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CHAPTER - I

INTRODUCTION.

1.0. NORM TALK:

Our planet, the earth is unique to have life in it. The physical facilities of the earth that facilitates life and life systems, took millions of years to reach the present state through natural process. The foundation of civilizations marked the beginning of damages caused to both these systems since it required the natural resources as an input for its growth and development. The industrial revolution of the modern period caused irreversible damage to the system although it brought comfort and employment to the masses. The rapid growth of human population aggravated the problem, increased the demand on nature many folds, which in turn threatens the very existence of life.

1.1. Conceptual framework of environment.

The growing concern about environment made many to think and explore the concept, nature, significance and development of natural environment. The term environment has been derived from the French word Environner, which means to encircle or surround.¹ It was used to refer the elements envelope the living beings and the earth. The French naturalist Etienne Geoffroy Saint-Hilarie used the term ‘milieu ambient in 1835 to state the dependence of organisms upon its physiographic surroundings.² Douglass and Holland in their attempt to define the term environment highlighted the influence of physical factors over the growth, behaviour, development and maturity of living organisms.³ T.D. Elliot identified the influence of physical factors as an agent of effective external
stimulation and interaction of any unit of living matter. The cultural element has been added as another dimension by Chhatwal as he viewed the environment as inseparable whole and interacting systems like, physical, biological and cultural elements which are interrelated individually as well as collectively in myriad ways. Two basic factors of environment are it is indivisible and has no geographical or ideological frontiers moreover it is common to all living organisms like, man, animals and plants. Along with physical elements like air, water and land its interrelationship with the living organisms has been stressed in the Environment (protection) act of 1986. The concept has been defined, as all the physical and biological surroundings and their interactions. Moreover people belong to the different professions and the different disciplines understand the term in their own perspective. The ecologists, the geographers, anthropologists, architects, engineers, doctors, psychologists use the term in different sense. Environment is holistic in nature consisting of its different physical, biological, social, cultural, economic, political etc., dimension, which is interrelated, with an independent of each other. The holistic nature is dynamic, which continually undergoes changes and develops towards a more stable holistic state.

These concepts on Environment may be classified as (a) Natural environment consisting of elements like, air, water, soil, mountains plants, rivers forest and the living organisms etc. (b) Man Made Environment such as, the villages, cities, industries and other institutions like buildings, roads canals, agriculture, transport, etc. (C) Social environment consists of social systems its
economic structure and culture and its influence on the population growth, employment, commerce, values etc. The environment can also be categorized as (non-living) and biotic (living) components. However it is taken to mean all those elements, which are physical and chemical, organic and non-organic components of the atmosphere, lithosphere and oceans that encompass the whole of earth.

To sum up the environment may be considered as consisting of circumstances, objects or conditions by which one is surrounded. Environment includes the complexes of climatic and other constituent factors like soil, biological bodies which act upon the organism or an ecological community. It could denote the phenomenon of existence around an area, in which the entire masses of animate as well as inanimate are an integral part. It connotes the entire philosophy on which the very survival of human race has balanced itself. It is not only the food for human development but also a lifeline for human existence.

ENVIRONMENTAL POLLUTION.

Pollution refers to the addition of unwanted substances (pollutants) or effects that adversely alters the natural or man-made environment. It is an undesirable change in the physical, chemical or biological characteristics of our natural resources like air, water and soil. These changes affect the living organisms and become a source for health hazards. The changes occur due to any chemical (e.g. oregano phosphorus compounds, DDT etc) or geochemical elements, (e.g. dust and sediments) or substances or sometimes biological
organisms and their products. The level of the environmental pollution can be estimated according to the changes in geographical distribution of various groups of organisms and also their morphological, cytological, physiological, biochemical and chemical changes. Disturbance in the natural cycle build ecological imbalance, a root cause of environmental pollution. Unscientific extraction and disposal of the natural resources alter the natural cycle adversely so as to add a composite article, which the ecosystem has failed to recycle. The synthetics and the composites are the two groups of materials a contribution of newer technologies that pose problems of disposal and recycling. Synthetics are the by product of fossil fuel, e.g., plastics, and the composites are a group of materials consists of the metals and non-metals reinforced by fibers of such materials such as glass, carbon and boron. The pollutants like, mercury, lead, oil, carbon dioxide, nitrogen, waste heat, pesticides, nuclear radiation, and noise, etc, have caused immense damage to natural resources like air water and soil that supports animal and plant life.

The pollutants can be categorized under non-degradable and biodegradable pollutants based on the time taken to get degraded in the environment. The substances of an ecosystem undergo naturally occurring cyclic process. However the Non-degradable pollutants like polychlorinated biphenyls or PCBs, and dioxins, plastics, aluminium, mercuric salts, DDT etc are chemical substances that get accumulated and do not degrade into harmless components, remain in the state for a very long period of time. Its cyclic process is very slow or never. Biodegradable pollutants are nutrients and other materials
that can be easily broken down and absorbed in the environment within a short period of time. As a result they do not get accumulated in the environment. But they do create problems when they are released into environment in large quantities. The pollutants are categorised based on its type like: smoke pollution, lead pollution, radioactive pollution, noise pollution, air pollution, water pollution and land or soil pollution, etc. Every pollutant has its own origin, pathways and affects but all the pollutants can spread throughout the biospheres thorough air, land or water.

**Aspects of environmental pollution**

One of the most obvious types of pollution results from the combustion of fossil fuels (coal + oil). Due to ‘thermal inversion’ the combustion produces are trapped and high concentration of harmful substances including sulphur compounds and hydrocarbons builds up. The use of DDT, pesticides, leads, and radioactive materials pollute the atmosphere and the discharge of sewage into the water threatens the aquatic life.

