Chapter 1

Introduction
Chapter I

Today the delicate ecosystem of our earth is facing a danger of destruction on a large scale. In the name of development man has over exploited the natural resources and has polluted the environment. Several species of flora and fauna are already extinct from the surface of earth and many more are on the verge of extinction. Forests are decreasing at an alarming rate, land is losing its fertility and world climate is changing due to global warming. The major components of the biosphere including the atmosphere, the ocean, soil cover, the climate system and the range of animal and plant species have all been altered by the intensity of human exploitation of the earth’s resources in the twentieth century (Chasek, 2009). The problem is becoming worse due to ever expanding population of the world.

The realization that we are on a path of self destruction has dawned on many individuals, organization and nations. There are many campaigns for environment awareness and for banning activities that endanger environment. However, these are only external and superficial measures that do not get to the grass root level of the problems. The cry of the time is that we need to change the basic attitude of people towards the nature only then any step towards preserving Environment will become effective and here Environmental Education can play a very crucial role.

1.1 Concept of Environment

The word ‘environment’ is derived from the French word ‘Environ’ which means to encircle or surround. So, environment can be defined as: The circumstances or conditions that surround an organism or group of organisms, or the complex of social or cultural conditions that affect an individual or community.
According to Douglas and Downey (1981), "Environment is organism's surroundings. Environment includes plants and animals as well as non-living constituents as water, air, light, soil and temperature."

Safra (2002) has defined Environment as the complex of physical, chemical and biotic factors that act upon an organism or an ecological community and ultimately determine its form and survival. Environment is taken to mean all those which are physical, chemical, organic and non-organic components of the atmosphere, lithosphere and oceans. Environment is the aggregate of external conditions that influence the life of an-individual or the population, specifically the life of man (Shrivastava, 2004).

Singh, (1997) defines 'Environment as the region, surroundings or circumstances in which anything exists, everything external to the organism.' The Director General of UNESCO Amadon Matter M' Bow (1982), while defining the concept of environment said, "From an outlook confined to physical and biological aspects of the environment there has been gradual transition to a broader conception of the environment which while giving those aspects their proper share of attention, also covers the man-made social, economic and technical environment so as to arrive at a comprehensive view of the many and complex inter-relationships between them. So, environment is the outer biophysical system is which people and organism exists. In a broader sense, the environment can be used to refer to anything living or non-living that surrounds and influences living organisms.

1.2 Environmental Education: Concept

Environmental Education has different meaning for people at different points on the continuum of understanding and from different schools of thought. This understanding may depend on their experience, professional and social backgrounds, academic level and learning achievement. Policy makers usually understand Environmental Education to be totally related to bugs and bunnies’ in the out of doors whereas environmental educators consider experiential
learning and behavioral change to be directly related to teaching about the Environmental Education. Likewise, there is also a difference of opinion about the nature of Environmental Education among scientists. Those dealing with natural sciences limit themselves to conservation and preservation of ecosystems and natural resources and social scientists consider successful Environmental Education to be indicative of model human behavior for management and protection of the environment. Economists, on the other hand, have human benefits such as monetary gains high on their agenda.

Given this scenario and conflicting opinions, it becomes very difficult to define the Environmental Education in terms that can encompass all the strands.

In reality the seed of Environmental Education has been around from a long time. Before being labeled as Environmental Education, it was named as nature study, conservation education (or even preservation education by some) and outdoor education.

Environmental concerns of the citizens have also been addressed under the guise of science, art, geography, social studies and citizenship education. The ultimate goal in all these efforts has been to understand the relationship between biotic and abiotic environment and the role human beings play in catalyzing changes in the natural world. It is the later concept that has caught the attention of many thinkers, philosophers and educators in recent decades. This section of intelligencia has been prominent in giving shape to the present structure of Environmental Education. According to Ramsey et al (1992) 'Environmental Education can mean concepts in ecology, outdoor education, environmental science.

Megenity has defined Environmental Educations as a multi-disciplinary approach to the study of humanity's problems of maintaining a livable earth.

According to Mccue (2003), "What environment education means depends on one's perspective, some see it as a teaching method or philosophy to be applied
to all subjects; others see it is a distant discipline, something to be taught on its own."

According to the first International Conference on Environmental Education held in Tbilisi Conference, Environmental Education is a process of developing a world population that is aware of, and concerned about the total environment and its associated problems and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively towards solution of current problems and prevention of new ones (UNESCO, 1977).

According to the Environmental Education Act, 1970 “Environmental Education is the educational process which deals with man’s relationship with his natural and man-made surroundings and includes the relation of population, pollution, resource allocation and depletion, conservation, transportation, technology and urban and rural planning to the total human environment.”

The General Assembly of the Asia-South Pacific Bureau of Adult Education (ASPBAE) explained Environmental Education as a lifelong learning process that involves all of us as learners and educators: is interdisciplinary, integrates the historical, political, social, economic and cultural contexts, covers a wide learning spectrum, brings awareness, understanding to action, values, indigenous and local knowledge, recognize the role of both women and men in the environmental protection, while contributing to the local and global realities and explore participatory and creative learning methods that are culturally appropriate.” (ASPBAE, 1996).

The Environment Education Project of Institute for Global Environmental Strategies (IGES) in its document regional strategy on Environmental Education in the Asia-Pacific, defined Environmental Education as “a holistic approach to the learning process, where by individuals and community acquire the knowledge, attitudes, skills, values and motivation to improve the quality of the environment and attain an ecologically and socially sustainable future (IGES, 2000).
Among these definitions the most comprehensive definition of Environmental Education has been given by IUCN/Commission of Education and Communication, CED, (1988) which states:

“Environmental Education as a process in which individual gain awareness of their environment and acquire and exchange the knowledge, values, skills, experiences and also the determination which will enable them to act individually and collectively to solve present and future environmental problems.”

Thus, from the various definitions of Environmental Education, it can be concluded that Environmental Education is a continuous, life-long process involving education about the environment, in the environment and for the environment.

1.2.1 Goals of Environmental Education

Without a clear statement of goals, an Environmental Education programme would become a series of unrelated experiences, focusing perhaps on limited Programme objectives. The goals of Environmental Education as formulated at the Tbilisi Conference (UNESCO 1977) are as follows:-

- To foster clear awareness of and concern about economics, social, political and ecological interdependence in urban and rural areas.

- To provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment.

- To create new patterns of behavior of individuals, groups and society as a whole towards the environment.

According to Troost (1972) the major sub groups of Environmental Education are to help individual acquire:
• A clear understanding that man is an inseparable part of a system, consisting of man, culture and the biophysical environment, and that man has the ability to alter the inter relationships of this system.

• A broad understanding of the bio-physical environment, both natural and man-made, and its role in contemporary society.

• A fundamental understanding of the bio-physical environmental problems confronting man, how to help solve these problems and the responsibility of citizens and government to work towards their solution.

• Attitude of concern for the quality of the biophysical environment which will motivate citizens to participate in bio-physical environment problem-solving.

1.2.2 Objectives of Environmental Education

The objectives of Environmental Education as formulated at Tbilisi conference (UNESCO, 1977) are as follows:

**Awareness** - To help social groups and individuals acquire an awareness of sensitivity to the total environment and its allied problems.

**Knowledge** – To help social groups and individuals gain a variety of experiences in, and acquire a basic understanding of environment and its associated problems.

**Attitudes** – To help social groups and individuals acquire a set of values and feelings of concern for the environment, and the motivation for actively participating in environmental improvement and protection.

**Skills** – To help social groups and individuals acquire the skills for identifying and solving environment problems.
Participation – To provide social groups and individuals with an opportunity to be actively involved at all levels in working towards solution of environmental problems.

Understanding – To develop a basic understanding of structure, process and problems of environment interdependence of environmental components.

Ability – To develop an ability for evaluating environmental components and educational programme in terms of ecological, economical, social, cultural, aesthetic and educational factors.

The above objectives are related to all levels and both formal and non-formal system of education. In the formal system of education four different but interrelated components have been recognized which are listed in table 1.1

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>Objectives</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Awareness of environment</td>
<td>Primary Education (Knowledge)</td>
</tr>
<tr>
<td>2.</td>
<td>Relevance for real life situation of environment</td>
<td>Secondary education (understanding)</td>
</tr>
<tr>
<td>3.</td>
<td>Conservation of natural resources of environment</td>
<td>Higher secondary education (skills)</td>
</tr>
<tr>
<td>4.</td>
<td>Sustainable development by solving problems of environment</td>
<td>College and university education (Attitude and Evaluation)</td>
</tr>
</tbody>
</table>

1.3 Initiatives taken at International Level

In 1970, the International Union for the Conservation of Nature and Natural resources (IUCN) held a working meeting on Environmental Education in the school curriculum in Nevada, USA (IUCN, 1970). The deliberation of the conference continues to be a major influence on the development of Environmental Education. In 1971, there was organization of American State’s Conference on Education and Environment in the America. It emphasized the
teaching of this subject in order to develop the ability to clearly think out complicated environmental problems which are political, economic, philosophical and technical.

One of the landmarks in the history of Environmental Education is the **Stockholm Conference** on Human Environment organized by UNESCO, in June 1972. It was an international conference convened under United Nations auspices held in Stockholm, Sweden from June 5-16, 1972. It was UN’s first major conference on international environmental issues and marked a turning point in the development of international environmental politics. The conference was attended by representatives of 113 countries, 19-intragovernmental agencies and more than 400 inter-governmental and nongovernmental organizations. The meeting agreed upon a Declaration containing 26 principles concerning the environment and development, an Action Plan with 109 recommendations. One of the key issues addressed was the use of CFCS (Halocarbons), which seemed to be responsible for the depletion of ozone layer. Global warming was also mentioned, but in this matter nothing of substance was achieved. Apart from increasing awareness of environmental issues about public and governments, the conference also laid framework for future environmental cooperation, which led to the creation of global and regional environmental monitoring networks and the creation of the United Nations Environment Programme (**UNEP**)  

The **UNESCO-UNEP** launched the International Environmental Education Program (**IEEP**) in 1975.

In 1975, **Belgrade** the first International conference on EE was held in 1975 in Belgrade Yugoslavia. The purpose of the meeting was the follow up on the
recommendation of the UN conference on the Human Environment by creating the International Environmental Education Program (IEEP) for the period 1975-85. In the workshop: A Global Framework for Environmental Education, referred to as Belgrade Charter was proposed. The Charter’s goal statement for Environmental Education has been generally accepted by professionals in the field.

The Charter States:

‘The goal of Environmental Education is to develop a world population that is aware of and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitude, motivation, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.’

Tbilisi Conference, 1977

The world first intergovernmental conference on Environmental Education was organized by the UNESCO in cooperation with the U.N. Environmental Programme (UNEP) and was convened in Tbilisi, Georgia (USSR) from October 14-26, 1977.

The Tbilisi Declaration was adopted by acclamation at the close of the intergovernmental conference.


The declaration and recommendations of the Tbilisi Conference made it possible to define the nature, objectives and pedagogical principles of Environmental Education and to establish broad guidelines for action in this field at the national and international levels. Since the Tbilisi Conference, the environment has been seen as a whole, simultaneously comprising natural aspects and those that result from human action; EE is viewed as a dimension of
the subject matter and practice of Education directed towards the solution of practical environmental problems through an interdisciplinary approach and the active and responsible involvement of each individual and of the community.

The Tbilisi Conference considered that EE should be made an integral part of the entire education process and aimed at every category of the population which includes:

- The general public and non-specialists;
- Socio-occupational categories whose activities have a significant impact on the environment.
- Scientists and technicians whose fields, whether in natural or the social sciences concern the environment and who need to receive specialized training.

