education course on the PG students’ attitude towards Environmental pollution.

The sample for the study comprised of 120 students studying in PG Departments of Karnataka University, Dharwad. The experimental group comprised of 60 students studying environmental course in their respective departments.

The students of environmental education were drawn from Departments of Botany, Zoology and Geography. The non-environmental education students were drawn from the Departments of Arts such as Kannada, English and History. The students represented the control group. The tool s used by the
investigator are: Environmental Pollution Attitude Scale (EPAS), developed by the investigator himself so as to collect the demographic details of the respondents and Personal Data Sheet (PDS) which was prepared and developed by Dr. Rajamanickam.

The statistical techniques which were used by the investigator were total mean, SD and 't' value was calculated for the comparison groups so as to find out the significance of the difference in their attitude.

The findings of the study revealed that environmental education students were having more favourable attitude towards environmental pollution as compared to non-environmental education students. When the scores of the sample groups were analyzed with the norms of the environmental pollution attitude test, it was found that environmental education students have moderately favourable attitude (awareness) towards environmental pollution, whereas non-environmental education students have neutral attitude towards environmental pollution.

The mean scores obtained by the male and female students on environmental pollution attitude scale are 102.71 and 101.98 respectively. The 't' value obtained for the mean difference between these groups is 0.29, which is not significant at 0.01 or 0.05 level. This result indicates that there is no significant difference between male and female students in their attitude towards environmental pollution.

When the scores of the male and female students are analyzed with the norms of the test, it is found clearly that both male and female students have moderately favorable attitude towards environmental pollution.

These above findings shows that environmental education has a positive influence on favourable attitude formation towards environmental pollution and related issues and also has a high concern towards environment and its related problems.

The findings of the study also indicate that there is no significant difference between male and female students in their attitude towards environmental pollution. It was also found from the above studies that both
male and female students have a moderately favourable attitude towards environmental pollution. When the scores of Male and female students were analyzed with the norms of the test, it is found that the both male and female students have moderately favourable attitude towards environmental pollution.

Thus, through the above study, the researcher concluded that standard Environmental Education course influences the attitude level of the students towards environmental pollution and related issues and there is no significant difference between male and female students in their attitude towards environmental pollution and related issues.

C. Naseema (2006), in her studies, have tried to find out the effect of the social position of the secondary school pupils, their knowledge of environment and how their sex difference have influenced their attitude towards the environment.

The objectives of the study set by the author were to find out the levels of attitude towards environment in secondary school pupils of Kerala and to test whether significant different exist between mean scores of attitude towards environment of pupils based on sex and different levels of social position.

The author further wants to see that whether significant difference exist between mean scores of attitude towards environment, for the comparable sub-samples based on locality and management category of the schools and to see whether the effect of sex and social position on attitude towards environment is significant or not.

The sample of study consisted of 460 students of standard IXth of secondary schools of Kerala and Stratified random Sampling technique was used for selecting the sample.

The tools which were used by the investigator to collect the data were, Scale of Attitude towards environment (SAE) and General Data Sheet (GDS). Mean, Median, Mode, Standard deviation and quartile deviations were used as statistical measures for interpretation and analysis of the scores. ‘F’ test was used to find out the group differences for the attitude towards environment of the sex groups and social position groups and also for relevant sub-samples.
based on locality and management category of the schools. 2 Way ANOVA with 2x3 factorial design was used to find out the main effect and interaction effect of the sex and social position on attitude towards environment.

The findings of the study by the author revealed that there was high percentage of pupils who were having moderately favourable attitude towards environment (38.9 to 56.2 %) and the percentage of pupils having high favourable attitude towards environment range from 19.3 to 36.4 %. It was also found after the study, that boys and girls differ significantly in their attitude towards environment and significant difference was noticed between high and low social position groups in their attitude towards environment and significant difference was noticed between high and low social position groups in their attitude towards environment, since the Cr of 5.3, exceeds the critical limit for significance at 0.01 level. The high and average social position groups differ significantly in their attitude towards environment at 0.01 level since the critical ratio is 10.2, while the average and low social position groups have no significant difference in their attitude towards environment (Cr = 0.18).

The findings of the test of significance for difference between mean scores for attitude towards environment revealed that rural and urban school pupils differ significantly in their attitude towards environment since the critical ratio of 0.86 does not exceed the critical limit for significance at 0.05 level.

Further findings for the test of significance revealed that Private and Government school pupils differ greatly in attitude towards environment as the critical limit is significance at 0.01 level. After the application of ANOVA to the sample scores it was found that the main effect of sex on attitude towards environment is negligible. Since the F value of 1.98 is less than the critical limit of significance at 0.01 level which is 3.58, it was found that the sex of the pupils do not have any major role in formation of their attitude towards environment.

Further it was revealed by the findings of the study by the author that the social positions of secondary school pupils have a predominant role in
determining their favourableness or unfavourableness towards their environment, as the F value of 2.58 is highly greater than the table F value of 6.66. It was also found that for the interaction effect of sex and social position the F value of 0.25 is not significant.

Thus it was concluded by the author, based on the above findings that the sex of the students does not seem to cause any difference in their attitude towards environment and influence of both physical and psychological environments which are caused due to socio-economic conditions of the family, parents' education, home condition of living, parents' love, care and incentives along with the cultural forces provide a resultant effect on the pupil's acquisition of environmental concepts.

They further concluded that pupil's acquisition of scientific concepts is controlled and influenced by a number of factors like nature of concepts, availability of instructional materials, methods of instruction, evaluation procedure, teacher training programme and characteristic of learners and among these, environmental interactions are the most influencing factors. So the author found that the environmental education must take into the consideration the various strata of the society based on their living environment and social position, and give them resourceful learning environments in the educational institutions and the government and local bodies should facilitate the secondary school teachers to enrich the knowledge of the environment or their surroundings. Thus the results of the study can be made useful to create a favourable attitude towards environment among children.

Suneetha (2006) took up a study so as to examine the status of basic understanding in the environmental education and the attitude towards environmental issues among the upper primary school students from Mysore district. The sample of the study consisted of 174 students from four schools of Mysore district. A post-test parallel group design was followed during the experimental study in which basic understanding test in environmental education and a scale of attitude towards the environment were developed. The attitude scale consisted of five basic components of environment, namely;
Biosphere, air, water, soil and energy. ANOVA, Duncan's Multiple Range Test and step-wise Multiple regression were followed to analyze the pooled data.

The author found in his studies that experimental treatment, using specially designed supplementary curriculum programme is, significantly much effective in developing favourable attitude towards the environment among the school children.

Apart from this, the study also demonstrated its effectiveness in terms of multidisciplinary approach, substantiating the infusion technique for teaching of environmental education.

**Abraham, Mercy and Arjunan, N.K. (2004)** undertook an investigation so as to study the pro-environmental behaviour of secondary school students in relation to their environmental knowledge.

The investigator undertook the investigation, so as to study the pro-environmental behaviour of secondary school students and to see that the differential effect of Gender and locale on the pro-environmental behaviour of Secondary school students.

The investigator also studied the degree of relationship between pro-environmental behaviour and environmental knowledge of secondary school students and compared the Coefficients of Correlation between pro-environmental behaviour and environmental knowledge of sub samples based on Gender and locale.

The study consisted of a sample of 624 secondary school students of Kerala, selected on the basis of Stratified Random Sampling technique. The sample was divided into 306 boys and 318 girls, rural and urban being 339 and 285 respectively. To carry out his investigations, the researcher developed two tools.

They were **Pro-Environmental Behaviour Scale, (PBS)** and **Environmental Knowledge Test (EKT)**. The Pro-Environmental Behaviour of the students was measured by using the PBS. The PBS is a likert type (3 point) scale which consisted of 30 items and covers 10 areas of areas of environmental action, viz; conservation of natural resources, conservation of
energy, recycling, waste disposal, pollution-abatement, planting trees, cleanliness and sanitation, kindness to animals, buying environmentally friendly products, and participation in Environmental protection activities. The scale has external validity of 0.53 and a test-retest reliability of 0.83.

The second tool was used to measure the Environmental Knowledge of the subjects. EKT is a standardized test consisting of 100 items, used to measure the knowledge of secondary school children, about various aspects of the environment and Environmental issues. The Split-Half reliability of the test, after correction for attenuation is 0.63. Face Validity and Content Validity were taken as validity of the test. The tools were administered on the sample in group situation and their responses were collected in separate response sheets, and the total score on the PBS and EKT were found out.

The data thus obtained were subjected to analysis using appropriate statistical techniques and interpreted accordingly. The mean and standard deviation for the total sample and relevant sub-samples based on Sex and locale were computed and group comparisons were done by applying the two-tailed test of significance for difference between means. Pearson's Product-Moment Correlation was used to discover the relationship between the variables within the total sample and each sub-sample separately.

The findings of the study revealed that only a small proportion of secondary school students' exhibit high environmentally mindful behaviour and boys and girls in secondary schools do not differ significantly in their pro-environmental behaviour. The study also found that there exists a low but positive correlation between pro-environmental behaviour and environmental knowledge of secondary school students and there exists no significant difference between rural and urban students in our secondary schools with regard to pro-environment behaviour and environment knowledge.

The findings also revealed that all the obtained coefficient of correlation are positive showing that there is an increase in environmentally responsible behaviour of the subjects and also there is a significant difference between boys
and girls in the degree of relationship between the pro-environmental behaviour and environmental knowledge.

In 2002, Shepardson, Daniel P, Harbor Jon, Cooper, Barbara; Mc Donald, Jim\(^3\), found in their studies that professional development programs should provide teachers with experiences that develop their knowledge and skills to integrate Environmental field studies into their school curriculum.