**Types of environmental pollution.**

Air is a mechanical mixture of different atmospheric gases. The contamination of air with dust, smoke and harmful gases are called air pollution. Air pollution is generally accomplished through the pollutants of gases and solid and liquid particles of both organic and inorganic chemical. Gases such as sulphur dioxide, carbon monoxide, hydrogen sulphide and emissions from volcanoes, swamps, dust, salt spray pollens from plants, etc., are continuously added to the air as a result of natural processes. According to the section 2 of
the air (prevention and control of pollution) act 1981, air pollution means the presence of unwanted solid, liquid or gaseous substances in the atmosphere in such a concentration as may be or tend to be injurious to human beings or other living creatures or plants of property or environment. Burning large amount of fossil fuels, cutting forests and reducing ocean planktons by pesticides and oil spills have altered the proportion of atmospheric gases and left out thousands of tones of solid waste in the form of dust, smoke and toxicant matters and atmospheric impurities. Thus the air is polluted both by natural or man-made activities.

**Causes of Air pollution.**

Automobiles are the major contributor of Air pollution in the metropolitan cities. The aircrafts, ships, rails, trucks, cars, buses, aero planes, motorcycles and other combustion engines emit 27,000 tonnes of pollutants every year.

The problem of automobile pollution assumes importance since the increase in the number of vehicles considered as an indicator of economic development. India two wheelers have multiplied by five times in the last decades while passenger car and diesel vehicle population had population had increased by 2.6 times. Yet another study reveals the presence of, hydrogen, sulphide, sulphates, oxides, chlorides, dust and other gases in the smoke and gas of the factories. Carbon dioxide and other poisonous gases are the by-products of the use of coal and biomass as fuel for energy. The insecticides used in farm land to destroy insects get mixed in the air.
The active role of the forests to control and regulate the cycle of carbon dioxide in the atmosphere got reduced since the size of forests has come down due to the human activities and the quantity of carbon dioxide increased in the atmosphere. Lack of proper systems of disposal of garbage and sanitary arrangements in the big cities pollutes the surrounding air and becomes a health hazard.

**Effects of air pollution:**

Most of the air pollutants are known to cause sickness and even death to human beings. CO reduces the blood carrying capacity of hemoglobin by binding with it and carries CO instead of carrying oxygen, which results in fatigue and drowsiness leading to coma, respiratory failure and death.

Constant exposure to sulphur dioxide, nitrogen dioxide affects the respiratory system of man. Irritation in the eyes and nasal cavities followed by increasing difficulty in breathing, pulmonary oedema and death are some of the other effect of nitrogen dioxide. Wood smoke can cause a heart disease called corpulmonale.

The diseases like emphysema, chronic bronchitis, pollen allergies, lung cancer, are common especially among city dwellers, caused because of variety of air pollutants. The ratio of carbon-dioxide has risen by 16% in the last 100 years. All this has bad effect on the climates. The gaseous discharge from an aluminum factory causes fluoride (fluorine) pollution in the air, which damages the natural vegetation. Cattle feeding on these plants developed swollen knees bones, tooth decay and ill health. Photochemical smog harm plants by killing the
leaf tissues. Yellowing of leaf is a common disease caused to plants by sulphur dioxide. The presence of particulate matter leads to the reduction in the phosynthetic rate of green plants, since it prevents the light reaching the plants and interferes with carbon-dioxide uptake. The hydrocarbons and particles like fly ash, soot and lead etc, obtained through incomplete combustion motor vehicles aero planes and chimneys of factories are believed to be the causes of cancer. The fatal incident of Bhopal was due to the presence of methyl isocynate in the air, Mathura refinery pollutes the surrounding atmosphere affecting Taj Mahal and bird sanctuary of Bharatpur.

Apparent depletion of the ozone layer in the atmosphere shows the impact of air pollution. The hole detected by scientists in the ozone layer above the atmosphere of Antarctica, measuring about 8.9 million sq. miles are formed under the influence of the follows of hydrogen, methane nitrogen released from interior of the earth. Rain in many parts of the world has become acidic, due to the effects of air pollution. The increased amount of carbon dioxide in atmosphere in turn increases the temperature of earth, known as green house effect. It also tends to prevent the wave radiation from earth. air India consumes 562 tones of fossil fuels and combustibles every year releasing about 94 million tones of poisonous materials in the atmosphere.\textsuperscript{15}

**Water pollution.**

Water pollution occurs when chemicals or nutrients enter water faster than natural processes can remove them. The pollutants include sewage, oils, silt, industrial chemicals and heavy metals, chemical from the air dissolved in rain
water and pesticides, fertilizers and herbicides leached from the land. Waste heat from industry, discharged without cooling, with the used coolant water, is also a pollutant. All of these pollutants can have serious implications for life.

According to World Health Organization (1966) water pollution is "Foreign materials either from natural and other sources are contaminated with water supplies and may be harmful to life, because of their toxicity, reduction of normal oxygen level of water, aesthetically unsuitable effects and spread of epidemics."

Putting anything unwanted and harmful, into the water, which was not there in its natural states forms water pollution. Therefore, one would agree that most of the problems of water pollution are man made and are the result of indiscriminate and unwise use of water bodies and its management. The polluted water changes its quality or composition and when it is used for drinking, it spreads deadly diseases such as typhoid, cholera, dysentery, jaundice and other viral diseases.