**Tbilisi Recommendation.**

The following set of statements is based upon the Tbilisi Report Recommendations 2 (1978).

**Environmental Education**

- Is a lifelong process;
- Is interdisciplinary and holistic in nature and application;
- Is an approach to education as a whole, rather than a subject;
- Concerns the inter-relationship and interconnectedness between human and natural system.
Final report, Tbilisi conference (1977)

EE must help to create an awareness of the economic, political and ecological interdependence of the modern world so as to enhance a spirit of responsibility and solidarity among nations. This is a prerequisite for solving serious environmental problems.

1987 – The Brundtland Commission, formally the World Commission on Environment and Development (WCED), known by the name of its chair, Gro Harlem Brundtland was convened by the United Nations in 1983. The commission was created to address growing concern about the accelerating deterioration of the human environment and natural resources and the consequences of that deterioration for economic and social development. In establishing the commission, the UN-General Assembly recognized that environment problems are global in nature and determined that it was the common interest of all nations to establish policies for sustainable development.

The report of the Brundtland Commission, ‘Our common future’ deals with sustainable development and the change of policies needed for achieving that. The definition of this term in the report is quite well known and often cited;

“Sustainable development is the development that meets the needs of the present without comprising the ability of future generations to meet their own needs.”

In July 1989, the leaders of the USA, the former USSR, the UK, France and Brazil discussed environmental issues together for the first time. They called for worldwide policies to be developed to pursue the goals of sustainable development. The meeting was nicknamed the ‘First Green Summit’ and a seven-page document with nineteen clause was produced, the ‘Paris Communiqué’.
In 1987, UNESCO – UNEP jointly organized workshop called the International Congress on Environmental Education and training, held in Moscow (USSR), 17-21 August 1987. The programme included: a review of progress and trends in EE since Tbilisi conference; the state of the environment and its educational and training implications; relation between intergovernmental environmental-scientific programme and EE and training; presentations of an international strategy for action in the field of EE and training through the 1990s.

(http://unesdoc.unesco.org/images/0015/001535/153585eo.pdf)

In 1992 – UNCED – Earth summit (Publication of Agenda 21)

UN Conference on Environment and Development (UNCED), Rio de Janeiro, 3-14 June, 1992 also known as the Earth Summit’ was held in Brazil. 172 government participated in it, some 2400 representatives of non-governmental organization (NGO’s), 17000 people attended the parallel NGO forum. The principal theme was Environment and Sustainable Development. Resulting document included - Agenda 21, the Rio Declaration on Earth and Development, the statement of Forest Principles, the United Nations Framework, Convention on Climate Change and the United Nations Convention on Biological Diversity.

Agenda 21

Agenda 21 is a comprehensive plan of action to be taken globally, nationally and locally by organization of the United Nations system, Governments, and the major groups in every area in which have human impact on the environment. Agenda 21, the Rio Declaration on Environment and Development and the statement of Principles for the sustainable management of forests was adopted by more than 178 governments at the United Nation Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, 3 to 14 June 1992.
1997, Kyoto Conference on Global Warning

The Kyoto Protocol is a protocol to the United Nations Framework Convention on Climate Change (UNFCC or FCCC), an international environmental treaty produced at the United Nations Conference on treaty is intended to achieve “Stabilization of greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.” The Kyoto protocol establishes legally binding commitments for the reduction of four green house gases (carbon dioxide, methane, nitrous oxide, Sulphur hexafluoride) and two kewlio group of gases (Hydro fluorocarbons and perfluoro carbons) produced by ‘Annex I’ (Industrialized) nations as well as general commitments for all members countries.

(http://en.wikipedia.org/wiki/kyoto_protocol)

On 8 Sept 2000, a three day Millennium summit of world leaders was held at the headquarters of the United Nations in New York City, the general assembly adopted the Millennium declaration. The millennium declaration has eight chapters and key objectives adopted by 189 world leaders during the summit.

(http://en.wikipedia.org/will/millennium_declamation)

The purpose of the summit was to discuss the role of United Nations at the turn of 21st century. This meeting was the largest gathering of world leaders in history as of the year 2000

In 1997, the UNESCO organized an International Conference on environment and Society: Education and Public Awareness for sustainability in Thessaloniki, Greece. The conference took place against the back drop of a new vision of the role of education and public awareness in achieving sustainability, which had emerged during recent years. Education was no longer seen as any objective in and of itself, but as a means to bring about changes in behavior and life styles to
disseminate knowledge and develop skills, and to prepare public support for changes towards sustainability emanating from other sections of society.


The World Wide Fund for nature (WWF) has assisted many countries in the region in implementing its South Asia Regional Cooperation Program Framework, in order to promote EE and capacity-building its natural resource management (CEE/IUCN, 1998).

ESCAP, 2000 The third ministerial conference on environment and development in Asia and Pacific was held in 1995 under the auspices of United Nations ‘Economic and Social Commission for Asia and the Pacific. Their intent was to promote sustainable development through education and related capacity building and decided upon five years regional Action Program for environmentally sound and sustainable development in the region (ESCAP, 1995). It adopted five year (2001-2005) Regional Action Program for environmentally sound and sustainable development consisting of eight critical sustainability issue (ESCAP, 2000).

Earth Summit 2002: The World Summit on Sustainable Development, (WSSD) or Earth Summit, 2002 took place in Johannesburg, South Africa from 26 August to 4 September 2002. It was convened to discuss sustainable development by the United Nations. WSSD gathered a number of leaders from business and non-governmental organization, 10 years after the first Earth Summit in Rio de Janeiro, 1992.

The Johannesburg Declaration was the main outcome of the Summit. It is an agreement to focus particularly on the worldwide conditions, that pose several threats to the sustainable development of our people, which includes chronic
hunger, malnutrition, foreign occupation, armed conflict, illicit drug problem, organized crime, corruption, natural disasters.

In Dec 2002, the United Nations General Assembly adopted a resolution (A/57/274) to put in place a United Nations Decade of Education for sustainable Development (DSED) spanning from 2005-2014 and designated UNESCO to lead the decade. The founding value of ESD is respect: respect for others, respect for the present and future generations, respect for the planet and what it provides to us (resources, fauna and flora). ESD want to challenge us all to adopt new behavior and practices to secure our future.


CEE, 2007: The fourth International conference on Environmental Education was held at Centre of Environmental Education, Ahmedabad in India from November 24 to November 28, 2007. The five day conference was attended by 1500 participants from 17 countries. The conference was hosted by centre for environment education on behalf of the Government of India. The event was co-sponsored by UNESCO and UNEP. The aim of the conference was to understand what has emerged out of the discipline of Environmental Education (EE) since Tbilisi and the role of Environmental Education within Education for sustainable Development (ESD). The conference provided a forum for practitioner to consider how EE and ESD can partner and strengthen each other towards building a sustainable future.

Copenhagen Summit (2009) The 2009 United Nations Climate Change Conference, commonly known as the Copenhagen Summit, was held at the Bella Center in Copenhagen, Denmark, between 7 December and 18 December. The conference included the 15th Conference of the Parties (COP 15) to the United Nations Framework Convention on Climate Change and the 5th Meeting
of the Parties (COP/MOP 5) to the Kyoto Protocol. According to the Bali Road Map, a framework for climate change mitigation beyond 2012 was to be agreed there.

The conference was preceded by the Climate Change: Global Risks, Challenges and Decisions scientific conference, which took place in March 2009 and was also held at the Bella Center.

The Copenhagen Accord was drafted by the US, China, India, Brazil and South Africa on December 18, and judged a "meaningful agreement" by the United States government. It was "taken note of", but not "adopted", in a debate of all the participating countries the next day, and it was not passed unanimously. The document recognised that climate change is one of the greatest challenges of the present day and that actions should be taken to keep any temperature increases to below 2°C. The document is not legally binding and does not contain any legally binding commitments for reducing CO₂ emissions. Many countries and non-governmental organisations were opposed to this agreement, but, as of January 4, 2010, 138 countries have signed the agreement. Tony Tujan of the IBON Foundation suggests the perceived failure of Copenhagen may prove useful, if it allows people to unravel some of the underlying misconceptions and work towards a new, more holistic view of things. This could help gain the support of developing countries. Malta's Ambassador for Climate Change, Michael Zammit Cutajar, extends this to suggest "the shock has made people more open to dialogue"

1.4 Initiative taken in India for Environmental Education

India, a country with the seventh largest landmass, is a land of ancient traditions, with over a billion people and at least 17 major languages, the diversity of India in terms of culture and biological wealth is enormous. In spite of rapidly changing lifestyles, the traditions of living in harmony with nature
and of environmentally sound practices underpin the lives of most people. It is against this backdrop that the country’s EE strategy has been evolved. The constitution of India explicitly makes environmental conservation a duty. The Central Government and all states within India now have a Ministry of Department of Environment. Education Departments recognize EE as an essential part of education. The law courts of the country have been sympathetic to environmental causes. India has a very large number of very active NGO’s who are involved in a variety of activities from policy analysis to school programs, from participatory natural resources management to activism.

1.4.1 Constitutional Directive for EE

Indian constitution has provided provisions for protection and improvement of environment in Article 48(A) in Directive Principles of State Policy and Article 51(A) in the Fundamental Duties. The fundamental Rights, Directive Principles of State Policy and Fundamental duties are the sections of the constitution of India that prescribe the fundamental obligations of the state to its citizens and the duties of the State.

**Article 48A** states -Protection and Improvement of environment and safeguarding of forests and wild life. The State shall Endeavour to protect and improve the environment and to safeguard the forests and wild life of the country.

[(http://www.commonlii.org/in/legis/const/2004/6.html)]

**Article 51A in the Fundamental Duty states**-

It shall be the duty of every citizen to protect and improve the natural environment including forests, lakes, rivers, wildlife and to have compassion for living creatures.
1.4.2 Initiatives taken by Government of India

Initiative taken by Government of India is one of the few nations in the world to have positively responded to the global concern for survival of the Earth system and given priority to environmental protection. The attention of the Government to deal with environmental issues can be attributed to the U.N. sponsored meeting on 'Environment' held at Stockholm in 1972. It was however towards the beginning of 1980 that the government took certain bold initiatives to deal with series of environmental issues; the most significant among these is Governmental action which leads to the formation of a full-fledged Ministry of Environment and Forests. As a nodal agency in the administrative structure of the central government, the Ministry has formulated environmental policies including legislative measures and started a number of projects aimed towards environment protection through our country. The most significant programme initiated by the central government include conservation and survey of flora, fauna, forests and wildlife, prevention and control of pollution, afforestation and regeneration of degraded areas and creation of environmental awareness among all sector of the country’s population.

The Forest Survey of India (FSI) has been set up to survey national forest resources and to assess the extent of forest cover and monitor broad changes in forest vegetation cover of the country using multi-satellite data.

The Forest (Conservation) Act, 1980 has been enacted to check diversion of forest land for non-forest purposes. This act was amended in 1988 to make it more stringent. Currently the protected areas under the National wildlife action plan comprise 75 National parks and 42 wildlife sanctuaries covering an area of over 140 thousand sq.kms.

Environment Impact Assessment has been made a statutory requirement for all development Projects. The environment clearance to develop projects is
subject to implementation of stipulated safeguards under the provision of the Environment (Protection) Act, 1986.

A National river action plan has been prepared for reducing the pollution load and improving the quality of water of major rivers of the country. To check industrial pollution, the central pollution control board has identified seventeen categories of highly polluting industries and initiated steps to adopt self-monitoring depending upon the pollution load and regular review of action taken by polluting industries.

To check air pollution, mass emission standards for petrol and diesel driven vehicles have been laid down for compliance for vehicles manufactured in future.

A network of environment information system (ENVIS) with its focal point in the Ministry of Environment and Forests has been created for information collection, storage and dissemination in environment related areas.