The article reports on a professional development model that engaged teachers in designing and conducting local environmental science projects. An overview of the professional development model is provided and evaluation data are reported, detailing the impact of the professional development model on teachers’ understandings about water-sheds, water quality and stream monitoring.

In 2002, Moseley, Christine; Reinke, Kay & Bookout, Veronica\(^3\) attempted to evaluate the effect of participation in a three day outdoor EE program on pre-service teachers’ attitudes towards self-efficacy which is a teachers’ belief that he or she can’t teach EE effectively and on outcome expectancy which is teachers’ estimation on his or her influence on student learning. Participants were a convenience sample of 72 pre-service elementary teachers taking a science methodology course at a state University. The tool used for the 3 tests was, Sia’s (1992) Environmental Attitude Inventory.

In 2001, Bendixen-Noe, Mary; Henderson, Janet; Plevyak, Linda, H.; Roth, Robert E; Wilke, Richard\(^4\), in their article, “Level of teacher preparation and implementation of Environmental Education:- Mandated and Non-Mandated EE teacher Preparation States(Environmental Education)”, examined associations between the level of teacher (K-6) preparation in EE and the level of implementation of EE in elementary school classrooms in Wisconsin (mandated Pre-service Competence) & Ohio (no pre-service Competence mandate) through correlational studies. The authors also measured elementary school teachers’ attitude towards EE. The results of the study found that the Wisconsin elementary teachers received more pre-service EE preparation and implemented more EE than Ohio teachers.
The results of the study also found that the attitudes towards EE were similar, but the Wisconsin elementary teachers were more aware of the Environmental Education programs than the Ohio teachers. **Legault et al (2001)**\(^4\) studied the impact of an environmental education program on students’ attitudes, motivation and behaviour. Results indicated that children who were part of the environmental education program group engaged in ecological behaviours, less for extrinsic motives than did children who were part of a control group.

**Dubey, Archana et al (1998)**\(^2\) found in her studies that educational status (ES) produced significant differential effects on overall environmental awareness of women.

A study by **Gardos et al (1997)**\(^3\), found that there was an immediate response to environmentally disturbed news and environmental attitudes of College students.

**Nasreen, Nakhat (1993)**\(^4\), studied attitude of College and University teachers towards Environmental Education. The results revealed that gender and experience in their direct effect significantly influenced the attitude of teachers towards environmental Education. Male teachers and experienced group of teachers exhibited more favourable attitude towards environmental Education than female and low experienced teachers. A significant difference was observed between the attitude of teachers from Science discipline and teachers from Humanities. As evident from such studies, environmental awareness greatly influences attitude towards environmental Education. Those who are more aware of environmental problems have a strong feeling about environmental protection, conservation and they are in favour of granting a significant place to Environmental Education in the curriculum at various stages of education.

**Malik, Amna (1993)**\(^5\), conducted a study on attitude towards environmental Education of AMU students and found that though Gender was not a matter of great influence on the attitude of students in general, but the subject discipline influenced the attitude of students towards environmental Education.
Praharaj, B (1991), conducted a study in which environmental knowledge, environmental attitude and perception was studied, regarding environmental education among pre-service and in-service secondary school teachers.

The investigator carried out the study to find out the level of environmental knowledge and attitude of pre-service and in-service secondary school teachers and also studied their perception regarding environmental education in the secondary schools. The sample for the study consisted of 302 in-service teachers serving in 50 secondary schools and 416 pre-service teachers of three teacher’s training college in Puri district of Orissa. The 50 schools were selected on the basis of Stratified Random Sampling. The environmental knowledge inventory was used to collect the data regarding environmental knowledge, the environmental attitude scale was used for measuring environmental attitude and a questionnaire was used to collect the data in perception of environmental Education. A personal data sheet was also developed to collect the data about present sex, place of residence, socio-economic background and teaching experience. The data were analyzed by applying percentages, ‘t’ test & one way ANOVA.

The investigator found in his studies that the level of environmental knowledge was found low among pre-service teachers, although knowledge was moderate and among the in-service teachers environmental knowledge, was moderate and factual knowledge about the environment was low.

The study also found that both in-service and pre-service groups of teachers differ significantly in their level of environmental knowledge, although the in-service group had a higher level of attitude towards environmental education than that of pre-service group.

It was found after the studies that there was a moderate correlation between environmental knowledge and environmental attitude.

S.P.Sinha (1991), conducted a study in which he concluded that the proper perception & cognition of environment could change the attitude of the human beings towards environment for utility of the environmental resources and
environmental education is one of the means of making the people aware of the consequences of environmental pollution and thereby reducing the environmental numbness.

Srichai, Naiyana, K (1988), conducted a study of environmental perceptions and attitudes of selected University students in Thailand, in order to investigate environmental perceptions and attitudes of Thai University students and factors influencing them. A total of 2,257 students were selected as sample from the faculties of Agriculture, Education and Engineering. A likert type questionnaire was made. The findings of the study revealed that students considered environmental problems less important than problems related to economics, social issues, education and politics. Students perceived deforestation and depletion of natural resources as major sources of environmental problems and placed overcrowding and pollution last.

Students indicated that the major causes of environmental problems were irresponsible businessmen and officers who failed to enforce the laws. Mass media such as T.V., newspapers etc. were ranked as the major sources of information followed by the lesson in the school.

Yount, James Robert (1988), studied the relationship between factors believed to contribute to the formation of an environmental attitude by college non-science majors. The results revealed that students who attended an environmental studies class did not significantly change attitude in comparison to the control group. They exhibited increase in their total count levels of the feasibility, in addition to students in the environmental studies courses with higher cognitive reasoning. Scores were more prone to increase total feasibility as a result of the course as well as change of attitude. The data implied a linkage between Cognitive and Affective domains in the environmental attitude decision processes.

Gupta, A (1986), studied attitude of teacher towards environmental Education. A tool was developed to measure the attitude of teachers towards environmental Education and compare the attitude of teachers teaching at various levels towards environmental Education. The sample consisted of 150
in-service teachers at primary, secondary and junior College levels admitted to vacation courses (1983-85) in B.Ed of University College, Nagpur, and 25 Lectures from 5 Colleges of Nagpur. The results revealed that the mean attitude score for all the groups of teachers was towards environmental Education, the degree of favour being high in case of Junior College teachers, then in Secondary College and lastly in Primary teachers. College teachers felt the need of organization of Environmental Education for the general group and Special group of learners. Teachers pointed out constraints like crowded class rooms, lack of time for proper planning of activities, loss of interest in the absence of regular follow up action etc for implementation of environmental Education programmes.

In general the teachers have shown a favourable attitude towards Environmental Education, their divided opinions or unfavorable attitude towards some issues, on the attitude scale. This indicated their lack of awareness of the interdisciplinary nature of the study.

Nancy, S.W. (1985)^51, developed a short, valid and reliable instrument so as to measure the attitude of environmental concern. This short scale of environmental concern has the necessary psychometric characteristic to become a useful tool for investigating the attitude of environmental concern. With repeated use, the short scale of environmental concern could become a standardized instrument for measuring environmental concern (attitude) among US adult populations.

2.3. Studies based on the attitude of teachers towards the Environmental values:

Durani, P.K. & R.K. S. Arora (2005)^52, in their study found that how teaching of values are related to environmental Science. They further found that, in environmental Science, the values development strategies that are expected to yield the best results are those which emphasize the provision of opportunities for the learners to act on their values.
They further said, that, “A student cannot appreciate environment based-values, if he has not mastered the basic principles and facts about the environment.”

The authors further point out that, the objectives of teaching environmental Science in context of value development, should, therefore, be to develop perceptual, conceptual and attitudinal abilities of the learners for insightful learning concerning their environment.

To conclude the author, emphasizes upon the fact that a Science teacher can succeed in teaching his students about environmental values if he possess skills in motivating the students towards the concerns of environment and also uses appropriate anecdotes, analogies, examples, experiences etc.

In 1978, the UNESCO-UNEP conference declared that Environmental Education should be provided to all ages at all levels in both formal and non-formal systems.

Through Environmental Education, individuals should be prepared for improving the quality of life and protecting the environment with due regard given to ethical values.

In 2004, McMillan, Emily E; Wright, Tarah & Beazley, Karen conducted a study so as to evaluate the impact of an introductory University-level environmental studies class on the Environmental values of students. Interviews & questionnaires were used to determine whether values changed or developed after taking the class.

Unstructured interviews were conducted and questionnaires were administered in a pre-test, post-test fashion at the beginning and at the end of the eight month class. The students were found to deepen their Environmental values after attending the class becoming more ecocentric & less homocentric. The students showed greater sophistication in their answers to the final questionnaire & interview.

Dadhich, L.K. (2003) highlighted the importance of value based environmental education in his article “Emerging challenges in value-based environmental education-Indian success stories”. The author highlighted in this
article that environmental education should be integrated into the whole system of formal education at all levels to promote the necessary knowledge, understanding, values and skills needed by the general public and many occupations of groups, for their participation in devising solutions to environmental questions.

The author emphasized that value education means an introduction of extra-curricular or informal activities emphasizing participation. These include excursions, study tours and field studies along with many other activities carried out such as youth associations, clubs, political movements and trade unions. The author further points out that value-based Environmental Education means to fulfill the need to develop new methods for the Environmental Education to be focused on the solutions of specific problems to be seen, to be of particular relevance to the society for developing an understanding of the environment and acquiring skills which could enable solution of problems that arose in management of the environment.

The author further highlights, that value based Environmental Education is of vital importance since it makes possible to overcome many of the administrative or bureaucratic difficulties associated with conventional or formal education.

According to the author, value-based environmental education is basically a combination of principles of Sociology and Ecology, which are necessary to enable the learners to foresee the consequences of their environmental work.