Water pollution comes from point and non point sources. Point sources include pipe outlets and other direct and observable sources of pollution. These may be easily identified and controlled. Non-point sources include acid precipitation (rain) and the run-off (the water that drains off) of fertilizers from large areas (the fertilizers mix with the irrigation water and flow off into nearby water bodies). These pollution sources are complicated and difficult to identify and control.
Despite controls to minimize spills (spilling of oil), technological snag and human error during oil drilling operations, accidents and disasters are common because of which the surrounding waters are polluted. Moreover, oil refineries are known for the emission of huge quantities of pollutants into air and water. Stagnant waters (e.g., lakes, ponds) are more easily polluted than flowing waters (e.g., rivers, streams) as pollutants tend to accumulate in the former. However, in the latter, the pollutants spread faster and further. Though water as other natural substances has self-purifying capacity during recycling processes, increase in the agricultural and industrial activities during recent years has led to water shortage and pollution. Water pollution, a purely man-made phenomenon, is caused due to heavy influx of household wastes and factory effluents beyond the self-purifying limit of a water channel. In rural areas of developing countries like India, water-borne diseases are increasing at an alarming rate.

Causes of water pollution

The main cause of water pollution is the discharge of solid and liquid waste products containing pollutants on to the land surface and coastal waters. Water pollution may be caused by biotic and abiotic contaminants. Disposal of domestic garbage into water bodies gets dissolved partly in the river water and these toxic wastes reach the sea when the river merges into it. The pollutions of sea cause loss of fisheries and vegetation and each loss has reached as much as 40 per cent.

The unclean water of sewerage is another cause of polluting water in the rivers, canals, and streams. The of human excreta, soaps, waste papers, waste
water of kitchen, washing of clothes etc, harbour certain microorganisms which are pathogenic, e.g., coliform bacteria, and eggs or larvae causes gastrointestinal parasites in human beings.

Industrial wastes and effluents and the complexity of farming and manufacturing industries burden the lakes, rivers and reservoirs beyond their self-cleansing capacity. The effluents carry lots of pollutants and affect the life of flora and fauna of aquatic ecosystem in an indirect way, by bringing in changes in the quality of water.

The pesticides and biocides like D.D.T, Mercury and other such medicines and the chemical fertilizers and biocides are used to increase the agricultural production. All those chemical and biocides sprayed in crop fields, ultimately finding their way into water system through leaking or agricultural run off. Different kinds of detergents used for cleaning purposes are ultimately mixed with river, water and deposit phosphate. All these foreign elements change the water and make it poisonous. Leakage of oil from offshore oil wells and oil tankers envelope a major portion of sea surface endangering plankton, marine life and water birds.

**Effects of water pollution**

Water is a vehicle for transmission of diseases, among humans and other living beings. Diseases such as diarrhea, cancer, cholera, jaundice, typhoid, dysentery and tuberculosis etc., are transmitted to human beings when sewage water enters into the source of water. Though purification of drinking water through chlorine has greatly reduced the threat water borne diseases in the
cities it is seriously affecting the rural areas of developing countries like, India. Accidental blow-out in offshore oil well pours affects oceanic vegetation and fisheries. So much as 40% of loss on account of diseased water has been recorded. 26

Thermal hot air or hot effluents at very high temperatures to the streams a river, or lake, affects the aquatic life in these water bodies. The discharge from the agricultural fields that contains fertilizers and pesticides affect the quality of food stuffs, make water unfit for drinking and causes diseases related to kidney blood and urine and brain tissues. 27 Furthermore, industrial effluents altering the quality of water and cause damage to the flora, fauna of aquatic ecosystem. 28

Chemicals accumulated in living tissues of sea organisms are transferred to human beings and cause diseases like physical deformities, mental disorders and even deaths.

Land pollution

Soil is another natural resource like air and water which supports life. The excessive use of fertilizers, pesticides, herbicides and improper disposal of solid wastes contaminates it. Soil is becoming increasingly polluted with toxic chemicals and heavy metals reach the food chain and endanger the human life. 29

The decrease in the quality of soils either due to human activities or natural sources or by both is known as soil pollution or soil degradation. Soil pollution is a common phenomenon in urban areas and is increasing at a terrific rate owing to indiscriminate dumping of city garbage, industrial wastes, using sewage water for irrigation, and unscientific use of chemical fertilizers and
insecticides, etc. In the rural areas of developing countries like India, soil is comparatively free from toxic and harmful substances but increasing use of chemical fertilizers, insecticides and canal irrigation, etc., to increase the food production has made the soils vulnerable to pollutants. Some social habits associated with open drains, garbage disposal and field lavatories are not less responsible for contaminating the village lands.

Land pollution is both a natural and social hazard. The fertility of soil is diminishing on account of dust storms, floods and irrational use of irrigation. The problems of soil erosion and salinity of the soil have come up. Our mother-earth has been invaded and land pollution is increasing.

**Causes of land pollution**

Solid wastes and chemicals cause the soil pollution or land pollution. Extension of residential sites in the farmlands and grasslands to facilitate the ever-growing population causes decline in land fertility. Deforestation causes soil erosion. Moreover, the excessive use of chemical fertilizers, pesticides, insecticides and herbicides being used to increase production eating into the vitality of the land. Hydrogen bombs, atomic experiments and nuclear explosions are causing air as well as land pollution. The natural and anthropogenic sources of radioactivity pollution cause irreversible damage to the soil. The uranium mining, unsafe dumping of nuclear power plant wastes, X-rays, diagnostic kits, test laboratories etc. causes radioactive pollution. The nuclear power plant disaster of Chernobyl in the erstwhile USSR forced people to abandon the place of living and the agricultural product of the Russian federation.
for a quit longer time banned in the European countries because of radioactive
contaminated soil.