A number of documentary films and Cinema slides on environment related topics have been produced to promote Public awareness on environmental issues. The national press is also playing a critical role in this respect.

A number of non-government organizations (NGO’s) and other voluntary groups have also been quite active and vocal on environmental related issues. Chipko movement in Garhwal and ‘Appico movement in North Karnataka against deforestation highlights the involvement of voluntary groups for saving the environment.

(http://www.ciesin.org/kiosk/publications/94-0006.txt)

The Ministry of Human Resource Development entrusted with the overall responsibility of education at all levels, has included Environment Education as a key input into the education system.
The UNESCO commission in the Ministry of Human Resource Development (MHRD) is the National Focal Point for ESD. MHRD has appointed Centre for Environment Education (CEE) as the Nodal Agency for implementing ESD in India.

In January 2006, The Indian National Commission in cooperation with UNESCO constituted a National DESD Committee comprising experts and officials from Government, civil society, Academia and NGOs on Education, Environment Culture, Social Sciences, Sciences Communication and other related fields.

**Centre for Environment Education (CEE)**

The Center for Environment Education, over the past 22 years has been working in the field of environment and sustainable development in the country. It has developed innovative programmes, educational materials, undertaken demonstration project and built capacities in this field. Since its inception in 1984, CEE has worked in areas of Environmental Education and sustainable development with diverse communities such as rural and urban, government, teachers, school children, higher education authorities among several. CEE has been designated as the Nodal Institution for the implementation of DESD in India. The National Action Plan for DESD is under preparation for further consultation. The key thrust areas of DESD in India have been identified as:

- Developing Public Understanding and Awareness
- Improving access to basic quality education
- Reorienting existing education programmes
- Providing training
The National Committee for the decade met twice to discuss the process of Progressing DESD in the country. CEE has presented a Draft of National Action plan to the committee. This was forwarded to the Planning Commission working Group for the XI five year plans. The draft of the National Action Plan aims at the following:

- Incorporate ESD into National Sustainable development plans and National Education Plans
- Align policy, mandates and other such frameworks to support ESD.
- Enable widespread awareness and understanding of ESD.
- Capacity building of educators and trainers with relevant knowledge, information and skills to address ESD
- Promote research and development for ESD

(http://www.desd.org/desdcd/India.pdf)

**Five Year Plans**

The economy of India is based in part on Planning through its five-year plans, developed, executed and monitored by the Planning Commission. Major plans have been made for the conservation of environment in these plans.

In the **Sixth plan** (1980-1985), The Government of India set up a Department of Environment. The State/UT Govt. were also asked to set up structures which could act as a focal points for environment Major activities in the area of environment on which work was initiated or stepped up during the Sixth plan include water and air pollution monitoring and control, environment impact assessment, nature living resource conservation, special projects on wildlife, ecological studies by the Botanical and zoological
surveys of India, development programmes, environment research promotion and environment information, education, training and awareness.

Source: http://en.wikipedia.org/wiki/five-year_plan_of_India

**Seventh Five (1985-1989) Year plan for the sector of Environment and Ecology includes:-**

The problem encountered in the field of environment in India arise due to poverty and under development as also the negative effects of development programme which have been badly planned or badly implemented. Due to pressing need to improve the conditions of our people, many concerned with development activities lose sight of environmental and ecological imperatives.

The damage being done to the environment because of the large size of population and its increase and scale of developmental activities is of such magnitude that urgent remedial measures are called for. Official and voluntary agencies must work together to create the needed awareness, indeed environment is all-pervasive and the success of our efforts will ultimately call for the involvement of the entire population at all levels

**Eleventh Five-Year Plan (2007-2012)**

Environmental concerns have been given due importance in the eleventh five-year plan .It includes

- Increase forest and tree cover by five percentage points.
- Attain WHO standards of air-quality in all major cities by 2011-12.
- Treat all urban waste water by 2011-12 to clean river water.
- Increase energy efficiency by 20 percent by 2016-17.
1.4.3 Status of EE in Schools

The education system in India has incorporated certain aspects of environment in school curricula as far back as 1930. The Kothari Commission (1964-66) also suggested that basic education had to offer EE and relate it to the life needs and aspirations of the people and the nation. At the primary stage, the report recommended that the aim of teaching science in the primary school should be to develop proper understanding of the main facts, concepts, principles and processes in physical biological environment. EE at primary secondary, higher secondary levels were treated in different way. EE is an essential part of every pupil’s learning. It help to encourage awareness of the environment, leading to informed concern for and active participation in resolving environment problems.

According to National Policy of Education (NPE, 1986)

“There is a paramount need to create a consciousness of environment. It must permeate all ages and all sections of society beginning with the child. Environmental consciousness should inform teaching in schools and colleges. This aspect will be integrated in the entire educational process.”

The National Policy on Education, 1986 and the revised National Policy on Education, 1992 have spelled out the priorities considered essential to restructure the country’s education system in order to equip the younger generation to face future challenges.

The National Council of Educational Research and Training (NCERT) which is an advisory body of the Ministry of Human Resource Development have been entrusted with the task of effecting qualitative improvement in school education.
The development of curricula and preparation of text books for school education has been among the main activities, besides its research, training and extension functions. The guidelines provided by the NCERT in the document ‘The curriculum for ten year school- A framework (1997) and the revised ‘National Curriculum Framework for school Education in India (NCERT 2000) form the basis for the development of School curricula at different levels in all the states and Union Territories. School curriculum is being revised and enriched from time to time by including or integrating new themes or concepts in different school subjects. Environment education concepts are also one of the notable among others.

In the case of formal education, NCERT attempt to give an environment thrust to school education at the primary and middle levels. At the primary level (NCERT EE in school curricula) the concept of an integrated approach titled Environmental Studies (EVS) has been followed. At the secondary level the NCERT favors the infusion of environmental concerns in the science subjects. Social Science and art subjects at higher secondary levels lack this infusion. But the Environmental Orientation to School Education Scheme (EOSE) which aims to bring locale specific environmental issues with the purview of School teaching has overcome this lacuna.

The Supreme Court of India in Dec. 2003 directed the NCERT to prepare a module (model) Syllables for Class I to XII which will be adopted in every state in their respective schools. It further directed that ‘NCERT’ be appointed as Nodal agency to supervise the implementation of this court order.

NCERT developed a syllabus for EE for 1 to 12 standards which was accepted by the SC. Compliance to Supreme Court order is mandatory and desirable and applies to all states and Union Territories.
1.4.4 Environmental Education (EE) at undergraduate level in India.

In 1991, The Supreme Court of India directed the states and other authorities to create environmental awareness among the students through the medium of education and ordered to strictly implement this under the supervision of the State authority.

The Supreme Court inter alias directed the UGC to take appropriate steps to prescribe a course on environment and consider the feasibility of making environment a compulsory subject at every level of college education. In pursuance of this, the UGC invited proposal from the universities for introduction of Courses in EE and the following programmes were approved.

(i) Proposals for organizing workshop/seminar/refresher courses on environment awareness.

(ii) Project on Fly – ash Accumulation and comparatives of finding avenues for its mass scale utilization.


(iv) Introduction of M.Sc. course in environment education, programme to telecast nearly 100 episodes on environment awareness through its country-wide classroom programme and preparation of a booklet for colleges as foundation course at undergraduate level and popular literature like handouts, pamphlets on environmental awareness.

As a result of Supreme Court’s ruling the subject of Environmental Education was made compulsory at undergraduate level. The Panjab University,
Chandigarh was the first university in India to start the compulsory course of Environmental Education at undergraduate level.

But in spite of the court’s order, much effort was not taken at higher levels to improve the status of EE. M.C. Mehta in 2000 filed a petitioner (c) No.289 in the court stating that the steps taken by various states and other authorities are insufficient and not in conformity with the support and object of order of the court. He submitted that the states and other authorities should prescribe a suitable syllabus by way of a subject on environmental awareness, not only in primary level of education, but also in the higher courses leading up to even postgraduate level. He submits that the University Grants Commission, NCERT and AICTE which are some of the apex bodies in prescribing and controlling educational standards should be directed to work out a proper syllabus to be taught at different levels uniformly all over the country. In the absence of such uniform prescribed syllabus in the educational institutions in various states, different institutions are adopting different methods, some of which are only basis which do not fulfill the requirements of the direction issued by the court.

Source: Down-to-Earth


On 18 December 2003, the Hon’ble Supreme Court of India directed that ‘We accept on principle that through the medium of education awareness of the environment and its problems related to pollution should be taught as a compulsory subject. The University Grants Commission will take appropriate steps immediately to gave effect to what we have said i.e. requiring the universities to prescribe a course on environment so far as education up to the college level is concerned, we would require every State Government and every Education Board connected with education up to the matriculation stage or even
intermediate college to immediately take steps to enforce compulsory education on environment in a graded way.”

(http://www.greenteacher.org/?Page_id = 29#)

A compulsory course of Six months module syllabus for Environmental Education for undergraduate courses is implemented in all the branches of higher education in all the Universities/Colleges as per the directive of Hon’ble Supreme Court of India.

1.5 Concept of Evaluation:

Evaluation is a broad concept. Literally, evaluation means ‘assessing the value of’. Evaluation is done in all spheres of life in informal or formal ways, wherever one wishes to know and understand the consequences of some action or event. Evaluation is a systematic determination of merit, worth and significance of something or someone using criteria against a set of standards. Evaluation often is used to characterize or apprise subjects of interest in a wide range of human enterprises (from Wikipedia).

UNESCO (1981), in its general conference, laid down that evaluation is a study which permits a rigorous scientific measurement of the effect of a project or an activity, taking into account its objectives as established before its inception. The purpose is not only to determine the nature of this activity in its social, economic or cultural context, but also to derive guidelines for its future planning as well as of new projects of similar nature.

Evaluation according to Rogers (1986), is an essential tool of learning, especially in the area of practice. It helps in planning new strategies, choices and establishing priorities to determine where we are at present and what to do next. In summing up, evaluation helps in improving our performance as planners, organizers, managers, teachers, evaluators and participants as well.
The main purpose of evaluation is to promote learning, point out the way to progress and to assess the accountability of factors. It enables the programme planners to make a programme more effective. The use of evaluation report will of course largely depend on its purpose or the relative importance of purposes. It forces us to test our goal, our methods and procedures against needs and accomplishments and to modify them in the light of our findings and provides sound basis for future planning (Dale, 1998).

Evaluation in development programmes and projects has been promoted and finalized from 1960’s onwards by donor agencies, which wanted ‘true’ account of how well things had been done and what had been achieved. The idea was to have an objective analysis which was considered possible through the engagement of independent persons to conduct them through standardized procedures of data collection and by using quantitative measures (Mikkelsen 1995, Rubin 1995).

Evaluation occupies a key position in education. The main purpose of evaluation is to improve learning and instruction. All other uses are secondary or supplementary to this major purpose.

As Ricco (1962) noted, “the major purpose of evaluation is to ascertain the current status of service or activity within a frame of reference, and on the basis of this knowledge, to improve the activity in terms of quality and efficiency.” Programme improvement is the fundamental purpose of evaluation.

To ignore evaluation, according to Gutsch & Alcort (1970), is to invite at least four undesirable conditions: (i) a weak or mediocre service at a level of quality far below the possibilities. (ii) an apathetic, indifferent staff and a student body with little motivation for improvement. (iii) a general failure to provide and utilize the proper activities, tools and procedures essential to the educational
progress of youth, and (iv) inefficiency in the use of staff members and the school’s resources.

Rao (1991), the following are among the major goals of evaluation.