The author further points out to the fact that value-based environmental education stresses, upon the development of environmental understanding through self-awareness in our children as responsible environmental citizens, so that they know the ground they stand on, while maintaining a sense of wonder with nature.

Thus to conclude the findings and discussion, the author says that, “we have to develop the ecological and holistic worldview, which connects us with
the rest of the nature—both materially and spiritually and religious traditions emphasize this connection.

Thus, in brief, we can say that environmental ethics and values should be developed so as to contain the spiritual elements of the nature as environmental ethics and values basically ensure living in ‘PEACE’ and not in ‘PIECES’.

Srivastava (2003), conducted a comparative study of the life style and value pattern of the students in schools with different medium of instruction and the students from intermediate class grades (+2 stage).

Samples for the study were collected through a lottery system that is Random Method from four Hindi and four English medium colleges of Lucknow city. The tools of the study used by the author were Value Scale (prepared by Srivastava and Ram), the Life Style questionnaire and SES Scale Urban (by Datta). ‘T’ test was used for the analysis of the data. The author found that the respondents from two different medium differ in terms of their cognitive aesthetic and health related values, where as students from English medium school were found to be superior. However in terms of economic, patriotic, social, ability and religious values, they were found to be inferior to their counter respondents group from Hindi medium. The findings of the study further revealed a zero difference among the Lingua groups, so far as their scores on ‘Modern Indian Life Style’ is concerned.

Howard, S Irwin (1982), emphasized that education should be value oriented. Many people believed that environmental problems were simply biological, physical and chemical and these problems could only be solved by biotechnological advancement. However, environmental educationists recognized that in many ways the disruptions in our ecosystem were merely symptoms of underlying social beliefs and values. The main aim of the study by the author was through the use of various means and ways to integrate various value education successfully into environmental education.
S.C. Jain (1976)\textsuperscript{57}, described the incorporation of social, ethical and environmental values into Biology in India’s elementary and secondary schools.

2.4. Studies based on Environmental Education and its related problems:

In 2008, Negev, Maya; Sagy, Gonen; Garb, Yaakov; Salzberg, Alan & Tal, Alon\textsuperscript{58} conducted a National Survey of XII\textsuperscript{th} grade students in Israel to evaluate their Environmental Literacy including the dimensions of Environmental knowledge, attitudes and behaviour.

The authors presented the results of the survey, the correlations between these different dimensions and their associations with demographic and experiential data. The authors found a significant correlation between knowledge and behaviour –Ethnic & Socio-economic characteristics were moderately associated with Environmental Literacy, whereas the presence of an adult who mediated children’s relation to nature was strongly related to Environmental Literacy.

In 2007, Peer, Sara; Goldman, Daphne & Yavetz, Bela\textsuperscript{59} studied Environmental attitudes and knowledge of 765, first year students in three teacher-training colleges in Israel. The author studied the relationship between these variables and background factors and their relationship to Environmental behaviour, although the students’ Environmental knowledge was limited, their overall attitudes towards the environment were positive.

The authors found in their results a positive relationship between the Environmental knowledge and the environmental attitudes of the students and the level of their mothers’ education.

The results have also shown that students majoring in fields related to the environment were more knowledgeable and had more environment oriented attitudes in their behaviour.
Kumari, Chandra, Kumar, Surjeet & Gauraha, Manu (2006) conducted a study to assess the environmental awareness, environmental attitude and Intentional ecological behavior among adolescents.

The authors tried to study the awareness of adolescents and attitude of boys and girls towards environment. The author also tried to study the intentional behaviour of adolescents towards the environment.

The authors further studied the relationships between the environmental awareness, environmental attitude and between environmental awareness and intentional ecological behavior and also studied the relationship between environmental attitude and intentional ecological behavior.

The sample of the study were students of XI and XII Standard of Gorakhpur city; Gorakhpur district (U.P.). The sample was selected from four schools of Gorakhpur city schools randomly by chit system.

The investigator used three tools for the study. One tool was Intentional Ecological Behavior Checklist which was self prepared and the other two tools used were Environmental Awareness Ability Measure by Prakash Kumar Jha and Environmental Attitude Scale by N.N. Srivastava and Shashi Prabha Dubey.

Survey method was used for the collection of the data. The findings of the investigations by the author revealed that 72% girls and 66% boys were present in the category of High awareness level and only 4% girls and 14% boys were found be having low awareness level.

These respondents were found to be aware of harmful effects of sound pollution, malnutrition, water pollution, green house effect, impact of forests, immunization, restrictions of jet planes and the responsibilities of the individuals towards environment and its conservation.

It was also found by the author that 36% girls and 44% boys had a favourable attitude towards the environment, while equal percentage of boys and girls had unfavorable attitude towards environment.
Further, findings of the study, have shown that majority of the respondents were found to have a positive behaviour trend i.e.; with change in environment, the behaviour of respondents changed in a provable eco-friendly direction.

Thus the author concluded that there exists no significant relationship between environmental awareness and attitude and also no significant relationship was found to exist between environmental awareness and ecological behaviour and between environmental attitude and ecological behaviour.

A study was conducted by Devi, D.Uma and Reddy, P.Adinarayana (2006), in which the authors tried to check the knowledge and educational needs of the environmental awareness and related environment aspects among the rural adults.

The author in their studies have tried to identify the knowledge level among different categories of the rural adults such as adult education learners, adult education volunteers, education guarantee scheme instructors, elementary school teachers, Aganwaadi workers, health workers, organized and unorganized sector workers, village secretaries, village sarpanches etc, in different areas of environmental aspects. The author have also tried to find out the educational need level among the different categories of rural adult such as adult education learners, adult education volunteers, education guarantee scheme instructors, elementary school teachers, Aganwaadi workers, health workers, organized and unorganized sector workers, village secretaries, village sarpanches etc, in different areas of environmental aspects. The author have also tried to find out the significant differences in the knowledge possessed by the different categories of rural adults such as adult education learners, adult education volunteers, education guarantee scheme instructors, elementary school teachers, Aganwaadi workers, health workers, organized and unorganized sector workers, village secretaries, village sarpanches etc, in different areas of environmental aspects.

The researcher aimed to find out that if there exists any significant difference in the attributed need level among the different categories of rural
adults such as adult education learners, adult education volunteers, education guarantee scheme instructors, elementary school teachers, Aganwaadi workers, health workers, organized and unorganized sector workers, village secretaries, village sarpanches etc, in different areas of environmental aspects.

The total sample consisted of 600 respondents from 10 groups of rural adult residing in different areas of A.P. such as Rayala Seema, Telangana & Coastal A.P. Chitoor district of A.P.

Both open and closed types of questionnaires which were prepared by the author were used to find out the knowledge level of the sample. A three point Rating Scale was used for those rural adults who could not read nor write and were interviewed by the author.

The analysis of the collected data was done by using SD, Mean, and ‘F’-test (ANOVA) so as to find out the significant difference levels among the sample.

The findings of the study by the author revealed that the knowledge level among the different categories of rural adults who are involved directly or indirectly in Akshara Sankranthi programme, were organized workers who possess high knowledge in all aspects of environmental concerns such as Air pollution, Noise pollution, Water pollution, Forest issues, Pollution due to dams and mines, Land pollution, Population issues, Environmental sanitation, Food issues and Environmental legislation etc.

After the organized workers, the workers working in the unorganized sectors of rural areas stood in the next rank followed by health workers, village sarpanches and education guarantee scheme instructors, elementary school teachers, Aganwaadi workers and village secretaries, adult education volunteers and adult education learners.

It was found through ‘F’- value that there exists a significant difference in the knowledge possessed by the sample and further it is found that organized and unorganized workers possess more knowledge than the other educated groups.
Further findings by the author of the study revealed that village secretaries were more interested to know about the environmental aspects when compared to others. They expressed high need levels followed by village sarpanches, education guarantee scheme instructors, unorganized workers, elementary school teachers, health workers, adult education learners, adult education volunteers, organized workers and Aganwaadi workers.

Since the ‘F’-value of the scores is insignificant, thus it was concluded by the author that the policy makers, curriculum designers should make the lessons appropriate, so as to inculcate environmental awareness among the rural adults and to cater their needs.

Thus to conclude his studies, the author finds that continuing education centres should play an important role in promoting environmental concerns among the adult learners and these centers should also help the Prerak at the centre for the information.

Thus from the above study it was found that majority of the sample possessed poor knowledge about the environmental concerns.

Gupta, Surojit Sen (2005) in an article, “Environmental awareness and EE—the need of the hour”, highlighted the importance of Environmental Education. The author in her article says that “Environmental Education is a practical process to equip man with knowledge skills and commitment to improve his/her environment”.

EE is needed not just for creating awareness and knowledge among people; its effect is far more. It inculcates the development of right attitude and awakening of the urge to make the world a better place to live in. So one of the very important tasks of Environment Education is to make the society learn and understand about the importance and harmonious relationship between man and the environment.

In Environmental Education more emphasis should be given on learning than on teaching. Focus should be on learner centered activities and participation. Thus, Environmental Education is and has to be integral part of all education programmes and also should become part of social, cultural and
economic development education. Environmental Education should enable people to perceive the environment in its totality that is the totality of physical, biological, socio-economic and cultural complex. Environmental Education must aim at enlisting the cooperation and involvement of the people in environmental action. One of the primary goals of Environmental Education is to encourage more environmentally responsible behaviours. Thus, to conclude, the author said, “It is a common believe among people that matters of educational importance are dealt with an educational institution and certainly institution cannot neglect this vital aspect of education. Enthusiastic efforts must be made to include Environmental Education as an integral part of curriculum from primary to higher educational level. Three types of action oriented courses of study should be introduced at all three levels of education

1) Primary
2) Secondary
3) Higher Education.