Dumping of untreated urban wastes consisting of domestic wastes, waste from shops, biomedical wastes, construction or demolition wastes and the wastes from markets are the pollutants in the urban areas. The bio-degradable wastes can be eliminated using micro organisms in the treating plants and the non degradable items like the plastics, polythene bags, scrap metal, glass bottles pollutes the soil and atmosphere in the city areas. The industrial wastes like the grey, powdery unburnt residue of materials known as fly ash discharged by the industries form huge mounds spoil the landscape. Acid rain has polluted huge land masses in different parts of the world in the resent years. Acid rain is the result of presence of the sulphur dioxide gas discharged by chemical industries into the atmosphere and the vehicles, which run on internal combustion engines. The acid rain makes the soil toxic due to presence of acid in it.

**Effects of land pollution**

Land pollution affects agricultural production. It adversely affects the fertility. The soil pollution affects the human beings, the animals and plants adversely and degrades the quality of soil pollution results in the decrease of agricultural production. Land pollution causes decrease in farmland, croplands and grassland soil erosion is also the effect of land pollution.

Imbalance in the atmosphere due to dryness of land is the effect of soil pollution. Another effect of land pollution is the shortage of drinking water for irrigation. Well water is also polluted due to land pollution. The residue of
chemical fertilizers like pesticides goes into the soil contaminating plant leaves, roots, fruits, etc. and is thus transmitted to animals and human beings which is the cause of various diseases.\textsuperscript{42}

**Noise pollution**

Noise is a type of atmospheric pollution produced by a mechanical device or vibrating source. Noise is the unwanted and undesirable sound created by industrial units, construction sites, radio, microphones, automobiles, aero planes, railway engines, irrigation pumps, etc., which break the silence of the environment. Sound can propagate through a medium like air, liquid or solid. Sound wave is a pressure perturbation in the medium through which sound travels. When this noise exceeds permissible limits it became a polluting agent and cause for worry.

Noise may be defined as the state of discomfort and restlessness caused to man by unwanted high intensity sound. Noise pollution occurs both from nature such as cloud thunder, high intensity rainfall, storm and hail stone etc. as well as the human activities.

It is a shadowy public enemy whose growing menace has increased tensions, nervousness and psychological strains in human beings. Although a soft rhythmic sound in the form of music and dance stimulates brain activities, removes boredom and fatigue, but its excessiveness may prove detrimental to living brings. Noise pollution is previously confined to few special areas like
factory or mill, but today it engulfs every nook and corner of the globe reaching its peak in urban areas. 43

1.2. CONCEPT OF ENVIRONMENTAL EDUCATION

Environmental education is a new area of study in the discipline of education with recent developments and advancements. Until the 19th century the necessity for the knowledge on environment, awareness and the effort to teach to the future generations was not felt. The natural disasters that followed the industrial revolution in England and man made disasters of the first and second world wars and of the atomic onslaught of America on Hiroshima and Nagasaki followed by series of atomic tests conducted by developed countries after the war served as an eye opener to the thinkers, scientists, policy makers and the social activists. The idea of limiting the human activities was the result of the concerns of the common man on acid rains, and health hazards, which Europe and other parts of the world witnessed.

Many have now recognized the value of environmental education and the need to be taught to the students. Environmental education has been and is being discussed at various forums, at several national and international levels. Environmental education is education through, about and for environment. Teaching learning can be carried out through, the various activities. The child can learn about the physical environment through the school subjects like, geography and biology course materials and the cultural and social environments, which reconnects with schools, banks, self-government, industries, transport, trade, and religion monuments can be learnt through the
subjects like civics, economics, history etc., and realize the significance and the value of environmental education.\textsuperscript{44}

Environmental education is an integrated process which deals with man's inter-relationship with his natural and man-made surroundings, including the relation of population growth, pollution, resource allocation and depletion, conservation, technology for urban and rural planning to the human environment. Environmental education is a study of factors influencing eco-systems, mental and physical growth, living and working condition, decaying cities and population pressures.\textsuperscript{45}

1.2. Definitions:

Environmental education has been defined in a number of ways. The Nevada conference of the international union for the conservation of nature and national resources held in the year 1970, defined that, "Environmental education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings. Environmental education entails practices in decision-making and self-formulation of code of behaviour about issues concerning environmental quality."\textsuperscript{46}

The concept formulated in the United States environmental education act, 1970 reflected similar views of Nevada conference. It says "Environmental education means the educational process dealing 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, urban and rural planning to the total human environment.\(^{47}\)

The Finnish national commission organized a seminar on the environmental education for UNSECO at jammi in 1974, supplemented it as: "A way of implementing the goal of environmental protection; environmental education is not a separate branch of science or subject of study. It should be carried out according to the principle of lifelong integral education."\(^{48}\) The first report of the British Royal Commission on Environmental Pollution (1971) added further in the concept as: "The best insurance for the environment is a commitment on behalf of the public to prevent the deterioration of air, water and land."\(^{49}\) According to R.A. Sharma (1996): "Environmental education refers to the awareness of physical and cultural environment and perceives its relevance for real life situation. The problems and issues are to be identified. The imbalances of environment are to be improved in view of sustainable development."\(^{50}\) The national anti-pollution law of Japan made in 1969 has stressed that 'In order to enable people to enjoy good health and a high quality of life, it is vital to prevent harmful effects to human health and the damage caused by pollution of air to the environment, water and soil, noise vibration, noxious smells, etc., caused by firms and individuals. The environment includes animals and plants and their ecological systems which are closely bound to the livelihood of people.'\(^{51}\) Education plays a vital role in rebuilding human behaviour and attitude. UNSCO, recognizing the crucial role that education plays in environmental action, it initiated a number of educational activities in the member states under the
The International workshop on environmental education held in 1975 at Belgrade facilitated the launching of (IEEP) and paved the way for the formation of intergovernmental statement on environmental education for the first time. It listed the aims, objectives, key concepts and guiding principles of the programme, in a document prepared at meeting known as 'The Belgrade Charter-a Global Framework for Environmental Education' 52.