Firstly, through a systematic and dependable evaluation the appropriateness of the programme can be judged. Secondly, it can help locate the weaknesses or limitations of the programme so that suitable remedial steps can be taken to correct the shortcomings well in time. Thirdly, it can help discover effective measures to improve the programme. Fourthly, it can indicate to the subjects the nature of progress made and help motivate them towards more effective results. Fifthly, it can help the administration or management to make the necessary personal and material resource available to the programme to improve its effectiveness of demonstrating to the society or country at large, the meaningful factors as well as the utility of the programme.

In the present evaluation study, ‘evaluation’ involves judging the existing status of Environmental Educational at undergraduate level, both in quantitative as well as qualitative terms. The present study tries to evaluate the stated objectives and the whole teaching learning process of Environmental Education undergoing at undergraduate level in the colleges under the three universities i.e. Guru Nanak Dev University, Amritsar; Panjab University, Chandigarh and Punjabi University, Patiala.

1.6 Concept of Environmental Awareness

The term Environmental Awareness has been used in Environmental Sociology and Education since 1970. The concept has often been used in a narrow meaning in empirical studies, but in more theoretical purposes it has usually been defined more widely, as the totality of cognition, attitude and action. It is not very simple to study environmental awareness in its wider meaning because attitudes and actions often seem to be in some kind of contradiction. So, here in
this research work, the researcher took environmental awareness simply as the ability to observe daily conditions and surroundings and make on-the-spot decisions for degrading environment either to avoid danger or take advantage of the opportunities offered.

Environmental awareness may be defined as to help the social groups and individuals to gain a variety of experiences in and acquire a basic understanding of environment and its associated problems.

At the Belgrade International Workshop (1975) working documents were provided by the trend papers that described the state of the art of Environmental Education in all the parts of the world and provisions to extend and explore the environmental awareness. It also states - Environmental awareness may provide power and understanding:

- To recognize the interdependence among physical environment, plants and animal life for survival, growth and development.

- To take decisions individually and collectively and initiate actions for social, cultural and economic survival, growth and development and for conservation of nature and natural resources.

- To identify human, material, space and time resources in the environment. To recognize ways of making effective use of environmental resources.

Some recommendations given at The United Nation Conference of Human Environment (Stockholm, June 1971), specially constituted the foundation of frame work for cooperative effort at international level, which states that environmental awareness may be developed by:

- Identifying, analyzing and understanding the needs and problems of personal life, social life and national life.
• Appreciating, promoting and using the environment to improve health, vocation and social and national life.

• Interacting with Government and social agencies and utilizing the development facilities provided by these agencies in his/her individual capacity and also for organizing certain community activities.

• Developing the aesthetic sense to appreciate beauty and adopt it in personal and social life.

Environmental awareness provides the understanding and competence to recognize environmental resources and interdependence between physical and biological components of the environment for growth and development. Environmental awareness involves the knowledge of both natural and manipulated environment but it confines itself only upto the theoretical aspect. It is limited only to the understanding aspect of problems and their solutions but does not involve much of task and activity. It confines itself to cognitive level only.

To create environmental awareness among people is one of the important measures to protect our natural environment from decay and degradation. For preservation and up keeping of pollution control measures, we have to start educational and literacy drive for the people to develop consciousness as to why conservation of environment is necessitated. For injecting the sense of awareness among people everywhere, the organisation of seminars, conferences and symposia etc. is indispensable to provide literature on it and making use of vast mass media in various spheres of environment.

Environmental Awareness helps in creating conservation consciousness. It is an established fact that the success of a conservation movement depends not on the quality of its science, not on the sincerity of the people who follow it, not even
on the funds provided for the cause (even though these factors are important), it depends upon how widely and compellingly the message is spread to make people more environment oriented. This dissemination of message depends on environmental awareness.

1.7 Attitude towards Environment

Defining as attitude however is problematic and there is still no consensus on a definition for it. Also, attitudes are often associated with multiple, and even contradictory values (Schultz, 2001). The concept has therefore been defined in various ways by various researchers, usually depending on their specific theoretical framework and the constructs they investigated.

Plug, Meyer, Louw and Gouco (1986) for example define an attitude as a relatively stable, predominantly learnt disposition of an individual towards a specific object (for example, People, things, or ideas).

Fishbein and Ajzen in Thirion (1990) believe that an attitude consists of and is influenced by three components, namely the subject (a person with a specific attitude); the object (at which the attitude is directed) and the situation (in which the subject and an object interact with one another). A change in any of these components can cause the attitude to change.

Eagly and Chaiken (1993) on the other hand defines attitudes as psychological tendencies that are expressed by evaluating a particular entity (for example the environment) with some degree of favour or disfavour. This evaluative response may be expressed as a cognitive tendency (thoughts and ideas about an object like the environment for example); as an affective tendency (positive or negative feeling towards or about the environment) or a behavioural tendency (action towards the environment) or a combination of two or all there of these psychological tendencies. As attitude only develops after a person has
responded evaluative to the attitude object and is then expressed and manifested in overt cognitive, affective or behavioural responses (Willers, 1996).

Attitude is a powerful resource of human motivation capable of arousing and sustaining concentrated effort. They determine our pattern of life as well as success and happiness. Attitudes are great driving forces in achieving the goals. An individual who has developed a positive attitude will succeed more in achieving his goal than a person who has developed a negative attitude. An attitude is an effective byproduct of an individual's experience and has its base in inner urges, acquired habits and environmental influences by which an individual is surrounded. The importance of attitude in the life of an individual is universally acknowledged. It determines the actions of a person and supply the code by which the behaviour of an individual is judged.

The term attitude was first used to denote, “the sum total of man's indications and feelings, prejudice or bias, preconceived notions, ideas, fears, threats and convictions about any specific topic.” (Thurston & Chave, 1929)

All Port (1935) defined attitude as, "a mental and neural state of readiness, organized through experience exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related."

This definition reveals the following facts:

1. Attitude is the mental or neural state of readiness.
2. Attitude influences and changes the reaction of an individual.

Young (1951) had defined attitude as a learned and more or less generalized and effective tendency or predisposition to response in a rather persistent and characteristic manner usually positively or negatively in reference to some situation, idea, value, material object or person or group of persons.
Atitudes result from personal desires and group simulations. They actually are a part of an individual's personality; According to Crow and Crow (1991) "Atitudes are personal and relate to feelings of a person." These are uniquely organised in each person. As Sherif and Cantril (1947) had put it, "Most attitudes have the characteristics of being part of me." One does not favour a particular object. One accepts some path or rejects it. All these beliefs, favorableness and acceptance are the expression of an attitude.

According to Freeman, (1955) "Attitude is a dispositional readiness to respond to certain situations, persons, objects or ideas in a consistent manner, which has been learned and has become one's typical mode of response."

According to Thondike and Hagen (1957), An Attitude means a feeling of favourableness and unfavourableness towards some groups, institutions or propositions."

According to Stephen P. Robbins (1999), "Attitudes are evaluative statements either favourable or unfavourable-concerning objects, people, or events. They reflect how one feels about something."

Like other aspect of personality, attitudes are acquired and not innate. No one is born with an attitude. They are learned in culture in course of individual development. The kind of environment in which one grows has an indelible impact on the attitudes one possesses. Sherif and Cantril (1947) define attitude as, "A habitual way of looking at an object a person or an idea." Attitudes are learned often unconsciously and are always tinged with emotions of fear, love or hate. Some of, our attitudes come from straight thinking, from direct experiences but the majority is born of prejudice and merely reflect the attitude of our parents, teachers and friends. So, individual attitudes are developing moment by moment.
Attitudes operate in specific behaviour pattern and are associated closely with emotional reactions as Woodworth suggests that when an attitude is inactive it may be called a disposition and when an attitude consists of strong feelings it may be called a sentiment. Dutt, (1974) had also pointed out that attitudes are not purely cognitive in nature but cognitoeative in nature, i.e. they have two components, viz., cognitive and emotional towards psychological objects-complex or simple. Attitudes can exert a potent influence on an individual. They act as cause as well as results of the behavior. They represent the way one feels or thinks acts or talks in a situation. In simple words, we can sum up:

- Attitudes underline many of the significant and dramatic instances of man's behaviour.
- Attitudes when fully developed function as internal frame of reference.
- Attitudes work as state of readiness for motive arousal.
- Attitudes serve as fabric for the philosophy of life.
- Attitudes give continuity to human personality.
- Attitudes give meaning to one's daily perceptions and activities.

Ausekar, (1995) points out that positive attitudes promote growth, negative attitudes hinder growth, critical attitudes help in taking wise decisions and tolerant attitudes help in adjusting to new situations, So attitudes provide us with a personal outlook on the world through our feelings, biases, preconceived notions, ideas, fears, threats and convictions.

Thus attitude is an emotional and motivational force towards a psychological object. It is a basic component of how we ascribe meaning to our interpersonal and physical environment.
Characteristics of Attitude

Shaw and Wright (1967) mentioned six general characteristics of attitude. These are:

- Attitudes are learned through social interaction.
- Attitudes have specific social referent or specific classes. It's not necessary that referents be concrete objects. It may include abstract referents as god, peace etc.
- Attitudes are based upon evaluative concepts regarding characteristics of the object.
- Attitudes are constructed as varying in quality and intensity on a continuum from positive through neutral to negative.
- Attitudes are stable and during; very difficult to change.

Thus attitude means the individual's prevailing tendency to respond favourably or unfavourably to an object. Social psychologists distinguish and study three components of the responses: (a) Cognitive component, which is the knowledge about an attitude, object whether accurate or not. (b) Affective component, feelings towards the object and (c) Cognitive or behavioural component, which is the action taken towards the object. Attitude towards environment commonly refers to the environmental concerns (Vining & Ebreo, 1992); Environmental concern is used either as a multiple or single component approach (Fuhrer, 1995) and covers either in general or some particular aspects of environment. Paper by Florian G. Kaiser et.al. (1999) established environmental attitude as a powerful predictor of ecological behavior.
1.8 Relationship of Awareness and Attitude

Both awareness and attitude are interrelated to each other. Awareness gives way to attitude and attitude paves way for awareness. The more awareness people posses about an object, event or their environment, the more positive or negative attitude they posses according to the characteristics of the object. The more favourable attitude they have towards environment, the more knowledge they would like to gain about environment. Thus the researcher felt that environmental awareness and attitude towards environment are deeply correlated to each other. So to make any research study, related to Environmental Education, purposeful and meaningful it is appropriate to study the environmental awareness and attitude towards environment of that group for whom this subject is been introduced.

The researcher studied the environmental awareness and attitudes towards environment among the students after studying the subject of Environmental Education at undergraduate level.

1.9 Concept of Perception

One of the important cognitive factors of human behavior is Perception. It is essentially a psychological process. It is the chief mechanism by which people come to know about their surrounding milieu. It is the process by which people select, organize, interpret, retrieve and respond to information from the world around them (Schiffmann, 1990). A person gathers information from the five senses of sight, hearing, touch, taste and smell. Through perception, people process information inputs into responses involving feelings and actions. It is way of forming impressions about oneself and other people in daily life experiences. It also serves as a screen or filter through which information passes before it has an effect on people. The quality or accuracy of a person's perception has a major impact on his or her responses to a given situation.
Therefore there can be no behavior without perception and perception lies at the base of every individual behavior. Some important points regarding perception are:

1. People's actions, emotions, thoughts and feelings are triggered by perceptions of their surroundings.

2. Perception is the intellectual process, by which a person acquires the information from the environment, organizes it and obtains the meaning from it.

3. Perception is the phase of operation that takes place after the information is being received.

4. Perception is the basic cognitive or psychological process. The manner in which a person perceives the environment affects his behavior.