The courses should be made interesting to the participants by assigning an active role for each one of them. At the primary levels efforts need to be made to supplement and correct the information the child has already gathered about his environment, particularly helping him/her to know more about the immediate surroundings. At the secondary levels, students should be helped to build on to the knowledge of immediate surroundings and engage in projects through which more personal and independent association of the environment can be made. At the higher educational level, more progress has to be made in identifying need and organizing “protection” projects.

Environmental Education awareness also has to be raised among public, administrators, planners, developmental workers, students and general public to stop pollution by following certain rules.

There should be co-ordination among various departments engaged in developmental activities and every scheme, has to be scrutinized by the department of environment or by a cell looking after ‘Environmental worthiness’ of plans in the respective departments. Agencies involved in
Environmental conservation and control of pollution should also coordinate their works for better returns. Timely monitoring and follow up actions after implementation of schemes/plans has to be taken up. Hence every one has to share the responsibility of conservation of the environment and make it more hospitable, clean, beautiful and pragmatic.

Singh, Sunil Kumar (2005)\textsuperscript{63}, highlighted the need of Environmental Education awareness in the article “Environmental Education: - A remedy for Environmental crisis”. The author in his studies explained how education and environment are related to each other.

The author in his studies concluded, that people while dealing with nature and natural resources have accumulated a lot of empirical knowledge on the basis of their experiences. This is based on the intrinsic relation that man and nature from part of an indivisible whole, therefore people in traditional societies developed an eco-centric view which is widely reflected in their attitudes towards plants, animals, rivers and the earth. All this knowledge of man is communicated in different ways to the next generation. This knowledge has been termed as “\textbf{Traditional Ecological Knowledge}, (TEK). It has been rightly said by NPE, 1986, that “Education is an investment in present and future”. So for betterment of present environment and to hand over that better environment to future generations, Environmental concerns must be incorporated at all levels of education, that is,

i) Pre-primary
ii) Primary
iii) Secondary
iv) Tertiary level of education.

The researcher in his article also points out that Environmental crisis is the greatest crisis of the day and Universities must take a lead in the area by framing suitable programmes for EE, personal training, materials preparation for Environmental Education and execution of whole program in a proper way.
Sundaramoorthy, T. & Sampath, K. (2004), at DIET Vadalur, Cuddalore, Tamil Nadu, conducted a study, in which they examined that how knowledge and attitude of pre-service teacher trainees who were doing a Diploma in teacher education, is related to their Environmental concepts.

It was found that the average score for the first year trainees on knowledge was 57.46% where as for the second year trainees it was 64.54%. In the three different categories, such as 'Constant'/ "Alternative", 'Fill in the blanks', and " Multiple choice", in which they were tested, a wide variation in the scores was recorded, both for first and second year trainees. With respect to attitude component, the average score for the first and second year trainees was 82% and 81% respectively. These higher values indicate that teacher trainees' have a highly positive attitude towards the environment. Though the attitude scores in general were considerably higher, the response of 10% to 65% of the trainees on 10 attitude statements were either neutral or against them. The “r” value for knowledge and attitude was 0.439. This positive and significant value indicates that knowledge and attitude are directly related to each other.

Thus it becomes known from the study that knowledge of the pre-service teacher trainees on Environmental concept was not remarkable. However, from the highest attitude score it is clear that they have a highly positive attitude towards the environment. The existence of positive and significant relationship between the knowledge and attitude implies that there is much scope for improving the affective aspect of the trainees towards the Environment, if interventions are made to improve their knowledge on Environmental concepts.

Panigrahi, S.K. (2004) in the article “Environmental Education: - Need of the hour”, concluded that the basic objective of Environmental Education is to raise public awareness and understanding of environmental issues with a view to promote the conservation and wise use of nature and natural resources.

The author also highlighted in his studies that Environmental Education should be used as a instrument for inculcating healthy personal and social attitudes towards environment and its development and the community should play an effective role in imparting Environmental Education in schools.
The author also emphasized that Environmental Education with a sustainable development will have to start with a process of questioning and understanding of the relevance of this orientation to education. Teachers should be made convinced of the need for an Environment Education orientation to teaching. Both, in-service teacher training and pre-service teacher training efforts are required to orient teachers to the Environment Education approach.

The author concluded his studies in his paper by emphasizing that environmental protection and conservation is very important for the promotion of sustainable development and to create public awareness about the significance and role of Environmental Education.

Verma, S.S. (2001), published a paper on Environmental Education in the new millennium. The approaches were to promote ideas and information on ideology, lifestyles and technologies which support rather than damage the environment through educational activities and residential course, to create general awareness on cleanliness, sanitation and Environmental issues, encourage individual and community involvement in the Environmental protection and finally paying for pollution.

The study concluded that future generations are likely to inherit a polluted and probably barbaric world of extreme inequality, science without civilization and society without humanity. In view of this, there is a great need to enact Environmental Education at different levels strongly complemented with sociological; and philosophical aspects of Environmental pollution to children, students and general masses of the society.

Luich, Chichhising (1998), studied the effects of an Environmental Education programme on responsible Environmental behavior and other associated factors of teacher college students in Taiwan. The purpose of this study was to develop an Environmental Education instructional program for Taiwanese College students. The proposed Environmental Education instructional program was developed through the integration and synthesis of several current theoretical frameworks and instructional models for different disciplines. The sample consisted of twelve classes of second year University
students and closed-ended pre and post tests questionnaire were distributed to them. The results support the effectiveness of educational program in influencing students Environmental awareness, knowledge, attitudes, self-efficacy, social support and responsible Environmental behaviour. Follow up tests provide support for the continuous educational effects on students responsible Environmental behaviour. These findings indicate that this instructional model provides a powerful approach to enhance responsible Environmental behaviour.

Monroe, Ronnie (1997), wrote a paper on the analysis of teacher beliefs and supporting structures in Environmental Education. Findings revealed that college education greatly influenced the teachers’ beliefs and practices. Although the subjects knowledge of Environmental Education literature was limited, her college experience grounded in action research and problem solving translated to teaching beliefs and practice supportive of and complementary to the Tbilisi objectives. Critical education questions were raised involving teachers’ beliefs and the effectiveness of specific Environmental Education strategies associated with the Tbilisi objectives.

Findings regarding teacher support revealed critical concern for Environmental Education. The subject believed that her schools science department failed to provide sufficient support due to Gender bias and the social, political aspects of Environmental Education. Recommendations involved the critical examination of Environmental Education within the context diffusion of innovations and models.

Medling, Michael, J. (1997), studied Environmental Education in China, “The case of secondary schools in Sicheran Province.” Since the Environmental protection emerged as a subject of 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 consideration in formulating Environmental policy. This research was drawn
on classroom observations and teacher interviews in schools which had early been pilot Environmental sites. Several themes in their teaching of Environmental studies emerged at these pilot Environmental Education schools. Data based on an Environmental questionnaire was collected from fifteen High schools in the Chendge region of Sichan province and was analyzed. Students in six pilot Environmental Education schools had significantly higher total mean scores on an Environmental knowledge scale than did students from the nine non-pilot Environmental Education schools in the sample. Differences in attitudes towards Environmental protection, which is statistically significant, were weaker than differences in Environmental knowledge.

Melweene, Martha, H (1996)^70, conducted a study on the comparison of Russian and American students concern about Environmental issues and implications for Environmental Education curriculum. A pilot study was conducted during 1992-93 school year to develop and test a questionnaire that would furnish information about student Environmental perception & concerns. Result of this study suggests that students’ Environmental perception can be determined and that these perceptions may provide a framework for teaching learning and curriculum for Environmental Education. The standards that are presented to educationists at this time do not sufficiently encompass Environmental issues researched in this study.

John, C.Smyth (1996)^71, published his paper on cultivating a National Strategy for Environmental Education, “A grower’s guide”. This paper reviews the process of strategy development, identifying the factors which seem to have contributed to its progress and considers its value as a model, which others might use and speculate on its future use in a world where the rate of change now appears to be exceeding the human capacity to adapt to it.

Sidana, Ashok and Pareek, K.M. (1996)^72, investigated interest towards Environmental Education among senior secondary students. They compared the interest of urban and rural as well as boys versus girls’ students towards Environmental Education. An inventory of Environmental Education
developed by the investigator was administered among the sample of 1000 students which included 500 boys from rural and 500 girls from urban areas. The study pointed that performance of students in general caused the ranks to take good interest towards Environmental Education. Significant difference between urban and rural students interest towards Environmental Education was noticed. Rural students possessed more interest than urban students and the boys and girls showed equal interest towards Environmental Education.

A study was carried out by **Herbert, Lynn. David (1996)**, to know the difference in interests across grades five through twelve and between the sexes in subject areas and learning activities common to science and Environmental Education. The aim was to provide general interest pattern and that could be used for motivation by science and Environmental Education instruction. An interest Inventory developed on curriculum of class IVth and Vth was surveyed by the researcher with the help of the views of the experts from India and Nepal. Through class observation and school surveyed by the researcher it was found that the proposed curriculum was functional but required more extensive evaluation for the whole range of units.

Likert scale techniques was used for the assessment of students interest in the subject areas of Biology, Earth Sciences, Health and Human welfare and in experimental inquiry and passive learning activities. The study showed that middle grades have average interest in health and human welfare while the High school grade boys showed interest in Earth Sciences but not girls.

All age group students of High school showed a greater interest in experimental education. At every grade level, the interest in experimental activities was high in both the sexes but it was higher in girls in comparison to boys. The technique like passive learning was not interesting among the middle grades students, but acceptable in high school students particularly juniors and seniors. It was found out that inquiry techniques were not interesting to any grades or sex in particular. A correlation between experience in the Environment and interest in passive learning was indicated by the regression analysis.
Maharjan (1995) conducted a study on the development of an Environmental studies curriculum, for primary schools of Nepal to measure Environmental awareness of the primary school children of Nepal. He developed an environmental studies science curriculum for classes IV<sup>th</sup> and V<sup>th</sup> and evaluated the developed environmental studies science curriculum.