The first intergovernmental conference on environmental education, held in Tbilisi, of former USSR, in the year 1977, was organized by UNSECO and 66 member states attended it. The conference prepared recommendations for the wider application of environmental education in formal and non-formal education; this significant event, and subsequent publications based on it, continue to provide the framework for the development of environmental education in the world today.53

In summary environmental education is an action processes related to the work of almost all subject areas. It is concerned wit the dynamic relationships between man and nature. It aims at improving the environmental quality.

B. Goal of environmental education:

Education in its various forms have been used to create, conserve and transfer knowledge from time to time, at the same time education has been used to develop human potential for his/her "self development" and also for making him useful for the society. It has rightly been stated in National Policy on Education, 1986 that "Education is an investment in present and future". So for
betterment of present environment and to handover that better environment to future generations environmental concerns must be incorporated at all levels of education i.e. (i) Preprimary, (ii) Primary, (iii) Secondary and (iv) Tertiary level of education. Steps in this direction have been initiated in the form of Environmental Education world wide since 1970's

The goal of environmental education is to develop a world population that is aware of, and concern about, the environment and associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively towards solutions of current problems and prevention of new ones. The overall goal of environmental education is to create environmental action so as to improve all ecological relationships including the relationship of humanity with nature and people with one another (Belgrade Charter, 1975). The ultimate goals of environmental education are:

a. to foster clear awareness of, and concern about economic, social, political and ecological interdependence in urban and rural areas;
b. to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the Environment and
c. to create a new patterns of behaviour of individuals, groups and society as a whole towards the Environment.

Environment education thus aims to assist individuals and groups to
- obtain an understanding that people are an inseparable part of an Environmental system and that whatever they do alters their surroundings in both harmful and beneficial ways:
- obtain a basic knowledge of how environmental problems can be solved, and recognize the responsibility of individuals and each segment of society to cooperate in their solution.
- Develop analytical thinking and Action Skills for understanding preventing and helping to correct environmental abuses.56

1.3. Objectives of Environmental Education:

The international conference of UNESCO and UNEP (1977) held at Tbilisi facilitated the formulation of objectives of Environmental education for both formal and non-formal Education at all levels as given below:

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

(2) **Knowledge**: to help individuals and social groups acquire basic understanding of the total environment, its associated problems and humanity's critically responsible presence and role in it.

(3) **Attitude**: to help individuals and social groups acquire social values, strong feelings of concern for the environment and the motivation for activity participating in its protection and improvement.

(4) **Skill** to help individuals and social groups acquire the skills for solving environmental problems.
(5) **Evaluation ability**: to help individuals and social groups evaluate environmental measures and education programme in terms of ecological, political, economic, social, aesthetic and educational factors.

(6) **Participation**: to help individuals and social groups develop a sense of responsibility and urgency regarding environmental problems, to ensure action to solve these problems.\(^{57}\)

**Principles of Environmental Education.**

The International Environmental Education Programme (IEEP) launched by UNESCO and UNEP in the year 1975 aimed at promoting exchange of information and experiences, research and experimentation, training, curricula and material development, and international cooperation in the field of EE. The international workshop on environmental education held in Belgrade in 1975 as part of IEEP’s activities, proposed a number of guiding principles for environmental education programmes. The Charter stressed that environmental education should:\(^{58}\)

- be a continuous lifelong process;
- be interdisciplinary in approach;
- consider the environment in its totality;
- emphasize active participation in preventing and solving environmental problems;
- examine major environmental issues from a world point of view giving due importance to regional differences; and
Promote the value of local, national and international cooperation in the solution of environmental problems.

The first intergovernmental conference on environment education held in Tbilisi, in the month of October of 1977 developed the guiding principles of environment education.

Environmental education should:

1. Consider the environment in its totality and built natural, technological, socio-economic political moral cultural and historical and aesthetic aspects.

2. Be a continuous life long process, beginning at the pre school level and continuing through all formal and non-formal stages;

3. Be interdisciplinary in its approach, drawing on the specific contents of each discipline in making possible a holistic and balanced perspective;

4. Emphasize active participation in preventing and solving environmental problems;

5. Examine major environmental issues from local, national regional and international point of views, so that learners receive insights into environmental conditions in other geographical areas;

6. Focus on current and potential environmental situation while taking into account the historical perspective;

7. Explicitly consider environmental aspects in plans for development and growth.
8. Emphasize the complexity of environmental problems and thus the need to develop critical thinking and problem solving skills.

9. Promote the value and necessity of local, national, and international cooperation in the prevention and solution of environmental problems with due stress on practical activities and first-hand experiences.

10. Relate environmental sensitivity, knowledge, problem-solving skills and values clarification to every grade level, but with special emphasis on environmental sensitivity to the learner's own community in early years.

11. Help learners discover the symptoms and real causes of environmental problems.

12. Enable learners to have a role in planning their learning experience and provide an opportunity for making decisions and accepting their consequences.

