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SEMESTER – IV

EDUCATION

COURSE 02

BLOCK I

ENVIRONMENTAL EDUCATION

KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

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COURSE INTRODUCTION

This is the course in Education for the fourth semester of two years Master Degree level. The course consists of two blocks. The course has been designed to familiarize the learners with the concept and importance of environmental education and make them aware of environmental problems, along with various mechanisms of environmental protection and promotion. Further, the course enables the learners to understand the basic concept of population education and the consequences and effects of population growth, in addition to introducing them with the various strategies of population control.

BLOCK INTRODUCTION

This is the first block of the course. This block covers the first part of the course, which is “Environmental Education”. The block comprises a total of nine units, from unit 1 to 9.

The First unit titled “Environmental Education” deals with the meaning and nature of environmental education, its definition and characteristics, its aims and objectives and the scope of environmental education. Further, unit also takes into account the different methods that can be adopted for imparting environmental education.

The Second unit, titled “Perspective of Environmental Education” attempts to throw light on the ecological and psychological perspective on the relationship of man and his environment.

The Third unit, titled “Environmental Degradation” introduces the learners to the concept of environmental degradation, its types, causes and prevention of environmental degradation and the role of education in promoting environmental awareness and change in attitude

The Fourth unit, titled “Environmental Pollutions” discusses the meaning and different types of environmental pollution - their causes, types, and adverse effects Further, how to prevent or control various environmental pollution are also included in the unit.

The Fifth unit, titled “Programmes of Environmental Education” as the title suggests acquaints the learners with the different environmental education programmes, along their importance at various levels of education.

The Sixth unit, titled “Conservation and Protection of Environment” discusses the conservation and protection of the environment and various legal and constitutional provisions for environmental protection.

The Seventh unit, titled “Agencies of Environmental Education” focuses on the different agencies or organisations – government, non-government; regional, national, international, etc. involved in protection

of environment and providing education to students and general masses in connection with environment through both formal and non-formal means.

The Eight unit, titled, “Media of Environmental Education” deals with different types of media that can be used effectively in the teaching learning processes of environmental education.

The Ninth unit, titled, “Challenges and Environmental Education” introduces the learners to the challenges of Environmental Education by discussing its problems and prospects with special reference to Assam.

While going through this block, you may come across some along-side boxes, which are put on the left side or right side of the text. These boxes will explain the meaning of some words and concepts within the text. Apart from this, there will be some broad and short questions which have been included under ‘ACTIVITY’ in some of the units and ‘CHECK YOUR PROGRESS’ in every unit. Activities will increase your thinking capacity because questions in the Activity box are not directly derived from the text. Hints on the answers to the short questions have been provided under section ‘ANSWERS TO CHECK YOUR PROGRESS’. Besides, a few text-related questions have been provided in ‘POSSIBLE QUESTIONS’. These questions will help to draw your attention on the probable topics for the examination purpose so that you can prepare for the same with confidence.

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UNIT 1 : MEANING OF ENVIRONMENTAL EDUCATION

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1.1 LEARNING OBJECTIVES

After going through this unit, you will be able to-

- discuss the meaning and nature of environmental education
- explain the characteristics, aims and objectives of environmental education
- explain the scope of environmental education
- discuss the various methods of environmental education.

1.2 INTRODUCTION

With the advancement of science and technology mankind has progressed well. But this has drastically changed man's relationship with environment since the prehistoric time to the present day advanced period. The industrial and scientific revolutions have led to rapid changes in our environment. Continuous exploitation of nature has put mankind in a crucial state of environmental crisis. But, the fact is that, the welfare and existence of human race depend upon proper interaction between man and his environment. Therefore, it has become necessary to develop new environmental ethics among all the people which can ensure a more harmonious and sustainable relationship between mankind and natural resources. This cannot be achieved unless humanity adopts a new way of life. The role of education in rebuilding human behaviour and attitude is very important. Therefore, we are evolving an educational system that will give due emphasis on environmental understanding, environmental awareness, environmental planning and management.

Environmental education is that branch of academic discipline which can act as a powerful instrument to educate people to maintain ecological balance with proper awareness, knowledge, skills, attitudes and commitment to improve the quality of environment. This unit deals with the meaning and nature of environmental education, its definition and characteristics, its aims and objectives and the scope of environmental education. Besides having knowledge of environmental education, as a student of education, it is essential for you to know how to impart environmental education. Therefore, the present unit also takes into account the different methods that can be adopted for imparting environmental education.

1.3 MEANING AND NATURE OF ENVIRONMENTAL EDUCATION

The term 'Environmental Education' consists of two words. One is 'environment' and the other is 'education'. Let us first discuss the meaning of the word 'environment'. The dictionary meaning of the word 'environment'

is surrounding or condition under which a person, animal or a plant lives or operates. It is the aggregate of all external conditions that affect our life. Environment as a whole consists of two basic elements- physical or natural environment and man-made or cultural environment. The physical environment consists of both biotic and abiotic elements. Plants and animals are examples of biotic environment, whereas land water, air, climate phenomena, etc are examples of the abiotic environment. Eco-system comprises the physical environment and all the organisms which live on this earth. In a particular territory, a large number of plant and animal species grow together and develop a chain of interaction and interdependence. Any change in any of the species, disturb the life of other species which is called disturbance in ecological balance.

Man is a unique and dominant species that has been interfering with the environment in various ways, such as, clearing forests, breaking grasslands, digging, drilling, mining minerals, etc. Although, in the beginning, the environment of early men consisted of only physical aspects of the planet earth, with the advancement of society men extended their environment through social, economic and political functions. Of late, humans' have exploited some of the valuable natural resources like mineral oil, natural gas, coal, etc. Man's interference with environment has often led to extinction of certain animal species, disturbing the ecological balance in nature. The term environment includes all those external forces that have influenced the conditions which affect life, nature, behaviour and growth, development and maturity of living organisms. It consists of the sum total of the stimulation that an individual receives from conception to death. Thus, environment is an inseparable whole and is constituted by the interacting systems of physical, biological, and cultural elements which are inter-related to each other.

Education is an independent field of study or discipline which is concerned with the process of development, i.e., teaching-learning, training and instruction. It aims at the physical, social, emotional, and intellectual development of the child. The chief concern of all educationists is with the environment of men. But humans cannot exist or live in isolation from the

other forms of life and also from plant life. So, the educationists should be concerned with the environment of all types of biological population. Environmental education is that branch of education which provides sufficient knowledge and understanding about the problems of environment. It contributes towards solving them, and also develops attitude and values conducive to environmental protection and understanding of interdependence of nature and people.

Environmental education aims at generating widespread awareness of environmental problems. It not only educates the world population about the natural environment and its problems, but also aims at developing knowledge, attitude and skills necessary to protect the natural balance in environment. For this, men must learn to distinguish between renewable and exhaustible resources and their relevance for the continuity of the human civilisation.

It is a fact that a man cannot live and prosper by being constantly at war with nature. On the other hand, he must learn to live in peace and harmony with nature. It is possible only when he learns the laws of nature, its secrets and mysteries. Environmental education is nothing but educating a man how to interact with the surrounding world so as to improve his or her world. It enables one to maintain his or her life. This, in turn, helps in the preservation of the human race. It scrutinises men towards the diminishing natural resources, environmental pollution and the problem of population explosion.

It is clear from the above discussion that environmental education is a process of providing learning experiences to obtain knowledge, understanding, skills and awareness with desirable attitudinal changes about man's relationship with his natural and man-made surroundings. Thus, environmental education is a new area of study which has evolved under the discipline of education to meet the challenges of environmental crisis. Thus, environmental education should be seen as a continuous life-long process, beginning at the pre-school stage level and continuing through all formal and non-formal stages. It should also be treated as an inter-disciplinary discipline that would help in teaching environmental education

from a holistic and balanced perspective. In a broader sense, environmental education means education for the environment, about the environment and through the environment.

1.3.1 Definitions of Environmental Education

The term 'Environmental Education' has been discussed in various national and international seminars and has been defined in different ways. Some of the definitions have been provided here to understand its nature and concept.

The International Union for the Conservation for Nature and Natural Resources Commission of Education in the International Working Meeting on Environmental Education in the School Curriculum held under the auspices of UNESCO in Paris in 1970 remarked:

"Environmental Education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his biophysical surroundings. It also entails practice in decision making and self-formulation of a code of behaviour about problems and issues concerning environmental quality."

The Finnish National Commission in a seminar held in 1974 stated:

"Environmental Education is a way of implementing the goals 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."

The Report of a Conference of African Educators held at Nairobi in 1968 stated:

"To create an awareness and an understanding of the evolving social and physical environment as a whole, its natural, manmade, cultural, spiritual resource, together with the rational use and conservation of the resource for development."

Mishra (1993) opined that, "Environmental education appears to be a process that equips human beings with awareness, knowledge, skill, attitude and commitment to improve the environment."

According to R.A. Sharma (1996): "Environmental Education refers to the awareness of physical and cultural environment and perceive its relevance for real life situation. The problems and issues are to be identified. The imbalance of environment are to be improved in view of sustainable development."

All the definitions mentioned above would remain incomplete, unless the definition formulated in the Tbilisi Conference held at Georgia in the USSR in October, 1977 under the auspices of the UNESCO and UNEP (United Nations Environment Programme) is not taken into account. The Tbilisi conference resolved that Environment Education involves:

a) **Awareness:** to help social groups and individuals so as to get an awareness of and sensitivity to the total environment and its allied problems.

b) **Knowledge:** to help social groups and individuals so as to gain a variety of experiences in and get a basic understanding of the environment and its associated problems.

c) **Attitude:** to help social groups and individuals achieve a set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection.

d) **Skill:** to help social groups and individuals so as to acquire skills for identifying and solving environmental problems.

e) **Evaluation ability:** to help individuals and social groups so as to evaluate economic, social, aesthetic and educational factors.

f) **Participation:** to give social groups and individuals an opportunity so as to be actively involved at all levels in working towards the resolutions of environmental problems.

1.3.2 Characteristics of Environmental Education

By analysing the above definitions we can derive the following characteristics of environmental education:

- Environmental education is a medium and a process of education that covers man's relationship with his natural and manmade surroundings.
- It refers to the knowledge and understanding of physical, biological and cultural environment and its relevance to real life situations.
- Environmental education also discusses the effects of population explosion, industrialisation, pollution, etc. on environment.
- Environmental education identifies the imbalances of environment and tries to improve it in view of sustainable development.
- It explains the co-existence of both living and non-living organisms and their contribution to the nature for its sustenance.
- Environmental education develops skills, attitudes, feeling and values needed to preserve and maintain environment.
- It utilises educational approaches, methods and techniques of teaching to identify the real causes of environmental problems and gives importance on recognising the interrelatedness of man with his cultural and biological surroundings.
- Environmental education involves both theoretical and practical aspects of environment to improve the imbalances and prevent the deterioration or pollutions.
- It appears to be an educational process that generates in learners positive value towards eco-equilibrium of a pollution free environment.