Ballantyne, R.R. (1995), developed a programme on Environmental Education for student teachers and for this purpose an Environmental Education programme was designed and then implemented with a group of 19 final year students at the Johannesburg College of Education. There was obviously specific body of knowledge that formed part of the programme, but this was secondary to the aim of developing environmentally sound attitudes and values. The study produced findings which were commonly accepted principles of Environmental Education and observation has a great significance for Environmental Education. It appears that whatever be the specific content, if the underlying process is understood and appropriately implemented, the educational event will be more effective.

Smyth, John C. (1995), published a paper on “Environmental Education and the guidance of change”. The paper studied how education is guiding human kind into more environmentally sustainable pathways. At the Earth Summit the need for it was made very clear as well as its present inadequacy.

The paper states that social environment in which people lead their lives overlap with the political and economic environment, while both of them are enclosed within the Physical environment, natural or built. These ingredients of sustainable development, the expectation of the main stake holders and the determinators of the wider Environmental systems in which they function, must be brought together to create a coherent vision of what education is aiming for strategies which fail to address all the stake holders concerned, in terms with which they can identify, are as unlikely to succeed as those which fail to recognize the ecological system. Some guiding principles for organizing strategies are reaffirmed.
Artemios, Athanoski (1994) studied the status of Environmental Education in comprehensive schools in Greece. The new institution of the Greek Comprehensive School is trying to correlate theory with practice and knowledge with production. The intention was to connect the school with natural, cultural and social environment and to help the students to obtain global knowledge of life, nature, work, production and community. The course also aimed at developing awareness in public and to motivate them towards environmental issues, so as to formulate new standards of ethics and behaviour towards the environment and to inter-relate the school with socio-ecological matters and problems.

Dr. Swami B.C. & Mrs. Das. R. (1994), in their article “Environmental Education at school level”, published in the Educational Review, state that there is a need to increase awareness and understanding of the environment and to achieve this goal, Environmental Education is the need of the day.

Yang, Jing-Shin (1994), conducted a study on perceptions of pre-service secondary school (Taiwan), concerning Environmental Education. The goal of this study was to provide a base for policy and decision making processes affecting Secondary Teacher Education in Environmental Education in Taiwan (The Republic of China). The study was designed to collect information from prospective secondary school teachers at National Taiwan Normal University (NTNU) in Taiwan regarding:-

1) Their attitude towards environmental concerns, including ecological and environmental relationships, management, population issues, pollution prevention and control, and industrial and technological impact.

2) Their perception of Environmental Education is that they will be able to implement plans.

3) The influence of Gender and grade level upon students’ attitude towards the Environmental Education and perception of Environmental Education.
The sample consisted of 290 senior secondary student teachers of Arts, Science and Education. The results indicated that pre-service secondary school teachers had substantial concern for environmental issues. Female’s attitude towards environment were more positive than male’s and lack of knowledge and lack of teaching skills were two concerns of pre-service secondary school teachers which they faced.

A.J. Clacherty (1993), published a paper on understanding student experiences on Environmental Education programmes. The paper revealed that attitudes, values, morals and ethics are important facets of Environmental Education. Evaluation of Environmental Education programmes must therefore, include methods appropriate to these facets. A phenomenological approach to understanding Environmental Education experiences is presented and is shown through the nature of the findings, which emerge to be valuable, powerful and worthy of inclusion in the field of Environmental Education evaluation.

Sarojini, Gopala Krishnan (1993), carried out a research on studying the impact of Environmental Education on the primary school children through Environmental Education. She studied whether the impact was influenced by factors like the area, medium of instruction, type of school and Sex. The investigator tried to inquire whether there was any correlation between Socio-economic status and Environmental Education test performance, and to find out whether the participatory learning approach created a better impact by comparing the Environmental Education pre-test and post-test which was used on a sample of 1451 students. The study concluded that more children had developed very good impact of Environmental Education, and it was also seen that teachers in total felt that the time was insufficient to give importance to learner centered activities and except few they had expressed that the facilities provided in the instruction was in adequate and more funds could have been allotted.

Sahoo, K.C. (1992), conducted a critical study of the conception and perception of Environmental Education.
The main objectives of the study were to study the concept and constituents of environment relationship between environment and man, dynamics of the environment and to renovate the concept of Environmental Education.

The Philosophical method employing intuition, introspection, reflection and speculation were used in this study. Meta analysis was used with regard to available literature.

The major findings of the study done by the authors were that the concept of environment can be broadly divided as Natural and man-made types, and the flora fauna and atmosphere, hydrosphere & lithosphere constitute the abiotic and biotic environment respectively.

The study also found that man-made environment are of different types such as Social, Economic, Political, cultural, aesthetic, Historical, Geographical, Psychological, religious and academic. The study found that the fusion of different types of environment forms the holistic concept of environment. The relationship between man & environment is symbiotic in nature. The researchers also found that self management is the best formula for the good management of the environment, with focus on unity of life, Sustainable development, human welfare, futuristic and cultural progress.

**Norman, Katherine I (1992)**, carried out a staff development model for Environmental Education. The purpose of this study was to design and implement a staff developmental model that would assist experienced teachers in improving their knowledge and instructional abilities regarding Environmental Education.

This model was built by participant involvement in setting goals and included strategies for both bringing about change and for evaluating the effects of these changes on teachers and elementary school students. An analysis of the student scores indicated that the model was very effective in providing gains in student achievement.

**Lindsay, Purry and Brisbane (1992)**, conducted a study on Environmental Education in Australia and concluded that for the development and implementation of Environmental Education at the school levels, clear
guidelines were needed to assist schools with the complete tasks of curriculum development.

Walter, D.S., & Leal Filho (1992)* conducted a study on analysis of the logistical and structural problems involved in the undertaking of Environmental Education programmes in developing countries. A questionnaire was distributed among 136 member states and the results revealed that there were great differences in the status of Environmental Education among developed and developing nations and those social and economic problems create obstacles for the implementation of Environmental Education initiatives in developing countries. Due to large number of Environmental problems faced by developing nations, an increase in conservation education initiatives was required, in order to prepare both, as well as to understand and to face their country’s and ultimately their own, environmental problems.

Srivastava Ranjana, Singh Usha & Srivastava, R.K.(1992)*, in their paper on evaluation of Environmental Education and role of NGO’s in U.P. schools discussed the existing status of Environmental Education present at that time in U.P. schools, with reference to its importance, usefulness and effectiveness in rural water supply and sanitation programmes. Voluntary agencies have a role to play, as through these organizations effective transfer of education specially health, hygiene, sanitation, importance of acquiring and maintaining suitable source of drinking, water etc., is possible in rural areas.

Saxena, A.B. (1990)* studied the place of Environmental studies in primary schools. This study concluded that concept formation depended very much on the quality of real life experiences.

John Frens (1990)*, in his paper on accepting, the dual challenge for professional development in Environmental Education explores some of the curriculum issues involved in the development of a Master of Environmental Education Programme being developed at Griffith University in Brisbane during 1990. This paper begins with an analysis of the characteristics of Professional development programme that has been suggested as most
appropriate for a socially transformative enterprise such as Environmental Education.

This paper further outlined how the central questions, aims, objectives, course structure and proposed teaching methods of the Griffith University programme have been developed to meet the challenges of professional development in Environmental Education.

Arnell, B.M. (1989)\textsuperscript{a}, conducted a study on Environmental Education on the upper elementary grades of the public schools of Pennsylvania, to determine as to what extent Environmental Education is incorporated into the fourth, fifth and sixth grade public school curriculum in Pennsylvania as indicated through the opinion of teachers responding to a mailed questionnaire. It also intended to identify certain developmental programmes that could be effective in helping, teachers to expand their Environmental Education experiences. A sample of 114 principal and teachers were included. According to the findings of the investigator 78.6\% of the respondents felt that they were not adequately prepared to impart Environmental Education. He further noted that in-service training was not available to 70.9\% of the schools. Lack of time to develop Environmental Education Programme was the item most respondents indicated as inhibitive to Environmental Education curriculum development and finally teachers’ interests was the element most influential in implementing Environmental Education into the elementary curriculum.

Rajput, J.S., (1988)\textsuperscript{b}, conducted a research study for identification of teaching skills and training strategies required for implementing the environmental approach at the primary level.

The main objectives of the study were:-

1. To produce integrated material for Environmental studies –I (Social studies) and Environmental Studies-II (Science) for class III\textsuperscript{rd} to V\textsuperscript{th}.
2. To develop a strategy for teaching Environmental studies –I and II in classes III\textsuperscript{rd} and IV\textsuperscript{th} through the Environmental approach and 3) To test the relative efficacy of the developed strategies in relation to the objectives of primary education.
Another objective of the study is to identify teaching skills for the teaching through the Environmental approach. The statistical techniques of ‘t’-test and calculation of ‘F’- ratio were done to find out the significance of difference. Children of standards III\textsuperscript{rd} and IV\textsuperscript{th} of 10 Hindi Medium schools of Bhopal city were divided into the control group and the experiment group and were compared in their Environmental awareness.

The findings of the study by the author revealed that out of fourteen comparison groups in seven schools, 09 groups had no significant difference and the remaining 05 groups had a significant difference on the mean scores of environmental awareness for the experimental and control groups at pre-test and post-test level.

The findings of the study have also shown that out of the 14 groups, 05 groups had no significant difference on comparison between the groups and within groups and the significant differences obtained on some groups did not follow any uniform pattern.