1.4. The concept of environmental awareness

Awareness is being conscious about an object, idea, or concept. It can also be termed as responsiveness to stimulus. The interests or emotions of an individual over an object or idea because of its acceptability to it serve as a stimulus to acquire more knowledge in the concern area. Action is initiated to analyze and develop values and a sense of responsibility when an appropriate stimulus is used.

Environmental awareness is a conscious part of the mind which relates to realization and perception of knowledge (Good, 1973). It is concerned with its intent and action components of emotional and cognitive aspects. It is a state of
consciousness which enables one to think freely about the environment in a number of ways to improve the level of one’s own intention to shape his attitude and feel his behavioural responsibility.

Environmental awareness may also be defined as a state of factual familiarity knowledge pertaining to the environment as well as attitude and responsibility towards environment and various environmental issues. Thus environmental orientation or the degree of information, environmental attitude or the normal and neutral state of readiness to respond, organized through experience exerting directive or dynamic influence on behaviour (Allport, 1955) towards the environment and the responsibility regarding environmental issues and duties, or the inner urge, external or internal compulsion to perform a given task action and inclination to work consciously, are the three major dimensions of environmental awareness.

Awareness leads to analysis of issues. Analysis promotes action. Education is a fundamental means to foster a healthy and a dynamic awareness-analysis-action change. Environmental education programmes are needed to develop essence of awareness among the people. Environmental education is also considered as a viable package to create awareness, understanding and action towards environmental protection.

1.5 The concept of Attitude.

The term attitude is closely related to a Latin word, ‘apere’ which means to fasten. As psychologists use the word, attitude as a combination of beliefs, emotions and behavioural tendencies fastened to specific people, groups,
objects, or ideas. Attitude is a vital component of the behavior of any individual. One's behavior by and large, depends on one's attitude towards ideas, persons or objects in one's environment. One of the most cherished objectives of teaching is to develop positive attitudes in children towards what they learn and do.

7. General characteristics of attitude.

According to William A Matheus and J. Lahman (1978) in their documentary ‘Measurement and evaluation in education and psychology’ the following are the characteristics of attitude.

1. Attitudes are evaluative and can be presented on some continuum of favourableness.
2. Attitudes vary in intensity (strength of feeling) and direction.
3. Attitudes vary in affective saliency that is there are some attitudes that are accompanied by or connected with persons emotions.
4. Attitudes are relatively stable especially in adults; support the belief of many psychologists that attitude scales can provide reliable measures.

Attitudes are important in education because they affect learning efficiency. According to Travers (1973) an attitude is a readiness to respond in such a way that behaviour is given a certain direction. Mckenchie and Poyle (1966) define attitude as "an organization of concept, beliefs, habits and motives associated with a particular object".

Sorenson (1977) defined the term that, "an attitude is a particular feeling about something. It therefore involves a tendency to behave in a certain way in
situations which involve something, whether person, idea, object. It is particularly rational and particularly emotional and is acquired not inherent in an individual.\textsuperscript{65} Ones habitual way of regarding and thinking about people, about manners institutions and life in general develop from ones experiences, life circumstances and the people around him. And like other habits, specific attitudes can change with time and circumstances.\textsuperscript{66}

Attitudes do change with experience; prejudgment is a continuous process upon which orderly living depends.\textsuperscript{67} As the individual develops his cognitious feelings and action tendencies with respect to the various objects in his world, become organized into enduring systems called attitudes.\textsuperscript{68} An attitude toward something has three major components, "Beliefs about the object, feeling about the object, and behaviour tendencies toward the object. Beliefs include facts, opinions, and our general knowledge about the object. Feelings include love, hate, like, dislike, and similar sentiments. Behaviour tendencies include our inclinations to act in certain ways toward the object to approach it, avoid it and so on.\textsuperscript{69} According to tradition in social psychology, attitudes are precursors of behaviour. An attitude is a predisposition to respond in a certain way.\textsuperscript{70}

Formations of attitudes.

Some times attitudes are formed by direct instruction and as a rule attitudes are changed in much the same way that are formed in the first place. (L. Dodge Fernald & Peter S. Fernald.) An attitude represents a categorization of an object along an evaluative dimension. The object can be an actual physical act, another person, or some issue, and the attitude represents one's
degree of favorability. (Price et al, 1982). An attitude is a continuation of feelings and beliefs about an object, person, or event. Attitudes are made up of three distinct elements viz. behavioural, emotional and belief. (Landy, J. Frank, 1987). Attitude can be formed in any number of different ways. Attitudes can be formed through social comparison processes through the informational social influence that all groups of which we are members can have upon us, and there is self-perception processes. Socialization, in particular socialization in parents, undoubtedly exerts an influence upon attitude formation.

Formation of attitude among students starts right from the very beginning in the immediate environment provided by parents, friends, Neighbourhood, school and society at large. It is a condition of readiness for a certain type of activity. Attitude held by individuals may be simple or complex, Stable or unstable, temporary or permanent and fundamental or superficial. Attitudes are learned, because they are learned, they can be changed if deemed necessary. They are predispositions to respond overtly to social objects and are mostly not observable but are inferred from a person’s overt behaviour, both verbal and non-verbal. Thus on the basis of observations of a persons consistent behaviour pattern to a stimulus, we conclude that he display.

1.6. Academic Achievement

Academic achievement refers to the level of accomplishment or proficiency or performance in the given school subjects. Academic achievement also stands for the knowledge acquired and the skill developed at school through subjects or study or to do one’s best to accomplish task requiring skill and effort, to be a
recognized authority to accomplish something of great significance, to do a
difficult job well, to solve difficult problem and puzzles. To be able to do things
better than others and to write a great book, novel or play.