So most of our acts are primarily based on Perceptions. If we could not perceive anything, then we would know nothing except the contents of our mind. Perception is not a series of isolated events rather it is a continuous process producing continuous change in the perceiver. In this continuous process of perception, the perceiver is creating and constantly updating a model of the world and of himself in the world. Human beings affect the environment and are themselves affected by it. If this interaction is to take place, human beings must perceive the world. It means that sight, sound, smell, taste and tactile-information that offer clues about the world around them must stimulate human beings. Perception is based upon the organization and meaning that these stimuli have for the individual.

We can categories Perception as internal or external.
**Internal Perception** (Proprioception) tells us what is going on in our bodies. We can sense where our limbs are, whether we are sitting or standing; we can also sense whether we are hungry or tired and so forth.

**External Perception** (Extroception) tells us about the world outside our bodies. Using our senses, we discover colors, sounds, textures etc. of the world at large. The philosophy of Perception is mainly concerned with extroception.

Forgus and Melamed (1976) based their description of perception on cognitive structures; these are the processes that determine how humans interpret their surroundings. Humans interpret their surroundings on a "higher" level than those of animals which perceive the world in terms of stimulus, response or reflex-tropistic actions. Humans, on the other hand, perceive their world through information processing.

Kolasa (1969) defines Perceptions as the "Selection and organization of material which stems from the outside environment at one time or the other to provide the meaningful entity we experience."

Rao (1996) says "Perception is the process by which people organise, interpret, experience, process and use stimulus material in the environment so that they satisfy their needs."

Walsby et al. (2003) are of the view, "Perception is the ability of senses to recognise aspects of the environment, in particular any variation that may occur."

The factors that influence perceptual mechanism are of two kinds - Internal and external. Among the internal factors the most important are the needs, desires of individuals, individual personalities. Perception is also influenced or affected by the characteristics of perceived object or event or person. The external factors includes size, intensity, frequency, status etc. The way one perceives is
contingent not only on the capacity of one's physical structures for detecting stimulus configuration but also a product of many psychological conditions. The development of perceptual awareness can be effected by one's variety and quality of environmental experience.

It is an individual's window to the world. People first learn about the world through a neurological process called sensation. Perception is the process of attaching meaning to the neurological sensations the body experiences. It is an active process in which the perceiver plays an important role. It's a process of Interpretation. Figure 1.1 illustrates the three components that comprise the process - Attention, Construction and Interpretation of sensory inputs.

![Figure 1.1 Process of Perception.](image)

The perceiver selectively attends to sensory inputs, constructs a representation of the inputs and then interprets the construction. Perception then becomes an essential influence on subsequent action of the perceiver. When we say that perception is action-oriented then it becomes necessary for us to know the perception of Environmental Education among student-teachers and teacher-educators who are going to teach or are teaching it as a subject in their institutions. Only then the maximum benefit of Environmental Education as a subject can be attained. In the present research study the researcher has evaluated the different aspects of EE followed by the three Universities through the perceptions of principal, teachers and the students.
1.10 Review of Related Literature

A worthwhile study in any field of knowledge demands an adequate familiarity with the works that have been done in that field. Survey of related literature equips the researcher with adequate and up-to-date information regarding the field in general and the problem in particular. An attempt was made to explore the various studies conducted in the area of Environmental Education with a view to find out the aspects studied, methodology followed, major findings and direction for further research. The relevant studies related to the field of Attitude towards environment and Environmental Awareness and Environmental Education are discussed under the following headings:

- Research studies on attitude towards environment and environmental awareness
- Research studies related to the field of Environmental Education which are studied under these three headings:
  - Status Studies
  - Effectiveness Studies
  - Studies conducted in India

1.10.1 Research studies on Attitude towards Environment and Environmental awareness

Misah (1980) conducted 'a 'Survey on Environmental Attitude of Teachers from Western Region. In-service secondary school teachers, admitted to summer school cum correspondence courses of Regional College of Education, Bhopal, were administered Likert type Environmental Attitude scale was prepared by the investigator. It was found that respondents had positive attitude towards environment. They had positive attitude towards population problem and agreed
Gupta (1981) studied the environmental awareness among children of rural and urban schools and non-formal education centers in Bhopal. He found that the difference between formal rural and formal urban schools was significant and was in the favor of formal rural schools. The difference, between non-formal rural and formal urban schools was also significant on environmental awareness and was in favor of non-formal rural schools.

Veera Vatnanond (1984) studied the current status of their teachers' institutions in regard to environmental problems and also proposed an environmental curriculum system for teachers' training programme in Thailand and the data indicated that most Thai teachers' training institutes offer studies about environment and its related problems, but environmental researches conducted by faculty members and environmental services provided to the public by faculty members were less emphasized in all areas of concern.

Cortes (1986) conducted a study to inquire into the knowledge, comprehension, responsibility and interest of secondary school students and teachers about local conditions, environmental issues and problems as a means of measuring their environmental consciousness. The findings of the study were that majority of the students were aware of pollution, pesticides, typhoons, volcanic areas and their environmental effects, but were unaware of effects of deforestation, and new techniques of fish culture and the total population of Philippines. Their environmental values were not consistent, teachers were aware of many events in the environment but could not explain their causes and their environmental values were also found to be inconsistent.
Madhagal and Ahmed (1987) developed an Environmental Education programme as well as an instrument to measure environmental awareness and attitude of Yeman Arab Republic High Students. The curriculum was developed to fulfill the need for Environmental Education in Yeman schools.

Shahnawaj (1990) conducted a study, on environmental awareness and environmental attitude of secondary and higher secondary school teachers & students & found that teachers had more awareness of the environment than students and trained and untrained teachers did not differ in environmental awareness. The girls possessed significantly more awareness than the boys.

Housbeck et.al (1992) surveyed 3206 students from a sample of thirty secondary schools of New York and found that students scored rather low on environmental knowledge but scored very high on environmental awareness and concern. Environmental knowledge was found to be positively correlated with age, family income, gender, exposure to mass media and personal interests outside school.

Gakhar (1993) in his study on Environmental Awareness found that the Environmental pollution Awareness among urban school going youth is significantly better than that of rural school going youth.

Chin (1993) studied environmental knowledge, attitude, behaviour of secondary student and Pre and In-service teachers in Taiwan. He found that students in rural Junior High Schools appeared to have the lowest level of environmental problems and vertical commitment. Rural teachers possessed less environmental knowledge than urban teachers. Girls tended to be more aware of environmental problems than boys.

Flong (1993) carried on a study to investigate environmental awareness and action for elementary school students and their parents in Taiwan. This Study suggests that parents' educational level, their environmental awareness &
encouragement action made a significant difference in awareness and encouragement action of their wards.

Quimbita (1994) studied the direct and indirect effects of the students background characteristics, institutional characteristics and college experience variables on environmental attitudes. A causal model is developed based on higher education literature and environmental attitude research to explain the development of environmental attitudes in all students. The findings recognized that the number of science courses and human ethical/social activist values play an important role in the development of a positive attitude towards the environment. Furthermore, academic and social integration directly influence the development of environmental and attitude mediated by human ethics/social activist values.

Padhan (1995) conducted a Study entitled environmental awareness among teacher trainees & found that as regard to awareness between the urban & rural teacher trainees, the former group was significantly highly aware than the latter. The subject background of trainees also had its effect on knowledge and understanding of facts & concepts relating to different aspects of environmental problems.

Patel & Patel (1995) investigated environmental awareness and its enhancement in secondary school teachers and found that there was a significant effect of the whole treatment on environmental witness programme of the teachers of experimental group. There was no significant difference on mean score of environmental awareness possessing high and low experience of teachers.

Sabhlok (1995) studied the awareness and attitude of teachers and students of high school towards Environmental Education in Jabalpur district. The major findings were that government & primary schools differ significantly on their Environmental awareness in favour of private schools and boys and girls
differed significantly in favour of boys. Male & female teachers differed significantly in their environmental attitudes. Female teachers have more favourable attitude towards environment than male teachers. The teachers have more environmental knowledge than the students. The urban and rural teachers also differed significantly their awareness of Environmental problems.

**Shuriock (1995)** made an investigation into the environmental attitudes and behaviors of grade VIII students. In this five case studies were presented which portrayed the lived experiences of the adolescent involved. Information was collected through the use of personal journals. This thesis concludes with a discussion that there is need for qualitative research in Environmental education and gave recommendations for improving the commitment to environmental action within adolescents.

**Bhattachrya (1996)** conducted a study on Environmental awareness among primary grade girl students and their parents in Varanasi and did (not find any sex difference in the case of grade III and V girl students in terms of their environmental awareness. Significant difference in the mental awareness was found in the girl students of the grade III and V and their parents.

**Liu (1996)** found a significant difference in the environmental attitude between Chinese students and American Students. The Chinese students revealed stronger positive attitudes towards environment than the American students.

**Prajapat (1996)** conductive a study to assess the effects of programmes developing awareness towards environment among pupils of standard IV and assessed its effectiveness. Major findings of the study were that among the IV graders the effects of programme developing environmental awareness were highly significant. The programmes affected students from non-government schools more and the pupils of all the age groups were more enthusiastic
towards receiving the education through the programme than through the text books.

Mendoz et al. (1997) in a study on high school student’s awareness air pollution found that awareness on air pollution was greater in the private school students than in the public school students. More than 50% of students from both schools do not consider smoke a source of air pollution. Students with higher socio-economic level have a greater awareness and more information on air pollution.

Surbook (1997) conducted an experimental study regarding children’s exposure to the natural environment and their environmental attitudes. The results indicated that environmental attitudes vary at different age levels with the seven year old children’s environmental attitudes mean score lying the highest of the three groups of 4 years, 7 years and 10 years of children.

Dubey and Samal (1993) conducted a research entitled Environmental awareness among women. The major findings of research were that environmental awareness among urban women was significantly higher than the environmental awareness among rural women.

Lalonde (1998) did a comparative study of environmental attitudes and religious beliefs of people. The findings suggested that there is a relationship between environmental attitudes and religious beliefs. An unexpected level of unity was revealed in the respondents’ collective contribution to devising a global environmental ethic. A number of principles or concepts appear to represent common ground for an interface between two district domains: ecology and spirituality.

Florian & Kaiser et.al (1999) presented a paper on Environmental Attitude and Ecological Behaviour. This paper establishes environmental attitude as powerful predictor of ecological behavior.
Dunaway (1999) conducted a survey to assess the environmental knowledge, attitudes and behaviour of Law students at two States of Kentucky law schools. From the data available, the researcher concluded that the level of education is positively co-related to the level of environmental knowledge. These students had a higher score on the environmental knowledge section of the survey; the results demonstrated a relationship between environmental knowledge, attitudes and behaviour.

Place (2000) surveyed the impact of early life outdoor experiences on an individual's environmental attitudes and found that encouraging and providing opportunities for interaction with natural environments during an individual's early life is important in developing environmental attitudes.

Evans et.al (2002) conducted a survey of 555 women living in northern Manhattan in New York City. The Survey was conducted to find out Awareness of Environmental Risks and Protective Actions among minority women in Northern Manhattan. The findings suggested that overall awareness of environmental risks to children's, health was high, with more than 95% respondents identifying lead, household pests, pesticides, tobacco smoke and drugs harmful to health. Similarly more than 95% of respondents reported taking one or more protective actions to reduce these risks. The reported level of specific protective actions to reduce these risks, however, varied greatly. In each area of risks the most frequently reported actions were effective ones, but many other important protective actions were rarely mentioned, suggesting that there was room for an educational campaign to teach women new ways to protect their families.

Kaur (2002) made a study of the impact of scholastic attitude and scientific attitude on environmental awareness of +2 students of Moga district in Punjab. It was found that there was a significant difference of environmental awareness
between boys and girls. Girls were having more environmental awareness aware than boys. Moreover rural girls were more aware than rural boys about environment.