Euler, Aline (1988)	extsuperscript{91}, conducted a similar study to examine the effectiveness of Environmental Education Programmes on the Environmental knowledge and attitude of students of sixth grade. A Multiple Choice Environmental Knowledge Test (EKT) and two attitude instruments, viz; the Millward Grinter Outdoor Attitude Inventory (MGOAI) and the Environmental Attitude Scale (EAS), which included attitude towards nature centers, city parks, plants, wild life and wild life and pollution, were administered to a sample of 267 students. The study demonstrated the influence of Environmental Education programmes of short duration on urban areas. From the study it was recommended that teachers begin to address the many Environmental problems and issues faced by the society, through Environmental Education programmes.

Soudabeh,A (1986)\textsuperscript{92}, studied the relationship among male and female sixth grades students of their attitude and their outdoor Environmental Education experience. The study investigated the perceptions of students towards their teachers, school and self in three settings:-
1) The regular school day one week before an outdoor Environmental Education experience.

2) At the end of one day outdoor Environmental Education experience.

3) The regular school day three weeks after the outdoor Environmental Education experience.

A sample of 314 sixth grade students was taken including both male and female. A ten item questionnaire was administered to them. Results indicated a significant change in students’ attitude, particularly those of boys, following outdoor experience. Students of both sexes showed positive attitude towards teachers in a regular school day, three weeks following the outdoor experience and finally it was concluded that outdoor Environmental Education was an appropriate way of instructions to motivate students’ perceptions of their school, teachers as well as themselves in a positive direction.

David, H.L. (1986), worked out a comparative study of interests in Science and Environmental Education, and their implication for instruction, to provide general interest patterns that could be used for motivation by Science and Environmental Education instructors. Moreover the study tried to assess student interest in the subject areas of Biology, Earth Science, Health and Human welfare and in experimental, inquiry and passive learning. An Interest Inventory was developed and administered on a sample of 239 students. The study identified that middle grades showed average interest or disinterest in Health and human-welfare, whereas the high school grades showed uniformly good interest.

He further noticed that in High school grades the boys showed interest in Earth Science but girls were found disinterested. All the age groups showed interest in Environmental Education. Passive learning technique was not interesting to any grade or sex in particular.

Ehsan, Md.A. (1985), conducted an evaluative study of Environmental Education Programmes in the primary schools of Bangladesh, examined the nature and scope of the existing Environmental studies programmes and to evaluate these components in order to determine their strengths and
weaknesses. The study was conducted on a sample of 107 respondents. The data was collected through a questionnaire. The study revealed that the general programme objectives of teaching Environmental studies had not been stated in the existing programmes, most of these instructional objectives appeared to cover the Cognitive domain only. All content units of classes IIIrd, IVth and Vth were suitable to the learners need, abilities and experiences. There was a balance of content between Physical and Biological Sciences. The set of programme objectives had fulfilled the categories of Environmental Education objectives as recommended by UNESCO and further all the experts felt that the suggested instructional media had taken into account through locally available resources and low cost materials.

Daniel, D.R. (1985)\(^8\), in his study described teachers’ opinions about Environmental Education in Pennsylvania. The result of this study indicated that there was a need to continue the thrust and development of Environmental Education in the state.

Hoffman (1978)\(^9\) suggested that Environmental Education could be connected with literacy education. Hence topics from General Science, Social Science, Geography, Economics, Civics etc. were combined together and presented in the form of environmental problems. The Objectives of these studies were to develop awareness about environmental problems.

Heinser Edward, A (1977)\(^10\), conducted a study to develop guide for the implementation, organization and administration of K.R Environmental Education programmes. The authors found nine more areas as important areas in the planning for actual running of such a programme within a school system.

These nine areas which were considered are as following:-

a) A rationale for Environmental Education.
b) The history of Environmental Education.
c) Initial implementation & Goals.
d) Philosophy
e) Curriculum and the Environmental Education process.
f) Pre-camp resident school administrative tasks.
g) Resident school distraction tasks.
h) Evaluation strategies.
i) Trends and Issues in Environmental Education programmes. 
Althoff and Greig (1977), through their work revealed that the respondents showed great deal of concern about the environmental issue, a relatively low level of dedication towards the environmental protection, and some degree of commitment of personal aids to solve the pollution problem.

Many conferences and seminar held in different countries, like Kuwait, Bangkok, Helsinki (Europe, Bogota, UNEP, AAU (1978), UNESCO (1980) Capuiro (1979), Marris (1976), Harvey (1977), emphasized upon the main functions of Environmental Education, which were to develop awareness of, and sensitivity to the total environment and its allied problems; to provide knowledge about the environment, to develop attitude, social values and strong feeling of concern for environment and for developing skills to solve environmental problems and so on.

Reid and Shaw (1975), were the first to study on Environmental Education and the problems related to Environmental Education, at primary and secondary level.

2.5. Studies based on the curriculum of Environmental Education:
Hanumanthaiah (2006), made an attempt to study the effectiveness of curricular creativity inputs in Physics at the secondary school level with a basic aim of preparing lesson plan in Physics at the Xth grade and to study the effectiveness of such lessons on the students, in relation to mental and psychological attributes.

A purposive sampling technique was adopted for the study where Baqar Mehdi’s (1975) test of creativity, RSSB test of mental ability and Socio-economic status Scale by Kuppuswamy, as well as two reaction questionnaires for experts and students were used as tools to, pool the data. Statistical technique such as 't'-test were applied for the analysis of the data.
Singh, Sunil Kumar (2004) conducted a study and made some observations regarding the inclusion of Environmental studies at the Undergraduate courses. The author made several observations, some of which can be highlighted in the following few lines.

The author found that as the University system is not active towards its responsibility of meeting the Environmental challenges/crisis in the society, so the Hon’ble Supreme Court had to interfere in the matter for the welfare of the society. The author also observed that science courses at the UG level have several course contents related to Environmental Education and the Professional courses like B.Ed, B.lib, BPED, BBA and MBA etc give admission to graduates.

Another observation made by the author is that Universities take a lot of time to modify their syllabus and include EE as part of their syllabus, as they have a rigid structure for modification of the existing syllabus (Department Councils/Board of Studies/Academic Council). It was also noticed that Environmental Studies is of interdisciplinary nature and all the departments of Universities/colleges do not have sufficient faculty members with expertise in EE and the printed reading material in the area of EE as suited to different subjects is also not available in general.

The author also observed that like Environmental issues, there are other issues like human rights, consumerism, entrepreneurship, Management aspects, and gender issues etc, which are needed to be amalgamated in different subjects.

Thus on the basis of the above observations, U.G.C. without enquiring the present status of teaching, research and extension activities related to environmental issues in universities has issued a general notice for compulsory implementation of the course at the UG level.

The last observation made by the investigator was that the core Module syllabus for Environmental Studies proposed by U.G.C. is quite comprehensive. It has 8 different units, (i) The multidisciplinary nature of Environmental Studies (ii) Natural Resources (iii) Ecosystems (iv) Biodiversity
& its Conservation (v) Environmental Pollution (vi) Social issues & environment (vii) Human Population & the environment & (viii) Field work.
The above mentioned units are quite comprehensive in nature.

**Akbar, Syed Ahtsham (1997)**

conducted a study and did analysis of the curriculum at the graduation level with a view to incorporate Environmental Education in the light of the, “Objectives of Environmental Education defined by UNESCO”.

After the detailed analysis of the existing curriculum the researcher found that certain portions of syllabi were purely from environmental topics. There existed nothing on the environmental related issues and on the other hand there were courses which have direct relation with the nature but they too have limited area of knowledge.

There were certain courses which had direct relation with environment but ignored the important aspects of environment. Subjects such as Mathematics, Physics, Statistics and Computer Application were offering nothing on Environmental Education and subjects such as Geography and Geology which have direct bearing on environment, too failed to depict any concrete topic on Environment education.

It was found by the author that Geography curriculum provides great amount of information on atmosphere, its composition but not about the good and bad effects on humanity. Geography as a subject talks of population but never conveyed the drawbacks of population explosion or of water pollution.

The author found that EE is being emphasized as an interdisciplinary as well as multidisciplinary in approach. In the Chemistry curriculum also, the author found nothing much concerning, regarding Environmental Education, however there exists a little, portion on Environmental Education in the curriculum of Industrial Chemistry.

Therefore, the author after much tedious analysis found that curriculum has nothing to offer on Environmental Education as far as the problem of Environmental pollution, its conservation, protection and necessity of awareness is concerned.
The author thus concluded that Environmental Education has become so important that it should be introduced at all the levels of formal system of education.

Thus the author felt that in order to create purposeful appropriate awareness the introduction of Environmental curriculum has to be affected at various levels of the formal education system. Bottger, (1995)\textsuperscript{103}, introduced environment as a subject for the school curriculum. The author found during his studies that countries like Bangladesh and Hungry introduced formal environmental education as a subject, while in countries such as Canada, Costa Rica, Denmark, Japan; it was introduced as an added component.

It was also found by the author that the need for Environmental Education varied from country to country according to the environment problems and situations existing in these countries. Aziz, Rafat (1994)\textsuperscript{104}, in her analytical study of Environmental Education curriculum at primary school level, developed a questionnaire to measure the opinion of teachers about the curriculum and contents.

The author tried to find out the difference in opinion of teachers about the Environmental Education curriculum. The author further analyzed the effect of gender and teaching experience on teachers' opinion about the Environmental Education. 50 Primary school teachers were administered an opinionnaire by the author, which indicated that there was no significant difference between male and female teachers regarding their opinion about the objectives of Environmental Education, where as professional experience of teachers significantly influenced their opinion on the objectives of Environmental Education.