According to Michaels and Karnes (1950), the term 'achievement' means
relative accomplishment in a specified area of work. It is seen as "an expression
of one way the individual learns to utilize his energies, given certain innate
potentials and a particular patterns of a socializing pressure" by Mellinger and
Hoggard (1959).

According to the encyclopedia of psychology (Volume 1, 1972) 'achievement'
means

(i) General term for the successful attainment of some goal requiring certain
effort.
(ii) The degree of success attained in a task, e.g. solving a test.
(iii) The result of a certain intellectual or physical activity defined according to
individual and or objective (organizational) pre-requisites, i.e. proficiency.

1.7. Some important studies on environmental education

Environmental education has emerged as an important area where it is
considered as a process to develop awareness, knowledge, understanding and
positive attitude towards the environment, and commitment to protect and
improve it. Womersley and Stokes (1981) included awareness in the
Environmental Education to foster awareness of and concern about economic,
social, political and ecological interdependence in urban and rural areas. Deep
Britain Tidy Group (DBTG) has emphasized on the environmental awareness and language development. Rajput, et. al. (1980) highlighted the significance of Environmental education in developing empathetic relationship with various members of community and understanding their role and importance.

A large number of research studies have been conducted by various scholars in India in tune with the researches conducted abroad. The relationship between environmental awareness, settlement and sex (Parek and Ashok 1998), Intelligence and environmental awareness (Gakker and Karla 1998), environmental awareness between Science and non-Science streams, environmental impact of the use of fertilizers among the literate and illiterate farmers (Lyndem and Sing 2000), environment awareness among the sex, intelligence and settlement (Gakkar 1993), environmental awareness and literacy of women in Andhra Pradesh (Sayi Prasad 1987) were some of the studies conducted in different parts of India. There are some significant works and studies relating to the protection of environment like Bakshi and Naveh (1980), Martin and Wheeler (1975) Rloth (1976). Rajput and Saxena (1983) UNESCO (1977, 1981).

The findings were not identical. It is not a valid judgement to universalize these findings for broad theory formulations since the composition of society, socio economical and ethnic background of societies brings variations in the level of awareness and attitude of people in general on environment.

1.8 Justification of the study
1.8 Justification of the study

The subject of environmental education has of late been increasingly felt and debated far and wide because of rapid growth of population, ever-increasing demand for energy and the impact of the burning of fossil fuels, coal and construction of hydro-projects, conversion of forest lands for cultivation, depletion of ozone layer, raising temperatures all over the world and a threat for the human race. The decrease in natural resources and the inclination towards industrialization in the third world countries for increasing employment and economical development unmindful of its impact have fascinated many researchers all over the world both by academicians and entrepreneurs to understand the intensity of the growing pollutants, and the ever widening gap between the demand and supply of natural resources and its impact on different regions.

The environmental problems are seen not only at the global and national levels but also at the regional and the local level. The problem aggravated by the highly industrialized nations and its impact like cyclones, flashfloods, global warming, and tornado and health hazards affect not only the people of those nations but also the people living far from the said areas. Most plant-derived food and medicines have been discovered by exploiting the knowledge of indigenous people, whose rights and livelihood are being wiped out along with their forest homes. The introduction of high yielding varieties, pests, fertilizers endangered the bio-diversity, quality of the soil, and water sources. Arunachal Pradesh is not an exception to these problems.
Arunachal Pradesh though bestowed with thick forest cover mineral deposits and fossil fuel, efforts are underway for its modernisation. The industrialization, urbanization and construction of large dams for hydro projects, have caused shrinking of forest land, threat to wild life, soil erosion, landslides, flash floods and decrease in the average rainfall and raise in the temperature during summer further more pollution of rivers in the city areas are the concern of the people of the state. Preservation of virgin forest covers in the higher altitude, protection of endangered species and a viable alternative to the current agricultural practices of the hill tribes were the serious issues discussed at length in various academic forums and policy formulators.

The traditional practices of shifting agriculture and its impact on the environment of the north eastern India as a whole is the concern of the educateds, academicians, and the policy makers. Steps taken by the central and state governments in bringing an alternative to these practices were successful only to some extent since these practices were part of their culture and belief.

Studies on the people's awareness on their natural resources and its depletion, the necessity of sustained development, judicious utilization of the natural resources, level of literacy and its impact on the people's participation are the areas interesting to be studied. Because of the inaccessibility, economical and social backwardness very few researches have so far been conducted in the north eastern areas as a whole. None of such study has so far been made in Arunachal Pradesh. Therefore the problem of environmental
awareness and attitude of the under graduate and post graduate students on environmental education has been taken for the present study.

1.9. STATEMENT OF THE PROBLEM:

“ENVIRONMENTAL AWARENESS AND ATTITUDE TOWARDS ENVIRONMENTAL EDUCATION AMONG THE UNDERGRADUATE AND POSTGRADUATE STUDENTS IN ARUNACHAL PRADESH”

1.10. OBJECTIVES OF THE STUDY

The main objectives of the present research study are as under:

1. To assess and compare the environmental awareness and attitude among the UG and PG students of Arunachal Pradesh.
2. To study the influence of sex, academic achievement, race and their interactions on the environmental awareness and attitude towards environment education of UG and PG students of Arunachal Pradesh.
3. To study the influence of discipline and their interactions on environmental awareness and attitude towards environment education of the UG and PG students of Arunachal Pradesh.
4. To study the influence of Socio Economic Status, Settlement, and their interactions on environmental awareness and attitude towards environment education of the UG and PG students of Arunachal Pradesh.