CHECK YOUR PROGRESS

Q 1: Fill in the blanks :

i) Environmental education is a ..... branch of study.

ii) Environment is ..... under which a person, animal or a plant lives.

iii) Environmental education educates the world population to protect the nature in ..... environment.

iv) Environmental education should be ..... discipline making possible to teach it from a holistic perspective.

Q 2: What is meant by Environmental Education?

……..……

……..……

Q 3: Mention five characteristics of environmental education.

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1.3.3 Aims and Objectives of Environmental Education

Now that you are familiar with the nature, concept and characteristics of environmental education, you must have realised that environmental education is an educational intervention to meet the challenges of environmental crisis. As such, it has certain aims and objectives which are mentioned below:

- To help the students in acquiring knowledge and experience of the environment and the problems associated with it.
- To assist students to understand and appreciate the laws of nature and their implications for human beings.
- To develop appreciation and insights into the inter-relationships and interdependence between man and environment.
- To encourage the students to observe nature, appreciate its

beauty, understand its laws, and adjust with it in order to live in harmony with nature.

- To generate in learners positive value towards eco-equilibrium of pollution free environment.
- To help students in acquiring the skills for identifying and solving environmental problems.
- To develop attitude, values and concern for the environment and motivate the students towards active participation in protection and improvement of environment.
- To provide opportunity for active participation in prevention and solution of environmental problems.
- To develop thinking among students about man's destiny, the future of mankind and the duty of every generation to leave this planet as a befitting place for mankind to live infinitely.
- To enjoy life and prosper peacefully by respecting the laws of nature.

1.4 SCOPE OF ENVIRONMENTAL EDUCATION

The literal meaning of the term 'scope' is the range of matters or subjects to be studied. It implies field of activity, operation and application. Scope of environmental education means the breadth and comprehensiveness of learning experiences to be provided to the individual through the process of education.

We know that environmental education is a field of study under the discipline of education. But the concept of environmental awareness or the study of environment as an academic discipline is a new phenomenon which had its roots in the developed western world. At present, we are facing grave environmental problems because of human activities on ecology, ecosystem and the whole environment. Therefore, we are evolving an educational system giving due emphasis on different aspects of the environment which has made environmental education an independent entity.

The broad areas included under the scope of environmental education are- environmental understanding, environmental awareness, environmental planning and environmental management. As an academic discipline, it includes the following content areas within its scope (Shrivastava, 2004, p. 108-109).

- **Concept of Environmental Education:** This area includes concept of environment and its components, concept of education, meaning of environmental education and its relationship with other subjects and environmental education as a discipline.
- **Concept of Ecology and Environmental Pollution:** Ecology is the study which deals with the relationships of life forms with each other and with their surroundings. Pollution refers to the contamination of the environment- air, water and land with harmful wastes resulting from human activities. Environmental pollution has badly affected the whole biosphere and has become a major world-wide threat. This area includes concept of ecology and ecosystem, quality of environment, pollution and degradation, environmental pollution- air, water, land and noise, human ecology and environmentalism, interdependency in environment- food chains and food web flow of energy and biochemical cycles.
- **Concept of Educational and Psychological Environment:** Education aims at the physical, social, emotional and intellectual development of the child in which environment has a significant role. In effective educative process, teacher must know his student and the environment. This is one of the very important areas in the scope of environmental education which includes concept of educational environment, growth and development, psychological environment and mental health, population explosion and environment.
- **Concept of Environmental Management:** Environmental management is the process to improve the relationship between man and environment so that the quality of both the environment and human society may be improved. This improvement of relationships between man and environment may be achieved through check on destruction

activities of man, conservation, protection, regulation and regeneration of nature. This is a very broad area that comes under the scope of environmental education. It includes meaning and nature of environmental management, teacher education and environmental education, role of media in environmental education, social forestry and environmental education, problems and remedies of environmental education and evaluation of environmental education.

While discussing the scope of environmental education, we must keep in mind that the core content of environmental education is highly interdisciplinary in nature. But the difference lies at the level of purpose and objectives. The purpose and objectives of other subjects are to provide awareness of environment and environmental studies. But environmental education has to develop cognitive, affective and psychomotor abilities and efficiencies. In short, the scope of environmental education includes the body of knowledge and experiences about the environment to be provided to the individual through the process of education.



CHECK YOUR PROGRESS

Q 4: State four major objectives of environmental education.

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Q 5: What are the broad areas included in the scope of environmental education?

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1.5 DIFFERENT METHODS USED IN ENVIRONMENTAL EDUCATION

Environmental Education is considered the most significant programme for making people aware of the environmental degradation. People can be made aware through teaching and organisation of different programmes. Teaching of environmental education involves both practical

(hands-on) and theoretical (understanding) aspects. The major objectives of environmental education are creating awareness, changing attitude and bringing people into action towards environmental conservation and protection. It covers cognitive, psychomotor and affective domains of teaching-learning. The strategies of teaching and learning are wide ranging, based on its contents and components, levels of education and the objectives of environmental education. Various methods are there for teaching environmental education. Some of the effective methods are discussed here.

1.5.1 Discussion Method

Discussion is one of the simple forms of group-based learning method. This method can be used in a variety of situations in both secondary and higher education level. The strength of discussion lies in broad participation of members of the group. It is the responsibility of the teachers to encourage the students to participate in discussion. For effective utilisation of this technique, the teacher should give sufficient background information about the subject so that the students are ready to use it in discussion. This is a primary requisite for a discussion because a discussion cannot operate in a vacuum. The teacher can easily arrange discussion on any topic based on the curriculum of environmental education. It can develop higher cognitive abilities effectively apart from reinforcing knowledge. In this method, students can be involved actively. It is a kind of interaction method which makes the classroom more lively and strong. There are four types of interaction in discussion, namely, Teacher-Learner Interaction, Learner-Learner Interaction, Teacher-Material Interaction, and Learner-Material Interaction. Environment is a serious issue. Therefore, the use of discussion method can make the issue more clear among the students.

For teaching environmental education, the teacher can discuss a few environment related issues like scarcity of water in the cities, water pollution in sea, disposal of garbage, etc.



CHECK YOUR PROGRESS

Q 6: What are the types of interaction involved in Discussion method?

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1.5.2 Project Method

Another important method of environmental education is Project Method. It is any purposeful activity. Project is an activity undertaken by the pupils for the solution of a problem. The activity undertaken leads to learning. Some basic principles of the project method are:

- **Activity:** The project should involve activity which is either mental or motor.
- **Purpose:** Activity should be purposeful; it should be a felt need of the pupils.
- **Experience:** Project undertaken should provide varied types of experience to the pupils- manipulative, concrete, mental, etc.
- **Reality:** Project undertaken should provide real experiences.
- **Freedom:** The pupils should be free to undertake the different activities connected with the project.
- **Utility:** The activity undertaken should be useful.

Project method helps the students acquire knowledge about particular topic through their active involvement. It not only helps them to gather knowledge but also ensures self-learning. Basically in project method, students are given some particular topic or area to work on. Through observation, interview and other means students gather data on the selected theme and prepare their project followed by analysis. The report may be hand-written or typed, or it may include charts, models, pictures, etc. They can take help of their teachers as well as parents to accomplish the project.

The role of the teacher is to help the students throughout the project, although the main responsibility of carrying out the project work lies with the students. The teacher should help the students in selecting an appropriate subject, formulating objectives of the project, checking students' progress regularly, suggest modification, etc. In the teaching of environmental education, this method can be best used. A number of environmental projects can be assigned to students in school situations, such as, plantation in school campus, visit to the places of pollution, trip to wild life sanctuary, agricultural practices in rural areas, disposal of houses, etc.

1.5.3 Problem Solving Method

This is another significant method used in Environmental Education. Environmental degradation is a problem which can be addressed through this method. It is essential to make people aware about this problem. This, however, is only possible when the students are encouraged to take active part in the programme. Problem solving method is a method that is used by the teacher to help the students solve problems by themselves. In this method, students learn by working on problems. This helps the students acqire knowledge by facing the problems themselves. In problem solving method, the students are expected to observe, understand, analyse, interpret and find solutions, and perform applications that lead to a holistic understanding of the concept. This method develops scientific process skills. This method helps in developing brainstorming approach to learning concepts. It is a process from practice to theory and not vice-versa. Students live in the real world and like to deal with concrete things where they can touch, feel, manipulate things, then the method is useful in igniting the process of science learning.

Problem solving is the act of defining a problem, determining the cause of the problem, identifying, prioritising and selecting alternatives for a solution and implementing a solution. Problem-solving method aims at presenting the knowledge to be learnt in the

form of a problem. It begins with a problematic situation and consists of continuous, meaningful and a well-integrated activity. The problems are test to the students in a natural way and it is ensured that the students are genuinely interested to solve them.

In this method, students are given some problems, which they need to solve by finding alternative solutions. The report is presented followed by the solutions. In environmental education, the students can be given some problems like water pollution, noise pollution, etc.; by finding alternative solutions to these problems, the students can gain an in-depth idea of such serious problems. Therefore, in environmental education teaching, problem solving is considered one of the most important methods.



CHECK YOUR PROGRESS

Q 7: Write three characteristics of problem-solving method.

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1.5.4 Observation Method

Another method widely used in environmental education is Observation Method. Though this method is the most commonly used method especially in studies relating to behavioural sciences but in environmental studies too, this method can be used. Environment implies our surroundings. When we observe our surrounding, it helps us to know better as well as to establish a harmony with the nature. This will help the young students realise the importance of environment and how we can save it from disasters. The information obtained under this method relates to what is currently happening which helps in finding out the factors of environmental degradation and assist in finding solutions to it.

It is rightly believed that direct experiences are more effective in the processes of learning and are retained for a longer period of

time. Therefore, a student should be allowed and asked to observe simple phenomena of the earth and the sky so that he/she acquires awareness about living and non-living components and develops awareness about his/her wellbeing in the context of social and natural environment. The child gradually begins to form positive feelings and attitudes of environmental protection. He may utilise these skills and attitudes in his actions as personal habits. Personal habits can contribute in improving the quality of the environment. Observation under the careful guidance of teacher, on the immediate natural surroundings, geographic facts and relationships prove invaluable for the teaching of environmental education.

1.5.5 Dramatisation

Drama, as we all know, is primarily a living experience. It helps the child to expand the boundaries of his life space, enables him to express his imagination, concepts and feelings about events and happenings. Acting is a wonderful way of learning. Dramatic teaching is integrated into many different types of curriculum especially in the lower level of education. It is a method which refers to a collection of teaching tools that include traditional drama techniques like improvisation, storytelling, role playing and games. Dramatisation technique lays emphasis on engaging students through interactive activities. There are many ways to use dramatisation teaching methods in the classroom. Teachers can use it to help students gain deeper insights into topic, building concepts and themes. Moreover, it is also used as a means to test student's knowledge. A dramatic performance unfolds with a plot. The enactment of a play illumines the responsibilities of democratic citizenship; provide children with an understanding of the problems of community living, and a realisation of the importance of participating in community activities. It can convey the concepts of good environment and the abuse of environment.