However, the author found that there was a significant difference between male and female teachers regarding their opinion about the agencies of Environmental Education. It was found that male teachers significantly differed from the female teachers regarding their opinion about the method of imparting Environmental Education.
Kidwai, Zeenat (1991), conducted a study where she aimed to identify and thereby to critically analyze the instructional objectives of an environmental oriented curriculum in Geography at secondary stage at Delhi based schools, following a descriptive survey method. Data was collected from the sample group of teacher and students through the use of paper-pencil test, questionnaire, informal discussion and interview technique.

The author found that the importance of natural environment is neglected in formulating instructional objectives of teaching social science.

The study also found that there is a need to develop active and well-informed individuals for protecting and conserving the environment.

The author noticed that there was need to develop an understanding of the interactions and interdependence of the physical, biological, social, economic and cultural aspects of the environment and also it was observed that there is a need to develop individuals and communities skills for identifying and solving environment problems.

It was also observed by the author that to make teachers aware about the environment, public schools are better than the government schools. It was also observed by the investigator that there is a need to strengthen the method of teaching of Geography through environmental exposure and field trips in order to develop the required attitude towards environment.

Devi, Sushila A (1990), made a critical study of environmental curriculum in Andhra Pradesh.

Bennett, Linda, Baird (1989), conducted a study on the environmental themes in selected first, second and third grade science textbooks series so as to determine the treatment for the environment themes of air quality, water quality, wild life, soil and energy.

The study compared the treatment of the environmental themes in the four series, in the first, second and third grade levels of each series separately, in the first grade level, and in the second grade level and in the third level of the four series.
The author in his study concluded that there was no adequate treatment of the five environmental themes, in the science textbook analyzed. The degree of information was minimal and without a consistent linkage of themes through the grades. The content analysis of these four textbook series would indicate that they did not provide the knowledge which was vital in establishing the framework for learning about the environment.

Brown (1988)\textsuperscript{108}, made an attempt to determine the extent to which Environmental Education is incorporated into the fourth, fifth and sixth grade public school curriculum of Pennsylvania. The author discovered that 78.6% of 114 respondents (school principals and teachers) felt that they were not adequately prepared to teach Environmental Education. Lack of time to develop an Environmental Education programme was the major obstacle in Environmental Education curriculum development.

Thus in view of the author, teacher interest was the element most influential in implementing Environmental Education into elementary curriculum.

Renne, Colligan, Karen (1986)\textsuperscript{109}, conducted a study on development of environmental literature in Japan. According to him there is a rising consciousness of environmental issues among the people of Japan.

Themes which unite these novels and stories into a unique category of Japanese literature, included the human tragedy of pollution, pollution as a manifestation of class struggle, distrust of total faith in technology, man's relationship to the land as a system of which he's a part, a sense of place and a revival of aspects of traditional nature appreciation, coupled with contemporary ecological consciousness.

Ahmad, H.A. (1984)\textsuperscript{110}, found out that most of the teachers felt that the science and social science curricula in the Egyptian secondary schools was moderately effective in the development of the science, awareness and knowledge and environmental issues and problems.

The author further observed that the curricula was of limited effectiveness in several areas such as opportunities for students to develop their
attitudes towards environmental issues and problems, the development of skill to solve environmental problems and finally the participation in Environmental activities and planning.

The study found that multidisciplinary approach was perceived by the teachers sampled to be the most appropriate means of incorporating Environmental Education into the Egyptians secondary schools.

Deopuria, R.P. (1984)\textsuperscript{111}, conducted a comparative study of teaching Science through Environmental and Traditional Approach in schools of M.P. The author compared the Cognitive achievement of students of class V\textsuperscript{th}, IX\textsuperscript{th} and X\textsuperscript{th} towards science taught through the Environmental versus Traditional Approach. The author also compared the Environmental awareness and attitude of students when taught by above two methods. The author also compared the attitude of the teachers towards the Environmental Approach of teaching.

The study was conducted at three levels: - Primary, Middle and Higher Secondary school children. The findings of the study revealed that students of the Experimental group of Class V\textsuperscript{th}, VIII\textsuperscript{th}, IX\textsuperscript{th} and X\textsuperscript{th} obtained higher achievement score due to the teaching of science through the Environmental Approach.

The author found no significant difference between male and female teachers attitude towards the Environmental Approach. Also it was found that sex had no effect on the attitude towards the Environmental Approach for teaching science and the Environmental Approach followed different grade levels.

Ghose, A.M. (1982)\textsuperscript{112}, suggested non-formal education as a means to solve the Environmental problem of Calcutta's slums. His idea was to train people through non-formal education to collect reliable and updated data pertaining to the target community (slum dwellers) which can be used to plan specific “Environmentally oriented” projects.

Manuel N.V. (1982)\textsuperscript{113}, had conducted a study about using of environmental potentialities in education. The main objectives of the study were to analyze the text books in Environmental studies of the NCERT and of some state system.
Another objective of the study was to analyze some EE model in India and abroad and other relevant materials from the point of view of functional theory of EE.

The study also had the objective of finding some typical resources other than textbooks which can be useful for EE, develop some models of the EE representing a reasonable compromise between the Environmental Education theory and the practical condition in the education content. Relevant textbooks were analyzed in detailed, interviews, observations and focused group discussions with teachers and administrators and non-formal science education workers were conducted. The author found that very few genuine Environmental Education type activities seemed to have been undertaken in the primary schools, national level text books have some worthy aspects on the one side and at the same time it lacked the higher specifications commonly adopted in modern Environmental Education procedures.

**Joshi, B.P. (1981)**, conducted a study on development of science education for upper primary classes based on the environmental approach. They located environmental problems particularly in the state of Rajasthan, analyzed and enumerated the scientific view points and prepared instructional material and supplementary reading materials both for the students and teachers. Data was collected with the help of questionnaire, interviews, seminars etc and the results at the upper primary level were essential and vital to develop insight, and skills needed to influence not only the Environmental Attitude and behavior in students but also to stimulate their reorientation of values regarding the importance of Environmental Studies.

The authors found that children at primary level were interested and learnt from experiences with real things they could manipulate in some ways and the syllabus was not environmentally oriented. It lacked in field studies and did not contain information about ecological balance.

**SCERT (1980)**, studied an evaluation of textbooks in Environmental studies of class III$^\text{rd}$ and V$^\text{th}$. He compared the old and new science curriculum of classes III$^\text{rd}$ and V$^\text{th}$. The author compared the old Science curriculum of classes
IIIrd and Vth with respect to cognitive load on students, assessed the revised science curriculum with respect to instructional objectives attained, and assessed each unit of the revised curriculum with respect to its emphasis on modernity.

A sample of 20 headmasters, 200 teachers and 100 educated parents were administered a check list about the revised curriculum and the old curriculum in science, prescribed for classes IIrd and Vth.

The author in her study found that the old curriculum was not relevant to the child’s cognitive level; although most of the parents felt that it was easily understood by their children. The parents felt that the new curriculum increased the cognitive level of their children and some teachers and headmasters too agreed that the new curriculum was more helpful than the old one in enriching the knowledge of children.

Childress, Ronald .R (1978), made an attempt to identify, describe and analyze general curricular characteristics of a selected national sample of elementary and secondary schools educational programme on environmental education. He concluded that children are more involved in educational programmes at grades Vth, VIth, Xth, XIth & XIIth. The students’ needs and interests were the factors which exerted great influence on the selection of curriculum content. He also found that small group projects, class discussions, field trips, community visits were found to be very fruitful instructional strategies.

Doraiswami, S. (1970), in his article, “Environmental Education in the curricula of Indian schools”: said that “Ideas on conservation education” should be introduced in schools. In the curriculum at primary stages, efforts should be made to include topics concerned with conservation of plants, animals, soil, air & water.

The curriculum of the middle school include an important section on “Man & his Environment”, which is a summarized ecological perspective of the entire biology course. The high school course should include important chapters such as populations, ecosystems, biosphere & conservation of nature.
2.6. Studies based on Sustainable Development and its related problems:

Akram, Mohd, (2007), in his study says that, “During the 1980’s and 1990’s sustainable development has emerged as the most acceptable approach to environmental problems. Sustainable development advocates policies that would allow for economic growth while at the same time minimizing damage to the environment. A holistic view of Sustainable development opts for the doctrine of intergenerational equity. From this view point, sustainable development is the integration of environmental economic and social concerns of society so as to arrive at development paths which meet the needs of the present generation without compromising the ability of future generations to meet their own needs. In other words, Sustainable Development allows a long term utilization of environmental resources for social and economic development while at the same time, attempts to maintain the quality of the environment.”

The concept of Sustainability, and consequently, Sustainable development belongs to the social and cultural avenues of life too. Sustainability, in the social sphere would mean the establishment of an egalitarian community that ensures equal sharing of resources and opportunities, for sustained human welfare over a period of time, may be through generations. The Rio Declaration states that human beings are at the centre of concerns for Sustainable development, and they are entitled to a healthy and productive life, in harmony with the nature.

The goals of Sustainable development can only be achieved in the absence of a high prevalence of debilitating diseases, while obtaining health gains for the whole population requires poverty eradication. There is an urgent need to address the causes of ill health, including environmental causes, and their impact on development, with particular emphasis on women and children, as well as vulnerable groups of society, such as people with disabilities, elderly persons and indigenous people.
S.M. Sungoh, (2007), conducted a study in which he found that Environmental Education and sustainable development are correlated with each other and there inter-relationship is an environmental concern in higher education.

The author, said, that, “Sustainable means that something is viable and can be continued in the long term in a way that do not harm people but benefit them equally.

Development refers to the way in which the interaction between the environment, the economy and society progresses and changes. Development happens everywhere and involves everyone.