Pradhan (2002) studied Environmental Awareness among secondary school teachers and found that the teachers working in secondary school had low awareness about environmental problems. Teachers teaching science subjects have more awareness about environment than their Social Science and language counterparts. Teachers working in urban Schools were more aware of environment and its related problems. Both male and female secondary school teachers have same environmental awareness.

Kumari and Surendra G (2002) studied the attitude of adult education organizers towards environmental awareness with regard to gender and age, caste educational qualification and working experience have a prominent role in determining the environmental awareness among adult education organizers.

Asunta (2003) conducted a study on knowledge of environmental issues. The study concentrated on the area of environmental education and environmental attitude and behavior. The study clearly stated that important information sources on environmental issues for secondary school pupils are mass media and science teachers. It also proved that environmental concepts are very familiar to the students and that most students have slightly more confidence in the information gained from television than from their science teacher. Student’s Environmental attitudes in the country schools proved to be more negative than the sub urban schools.

1.10.2. Research studies related to the field of Environmental Education

Research studies related to the field of Environmental Education are studied under these three headings:
1.10.2.1 Status Studies

1.10.2.2 Effectiveness Studies

1.10.2.3 Studies conducted in India

1.10.2.1. Status Studies

Stapp (1974) – One of the proponent originators of the modern concepts of Environmental Education, developed an instruction programme approach for the implementation of environmental curricula (K-12) in primary and secondary schools. It was based on an action model. He suggested that school should design instructional programs to help develop skills such as critical thinking, problem solving and social change strategies. Such skills assist students to function more effectively in achieving goals arising from their attitudes of concerns for the environment.

UNESCO International EE Programme (1985) had undertaken comparative study of the incorporation of EE into elementary and secondary school curricula. A survey was designed to investigate how EE had been introduced in school curricula in different educational systems in various countries. This report presented EE in terms of its goals, objectives and guiding principles in various countries such as Germany, Japan, Malaysia, India, Sri Lanka etc. The aspects included in the study were

- National Policy on Environment and EE

- EE curriculum including aims, objectives, content, teaching methodologies and examples of learning activities.

- Evaluation

- Teacher education.
The study indicated that the development of curriculum specifications, teaching and learning materials and teacher education seemed to follow a common pattern with slight variations depending on the characteristics of educational system in different countries. Some countries had followed multidisciplinary module whereas some followed interdisciplinary module. Except in few countries, the most popular strategy for the incorporation of the environmental dimension into the school and teacher, education curriculum had been that of infusing it into existing subject related to various aspects of EE. It stated that very little information was available with regard to the present state of evaluation in the countries concerned, probably because such evaluation practices were still in an early stage of development. In the absence of any reliable data on the final outcomes of these programmes, it was not possible to evaluate the effectiveness of the programme.

Yang (1993) studied perceptions of pre-service secondary school teachers in Taiwan, The Republic of China towards Environmental Education. The findings indicated that secondary school teachers had a substantial concern for environmental issues. Female attitudes towards environment were more positive than male attitude. The overall measure of Pre-service secondary school teacher’s perception of Environmental Education did not differ significantly. There was a positive co-relation between the pre-service secondary school teacher’s view towards the environment and Environmental Education. Lack of knowledge and lack of teaching skills were two concerns of these teachers as they faced the challenge of conducting Environmental Education.

Walker (1995) examined Environmental Education from theoretical and practical perspectives in the context and structure of formal education. He formulated a definition of education and Environmental Education for formal and non-formal systems. Further, a set of criteria for curriculum planning and evaluation for education and Environmental Education was developed.
Outcomes of the search and the survey indicated that Environmental Education, in both formal and non-formal situations, should be based on constructs of formal educational theory for foundation and structure.

Taylor and Topalian (1995) evaluated the delivery of EE in the South Pacific Region, Fiji, Kiribati and Niue and attempted to evaluate those as case studies against models of good practice suggested in the literature. The findings revealed that Environmental Education was at different stages of evolution in each of these countries. In Fiji, the study showed that the teachers were often reluctant to employ anything other than a formalistic and didactic style. Despite impressive aims and the presence of curriculum content, the style of teaching was producing the student without real appreciation and sensitivity towards the environment. Rather the students were learning environment to succeed in an examination. In Kiribati also, the lack of relevant curriculum, printed resources and trained teachers and the examination driven curriculum were the major constraints for effective delivery of Environmental Education. But in contrary to these, Niue appeared to deliver EE effectively when compared with models of good practice suggested in the literature. In this case, like in Fiji, the EE was integrated with the whole curriculum. Teachers also applied a variety of methods such as story reading and group discussion to explore simple environmental themes.

Mollvenna (1996) conducted a comparative study of Russian and American Students concern about environmental issues and implications for the Environmental Education curriculum. The results of the study suggest that student’s environmental perceptions can be determined and that these perceptions may provide a framework for teaching learning and curriculum development for Environment Education.
Mounroe (1996) conducted a case study in the University of Montana, to analyze teacher’s beliefs regarding the objectives of Environmental Education as described by the Tbilisi declaration and identified structures that assisted the educators to realize those objectives. Data gathered involved subject and community interviews and observations. Findings revealed that college education greatly influenced the teacher’s beliefs and practice and even teachers and their supporting community possessed little knowledge of Environmental Education objective.

Kin (1996) attempted to investigate the present status and teacher’s perception of Environmental Education in term of curricular change in primary schools of Hong Kong. Two questionnaires surveys were conducted with a 3000 primary school teachers from two hundred primary schools. In addition, eight case study schools were studied and sixty two principals and teachers were interviewed. The results showed that Environmental Education programmes was not compulsory and found that some selected primary schools were there which focused only on local environment. Again the perceived non-monetary cost benefits of the implementing guidelines, perceived practicality of the “Guidelines”, perceived school supports and other support, issue of concern and the teacher’s work load were predictors for teachers’ behavioral intention towards promoting Environmental Education.

Sidana and Pareck (1996) conducted a study on environmental interest towards Environmental Education among secondary school students and found that there existed a significant difference between urban and rural student in interest towards Environmental Education. The rural students possessed more interest than urban students. The boys and girls showed a significant difference. The girls had more interest towards Environmental Education than the boys.
Lin, (2000) assessed the status of Environmental Education at the teacher preparation level in all pre-service training institutions across the Canadian provinces. In addition, two case studies examining the design, content and methods of two pre-service teacher educational courses with specifications in Environmental Education were conducted to understand and describe the nature of Environmental Education currently found in pre service teacher programmes.

Institute for Global Environmental Strategies (2001) evaluated the status of Environmental Education in Asia and Pacific Region. The finding showed that Environmental Education has shown growing momentum, but couldn’t show the effectiveness in real life situations. However, it had increased awareness of environmental problems.

Skamp and Bergman (2001) in their recent study of two schools involved in the cape project, found that even when schools had developed their school grounds as sites for learning, teachers had very limited and stereotypical views of their application in the curriculum.

Fleer (2002) studied about the curriculum compartmentalization: A future Perspectives on Environmental Education. 486 children aged 5-12 from eight primary schools of the Australian Capital territories and New South Wales were asked to think about their future Environment. The finding showed that the majority of the children demonstrated negative future by there drawing and diaries where as only few showed positive future. Overall, it was noted that older the children, the less positive were the children’s comments or drawings about the future. The children’s overwhelmingly negative perspectives underscore the need for curriculum developers, researcher and teachers to co-construct curriculum which builds learners towards a more positive future.

Barraza and Walford (2002) compared the Environmental Education between English and Mexican school children. This research analyzed the role of
national policy and classroom practices in the formation of positive attitudes towards the environment in young children. These two countries, England with EE policy and Mexico without EE policy are significant with cultural and structural differences in their educational system. Since 1990 EE has been incorporated in the primary education of Mexico covering two main areas like (i) knowledge (ii) the formation of values and attitude. In England, though a new direction in EE began from 1980, the three major government initiatives started from 1990s with the publication of “This common inheritance” and “Curriculum Guidance Seven” and review of the “National Curriculum” giving more emphasis on environmental topics in science and geography curricula. In this research a sample of 246 children from year three of primary education (7-9 yrs old) was chosen from five schools of Mexico and three from England. This study tried to find out the effect of school ethos and education system in acquisition of environmental knowledge. Ten environmental words were selected to test the children about the environmental knowledge. It was found out that 20 % of English children had heard all the words and 8.8% knew their meaning. Whereas in Mexican children, 13.2% were familiar and 1.3% knew their meaning. Differences were due to the different practice of delivery system of environmental issues. In England, more emphasis was given to practical and student centered activities. Where as in Mexico teachers followed traditional and didactic, method like reading the textbook as the classroom activity. Thus results revealed that the school with strong environmental policy seemed to transmit environmental information more effectively than schools with no environmental policy.

Curriculum Review of Environmental Education (2003) reviewed the Environmental Education in formal education sector of Australia. Findings showed that the nature and extent of the references to EE varied widely across the states and territories. EE learning outcomes were predominantly found in the
science, and studies of society and environment. The science contained the learning outcomes based around the learning about the environment. (e.g. ecology, energy and resources). Many learning outcomes emphasized exploring and investigating the environment. A wide range of skills and competencies were found in each of the curriculum documents. Learning outcomes dealing with personal action were rare. In society and environment EE had been emphasized with a common theme of sustainability which were changed over time, sustainability, land use planning, populations and resource usage. In the curriculum, biodiversity, values and view points, intergenerational equity and personal actions, greenhouse effect, air pollution, eco-efficiency, eco-space, ecological footprint etc were lacking. So this study suggested developing a national Environmental Education policy.

Tali (2004) conducted a case study of school-community collaboration in an elementary community school in Israel and followed up an Environmental Education (EE) school-based curriculum that involved the parents and community members in various indoors and outdoors activities. The collaboration was established in the framework of the Community School Approach. In these schools, parents were encouraged to be involved in planning school-based curriculum and participating in school’s formal and informal activities. The aim of the study was to describe Environmental Education-based school-community partnerships and to examine the advantages and limitations for such collaboration. Parents, teachers and community members were interviewed for a period of three years. Most of the participants acknowledged the unique nature of EE that allowed such a partnership, emphasizing local ideas of project-based learning in Environmental Education. The study described an exemplary collaboration and the development of local school- community partnerships, which could be adapted by other communities within elementary or middle schools.
**Keqin (2004)** study aimed at understanding the current situation of Environmental Education in the secondary vocational schools in Shanghai. A survey was conducted involving 1,495 students of eleven secondary vocational schools in Shanghai, focusing on five aspects, namely environmental awareness, environmental knowledge, environmental attitude, environmental skills, and environmental involvement. The analysis of the survey findings showed the existing shortcomings of the current Environmental Education in secondary vocational schools.

**Chatzifotiou (2005)** studied Greek primary school teachers to investigate Environmental Education awareness in three countries of Northern Greece. After finding the status of Environmental Education, the author stated the study’s rationale by defining the term ‘awareness’ and moved on to discuss the methodological consideration that guided the project. The findings showed that Environmental Education awareness was influenced by several philosophical notions about nature and its implementation was mediated by both local and state factors. However, the study strongly recommended that the development of school policies for Environmental Education should be encouraged through the national curriculum and a stronger emphasis should be placed in the school curriculum on the three fold categorization about, in and for the environment.