The role of a teacher is very significant in using dramatics as a method of teaching environmental education. He/she may ask the students to prepare scripts on environmental problems, prepare costumes, do the art work necessary for staging, plan a programme and send invitations and make all necessary arrangements. Thus, by engaging in a play, children explore in their own way, the activities and relationships of human living and acquire the much needed information and skills. Environment is a serious issue, and it is very essential to create awareness in children from grassroots level. Dramatisation technique helps the children realise its importance.

1.5.6 Field Trip

Environment itself means our surroundings. To know the environment and to maintain the ecology, we must explore our environment. Only bookish knowledge cannot help in developing a sense of belongingness towards the environment among the students. When they get the opportunity to explore nature they learn and develop the sense of attraction towards the same. The best way of giving them an opportunity to explore nature through education is Field trip, which is an essential part of school education. Generally a field trip is a trip made by students and teachers to see and study something naturally, culturally, socially or geographically significant. Environmental education can be taught effectively with the help of field trips or educational excursion method. This is the most practical method of teaching environmental education. This method provides real experiences through local observation, regional and national observation, geographical conditions observation, observation of historical places and remains, industrial area and natural vegetation which are the major components of the school subjects related to environment.

In the Observation method, awareness of the environment is provided through the perception of the students. It involves observation, imagination and ability of discovering the cause and

effect relationship among environmental components. Thus, it provides the learners a real exposure to environmental education. Field trips also develop the ability to appreciate natural environment and interpret one's own experiences and observations. For developing feelings of co-operation, group activities or team work, etc., field trip is one of the best methods of teaching environmental education. While organising field trips, certain points should be considered important to make teaching-learning effective. They are as follows:

- the specific objectives should be formulated
- to realise these objectives, ways and means should be identified
- a schedule containing date, time, number of students, duration and financial aspects should be finalised
- the means of transportation and time schedule should be finalised
- the visiting organisations should be contacted for the necessary arrangement

The success of field trips depends upon the selection of places and schedule of observation by the students. Every student should prepare a report about his/her observations. Every field trip should be followed by a group discussion to highlight the environmental components.



CHECK YOUR PROGRESS

Q 8: What are the things to be considered while planning a field trip?

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Besides the above mentioned methods, the teacher can organise lectures, debates, seminars and workshops on environmental issues. It is the teacher who can sensitise his/her

students for developing positive attitude towards environment, develop emotional commitment for improving the quality of environment which will ultimately motivate the citizens to work towards the solution of environmental problems



1.6 LET US SUM UP

- The dictionary meaning of environment is the surrounding or condition under which a plant or animal lives or operates.
- Environment as a whole consists of two basic elements- physical or natural, and man-made or cultural.
- Environmental education is that kind of education which provides sufficient knowledge and understanding about the problems of environment. It aims at generating widespread awareness of environmental problems.
- Environmental education is nothing but teaching people how to interact with the surrounding world so as to improve their own world. Thus, it is a medium and a process of education that covers people's relationship with their natural and man-made surroundings.
- Environmental education discusses the effects of population explosion, industrialisation, pollution, etc. on environment and identifies the imbalances of environment and tries to improve it in view of sustainable development. It involves both theoretical and practical aspects of environment to improve the imbalances and prevent deterioration and pollution.
- The scope of environmental education includes concept of environmental education, ecology and environment, educational and psychological environment and environmental management.
- Teaching of environmental education involves both practical (hands-on) and theoretical (understanding) aspects. A teacher can adopt different methods for imparting knowledge on environmental education

to the students. Some of the important methods are: Discussion method, Project method, Problem-solving method, Field trip, etc.



1.7 FURTHER READING

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1.8 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: (i) New (ii) surrounding (iii) balance (iv) interdisciplinary.

Ans to Q No 2: Environmental education is that branch of knowledge which has been developed to be used as a powerful instrument to educate people, to maintain ecological balance with awareness, knowledge,

skills, attitudes and commitment, to improve the quality of environment.

Ans to Q No 3: Environmental education covers man's relationship with his natural and man-made surroundings. Secondly, it refers to the knowledge of physical, biological and cultural environment. Thirdly, it discusses the effects of population explosion, industrialisation and population. Fourthly, it explains the co-existence of both living and non-living organisations, and fifthly, it is an educational process that generate in learners positive value towards eco-equilibrium of pollution free environment.

Ans to Q No 4: (i) To help the students in acquiring knowledge of the environment and its associated problems.

(ii) To assist the students to understand and appreciate the laws of nature.

(iii) To generate in learners positive value towards eco-equilibrium of pollution free environment.

(iv) To provide opportunities for active participation in working for prevention and solution of environmental problems.

Ans to Q No 5: (i) concept of environmental education

(ii) concept of ecology and environmental pollution

(iii) concept of educational and psychological environment, and

(iv) concept of environmental management.

Ans to Q No 6: The interaction involved in discussion methods are- Teacher-Learner Interaction, Learner-Learner Interaction, Teacher-Material Interaction, and Learner-Material Interaction.

Ans to Q No 7: Three characteristics of problem solving method are—

1. Problem solving is the act of defining a problem, determining the cause of the problem, identifying, prioritising and selecting alternatives for a solution and implementing a solution.
2. Problem-solving method aims at presenting the knowledge to be learnt in the form of a problem.
3. It begins with a problematic situation and consists of continuous, meaningful, well-integrated activity.

Ans to Q No 8: The things to be considered while planning a field trip are-

- the specific objectives should be formulated.
- to realise these objectives, ways and means should be identified.
- a schedule containing date, time, number of students, duration and financial aspects should be finalised.
- the means of transportation and time schedule should be finalised.



1.9 POSSIBLE QUESTIONS

A) Short Questions (Answer each question in about 150 words)

Q 1: What is meant by environment? Explain briefly.

Q 2: What should be the role of education for sustaining the environment?

Q 3: Write the meaning of sustainable development?

Q 4: What is meant by environmental management?

Q 5: Describe the project method for teaching environmental education.

Q 6: Explain the role of teacher in problem solving method.

Q 7: Write a note on importance of field trip in environmental education.

B) Long Questions (Answer each question in about 300-500 words)

Q 1: Define 'Environmental Education' and write a note on its characteristics.

Q 2: hat are the aims and objectives of environmental education? Discuss the role of education in the development of environmental awareness.

Q 3: What is environmental education? Discuss its nature and scope.

Q 4: What is the need and importance of studying environmental education in the present-day context? Explain citing examples.

Q 5: Discuss elaborately any two methods of imparting environmental education.

Q 6: How does dramatisation help in eradicating environmental degradation? Write from your own point of view.

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UNIT 2 : PERSPECTIVES OF ENVIRONMENTAL EDUCATION

UNIT STRUCTURE

2.1 Learning Objectives

2.2 Introduction

2.3 Perspectives of Environmental Education

- 2.3.1 Ecological Perspective of Man and Environment
- 2.2.2 Ecology of Man and Environment Relationship

2.4 Psychological Perspective of Man and Environment

- 2.4.1 How Environment Influences Us Psychologically?

2.5 Let Us Sum Up

2.6 Further Reading

2.7 Answers to Check Your Progress

2.8 Possible Questions

2.1 LEARNING OBJECTIVES

After going through this unit, the learners will be able to -

- describe the different perspectives of man-environment relationship
- identify the causes of their physical and mental ill health
- explain their actions in terms of their ecological and psychological relation with environment
- discuss the knowledge of the perspective for the need of sustainable use of the resources.

2.2 INTRODUCTION

In the previous unit you have learnt what is meant by environmental education. In this unit, we will discuss on perspectives of environmental education. Now a question may come to your mind on what are the different perspectives in environmental education. As an individual we may have different ways to looking at things. As such the overall environment can be seen from different perspectives on the basis of how it is related to us? If

you notice, human beings are not only physically connected to environment that means we are not only dependent for our food, air or water but also psychologically dependent on it. In this unit, an attempt has been made to highlight on the ecological and psychological perspectives on the relationship of man and his environment.

2.3 PERSPECTIVES OF ENVIRONMENTAL EDUCATION

Environmental education is a holistic, life long process which helps people to understand environmental issues and take appropriate actions to solve the environmental problems. It increases public awareness regarding the environmental functions and the required human behaviour for preserving and conserving the environment. The perspective of environmental education defines the ways in which it should be framed to highlight the various aspects on how we are dependent on the environment. The understanding of different perspectives of environmental education helps to develop the curriculum, teaching methods accordingly. In this unit, the emphasis is laid on the two perspectives that is ecological perspective and psychological perspective. If we observe our surroundings it can be found that human acts as a destructive force degrading the otherwise healthy ecosystem. Thus, the goal of the environmental education should be to teach people to be a less destructive force by developing a sense of responsibility in them. The ecological perspective views humans as a part of the larger social and ecological systems. Whie through their collective actions, have the potential to help rebuild the processes that are integral to the functionin of a healthy system. In the following sub sections we will discuss how man and environment is related ecologically.

2.3.1 Ecological Perspective of Man and Environment

Ecology is a science which deals with various principles that govern the relationship and interdependence between organisms and their environment. Ecological approach of study includes man-

environment relationship which is based on the mutual interaction between organisms and physical environment and between organisms in an ecosystem. The relationship of man and environment is two dimensional which influences and modifies each other. Ecological perspective is a concept of community psychology in which a community is viewed in terms of the interrelations among people, roles, organisations, local events, resources and problems. It accounts reciprocal interactions of individuals and their environment. The learning system is composed of individuals which interact with each other in their environment which again interacts with nature. Ecological perspective of relationship of man and environment includes dynamic process of growth, decline and reorganisation, nested systems and feedbacks. It suggests educational practices that helps the learners to view themselves as a part of the ecological system and contribute to the resource management practices and policies. Ecological perspective of man and environment is an approach for controlling and regulating the behaviour for the purpose of a desirable change among the students. Ecological perspective not only includes the interrelation between man and his environment but also includes many facets of human life. It is not confined to biological sciences from which it has evolved but also has reached the social sciences and is now viewed as a state of mind.

Dimension of Ecological Perspective*:*

- Ecological perspective helps us to understand the relationship between living organism and environment.
- It provides us an opportunity to understand the interdependence between organisms and environmental components.
- It helps to find approaches to regulate and control the behaviour of students for the welfare of the environment.
- It provides comprehensive awareness on the reciprocal relationship of the whole environment.

- It provides mathematical model to relate and predict the effects of environmental components.
- It shows ways to conserve and preserve the natural resources

Kinds of Ecology

There are various branches of ecology which helps us to gain different perspectives to understand environment and design practices and methods for the dissemination of knowledge.

- Habitat ecology provides understanding on different habitats on earth and their effects on the organism
- Community ecology is the study of the local distribution of animals in various habitats
- Population ecology is the growth, structure and the regulation of pollution (of organism)
- Human ecology studies the relationship between man and environment and the effects on each other
- Applied ecology studies the needs of human and the application of the ecological concepts
- Production ecology deals with the production of different eco-systems
- Geographic ecology studies the geographical distribution of plants and animals
- Another related branch of environmental ecology is sociology which deals with the ethology and ecology of mankind
- Ethology interprets the animal behaviour in natural surroundings
- System ecology analyses the structure and function of the ecosystem.