1.11. HYPOTHESES OF THE STUDY:

The following hypotheses have been formulated in view of the objectives of the research study,

1. There will be no significant difference in environmental awareness and attitude towards environment education towards environment education of UG and PG students of Arunachal Pradesh.
2. There will be no significant influence of sex, academic achievement, race and their interactions on environmental awareness and attitude towards environment education of the UG and PG students of Arunachal Pradesh.

3. There will be no significant influence of discipline and their interactions on environmental awareness and attitude towards environment education of the people of Arunachal Pradesh.

4. There will be no significant influence of socio economic status, settlement, and their interactions on environmental awareness and attitude of the UG and PG students of Arunachal Pradesh.

1.12. DELIMITATIONS OF THE STUDY:

The study has been delimited to:

1. Under Graduate and Post Graduate students of Arunachal Pradesh
2. Environmental awareness and attitude towards environment and environmental education
3. The variables like Sex, Achievement, Race, Discipline, SES, and Settlement.

1.13. OPERATIONAL TERMS:

1) **Undergraduate Students**: The students who are studying B.A., B.Sc., B.Com in colleges.
2) **Post Graduate Students**: The students who are studying M.A., M.Sc, and M.Com in the Rajiv Gandhi University.
3) **Environmental Education Awareness:** Knowledge of students and teachers environment related issues and educating the people about the rapid growth of environmental problems and its consequences.

4) **Attitude:** Tendency of undergraduate and postgraduate students to react favourably and unfavourably towards environmental education. It is represented by the scores obtained by sample students on the attitude scale toward environmental education.

5) **Cognitive Variables:** These are three variables, which are related to the mental faculties like academic achievement.

6) **Academic Achievement:**
It is defined as the cumulative scores of various curricular tests obtained in the previous Annual and Semester Examinations.

7) **Non-Cognitive Variables:** These are the variables, which are not related to mental faculties such as sex, race, socio-economic status, etc.

(a) **Sex:** It refers to the male and female students of undergraduate and postgraduate level.

(b) **Race:** Race means each of the major division of human kind having distinct physical characteristics or a tribe; the researcher used two categories of students i.e general category and scheduled tribe.

(c) **Socio-economic Status:** It refers to the social and economic factors, which are educationally, and psychologically the most important of the students. It represent by the scores obtained on the socio-economic status scale developed by the researcher.
References


4. Sapru, R.K. Environmental Management in India (Vol-I), New Delhi, Ashish publishing House, p-77


6. Trivedi, Environmental problems-Prospects and Constrains, New Delhi, Anmol Publications, P-3

7. CEE Southern Regional Cell, Activities for Eco-Clubs, (Bangalore: CEE Southern Regional Cello, P-89


16. Sharma, op cit., P.92

17. Paulsamy, op cit., P.92.
18 Ibid

19 Singh and sinha, op.cit., P-64


23 Ibid

24 ibid


26 Tiwari and Yadav, op.cit

27 Sharma, op cit , P-132

28 Paulsamy, op cit . P-100


31. Bhatia & Nanda, op.cit., P-224

32. Ibid.


34. Bhatia & Nanda., op.cit.

35. Ibid.


37 Joshi & Joshi op cit , P-72.

38 Ibid

39 Bhatia & Nanda, op.cit., P-226

40. Ibid.

41 Ibid

42 Tiwar and Yadav, op.cit., P.68

43. Ibid

44. Encyclopedia of Environmental Education-
45 Ibid, P-34
46 CEE, Environmental Education for youth (Ahmedabad CEE), P-7
47 Encyclopedia of Environmental Education-I, P-18
48 Ibid
49 Encyclopedia of Environmental Education-I, PP 18-19
50 R A Sharma, Environmental Education, (Meerut Surya Publication, 1977), P-47
51 Encyclopedia of Environmental Education-I
52 Encyclopedia of Environmental Education-I
53 Joy Parnes and Philip Neal, the hand book of environmental education, (London Routledge, 1994), P-13
54 P R Trivedi and Gurdep Raj Encyclopedia of Environmental Sciences, Management of Environmental Education and Research (New Delhi Akash Deep publishing house, First Edition, 1992), P-68
55 Encyclopedia of Environmental Education-I, P-105
56 Mamata pandya and Meena Raghunathan, Green School Series-A Guide to Green Material- Experiences and Learning in Developing Effective Environmental Education Material (Ahmedabad CEE, 1999), P-2
57 Encyclopedia of Environmental Education-I, P 107
58 Mamta and Meena, op cit, PP 1-2
59 Encyclopedia of Environmental Education-I, P 107
61 William a meehrens and Levin j lehmann (1978) measurement and evaluation in education and psychology, Holt, Richart and Winston inc USA PP 375-377
63 Travers, R M (1973) Educational Psychology, Macmillan company New York P 137
64 Mekeache, WJ and Doyle C L Psychology, Addison Wesley, 1966
65 Sorenson (1977) psychology in education Tata Macgrew Hill, New Delhi, p 349
66 Ibid- P-313
67 Scott H, Leland, The psychology of human development Macmillan, New Delhi, 1970
68 Krech, D. Cruchfields, S R Egerton, L B (1962) individual in society, MC
    Graw Hill Kogakusha, Tokyo P- 139
69 Morris G Charles (1985) Psychology an introduction, prentice hall inc
    Englewood cliffs P-504
70 Fernald and ferhal, (1999), introduction to psychology, fifth ed AITBS
    Publishers, Delhi P-489-490