**Mastrilli (2005)** studied about the Environmental Education in Pennsylvania’s elementary teacher preparation programmes. Out of seventy four institutions only forty two institutions responded. The three basic objectives of this study were to: (a) assess the current level of environment and ecology standards implementation in Pennsylvania pre-service elementary education programmes. (b) assess the current level at which EE pedagogical methods and strategies were integrated into Pennsylvania’s pre-service elementary education programmes and (c) identify positive factors that encourage EE inclusion as well as barrier. The finding showed that though the environment and ecology
was an educational standard and academic core subject in Pennsylvania, most teacher preparation programmes did not provide all the components of environment and ecology standards as required by Pennsylvania law. The positive factors in inclusion of EE were state certification guidelines and faculty interest where as the barriers of inclusion was due to budget, time constraints within existing curricula and schedules. Thus, the survey data showed the EE pedagogy and environment and ecology content knowledge were not institutionalized in Pennsylvania’s elementary education teacher preparation programmes to any significant extent.

Rajbhandary (2007) She studied the Environmental Education in primary schools of Kathmandu Valley. She studied the relevance, appropriateness, efficiency and effectiveness of Environmental Education at the primary level with regard to the learning outcomes, content, instructional methods, instructional materials, resources and the evaluation techniques.

1.10.2.2. Effectiveness Studies

Swan, (1974) in his research study, which was carried on its Inner City High School, found that in general the more knowledgeable the students were about air pollution; the lowest were their priorities of spending personal time on clearing up their air. In general, Swan stressed that perception is based upon both one’s previous experience and present environmental conditions. The development of perceptual awareness can be effected by one’s variety and quality of environmental experiences. Therefore, he suggested that an integral part of any Environmental Education programme is the provision of opportunities for students to explore a wide variety of different environments.

In a descriptive study by Supreka and Harms (1977), two methods of presenting Environmental Education were compared to determine their effects on students’ knowledge and attitudes toward energy and environmental issues.
Eight teachers used an inquiry (non-value oriented) approach and eight others used a value-oriented approach to teach a six-week Environmental Education unit to more than 600 high school students. Both treatments were found to produce significant cognitive gains compared to the control classes. The authors suggested that there was no difference in students’ gains in knowledge between the two approaches and only a slight difference in attitudes toward environmental issues.

The effectiveness of the project designed to enhance awareness of environmental issues was researched by Deluca, Kiser and Frazer (1978). Seventy five males and females from each grade level were randomly selected. A nearby school without a similar programme served as the control group. Environmental knowledge and tests were administered at all grade levels. Statistically significant differences, favoring the experimental group were found between the groups.

The effects of using an interdisciplinary approach as opposed to traditional approach for examining problems were addressed by Hepburn (1978). Her findings revealed difference in post-test scores between science/social studies modules of instruction involving ninth grade and slower tenth grade students. Comparisons were made at each grade level across four treatments: a science module, a social studies module, all interdisciplinary modules and a control treatment. Results indicated that the interdisciplinary treatment groups attained the highest mean scores.

The effect of an environmental unit on upper student’s concepts and knowledge about woodlands and associated environmental problems were studied by Gross and Pizzini (1979). The unit was presented for two months prior to a field trip. Seventy V grade students were randomly selected from a population of 295 for pre- testing. The remaining students received the post-test along with eighty five
VI grade students who had received the post-test along with eighty five VI grade students who had received the treatment one year previously. The researcher reported that the treatment resulted in a more positive way in student orientation about the use and abuse of wilderness. However, history and maturation effects were not controlled in this study. Also noted was a change in sensory and effective awareness of a natural community resulting from the one day field trip. To minimize the effects of the limited time spent in the field, the researchers recommended classroom instructional activities to facilitate concept formation prior to a field experience.

The effectiveness of a problem-solving module in understanding and solving environmental problems was examined by Andren (1979), who used community college students as the study sample. The problem-solving module consisted of twenty one questions grouped into six areas of problem identifications, historical context and proposing and testing solutions. An analysis of the contents of the student’s investigation reports indicated that the experimental group discussed economics, law, transportation issues, and population issues to a significantly greater extent than did the control group. It was concluded that this module was useful in systematically focusing attention on some of the necessary components of environmental problem solving.

Jaus (1982) in his study on “the effect of EE instruction on children’s attitudes toward environment” found the elementary school can change slightly positive attitudes toward the environment into strongly positive one. Jaus (1984) further suggested the environmental attitudes of elementary school people were retained over period of time. Kirk and Karbon, 1986 and Pomerantz (1986) supported that the foundation of environmental attitudes in childhood govern behavior throughout the adult life.
Subbarini (1989) studied the attitudes of Jordanian elementary school pupils toward the environment with the aim of assessing the efficiency of school curricula. A device, called “a scale to measure attitudes of elementary school pupils towards the environment” was developed and tested. The test was applied to a random stratified 1910 IV grade pupils from schools in Irbid Directorate of Education (North Jordon). The result of the study revealed favorable, but not very strong positive attitudes towards the environment in elementary school children. On the basis of the results of this study, it was taken to raise attitudes to strongly positive ones i.e. by environmentalizing text books of different subjects, teaching both cognitive and affective of action oriented materials and giving pupils the opportunity to have first hand experience of aspects of nature.

Mcconney and others (1994) studied the effects of an interdisciplinary Curriculum unit on the environmental decision making of secondary school students and found that the students exposed to the interdisciplinary curriculum unit offered more supporting statements for the environmental decisions as compared to control students.

Gama (1996) focused his study on the idea that for educators to engage in Environmental Education, they must first deeply understand the constructed and natural environment. The primary purpose of this study was to investigate how teachers grasp environmental paradigms, while remaining committed to teaching about environmental concerns. This goal was accomplished through participation in ‘experimental’ training Programme. The data showed that presumably as a result of instruction, the teacher’s orientations became informed by a richer conceptual framework, not only the new array of scientific concepts they learned during the training, but also by their prior knowledge. The semantic networks demonstrated that they reconstructed and reorganized environmental conceptual knowledge according to the principles of training.
There was no direct relationship between the environmental concerns and the paradigms.

**Liu (1996)** developed an Environmental Education instructional programme for Taiwanese College students and found its effectiveness on students’ environmental awareness, knowledge, attitudes, Self-efficacy, social support and reasonable environmental behavior.

**Lieberman and Hoody (1998)** found that student learned more effectively within an environment based context than within a traditional education framework. According to their study, the benefits of these environmental based programmes improved performance on standardized measure of academic achievement, reduced classroom management problems and increased enthusiasm for learning. A report by the National Environmental Education and Training Foundation (NEETF, 2000), Environment based education: creating high performance schools and students, and a State Education and Environment Round Table (SEER, 2000) study of schools in California further supported the premise that environment based education improved academic performance across the curriculum.

**Bradley (1999)** studied the relationship between environmental knowledge and environmental attitude of high school students. He assessed 475 high school students’ environmental knowledge and attitudes before and after exposure to a ten day environmental science course. Questionnaire results indicated significant differences in school students’ knowledge gain and attitudes after exposure. School students’ environmental knowledge scores increased by 22% and their attitudes became more environmentally favorable after they completed the environmental science course. A significant correlation was found between pretest knowledge scores and pretest attitude scores and between posttest
knowledge scores and posttest attitude scores. In both cases, school with high knowledge scores had more favorable environmental attitudes.

Legault, (1999) studied the impact of an Environmental Education Program children’s and parent’s knowledge, attitudes, motivation and behaviors. Results suggested that children in the experimental group were more likely to talk to a teacher and parents for ecological information and presented a more self-determined motivational profile. Additional analyses revealed that children enrolled in EEP performed ecological behaviors less for extrinsic motivation. Levels of knowledge, other attitudes and behavioral measures did not differ significantly between the two groups. Parents of children in the experimental group reported lower levels of satisfaction towards the environment and were more likely to get information on ecological issues and strategies from children. No other significant differences between groups of parents were found.

Wagenet (1997) studied the impact of a focused Environmental Education Programme on adults. He investigated the relationship between Adult education and environmental issues. Results were analyzed to determine if there were significant differences in knowledge, attitude or behavior among the survey groups. Respondents were grouped according to their readership level. Readers who fully utilized all the educational material sent by the researcher; N readers who received the educational package, but did not fully utilize it; and non-WEP who did not receive the educational package. Statistical analyses illustrated that Readers displayed a high level of fact recall and confidence in environmental knowledge than did non-readers or non-WEP. Application and evaluation of that knowledge was not however, significantly different among the three readership groups. In addition, results indicated that non-readers displayed a somewhat hostile attitude towards environmental issues.
Krantz (2002) conducted a study on the impact of Environmental Education workshops on teacher’s attitudes and efficacy. He found that attitudes and efficacy towards teaching environmental concepts are directly related to participant’s previous workshop experiences. Participants with previous workshop experience scored significantly higher than those participants without previous workshop experiences.

Aivazidis and Hellden (2006) compared traditional and web-based versions of an Environmental Education programme in terms of their effectiveness in raising knowledge and promoting attitude issues. They used a pretest-posttest nonequivalent control group quasi-experimental design. Results showed a statistically significant increase of knowledge scores for both groups. The junior high students who received Computer-Assisted Instruction (CAI) significantly outscored their peers who were taught traditionally in posttest knowledge scores. In addition, the CAI group demonstrated a significant increase in attitudes scores. The author found the correlation coefficient between knowledge and attitudes to be significant but low.

1.10.2.3. Studies Conducted in India

Gupta (1986) conducted a study of attitude towards Environmental Education and found that mean attitude score for all the groups of teaches showed a favourable attitude towards Environmental Education. The college teaches felt that the need for organization of Environmental Education teaching for the general group and special group of the learners. The teacher pointed out the constraints like crowded classrooms, lack of time for proper planning of activities, loss of interest in the absence of regular follow up action etc. are hurdles in the implementation of Environmental Education Programme.

Rane (1989) evaluated the environmental study approach of Parisar Asha in Municipal Schools in Greater Bombay, India. His study aimed at studying
organizational structure and mechanism for implementation of environmental studies approach, the perceptions of officials and teachers, and the achievements of standard I and II in languages, arithmetic and general science. He found the Environmental Studies approach functioning satisfactorily.

Kidwai (1991) developed a framework for an environmentally oriented geography curriculum at Secondary stage.

Kaur (1992) found that level of population awareness was not related to attitude towards Environmental Education.

Sahoo (1992) did his study of the conception and perception of Environmental Education and suggested that several workshops, committees and bodies at national and international level have thrown light on the conceptual analysis of Environmental Education. Environmental Education is a broad concept and is perceived as life long experience for all.

Gurung (1993), in his study entitled “Evaluation of models for Environmental Education in developing countries” made a comprehensive review using literature, an expert survey and interviews. He found Environmental Education in developing countries at a beginning stage. However, EE changed the attitude and behavior of people through raising action related to environmental awareness for resolving environmental problem and increasing peoples’ understanding of ecological concepts. According to him Environmental Education should be integrated in all forms of learning. In addition to that, he insisted to use local environmental problems and issues for teaching purpose. For this purpose, teachers of all levels should be qualified to teach Environmental Education.

In regard to school children Gopalkrishnan (1992) selected 1,451 students of class V from 10 different primary schools of Nilgris, Madras and Coimbatore in India and exposed them to EE and then put them through EE test (EET) and
found a very good impact of EE. The Madras children scored better than those of the other two places.

**Goswami and Pirta, (2002)** conducted an experimental study on inducing environmental concerns in girl students. The study attempts to apply indigenous approach in the area of environmental studies to experientially study its impact in creating environmental concerns. It was found that dissemination of information, knowledge, value and behavioral skills significantly affected the environmental concerns in female students. The three groups differed significantly on environmental concerns in the pretest as well as post test. The experimental groups showed significant improvement in environmental concerns.