Ecosystem

Another important part of the ecological perspective is Ecosystem. The ecosystem is a unit of organisms connected to one another and to their environment within a given space and time unit. It is composed of three basic components- biotic, abiotic and energy components. Ecosystem has its own productivity which is the process

of building organic matter based on the availability and amount of energy passing through ecosystem. There are basically two kinds of ecosystems:

- Natural ecosystems operated by themselves under natural conditions without any interference by man
- Artificial ecosystems which are managed by man

An ecosystem constitutes various kinds of population such as different types of plants, animals, and microbes all of which are interact with each other. Human beings are an integral part of that ecosystem which interacts and modifies different components of nature according to its convenience.



CHECK YOUR PROGRESS

Q 1: Write one dimension of ecological perspective.

.....

Q 2: Define the term human ecology?

.....

Q 3: What is meant by artificial ecosystem?

.....

2.3.2 Ecology of Man and Environment Relationship

Human beings are not just the products of environment alone, man has become the creator and transformer which dominates the ecology. Human being is in the highest level of the food chain. It not only consumes food but also produces the same. The relationship of man with the environment is different from plants and animals. Humans depend on nature for its survival and on the other hand, human being through his knowledge, scientific and technological advancements continues to transform the environment according to his needs.

The environmental change is occurring due to natural forces and the man made forces. Most of the environmental change has

taken place because of the exploitation of the natural resources by human beings. The main stressors such as- air, water, noise pollution etc. has changed the environment. The unlimited population growth has also degraded the natural environment.

Human beings are changing the environment through their activities, yet, we are too concerned with the environment and our surroundings as our survival depends on the survival of the natural environment.

The climate and humans are two major forces for the environmental change which directly influences the processes operative in environmental system. Availability of resources decides the pattern of human activities. And the most significant aspect of environment in influencing human activities are the natural resources. The economic viability also depends on what type of resources are available in the surroundings of human beings. Nowadays, international relations are also based on the available resources of a country and how it uses them.

Change in the agricultural system is also an area of study regarding the ecological perspective of the relationship between man and environment. The change in the agricultural system from traditional method to modern technological methods has increased the production and decreased the dependency on the environment. However, the use of chemicals in fertilisers has deteriorated the quality of the soil. On the other hand, consumption of those food products also has adverse effects on human health.

The rapid industrialisation also produces wastes of huge quantities which are affecting the air, water adversely and carbon dioxide released from the industries has affected the climate.

Deforestation is one of the results of human activity. The forests play an important role in maintaining the ecological balance. Deforestation of forests changes surface, air, temperature, moisture content and rainfall which also shapes and changes the lifestyles of human beings.

Recreational and tourism industry is growing day-by-day which has accelerated the loss of soil and continues to disturb the animal world.

The growth and increase in the population have disturbed the ecological balance of the environment. The over population has created the demands for more food, space and has resulted in man destroying the natural environment. The frequent incidents of man-animal conflict which occurs in Guwahati is also an example of the destruction of natural habitats of animals for the needs of man.

The pressure of human density in terms of population growth is increasing in the urban areas from the rural areas. The development of facilities such as health, education job opportunities has attracted the people to urban areas, which in turn has pressurised the transportation, water supply, electricity supply, sewage system etc. These pressures have led to physical and mental illness among people.

Though nature has blessed us with abundance, man should restrict themselves from destroying nature. The exhaustion of reserves is in large part due to the use of raw materials. Of course, there are other causes; land, for example, is also required for housing and infrastructure. However, the use of raw materials largely determines the rate of consumption of natural resources. The extraction and use of natural resources are responsible for environmental problems all over the world, and the social and economic impacts of their use cannot be justified always. We now take a closer look at these three aspects with regard to the use of natural resource.



CHECK YOUR PROGRESS

Q 4: Write the meaning of ecological perspective.

.....

Q 5: How does deforestation change human life styles?

.....

2.4 PSYCHOLOGICAL PERSPECTIVE OF MAN AND ENVIRONMENT

There is a transaction between environment and human beings. Environment affects human behaviour and human behaviour affects the environment, the two interact. Environment nourishes us, but it also holds the power to destroy us. From time immemorial, human beings are the victims of floods, earthquakes and other natural calamities. Though man has landed on the moon, we are not able to control the effects of the environment on human beings. Rather, we have created environmental hazards or in other words man-made hazards. And this has threatened us physically as well as mentally. Air pollution, water pollution, noise pollution and crowding have adverse effects on our mental health which again are man-made. The development of technology has also posed serious threats on us. Bhopal methyl isocyanate (MIC) 1984 is one of the major man-made disasters that continues to have intense and long-term adverse effects on the lives of the people. In the Bhopal disaster, more than 8,000 people died and over 2,00,000 were physically affected. Today, thousands of gas victims are still suffering from mental and physical health problems.

There is a close relationship between the environment and psychological processes of human beings. The environmental factors have a significant effect on both mental and behavioural activities of human beings. Mental activities denote how we perceive, judge, believe, interpret and our attitudes and the behavioural activities refer to how we respond to the environment. The social, economic, psychological, mental and physical well-being of a human being is also greatly affected by occurrence of different environmental hazards such as cyclones, floods, draughts, tsunami, etc. Also as mentioned earlier, our response to environment depends on our mental cognition, such as- how we see or attend to our surrounding or environment? It is a part of our lives or we just think that we are simply surrounded by our environment. The way we give attention influences our relationship with the environment. Our perception of the environment and the information restored in our brain helps to recognise, conduct and plan

our activities. Human beings tend to look for the environment which is familiar to them and can engage themselves with the surroundings. The environment in which we live shapes our mental aspects and cognition. If we live in an unhealthy environment it will lead to poor physical and mental health. If we live in a proper and healthy environment it will lead to a healthy life both physically and mentally.



CHECK YOUR PROGRESS

Q 6: Write the meaning of psychological perspective.

.....

Q 7: Write one dimension of the psychological perspective.

.....

2.4.1 How Environment Influences Us Psychologically?

The important area of psychological perspective of man and his environment is the role of perception, as every human being perceives the environment in their unique ways which in turn decides our reaction to various environmental situations. It directs our behaviour. Gestalt psychologists hold the view that a person lives simultaneously in different environments. It is the environment where rational behaviour begins and decisions are taken. As stated earlier, how a person perceives the environment shapes his responses towards it. The responses may be positive or negative.

The relationship of human beings with nature is very complex. Our environment changes almost every day and the living organisms have to adjust with that environment. And how well we adjust decides the quality of our life. A well-adjusted individual will be happier and healthier than the individuals who cannot adjust well. Environment embraces many points of view including how humans perceive and experience the environment in the psychological sense, how they modify and use it to serve human needs, and finally how humans accommodate their behaviour in a constantly changing ecosystem.

The quality of environment is also critical to human health, wealth and happiness. Some environments are conducive to restoring mental fatigue while some are not. The wealth of a person also depends on his environment.

Man is not just a mere product of the environment but is also a goal-directed being who acts upon his environment and who in turn is influenced by it. We are using the natural resources to fulfill our need which in turn is influencing us. On one hand, it has made our life comfortable, on the other it has affected us in a negative way. Due to destruction of nature we are facing problems like global warming, water scarcity which also increases our stress levels and we are more prone to other diseases. Human beings are not only affecting the earth on which they live but also other living organisms who share the earth with them.

Environment comprises various types of forces which influences, conditions life, our growth, development and maturity. Along with the natural environment, we have man made environments which affect our physical and mental health. The environmental stressors such as air pollution, water pollution, noise pollution has adversely affected our standards of living. They may also create problems especially due to failure of preferences, prolonged uncertainty, lack of predictability and stimulus overload. There are numerous behavioural and cognitive outcomes which include physical illness, diminished altruism, helplessness and fatigue.

The immediate living environment of the individual also directs our human life psychologically. Planning, the design of office and living space, the conservation of natural resources and the building of institutions are made to ‘share’, ‘serve’, ‘think’ and ‘feel’ for others around the individual. These are the ‘stimulations’ for a healthy life which a person receives till his death. People tend to seek out places where they feel competent and confident, places where they can make sense of the environment while also being

engaged with it. Preserving, restoring and creating a preferred environment are thought to increase sense of well-being and behavioural effectiveness in humans.

Another important aspect of man-environment relationships that can be studied under psychological perspective is the sense of place or place identity. Sense of place is a symbolic representation of the memories, feelings, values and experiences related to the physical setting. Place-identity provides the cognitive cluster that indicates the normative behaviour in that particular situation. For example, we behave differently in a formal setting than an informal setting. Gustafson (2000) suggested that place-identity is a cognitive structure which contributes to global self-categorisation and social-identity processes which is very important for the psychological well-being for each and every individual considering their living environment.

The basic human need that is shelter is satisfied by housing which provides security and protection against climatic conditions and unwanted intrusion. Housing environment also plays an important factor in the psychological wellbeing of a person. The housing environment can also be considered in terms of a wide range of architectural, economic, social and cultural factors which directly shapes the personality of an individual. For example, in a house where a child is properly taken care of, she/he gets the opportunity to play, share his/her feelings and interact with others will be more mature than a child who does not get anything from it.

The rapid growth of urbanisation which is known as 'engines of economic growth' has changed the scenario of both the rural and urban areas. People are migrating from the rural areas to urban areas in search of better economic prospects, and the need for economic wellbeing has overshadowed the environmental wellbeing. India has brought enormous problems of housing shortage and even deteriorating quality of housing, characterised by highly dense conditions. This has resulted in the poor living conditions and lack

of space for freedom. Also, it has resulted in the negative effect on the mental wellbeing of individuals. The effects of high density living in slum areas affects human behaviour as well.

Environment being a life support system needs proper planning to maintain its standards, to control environmental conditions and evaluate the impact of human activities on the environment. Environment is everything around us and people should have an understanding of their basic responsibilities to protect and conserve the environment. The relationship between man and environment is bi-directional, as both affect one another. The capacity of human beings to modify the environment is clearly a dynamic one, varying in both time and space. It is the responsibility of human beings to create a good and healthy environment for human beings and also save our environment as much as possible.



CHECK YOUR PROGRESS

Q 8: How does immediate living environment direct human behaviour?

.....

Q 9: What is meant by sense of place?

.....



2.5 LET US SUM UP

- Environment mainly comprises the natural environment (such as places, geographical features like rivers, mountains, valleys; environmental conditions like temperature, rainfall, flora and fauna) and the built-up environment (such as houses, buildings, cities, communities, etc.). The environmental conditions not only influence our physical environment but also our psychological wellbeing.