Sustainable development is about ensuring a better quality of life for everyone now and for generations to come. This means meeting four objectives at the same time.

1) Social Progress that recognizes the needs of everyone.
2) Effective protection of the environment.
3) Prudent Use of natural resources.
4) Maintenance of high and stable levels of economic growth and employment.

The author also emphasized the importance of “Education for Sustainable Development”. “Education for Sustainable Development” (ESD) enables people to develop the knowledge, values and skills to participate in decisions about the way we do things individually and collectively, both locally and globally, that will improve the quality of life now without damaging the planet for the future. It has a clear link with a number of curriculum subjects, viz; Geography, Citizenship and Science and many other aspects of the curriculum.

Sustainable development can be characterized as follows:-

1. Interdependence:

Understanding the connections and links between all aspects of our lives and those of other people and places at a local and global level, and that decision taken in one place will affect what happens else where.
2. **Citizenship and Stewardship:**

   Recognizing that we have rights and responsibilities to participate in decision making and that everyone should have a say in what happens in the future.

3. **Needs and Rights of Future Generations:**

   Learning how we can lead lives that consider the rights and needs of others, and what we do now has implications for what life will be like in the future.

4. **Diversity:**

   Understanding the importance and value of diversity in our lives—culturally, socially economically and biologically—and that all our lives are impoverished without it.

5. **Quality of Life:**

   Recognizing that for any development to be sustainable, it must benefit people in an equitable way, it is about improving everybody’s lives.

6. **Sustainable Change:**

   Understanding that there is a limit to the way in which the world, particularly the richer countries, can develop and that the consequences of unmanaged and unsustainable growth are increased poverty and hardship, and the degradation of the environment, to the disadvantaged of us all.

7. **Uncertainty and Precaution:**

   Realizing that as we are learning all the time and our actions may have unforeseen consequences we should adopt a cautious approach to the welfare of the planet.

   In another study by, **Akram, M (2006)**, the author, said, that future of a democratic state having substantial respect for human rights lies not only in having populist idealism of “Education for All” but in meeting with the realistic needs of “Employment for All”. Hence, creation of sustainable employment opportunities is the next step for the larger goal.

   In a study, **Akram, M. (2005)**, the author said that “the concept of sustainability and consequently sustainable development belongs to the social
and cultural avenues of life too. Sustainability in the social sphere would mean the establishment of an egalitarian community that ensures equal sharing of resources and opportunities for sustained human welfare over a period of time, may be through generations”.

The Rio declaration states that human beings are at the centre of concerns for sustainable development and that they are entitled to a healthy and productive life, in harmony with nature. The goals of sustainable development can only be achieved in the absence of debilitating diseases, while obtaining health gains for the whole population, which requires poverty eradication. There is an urgent need to address the causes of ill-health, including environmental causes, and their impact on development with particular emphasis on women and children, as well as vulnerable groups of society, such as people with disabilities, elderly persons and indigenous people.

F. Soundaraj, (2004)\textsuperscript{122}, in a study, mentioned the relationship between Education, Economy & Sustainable development. The author, said that the “Meaning of Sustainability sharply varies according to two sets of economists, the Anthropomo-centrists (who are concerned with economic development for the human) and Eco-centrists (who are concerned with the preservation of the ecosystem).

\textbf{Anthropomo-centrists} perspective views that Sustainable state is one in which economic development is sustained through time. This can be done by sustaining utilities (through restraint) and maintaining consumption levels to match them. It also views that it is a state in which resources are managed now as to maintain production opportunities for the future.

\textbf{Eco-centrists} perspective views that a Sustainable state is one in which natural capital stock, such as forest, sea and river is non-declining, or is being replenished, to make up for the depletion, through ‘resilience’. A Sustainable state is also viewed as one in which the yield of resources services (Example timber and fish) is maintained. Thus, Sustainable state is one which satisfies minimum conditions of ecosystem stability and resilience through time.
Advocates of this definition, known as ‘Green Economists’ put interests of the ecosystem above human economic development.

In another study by Puthenkalam (2004)\(^{123}\), the author advocated, the “Sustainable Human Development” approach for ensuring larger goals of sustaining development without disturbing the natural environment. According to the author, “Sustainable Human Development” puts people at the centre of development, regards economic growth as a means and not an end, protects the life opportunities of future generations as well as the present generation and respects the natural systems on which all life depends. Such a paradigm of development enables all individuals to enlarge their human capabilities to the full and to put those capabilities to their best use in all fields – economic, social, cultural and political.

In the final analysis, Sustainable Human development is pro-people, pro-jobs and pro-nature. It gives the highest priority to poverty reduction, productive employment, social-integration and environment regeneration. Puthenkalam emphasizes that the closer link between global poverty and Sustainability will also have to be analyzed carefully if the concept of Sustainable development is to have any real meaning.

Selvam, S.K.Panneer (2004\(^{124}\), in his article, “Environmental Education for Sustainable development”, highlighted that the content of formal education has four inter-grading and interrelated components they are:-

1) Awareness
2) Real life situations
3) Conservation
4) Sustainable development

About Sustainable development, the author says that, Sustainable development aims at utilization of finite resources in a wiser manner for development. There is a limit to the growth of living organism and thus the efforts are to be made to utilize the resource wisely and intelligently.

In a study by, Weaver, J.H., Rock, M.T. & Kusterer, K (2003)\(^{125}\), the author said that, another perspective on sustainable development looks
sustainable development from a broad based perspective. Broad based sustainable development has four components.

According to the author, the first component is a healthy, growing economy that constantly transforms itself to maintain and enhance the standard of living.

Second, the benefits of economic growth are equitably shared; women, minorities, immigrants, the poor, and the handicapped get a fair deal from economic growth.

The third component includes respect for Human Rights, good governance, a healthy civil society of NGOs, and an increasingly democratic society.

The fourth is sustainability, which means that in the process of economic growth, we don’t destroy the environment—foul the air, poison the water, pollute soils, mine the resource base, or destroy places of natural beauty, so that our descendants can enjoy the same or a higher standard of living.

In another study conducted by Sharma, S.K. (2001), the author opines that people often tend to view the various aspects related to Sustainable development independently without comprehending their synergy or interdependency. A systems or multidisciplinary approach is frequently recommended.

In the opinion of the author, Sharma, S.K (2001) the primary concern of Sustainable development approach is creation of conditions for ensuring Sustainable individuals. Human beings are mortal and nobody is going to remain alive forever. Hence the concept of Sustainable individual stands for conditions in which an individual is free from possibilities of immature or premature mortality (such as infant/child/adult mortalities) because of the scarcity of food, malnutrition or deadly diseases. Ensuring food, nutrition, and health for all is the first step towards Sustainable development.

In a study conducted on implementation of Sustainable development, by Khosla, A (2001), the author said, that, “One major approach towards understanding the implementation of Sustainable development agenda is
through creation of Sustainable livelihoods.” For the author, the central issue facing the society, North, South, East or West, is the need to create Sustainable livelihoods. Sustainable livelihoods create goods and services that are widely needed in any community. They give dignity and self esteem to the worker. They create purchasing power, and with it greater economic and social equity, especially for women and the underprivileged, and consequently, they do not destroy the environment. In short, a Sustainable livelihood is a remunerative, satisfying and meaningful job that enables each member of the community to help nurture and regenerate the resource base. The author, further states that Sustainable livelihood provide a powerful synthesizing, unifying concept that can bring the most disparate interests together to design more viable economic systems for the future in any country, rich or poor. The author says that, Sustainable livelihoods bind people to their communities and to their land.

These Sustainable livelihoods have a positive impact on health, fertility, reduction, migration and other demographic behavior, but they also permit a far more effective use of resources for the benefit of all. Large scale success of Sustainable livelihoods will depend on three factors Sustainable technologies, Sustainable enterprises and Sustainable economies.

The importance of Sustainable development can be summarized in the following few lines which are as mentioned:

Sustainable development is the fundamental challenge that all societies face if we are to avoid long term damage to the earth’s basic life-support systems. Young people and students will be the decision makers of the future, in both their professional and personal lives. They need to learn to live in ways that increase quality of life for themselves and others without eroding the earth’s resource at a rate quicker than they can regenerate.

---Education for Sustainable development brings a context and motivation to learning.

---Education for Sustainable development can help students to develop the understanding, skills and values to contribute in a positive way, which
enhances self esteem and increases motivation. The question that how education for Sustainable development is undertaken, is as important as what is taught. This means creating a learning environment where there are frequent opportunities to do so.

To conclude the author says that the development of Environmental Education over the past decades is associated closely with an increasing awareness of global socio-ecological crisis.

Significant shifts as the result of changes to our understanding of the environment, education and social dynamics have been made. One recent shift is adoption of Sustainability as a focus for Environmental Education.

In the 1980’s increasing concern about the effects of economic development on health, natural resources and the environment led the United Nations to publish the Brundtland report. This defined Sustainable development as, “development which the meet the needs of the present without compromising the ability of future generations to meet their own needs.”

In June 1992, the Rio-Earth Summit declared that “the right to development must be fulfilled so as to equitably meet development and environmental needs of present and future generations”. Sustainable development is not just about the society and our economy as well.

According to the author, Sustainable development encourages the conservation and preservation of natural resources and of the environment, and the management of energy, waste and transportation. Sustainable development is development based on patterns of production and consumption that can be pursued into the future without degrading the human or natural environment.

Sustainable development is development which involves the equitable sharing of the benefits of the economic activities across all sections of society to enhance the well-being of humans, protect health and alleviate poverty. If Sustainable development is to be successful, the attitudes of individuals, Educational Institutions at all levels, as well as governments with regard to our
current life styles and the impact they have on the environment will need to be changed.

Seminars, conferences, debates and talks are important but it is vital, that these results in actions and deeds.
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