Bharati Vidyapeeth Institute for Environmental Education and Research (BVIEER), India investigated the efficacy of the school curricula of the state and national level in the field of Environmental Education and its implementation (Dhavse, 2003). The project was titled as “Study of infusion of environmental concepts in school curricula and the effectiveness of it”. Language, general science and social science were the subjects chosen to identify the environmental concepts. The results of these studies were not too encouraging. From the content point of view, the researchers found a serious lack of local information and adequate information in different topics like pollution, biodiversity, alternative source of energy etc. It all showed lack of updates in the information. It also found the lack of a holistic approach in teaching of environmental concepts into real life experiences. There was very poor relay of information on systematic lifestyles and what individuals could and should do for environmental preservation through their personal daily activities.
Shan, (2003) discussed the role of teachers in Environmental Education and concluded that teaching of Environmental Education require not only the subject competence but also inquisitive frame of mind. Environmental Education should be made an integral component of educational process.

Powers (2004) evaluated one and two day forestry field programmes for elementary school. The study was to determine if a one-day forestry field visit increases knowledge and appreciation of natural resources in II grade students or two day field visit more effectively increase knowledge and appreciation than a one-day visit. Among seven schools one was from under served urban community and other was in more affluent sub-urban areas. A pretest, posttest methodology was used to determine changes in students’ (n=133) attitudes and knowledge before and after the field experience. Interviews and surveys were conducted with students, teachers (n=7) and staff (n=13) to provide context for the test data. It was found that both one and two day unit at Shelburne farms learnt and retained factual information but two day visit did not outperform one day visit. The most significant finding for knowledge retention was that the location and economic status of the school seemed more uniformly gained in knowledge than did the number of visits. The raw score for underserved urban community for tree drawing were 143(pre) jumped to 240 (post). Compared with sub-urban two day visitors’ raw score of 250 (pre) which improved to 292 (post). However, the test showed more significant increase in positive attitudes in two day visits students than in the one-visit students.

Singh (2004) observed in his article on Environmental Studies for undergraduate courses that to make Environmental Education movement an observable reality in India, Universities and colleges should come forward and give EE its due place in teaching, research as well as extension activities in all courses of study. Particularly to make it a mass movement, teacher education
university/college/department should come forward and take a lead in this direction.

Radha (2005) studied the attitudes towards environment and perceptions of Environmental Education among student-teachers and teacher-educators. She found that teacher educators possess more favourable attitudes towards environment and possess more environment awareness than student teachers. As compared to student teachers, teacher educators perceive Environmental Education more favourably. She found that Environment awareness and perception of Environmental Education have significant relationship with each other. Environmental awareness and attitude towards environment are also correlated to each other. Student-teachers and teacher-educators having high environmental awareness have more favourable attitude towards environment.

1.10.3. Summary of review of related literature

The review of related studies has been taken up under different themes. These studies have been summarized by the researcher theme-wise.


From the research studies based on Environmental Education the researcher has concluded that many researchers have emphasised on effective educational programmes and policies for Environmental Education [Stapp (1974), Mollvenna (1996), Kidwai (1991), Liu(1996), Lieberman & Hoody(1998), Swan

From all these studies related to Environmental Education the researcher felt that majority of the studies have focused on the current status and the effectiveness of EE at different stages of education. The review of the related studies showed that, though EE has been integrated into the curricula in many countries and also in India, but still it is in evolutionary stage and needs to be planned and implemented in proper manner. The Supreme Court of India has made the teaching of EE compulsory at the undergraduate level, but still the status of EE has not improved in India and at higher level the status is very poor. The researcher found that very little research work has been done in the
field of evaluation of Environmental Education in colleges in India and especially in Punjab. To know the status of teaching of EE we need detailed evaluation of the objectives, instructional methods, instructional materials and evaluation techniques etc. As very little work has been done regarding the evaluation of EE programmes in Punjab, therefore the researcher got interested in evaluating the Environmental Education at undergraduate level in Punjab.

1.11 Statement of the Problem

An Evaluative Study of Environmental Education at Undergraduate Level.

1.12 Defining the Statement

There is need to define various terms used in a statement as Whitney (1998) said “To define a problem means to put a fence around it, to separate by careful distinction.” Various terms used in the statement are defined as follows:

Evaluation

It means to ‘assess’ or ‘decide ‘the value of something. Evaluation is the systematic assessment of the worth or merit of some object, the word ‘object’ could refer to a programme, policy, technology, person, need, activity, and so on . The present evaluative study includes the complete study of teaching-learning process of Environmental Education followed by the colleges of the three Universities viz Guru Nanak Dev University, Amritsar; Punjabi University Patiala and Panjab University, Chandigarh at undergraduate level. It involves the objectives of Environmental Education, the content, text books, teaching methods, teaching-learning activities, the teacher and the evaluation techniques. The researcher has evaluated the course content of EE Programmes of the colleges under the three Universities through the perceptions of the principal, teachers and the students.
Environmental Education

It is a comprehensive life long process. It includes the study of environment and the inter relationship between the human beings and natural system and their impact on each other. Environmental Education is an organized effort to teach about how human beings can manage their behaviors in order to live sustainably by maintaining a balance with the nature. Environmental Education aims to teach people about the natural world and particularly about ways in which ecosystem works. Environmental Education aims to change people's perceptions about the value of natural world and to make man understand the impact of natural system on humans and human society. Environmental Education brings awareness about the environment and its related issues. Environmental Education also brings changing in the attitude of an individual towards the environment.

Undergraduate classes – It includes the classes after (10+2) i.e. B.A., B.Sc, B.Com, BBA, BCA.

1.13 Objectives of the Study

The objectives of present study are given in three sections:

Section-I

1. To study the course content of Environmental Education programme in the three Universities viz, Guru Nanak Dev University, Amritsar; Punjabi University, Patiala and Panjab University, Chandigarh in the context of UGC guidelines.

2. To find out and compare the perceptions of principals in the colleges of the three Universities regarding the following; Objectives of EE; relevance of the subject; teachers teaching EE and evaluation techniques in the subject of Environmental Education at undergraduate level.
3. To find out and compare the perceptions of teachers teaching in the colleges of the three Universities regarding the following: objectives of EE; relevance of the subject; content; instructional materials; instructional methods; teaching learning activities; resources and evaluation techniques in the subject of Environmental Education at undergraduate level.

4. To find out and compare the perceptions of students studying in the colleges of the three Universities regarding the following: relevance of the subject; content; instruction materials; instruction methods; teachers teaching EE; teaching learning activities and evaluation techniques in the subject of Environmental Education at undergraduate level.

5(a) To find out the problems faced by the Principals regarding the subject of EE in the colleges of the three Universities at undergraduate level.

5(b) To find out the problems faced by the teachers teaching the subject of EE in the colleges of the three Universities at undergraduate level.

5(c) To find out the problems faced by the students studying the subject of EE in the colleges of the three Universities at undergraduate level.

6. To find out the suggestion given by the principles, teachers and the students of the colleges of the three universities for improving the teaching learning process of the subject of Environmental Education at undergraduate level.

Section-II

7. To compare the Environmental Awareness Questionnaire (EAQ) scores of the students studying in the colleges of the three universities.
8. To compare the Environmental Awareness Questionnaire (EAQ) scores of the students from the rural and urban colleges of the three universities.

9. To compare the Environmental Awareness Questionnaire (EAQ) scores of female and male students studying in the colleges of the three universities.

Section-III

10. To compare the difference in the Pre-Post Test EAQ scores of the students studying in the colleges of Panjab University, Chandigarh.

11. To compare the difference in the environmental awareness of students in relation to their residence, gender and subject stream.

11(a). To find out the difference in the environmental awareness of students residing in rural and urban areas.

11(b). To find out the difference in the environmental awareness of female and male students.

11(c). To find out the difference in the environmental awareness of science, commerce and humanities students.

11(d). To study the interactional effect of gender and residence on the environmental awareness of students.

11(e). To study the interactional effect of gender and subject stream on the environmental awareness of students.

11(f). To study the interactional effect of residence and subject stream on the environmental awareness of students.

11(g). To study the interactional effect of gender, residence and subject stream on the environmental awareness of students.
12. To find out the difference in the Pre-Post test attitude scores of the students studying of Panjab University, Chandigarh.

13. To find out the difference in the attitudes of students towards environment in relation to their residence, gender and subject stream.

13a. To find out the difference in the attitude of students residing in rural and urban areas towards environment.

13b. To find out the difference in the attitude of female and male students towards environment.

13c. To find out the difference in the attitude of science, commerce and humanities students towards environment.

13d. To study the interactional effect of gender and residence on the attitude of students towards environment.

13e. To study the interactional effect of gender and subject stream on the attitude of students towards environment.

13f. To study the interactional effect of residence and subject stream on the attitude of students towards environment.

13g. To study the interactional effect of gender, residence and subject stream on the attitude of students towards environment.

14. To find out the correlation between the attitude towards environment and environmental awareness.

1.14 Hypotheses of the Study

1. There is no significant difference in the perceptions of principles of the colleges of the three Universities regarding the following; Objective of EE; Relevance of the Subject; Teachers Teaching EE and Evaluation
techniques followed in the Environmental Education at undergraduate level.

2. There is no significant difference in the perceptions of teachers teaching EE in the college of the three Universities regarding the following: objectives of EE; relevance of the subject; content; instructional materials; instructional methods; teaching learning activities; resources and evaluation techniques in the subject of Environmental Education at undergraduate level.

3. There is no significant difference in the perceptions of students studying in the college of the three Universities regarding the objectives; relevance of the subject; content; instructional material; instructional method; teaching learning activities; resources and evaluation procedure of the subject of Environmental Education at undergraduate level.

4. There is no significant difference in the Environmental Awareness Questionnaire (EAQ) scores of students studying in the colleges of the three universities.

5. There is no significant difference in Environmental Awareness Questionnaire (EAQ) scores of students from rural and urban colleges of the three universities.

6. There is no significant difference in Environmental Awareness Questionnaire (EAQ) scores of female and male students studying in the colleges of the three Universities at undergraduate level.

7. There is no significant difference in the Pre-Post test EAQ scores of the students studying in the colleges of Panjab University, Chandigarh.

8. There is no significant difference in the environmental awareness of students in relation to their residence, gender and the subject stream.
8a. There is no significant difference in the environmental awareness of students residing in rural and urban areas.

8b. There is no significant difference in the environmental awareness of female and male students.

8c. There is no significant difference in the environmental awareness of science, commerce and humanities students.

8d. There is no significant interactional effect of gender and residence on the environmental awareness of students.

8e. There is no significant interactional effect of gender and subject stream on the environmental awareness of students.

8f. There is no significant interactional effect of residence and subject stream on environmental awareness of students.

8g. There is no significant interactional effect of gender, residence and subject on the environmental awareness of students.

9. There is no significant difference in the Pre-Post test attitudes scores of the students studying in the colleges of Panjab University, Chandigarh.

10. There is no significant difference in the attitude of students in relation to their residence, gender and the subject.

10a. There is no significant difference in the attitude of students residing in rural and urban areas towards environment.

10b. There is no significant in the attitude of female and male students towards environment.

10c. There is no significant difference in the attitude of science, commerce and humanities students towards environment.
10d. There is no significant interactional effect of gender and residence on the attitude of students towards environment.

10e. There is no significant Interactional effect of gender and subject stream on the attitude of students towards environment.

10f. There is no significant interactional effect of residence and subject stream on attitude of students towards environment.

10g. There is no significant interactional effect of gender, residence and subject stream on the attitude of students towards environment.

11. There is no positive correlation between the attitude towards environment and environmental awareness of students.

1.15 Delimitation of the Study

1) The area of the study is delimited to undergraduate colleges affiliated to Panjab University, Chandigarh; Guru Nanak Dev University, Amritsar and Punjabi university, Patiala.

2) The study is delimited to the Principals of the colleges, the teacher teaching the subject of Environmental Education and the students studying the subject of Environmental Education at undergraduate level.

3) The study is limited to degree colleges only.