- Ecology is a science which deals with various principles which govern the relationship and interdependence between organisms and their environment. Ecological perspective of relationship of man and environment includes dynamic process of growth, decline and reorganisation, nested systems and feedbacks. It suggests educational practices that helps the learners to view themselves as the part of the ecological system and contribute to the resource management practices and policies.
- Another important part of the ecological perspective is Ecosystem. The ecosystem is a unit of organisms connected to one another and to their environment within a given space and time unit. It is composed of three basic components- biotic, abiotic and energy components. Ecosystem has its own productivity which is the process of building organic matter based on the availability and amount of energy passing through ecosystem
- Human beings are not just the products of environment alone, man has become the creator and transformer which dominates the ecology. Humans are in the highest level of the food chain. They not only consume food but also produce the same. The relationship of man with the environment is different from plants and animals. Human depends on the nature for its survival on the other hand human beings through his knowledge, scientific and technological advancements transforms the environment according to his/her needs.
- Environment not only influences the physical entity of human beings but the psychological wellbeing also depends on the environment. There is transaction between environment and human beings and individuals change their environments and their behaviour and experiences change their environment. Environment affects human behaviour and human behaviour affects environment and thus, the two interact.



2.6 FURTHER READING

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2.7 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Ecological perspective provides us an opportunity to understand the interdependence between organisms and environmental components.

Ans to Q No 2: Human ecology studies the relationship between man and environment and the effects on each other

Ans to Q No 3: Artificial ecosystem is managed by human beings.

Ans to Q No 4: Ecological perspective is a concept of community psychology in which a community is viewed in terms of the interrelations among

people, roles, organisations, local events, resources and problems.

Ans to Q No 5: Deforestation is one of the results of human activity. Forests play an important role in maintaining the ecological balance. Deforestation of forests changes surface, air, temperature, moisture content and rainfall which also shapes and changes the lifestyles of human beings.

Ans to Q No 6: There is a close relationship between the environment and psychological processes of human being. The environmental factors have a significant effect on both mental and behavioural activities of human beings. Mental activities denote how we perceive, judge, believe interpret and our attitudes whereas behavioural activities refer to how we respond to the environment.

Ans to Q No 7: The way we see or attend to our surrounding or environment shapes our action towards it. It is a part of our lives or we just think that we are simply surrounded by our environment. Also, the way we give attention influences our relationship with the environment.

Ans to Q No 8: Planning, the design of office and living space, the conservation of natural resources and the building of institutions are made to share, to serve, to think and to feel for others around him. These are the stimulations for a healthy life which a person receives till his death. People tend to seek out places where they feel competent and confident, places where they can make sense of the environment while also being engaged with it.

Ans to Q No 9: Sense of place is a symbolic representation of the memories, feelings, values, experiences related to the physical setting.



2.8 POSSIBLE QUESTIONS

A) Short Questions (Answer each question in about 150 words)

Q 1: What do you understand by ecological perspective?

Q 2: What is the meaning of habitat ecology?

Q 3: Define the term ecosystem.

Q 4: What is psychological perspective with regard to the environment?

Q 5: How is man and environment related ecologically?

Q 6: How is man and environment related psychologically?

Q 7: What is sustainability?

B. Long Questions (Answer each question in around 300- 500 words)

Q 1: Discuss the ecological perspective of man and environment relationship with proper illustration.

Q 2: How does modern science and technology affect us physically and mentally? Explain with suitable examples.

Q 3: Discuss the effect of environmental conditions on the psychological well-being of human beings.

Q 4: How to revert the influences of negative environmental conditions? Describe.

Q 5: How does urbanisation affect us? Discuss.

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UNIT 3 : ENVIRONMENTAL DEGRADATION

UNIT STRUCTURE

3.1 Learning Objectives

3.2 Introduction

3.3 Concept of Environmental Degradation

- 3.3.1 Types of Environmental Degradation
- 3.3.2 Causes of Environmental Degradation
- 3.3.3 Prevention of Environmental Degradation
- 3.3.4 Role of Education for Environmental Awareness and Attitude Change

3.4 Let Us Sum Up

3.5 Further Reading

3.6 Answers To Check Your Progress

3.7 Possible Questions

3.1 LEARNING OBJECTIVES

After going through this unit, you will be able to -

- explain the meaning of Environmental Degradation
- identify the different types of Environmental Degradation
- find out way to prevent of Environmental Degradation
- discuss the role of education for Environmental Awareness and Attitude Change.

3.2 INTRODUCTION

This unit introduces you to the concept of environmental degradation, its types, causes and prevention of environmental degradation and the role of education in promoting environmental awareness and change in attitude. The basic question as to what are the factors that cause environmental degradation need to be explored first in order to create environmental awareness among the masses. Historically speaking, since the last century or so, there has been an alarming increase in human activities that cause

environmental degradation. Today, every aspect of our environment is endangered. The air we breathe, the water we drink and the land on which we grow our food all have been exposed to pollution causing large scale environmental degradation. To over-come the resultant environmental crisis the world is coming together to use technology and resources to repair the damage already done to our environment and also to propagate the use of substitutes in place of certain harmful chemicals so that we can protect and preserve our environment.

3.3 CONCEPT OF ENVIRONMENTAL DEGRADATION

Environmental degradation is a wider and comprehensive term which refers to the lowering and the deterioration of the quality of the environment caused by both natural processes and human activities at local, regional and global perspectives. Environmental pollution is a component of the degradation that means an over-all lowering of the environmental qualities because of the adverse changes brought about by human activities. Environmental degradation is further complicated by rapid increase in population. The quick growth of urban population in the industrially developed cities has resulted in the pollution of air, water, and sound. It has now created a situation where air is unfit for breathing, water is unfit for drinking, and the soil is unfit for cultivation.

Thus, the present population explosion and industrial growth along with pollution have combined to cause large scale environmental degradation in the form of pollution of the natural resources. This pollution is largely a man-made problem particularly in the developing countries of the world. Degradation of environment may result from human activities as well as natural disasters.



LET US KNOW

Environmental pollution and environmental degradation are used interchangeably by most people but in reality, these are two different concepts and

have different meanings. Both environmental pollution and environmental degradation are concerned with the lowering of the quality of the environment. Environmental pollution means lowering of the quality of the environment at local level caused by human activities for exploitation of resources. On the other hand, environmental degradation means deteriorating the environmental quality at the global, regional and local level by natural processes as well as human activities.



CHECK YOUR PROGRESS

Q 1: Explain the term 'Environmental degradation'. Write within 50 words.

.....

.....

Q 2: Give the differences between environmental pollution and environmental degradation.

.....

.....

3.3.1 Types of Environmental Degradation

Environmental degradation is divided into two main categories on the basis of the factors responsible for the lowering of the quality of the environment. These are-

(a) Hazards and events

(b) Environmental pollution

Environmental hazards are those extreme events caused by natural process or man's activities which exceed the tolerable magnitude within or beyond certain time limits which make adjustment difficult and result in the loss of property and lives.

Environmental pollution can be defined as any undesirable change in the physical, chemical or biological characteristics of any component of the environment (air, water, soil) which can cause harmful effects on various forms of life or property. The main types

of pollution are - air- pollution, water-pollution, soil pollution etc.

3.3.2 Causes of Environmental Degradation

We know that environmental and ecological changes are the result of the changes brought about by science and technology in human life. With the advent of socio-economic, scientific and technological development there has been the serious problem of environmental degradation. In general, the causes of environmental degradation may be divided into two- physical or natural and human actions.

Physical or Natural: Environmental degradation is caused by certain natural phenomena. Some of these are as follows:

- **Soil Erosion:** The loss of soil or disturbance of the soil structure is called soil erosion. Soil erosion causes uprooting of plants resulting in deforestation, loss of pastures, expansion of deserts and increase in the frequency of droughts and floods. It also causes soil creep, earth flow, mudflow, landslides etc.
- **Earthquakes:** Earthquakes are tremors which are produced by the passage of vibratory waves through the rocks. The devastations caused by earthquakes to the life of man and property as well as to the ecosystem is very high. Earthquakes also lead to landslides, change in the course of rivers, loss of plants and animal life, destruction of dams and development of faults and fractures on earth's surface.
- **Volcanoes:** A volcanic explosion is an environmental hazard of the severest type, causing heavy loss to plant and animal life. It can also cause major hazards to people who live near them. Large plumes of ash and gas ejected high into the atmosphere can influence climate, sometimes on a global scale.
- **Floods, droughts and famines:** Floods and droughts are natural hazards related with rainfall. Calamities like floods and droughts pose a serious problem to the whole environmental

setup of a region. Floods cause accelerated erosional, transportational and depositional activities of the river with the consequent effects on soil. Drought is also a natural hazard which has its impact on the regional ecosystem. Generally, the areas getting rainfall which is too less to support agricultural production are usually called drought prone areas. When droughts become severe they cause famines, which have devastating effects on men, animals and also on the environment.

- **Desertification:** Desertification is a process through which fertile or non-desertic land is converted into dry, infertile or desertic land. Desertification leads to conversion of irrigated croplands to desert like condition in which agricultural productivity significantly falls. It is characterised by severe ecological degradation with the loss of vegetation cover, loss of bio-diversity, depletion of ground water, salinity and severe soil erosion.
- **Tropical Cyclones, Thunder Storms and Tornadoes:** Tropical Cyclones are the most powerful and destructive types of cyclonic storms. It destroys life and property as well as forests and animals. It is also responsible for changes in atmospheric and environmental conditions. A thunderstorm is an intense local storm caused by strong conventional activity. Thunder and lightning normally accompany the storm and rainfall and sometimes lead to cloud burst also. A tornado is a small intense cyclone in which the air spirals at a tremendous speed. A tornado moves with a wind speed of upto 400 Km per hour in a funnel like shape. The end of the funnel cloud may alternatively sweep the ground, causing complete destruction of anything in its path.
- **Environmental Degradation due to human actions:** Man has created an imbalance in the environment by exploiting it haphazardly to fulfill his needs. Thus, some of the important

human factors which lead to environmental degradation are as follows:

- **Overpopulation:** The root cause for the change in the environment is the explosion of human population. Phenomenal increase in human population and the consequent increase in the use of fossil fuel and deforestation have resulted in the increase in green house gases such as carbon dioxide. Growing population has also adverse effects on human health and quality of life.
- **Industrialization:** Industrialization has led to rapid deforestation, unorganised mining, pollution etc. It has created disturbance in the eco-sensitive areas like ozone layer, tropical forests, and led to the extinction of several species of wildlife birds and plants. Industrialization produces a variety of pollutants such as gases, smoke, oil, plastic metallic waste, and acids etc which degrade the environment.
- **Urbanization:** Industrialization leads to the mushrooming of cities all over the world. Industries are mainly centralised in the urban areas and the attraction of job opportunities encourage migration of the rural population to the cities. It results in the growth of slums in the urban areas and highly productive agricultural land is encroached by urban houses, roads and industries. On the environment side, urban centers concentrate on much of the world's pollution and green house gas emissions. Thus, unplanned urbanization leads to degradation of human health and the quality of the environment, contributing to social, ecological and economic instability in many countries of the world.
- **Deforestation:** Deforestation has brought about environmental disaster. The disaster includes increased carbon dioxide content in the atmosphere which has affected the increase of green house, soil erosion, change in the climate, increasing green house effect, flood, drought etc. It also leads to loss of

the habitats of wild life and loss of valuable species including medicinal plants.

- **Mining activities:** Large scale mining operation is responsible for environmental degradation. Mining leads to large scale destruction of natural vegetation and wildlife which creates ecological problems. It may also cause respiratory diseases among the workers as well as among the residents of the nearby areas.
- **Use of Pesticides:** The excessive use of chemical fertilizers and pesticides has resulted in the degradation of the environment which poses a threat to human health. High doses of these highly toxic insecticides not only affect other forms of life, but ultimately find their way in man through ecological cycles.

3.3.3 Prevention of Environmental Degradation

Prevention of environmental degradation should be the foremost priority. Certain natural phenomena like earth quakes, soil erosion, droughts, floods, landslides can cause environmental degradation. Effective measures need to be taken up urgently to prevent and control air pollution, water pollution, soil pollution, noise pollution etc.

Air Pollution: It is very essential to control air pollution. Efforts should be made to minimise air pollution as much as possible. Some of the techniques by which air pollution can be minimised are-

- Vehicular pollution is a common feature in the towns and cities. Proper and regular tuning of the vehicles should be done. Car pool concept should be introduced and is to be followed in practice by the car owners.
- Using low sulphur coal in industries.
- Use of organic manure instead of commercial fertilizer.
- Using non-conventional sources of energy.

- Planting of more trees, consumption of electricity should be reduced.

Water Pollution: Controlling water pollution is what some easier than controlling air pollution. Water pollution can be prevented and controlled by adopting several remedial measures. They may be mentioned below -

- Proper drainage system should be provided for separate flow of sewage water and rain water.
- Water control act may be adopted by the concerned authority.
- Agro-chemicals like pesticides and fertilizers should be reasonably and judiciously used in agriculture.
- Use of fertilizer in agriculture may be supplemented by nitrogen fixing plants.
- Polluted water may also be purified by using solar power.
- Pollutants present in water may be removed by using the method of water purification.

Soil Pollution: Survival and growth of the living organisms basically depend upon the equality of the land and soil. To check soil pollution and to improve the quality of soil the following steps may be taken -

- Farmers should be trained in the appropriate use of the fertilizer chemicals.
- Bio-gas may be produced from the organic waste products.
- Soil erosion by irresponsible cutting of hilly areas should be stopped by making laws.
- Use of DDT as insecticides should be restricted.
- Industrial water products and garbages of the urban areas should be properly disposed.

Noise Pollution: Noise or sound created in the environment may also be a state of pollution that causes physical and psychological harm. The following steps may be suggested for effective control of noise pollution:

- Noise pollution has been included under the Air Pollution Act to taking its legal step.

- Planting more trees having broad branches along the high ways, Streets and noisy places will act as effective noise barriers.
- Sound absorbing devices may be used to control noise in the residential areas and in the industries.
- Noisy and heavy vehicles should not be allowed near hospitals, schools, etc.
- Proper oiling of machines.

Solid Waste Pollution: Increasing use of the industrial goods and maintaining high Standards of living by the people have at present given rise to the problem of solid waste Substance pollution. This emerging problem of solid waste in the city life may be solved to some extent by adopting the following measures:

- Organic waste may be transformed into bio-gas.
- Re-cycling or re-processing of the materials into useful products.
- Burning the products on the spot.
- Garbages may be used for filling the marshy land and low land areas of the cities.

Radio-Active or Nuclear Pollution: There are certain poisonous nuclear substances that cause harmful effect on the living organisms of the environment. These radio-active substances are produced from human sources like nuclear war, nuclear power plants, x-rays etc. Atomic power experimentation and explosion in the land and have to be stopped by the world organization in the international context. For this purpose, Atomic Energy Act has already been passed in 1962. It may take certain effective steps to stop nuclear pollution. They may be mentioned below:

- Atomic energy should be used for peace and economic progress rather than for war and destruction.
- Waste products of the laboratory that contain radio-active elements should be properly disposed.
- Site of the nuclear power plants should be carefully selected.

- Awareness should be created on the global level with regard to the nuclear pollution and its possible danger.

Environmental degradation due to physical or natural factors: There are some physical or natural causes of environmental degradation such as earthquakes, floods etc. Earthquake is a natural hazard which causes great loss to life and property. Damage to life and property can be prevented by constructing earthquake resistant buildings in the earth quake prone-zones. Assam type houses are preferable in Assam as the state is located in the seismic Zone.

It is difficult to prevent and control landslides. The first step to prevent landslides is to stop deforestation. It can be minimised by stabilising the slope by draining the surface and sub-surface water and by providing slope support like wired stone blocks.

One can not entirely get rid of floods as it is a natural phenomenon. But, the impact of floods can be minimized by means of technological skill, better warning systems and various control measures adopted by the Governments.

Human action: The rapid rate of population growth, industrial expansion unplanned urbanization, agricultural development, deforestation etc. are continuously accelerating the frequency and magnitude of natural hazards and disasters. The quality of the environment should be maintained through environmental planning, people's participation, environmental status evaluation and environmental legislation and administration. Some atmospheric hazards are caused by human activities such as dams, deforestation etc. To avoid these atmosphere hazards, alternatives plans and projects may be introduced.

The Educational Management Plan tries to maintain the quality of environment by:

- Safeguarding and preventing environmental impacts.
- Making contingency plans for dealing with accidents or disasters.
- Planning for rehabilitation of projects.
- Monitoring and feedback mechanisms on implementation of

necessary safeguards.

In the prevention of environmental degradation, education can play a significant role.

- Education must provide information about the occurrence of the extreme events and disasters through the various media well in advance so that everyone can be mentally prepared and can plan for their protection.
- Education should be able to train the administrators and policy makers to handle the situation created by a disaster by providing detailed maps of the problem area.
- Education can help in explaining the techniques and measures of immediate relief for the reduction of disasters.
- With the help of education one can learn about safety rules of building construction to reduce the causalities created by natural hazards.



LET US KNOW

- Environmental degradation is divided into two main categories. These are hazards and Environmental pollution.
- Human beings can make judicious use of natural resources like petroleum products and form small groups and adopt 'car pool' methods of transportation.
- Re-use of water should be practised if possible. For example, waste water from the kitchen may be used to water the kitchen garden.
- Population growth should be checked to prevent the environmental degradation.
- The quality of the environment should be maintained through environmental planning, people's participation, environmental status, and environmental legislation and administration.



CHECK YOUR PROGRESS

Q 3: Mention the different types of environmental degradation.

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Q 4: Mention briefly the cause of environmental degradation.

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Q 5: Mention any four ways of controlling air pollution.

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Q 6: What measures can be taken to prevent soil pollution?

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ACTIVITY 3.1

"Over population and environmental degradation are inter-related" – explain how?

Write in your own words

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3.3.4 Role of Education for Environmental Awareness and Attitude Change.

Education can be used as the powerful instrument of social change, social control and development in the modern society. The problem of environmental degradation in the form of environmental pollution is largely being caused by man-made sources. As such, it can be controlled and regulated to a great extent through educating people to exhibit responsible behaviour towards the environment. Some of the measures to be taken in this regard are as follows :

- Creation of environmental awareness, developing concern for the problems of environment, developing values and attitudes are some of the initial steps education may take in order to develop responsible behaviour towards the environment.
- Education should provide and arouse awareness about the hazards and disasters among the general public and train the administrators and policy makers to handle the situation created by a disaster by providing detailed maps of the problem area.
- Environmental awareness through education can be provided to all sections of the society through formal and informal agencies. Environmental education must be imparted to the students' right from the early childhood.
- Environmental issues may be incorporated with almost all branches of knowledge.
- Both the interdisciplinary and multi-disciplinary approaches of education may be employed in order to provide environmental education. In the multi-disciplinary approach, important environmental concepts are infused into existing discipline or subjects. These approaches may integrate the knowledge, attitudes, skills and commitment that will result in informed decisions, responsible behaviour and constructive actions.
- Degradation of nature in the form of air, water and land pollution and energy crisis are owing to the problem of human population explosion. So, environmental education should be designed and organised in the context of controlling population through education.
- Environmental education aims at creating mass awareness among the people. For this purpose seminar, group discussion, study circle etc. should be organized on the local, regional, national and even international level.

Education is a potent medium through which human beings can express their fullest potential. It is of critical importance for

changing the attitude and behaviour towards sustainability and responsibility. Both formal and informal education is necessary for empowering people so that they bear their responsibility towards environment and to address their concerns about sustainable development. It is also crucial for developing environmental awareness, attitudes and values, skills and behaviour required for sustainable development and for participating in and influencing the decision making process.



LET US KNOW

- Education in all its form is essential for fostering responsible environmental awareness amongst the people. Some measures can be adopted through education for providing awareness and developing the right type of attitudes and values towards the environment-

Environmental education is to be introduced in all educational institutions.

Interdisciplinary approach is needed.

Environmental issues may be incorporated with almost all branches of knowledge.

Population Education should be introduced.

Mass awareness programme should be taken up.



CHECK YOUR PROGRESS

Q 7: Mention in 3 to 4 sentences the role of education in fostering responsible environmental awareness in the people.

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3.4 LET US SUM UP

- Environmental degradation may be defined as continuous wearing out of environment or deterioration of environment due to continuous overexploitation and excessive dependence on its resources.
- Degradation of environment may result from human activities as well as natural disasters.
- Environmental pollution means lowering of the quality of environment as well as the deterioration of the quality of environment at the local level caused by human activities and exploitation of resources.
- Environmental degradation is divided into two main categories such as – Hazards and events, environmental pollution.
- Degradation of the environment may be caused by various factors including - air pollution, water pollution, soil pollution, population explosion, urbanization etc.
- To prevent the environmental degradation, the quality of environment should be maintained through proper environmental planning, people's participation, environmental legislation and administration.
- Education in all its formal aspects is essential for fostering responsible environmental awareness and attitude change amongst the people.
- Education plays a significant role for reducing the impact of natural hazard, and disaster. Education must be broad-based and it should reach each and every individual.



3.5 FURTHER READING

1) Mohapatra, D. (nd). *Environmental Education*. New Delhi: Kalyani Publishers.

2) Reddy, K.P. & Reddy D.N. (2003). *Environmental Education*.

Hyderabad: Neelkamal Publication Pvt. Ltd. Hyderabad.

3) Sharma, R.A (2005). *Environmental Education*. Meerut: R. Lall Book Depot.



3.6 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Environmental degradation means the overall lowering of the environmental qualities on account of the adverse changes brought in by human activities in the basic components of the environmental to such an extent that these changes adversely affect all biological communities in general and human society in particular.

Ans to Q No 2: Environmental pollution means the lowering of the quality of the environment at the local level by human activities. On the other hand, environmental degradation means deteriorating the quality of environmental at the global, regional and local level by natural processes and human activities.

Ans to Q No 3: Environmental degradation is divided into two main categories such as - Hazards and events, environmental pollution.

Ans to Q No 4: Environmental degradation is caused by certain natural phenomena like - Soil Erosion, Earthquakes, Volcanoes, Flood, droughts and famines etc. Environmental degradation takes place due to many human activities like - Over population, Industrialization, Urbanization, Deforestation, Mining activities, Use of pesticides etc.

Ans to Q No 5: The four ways by which air pollution can be minimized are:

- Vehicular pollution being common in the towns and cities, Proper and regular tuning of the vehicles should be done. Car pool concept should be applied.
- Using low sulphur coal in industries.
- Using of organic manure instead of commercial fertilizer.
- Using non-conventional sources of energy.

Ans to Q No 6: To check soil pollution and to improve the quality of soil following steps may be taken:-

- Farmers should be trained in the appropriate use of the fertilizer chemicals.
- Bio-gas may be produced from the organic waste products.
- Soil erosion by irresponsible cutting of hill areas should be stopped by making laws.
- Use of DDT as insecticides should be restricted.
- Industrial water products and garbages of the urban areas should be properly disposed.

Ans to Q No 7: Environmental awareness can be provided to all sections of the society through formal and informal education. Environmental issues may be incorporated with almost all branches of knowledge. Environmental education should be designed and organised in the context of control of population through education. Environmental education is a plan of creating mass awareness among the people. For this purpose seminar, group discussion, study circle etc. should be organised on the local, regional, national and even international level.



3.7 POSSIBLE QUESTIONS

A) Short Questions (Answer each question in about 150 words)

Q 1: What are the types of Environmental Degradation? Discuss each type briefly.

Q 2: How environmental education is different from environmental pollution?

Q 3: Suggest the ways and means to prevent water pollution.

Q 4: Mention the different steps to improve the quality of soil.

Q 5: Mention the role of education in the prevention of environmental degradation.

B) Long Questions (Answer each question in about 300-500 words)

Q 1: What steps should be taken for the prevention of degradation? Discuss.

Q 2: Discuss the various causes of environmental degradation.

Q 3: What should be the role of education for creating environmental awareness among the masses? Discuss.

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UNIT 4 : ENVIRONMENTAL POLLUTION

UNIT STRUCTURE

4.1 Learning Objectives

4.2 Introduction

4.3 Meaning of Environmental Pollution

4.4 Types of Environmental Pollution

- 4.4.1 Air Pollution
- 4.4.2 Water Pollution
- 4.4.3 Land or Soil Pollution
- 4.4.4 Solid Waste Pollution
- 4.4.5 Noise Pollution
- 4.4.6 Radio-active Pollution

4.5 Let us Sum up

4.6 Further Reading

4.7 Answers To Check Your Progress

4.8 Possible Questions

4.1 LEARNING OBJECTIVES

After going through this unit, you will be able to -

- describe the meaning of environmental pollution
- identify the sources of different types of environmental pollution
- list the different types of environmental pollution
- interpret the adverse effects of different types of environmental pollution
- state how to prevent and control the various types environmental pollution.

4.2 INTRODUCTION

One of the greatest challenges that the world is facing today is that of environmental pollution, increasing with every passing year and causing grave and irreparable damage to the earth. We shall, here, discuss the

meaning and different types of environmental pollution. Again, here we shall discuss the causes, types, and adverse effects of different types of environmental pollution. Further, we shall see how to prevent or control various environmental pollution discussed.

4.3 MEANING OF ENVIRONMENTAL POLLUTION

Man's attempt to conquer nature has upset the natural relationship between man and his environment. Man's reckless and indiscriminate exploitation of nature has disturbed the ecological balance between living and non-living components of the environment. By his reckless acts, man is not only threatening his own survival on this planet, but also the survival of other living organisms. It is needless to mention here that for normal and healthy living a conducive environment is required by all living beings, including humans, livestock, plants, micro-organisms and the wildlife. The favourable unpolluted environment has a specific composition. When this composition gets changed by addition of harmful substances, the environment is called polluted environment and the substances polluting it are called pollutants. Therefore, environmental pollution can be defined as any undesirable change in the physical, chemical or biological characteristics of any component of the environment (air, water, soil) which can cause harmful effects on various forms of life or property. According to the Environment (Protection Act), 1986 also "environment pollution" means the presence in the environment of any environmental pollutant.

Though environmental pollution is not a modern phenomenon but present environmental pollution is caused mostly by human activities. It is commonly agreed that pollution is, without doubt, the outcome of urban industrial technological revolution and rapacious and speedy exploitation of natural resources, increased rate of exchange of matter and energy and ever increasing industrial wastes, urban effluents and consumer goods.

The problem of environmental pollution is global and concerns all countries irrespective of their size, level of development or ideology. For example, if the nuclear test is carried out in one part of the world the fall out may be carried by winds to any other part of the world and such fall out of

irresponsible disposal of radioactive from a remote energy plant in one country may turn out to have greater of full-fledged war.

4.4 TYPES OF ENVIRONMENTAL POLLUTION

The classification of Environmental Pollution is a difficult task because the pollutants and the media through which the pollutants are transported are all interconnected and inter-related. However, pollution may be classified from the point of view of object which is polluted. From this point of view, pollution may be classified as follows:

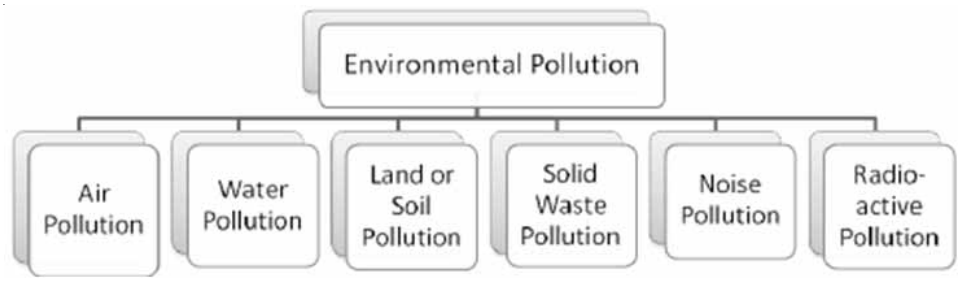


Figure: 4.1 Types of Environmental Pollution



CHECK YOUR PROGRESS

Q 1: Define environmental pollution.

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Q 2: Mention the different types of environmental pollution.

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Let us now discuss all these types below:

4.4.1 Air Pollution

The problem of air pollution came into existence in the prehistoric times when man discovered fire for cooking, heating and to provide light in his cave. Air pollution is an atmospheric condition in which certain substances (including the normal constituents in excess) are present in concentrations which can cause undesirable

effects on man and his environment. These substances include gases, particulate matter, radioactive substances etc.

Sources of Air Pollution:

There are two main sources of air pollution as follows:

- Natural Sources: These include volcanic eruptions, deflation of sands and dust, sea salt sprays, biological decay, wild or forest fires in natural vegetation etc.
- Man-made Sources: Man-made sources include thermal power plants, industrial units, vehicular emissions, fossil fuel burning, agricultural activities etc.

Apart from these, a variety of pollutants are released into the air from different sources. Some of them are as follows:

- Carbon Compounds: These are mainly carbon dioxide and carbon monoxide, the former released by complete combustion of fossil fuels and the latter by automobile exhausts.
- Sulphur Compounds: These include SO2, H2S and sulphuric acid, mostly released by fossil fuel (coal etc.), based power generating plants (Thermal plants) and industrial units (refineries).
- Nitrogen Oxides: These include chiefly nitrogen monoxide, nitrogen oxide, nitric acid and mostly released by automobiles, power plant and industries.
- Ozone: Its level may rise in atmosphere due to human activities.
- Fluorocarbons: These come from industries, insecticides spray etc.
- Hydrocarbons: These are chiefly benzene, benzpyrence, etc which are mostly discharged by automobiles and industries.
- Metals: These include chiefly lead, nickel, arsenic, beryllium, tin, vanadium, titanium, cadmium etc. present in air as solid particles or liquid droplets or gases. They are produced mostly by metallurgical processes, automobiles, seaspray etc.

Types of Air Pollution:

Regarding classification, air pollution is divided on two bases. Such as

- On the basis of types of pollutants, and
- On the basis of types of sources of pollutants.

On the basis of types of pollutants air pollution can be further subdivided into two types such as-

- Gaseous pollution and
- Particulate air pollution.

Again on the basis of types of sources of pollutants, air pollution can be further subdivided into four types such as-

- Automobile air pollution
- Industrial air pollution
- Thermal power plants pollution
- Nuclear pollution.

Adverse Effects of Air Pollution:

Air pollution causes several kinds of damages to man, animal, plants and also on weather, climate and atmospheric processes. Some of them are mentioned below:

- Air pollution has very serious types of pathological effect on man. It causes several types of diseases to man.
- Air pollution has damaged both agricultural crops and natural plants and vegetation.
- There has been injury to agricultural livestock, particularly from air borne fluoride and arsenic pollution.
- Air pollutants mixing up with rain can cause damage high acidity in fresh water lakes. This affects aquatic life especially fish.
- Air pollution also takes its role of buildings and other manmade objects such as famous building, monuments and art treasures.
- Air pollution also effects weather and climate on regional, continental or global basis.
- The increased amount of carbon dioxide in atmosphere cause to increase the temperature of earth. It is known by the phrase 'Green house effect'.
- It causes obstruction to vision of pilots and has caused air craft accidents.

Prevention and Control of Air Pollution:

Air pollution can be minimised by following methods:

- Using mass transport system, bicycles etc.
- Vehicular pollution can be checked by taking steps like regular tune-up of engines, replacement of more polluting old vehicles and installing catalytic converters etc.
- Shifting to less polluting fuels like hydrogen gas.
- Using non-conventional sources of energy like solar, wind etc.
- Using biological filter and bio-scrubbers.
- Siting of industries after proper Environmental Impact Assessment studies.
- Using low sulphur coal in industries.

4.4.2 Water Pollution

Water pollution can be defined as alteration in physical, chemical or biological characteristics of water making it unsuitable for designated use in its natural state.

Sources of Water Pollution:

There are two main sources of water pollution. These are as follows:

- Natural sources: Water pollutants include soil erosion, volcanic eruption, landslides, coastal and cliff erosion, floods, decomposition of plants and animals etc.
- Man-induced Sources: Water pollutants include industries, power plants, underground coal mines, urbanisation, and surface run-off from agricultural fields, cultural activities (religious fairs and pilgrimage) etc.

The main source of surface water pollution are-

- Sewage and other wastes generated in the cities and towns.
- Effluents and wastes generated by industries, especially chemical industries.
- Chemical fertilisers and pesticides used in agricultural activities.
- Oil spillage into sea-water during drilling and shipment pollute it.

- Waste generated by thermal power plants and nuclear power plants.

Ground water seems to be less prone to pollution as the soil mantle through which water passes helps to retain various contaminants due to its cation exchange capacity. However, there are number of potential sources of ground water pollution. Septic tanks, industry (textile, chemical, tanneries), deep well injection, mining etc. are mainly responsible for ground water pollution, which is irreversible. Ground water pollution with arsenic, fluoride and nitrate are posing serious health hazards.

Types of Water Pollution:

Based on the types of sources and storage of water, water pollution may categorise as follows:

- River water pollution
- Lake water pollution
- Sea water pollution
- Surface water pollution
- Ground water pollution

Based on the sources of pollution, water pollution may be categorised as follows:

- Industrial waste water pollution
- Solid waste water pollution
- Sewage water pollution
- Domestic water pollution

Harmful Consequences of Water Pollution:

Following are some important effects of various types of water pollutants:

- Human infectious diseases are among the most serious effects of water pollution, especially in developing countries where the sanitation is usually inadequate or non-existent.
- The discharge of nitrogen, phosphorus and other nutrients coming from various man-made sources stimulates the algae growth in these run offs and coastal zones to dangerous levels.

This excess in algae is harmful to the local habitat and uses all the oxygen, killing off the native aquatic life. Nutrient pollution can also cause unusual outbreaks in fish diseases.

- Exposure to oil or its chemicals can alter the ecology of aquatic habitats and the physiology of marine organisms. Evidence strongly suggests that components of crude oil persist in the marine environment for years and are extremely toxic to the aquatic life.
- Pesticides are carried into water systems by rain water runoff and are sometimes even sprayed directly into waterways as part of pest-control. Pesticides are used for protecting the farmer's crops. When enough of these pesticides get carried into the water, they can have serious effects on our health as well.
- Dangerous chemicals used in mining processes are carried into rivers and lakes and have devastating effects on the water. When rain or surface water flows over exposed rock and soil, it can combine with naturally occurring sulphur to create sulphuric acid.
- Industry machinery is cooled by water from lakes and rivers. This water then returns to the water sources in a heated state. Fish and other organisms that have adapted to a particular temperature can be killed from thermal shock, and the extra heat can disrupt the spawning. Warmer water temperatures also reduce the oxygen content in the water, which increases the organism's susceptibility to disease, parasites, and the effects of toxic chemicals.
- Excess of fluoride in drinking water causes defects in teeth and bones called fluorosis.

Prevention and Control of Water Pollution:

The following measures are recommended for checking water pollution:

- Judicious use of agrochemicals like pesticides and fertilisers

which will reduce their surface run-off and leaching. Avoid use of these on sloped lands.

- Use of nitrogen fixing plants to supplement the use of fertilizers.
- Adopting integrated pest management to reduce reliance on pesticides.
- Prevent run-off manure. Divert such run-off to basin for settlement. The nutrient rich water can be used as fertilizers in the fields.
- Separate drainage of sewage and rain water should be provided to prevent overflow of sewage with rainwater.
- Before the discharge of wastewater, it should be disinfected to kill the disease-causing organisms like bacteria.
- Proper treatment of industrial wastewaters is essential before being discharged.

4.4.3 Land or Soil Pollution

Soil pollution, which can also be called soil contamination, is a result of acid rain, polluted water, fertilizers, deforestation, dumping of solid wastes etc., which leads to bad crops. Soil contamination occurs when chemicals are released by spill or underground storage tank leakage which releases heavy contaminants into the soil.

Causes of Soil Pollution:

There are different causes of soil pollution. Some of them are mentioned below:

- **Industrial Activity:** Most industries are dependent on extracting minerals from the Earth. As a result, the industrial waste lingers in the soil surface for a long time and makes it unsuitable for use.
- **Agricultural Activities:** Chemical utilization has gone up tremendously since technology provided us with modern pesticides and fertilizers. They are full of chemicals that are not produced in nature and cannot be broken down by it. As a result, they seep into the ground after they mix with water and

slowly reduce the fertility of the soil.

- **Waste Disposal:** Every human produces a certain amount of personal waste products by way or urine and faeces. While much of it moves into the sewer the system, there is also a large amount that is dumped directly into landfills in the form of diapers. Even the sewer system ends at the landfill, where the biological waste pollutes the soil and water. This is because our bodies are full of toxins and chemicals which are now seeping into the land and causing pollution of soil.
- **Accidental Oil Spills:** Oil leaks can happen during storage and transport of chemicals. This can be seen at most of the fuel stations. The chemicals present in the fuel deteriorate the quality of soil and make them unsuitable for cultivation.
- **Acid Rain:** Acid rain is caused when pollutants present in the air mixes up with the rain and fall back on the ground. The polluted water could dissolve away some of the important nutrients found in soil and change the structure of the soil.

Effects of Soil Pollution:

- Considering how soil is the reason we are able to sustain ourselves, the contamination of it has major consequences on our health. Crops and plants grown on polluted soil absorb much of the pollution and then pass these on to us. This could explain the sudden surge in small and long term illnesses.
- The ecological balance of any system gets affected due to the widespread contamination of the soil. Most plants are unable to adapt when the chemistry of the soil changes so radically in a short period of time. Fungi and bacteria found in the soil that bind it together begin to decline, which creates an additional problem of soil erosion.
- The toxic chemicals present in the soil can decrease soil fertility and therefore decrease in the soil yield. The contaminated soil is then used to produce fruits and vegetables which lacks quality nutrients and may contain some poisonous substance

to cause serious health problems in people consuming them.

- The emission of toxic and foul gases from landfills pollutes the environment and causes serious effects on health of some people. The unpleasant smell causes inconvenience to other people.
- The death of many soil organisms in the soil can lead to alteration in soil structure. Apart from that, it could also force other predators to move to other places in search of food.

Control of Soil Pollution:

To check soil pollution, the following measures are suggested:

- Initiate control measures to check soil pollution.
- Make judicious use of chemical fertilisers, pesticides and insecticides.
- The use of DDT should be restricted.
- Integrated Pest management should be adopted.
- Organic farming practices should be encouraged.
- Industrial and urban wastes should be disposed properly.
- Stress should be laid on crop management and land use.
- Farmers should be educated on the harmful effects of the excess use of chemical fertilizers and other farming practices that are harmful to soil.



CHECK YOUR PROGRESS

Q 3: Mention the types of air pollution.

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Q 4: Write two causes of soil pollution.

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4.4.4 Solid Waste Pollution

All solid and semi-solid wastes arising from human and animal activities and are discarded as useless or unwanted are

included in the term 'solid wastes'. Solid waste is often called the third pollution after air and water pollution. It includes garbage, rubbish, ashes and residues, demolition and construction wastes, dead animals, radioactive wastes. The amount of solid waste produced in urban India is steadily and rapidly increasing.

Source of Solid Wastes:

Different sources of solid wastes pollution are:

- **Domestic Wastes:** Waste that arises from household activities of human beings includes garbage, rubbish and Ashes.
- **Industrial Wastes:** Wastes which arises from industrial activities includes construction and demolition wastes, discarded equipment and tools, mining wastes etc.
- **Agricultural Wastes:** These include agricultural residues and poultry and diary wastes. Further, agricultural wastes may also include packing and cans of fertilizers, pesticides and soil conditioners used in modern agricultural practices.
- **Commercial Wastes:** Wastes those arise from public places such as offices, markets, restaurants, streets etc. includes building wastes, garbage, hazardous waste, ashes and rubbish.

Types of Solid Wastes:

Different types of solid wastes are:

- **Biodegradable Wastes:** Wastes which can be broken down into simpler and harmless substances by nature in due course of time using biological means.
- **Non-Biodegradable Wastes:** Wastes that cannot be broke down into simpler and harmless substances by biological means. For example- plastics, polythene bags, glass objects etc.
- **Toxic Wastes:** These can pose a substantial danger to the health of living beings and environment, immediately or over a period of time. For example- pesticides, heavy metals like mercury and sulphur dioxide etc.

- **Non-toxic Wastes:** Wastes that do not pose any problem to the health of living beings or to the environment. These are generally domestic wastes which are easily biodegradable. For example- papers, rags, boards etc.
- **Biomedical Wastes:** Wastes generated from hospitals, health centres, medical and dental colleges and laboratories. For example- biological cultures, used syringes etc.

Harmful Effects of Solid Waste:

- Improper handling of solid wastes is dangerous to health and environment.
- Improper disposal of solid wastes are resulted in the deaths of humans and animals through contamination of crops of water supplies.
- Uncontrolled dumping of urban wastes destroys the beauty of the countryside.
- Uncontrolled burning of open dumps can cause air pollution.
- Solid wastes are also responsible for water pollution.

Control of Solid Waste Pollution:

There is an urgent need to control solid waste pollution. The following methods are suggested in this regard- (i) Recycling method, (ii) Burning of waste and utilisation for heat, (iii) Generating electricity, (iv) Composting of organic waste for preparation of manures and biogas.

In big cities and towns, solid waste are purchased by Kabaries, thus, nothing goes waste and throw away as waste materials.

4.4.5 Noise Pollution

Noise pollution is an excessive or annoying degree of noise in a particular area. High level noise is a disturbance to the human environment. Because of urbanization, noise in all areas in a city has increased considerably.

Sources of Noise Pollution:

Different sources of noise pollution are as follows:

- **Household Sources:** Food Mixer, Grinder, Vacuum Cleaner, Washing machine and Dryer, Air Conditioner, Straightners and curlers, Cooler, TV, iPods and Earphones, Loud speaker, Neighbour's Barking Dog.
- **Social Events:** Places of Worship, Discos and Gigs, Parties, Markets where people sell goods with, loudspeaker. When these events are not often, they can be termed as nuisance rather than noise pollution.
- **Commercial and Industrial Activities:** Printing Presses, Manufacturing Industries and Construction Sites.
- **Transportation:** Road Traffic Noise, Aircraft Noise, Noise from Rail Roads.

Causes of Noise Pollution

Different causes of noise pollution are:

- Poor Urban Planning
- Sounds from Motor Vehicles
- Sounds from Musical Instruments
- Car Alarms
- Office Equipment
- Factory Machinery
- Construction Work
- Barking Animals
- Appliances
- Audio Instruments
- Loud Speakers
- Noise Created by People

Effects of Noise Pollution

- **Interference with man's communication:** In a noisy area communication is severely affected.
- **Hearing damage:** Noise can cause temporary or permanent hearing loss. It depends on intensity and duration of sound

level. Auditory sensitivity is reduced with noise level of over 90 dB in the mid high frequency for more than a few minutes.

- **Physiological and Psychological changes:** Continuous exposure to noise affects the functioning of various systems of the body. It may result in hypertension, insomnia, gastro-intestinal and digestive disorders, peptic-ulcers, blood pressure changes, behavioural changes, emotional changes etc.
- **Effect on Animals:** Animal are badly affected by noise pollution which are as follow:
  - Damages Nervous system
  - Altering Prey/predator detection
  - Creates problems in Navigation
  - They become Dangerous and Attacking
  - Raise Metabolism
  - Reduction of useable Habitat
  - Death of Certain Species
  - Genetic and Evolutionary Problems

Control of Noise Pollution:

Following are the methods to control and reduce the noise pollution:

- **Source Control:** The gadgets are to be developed to control noise at source.
- **Transmission Control:** The room walls can be covered with sound absorbers.
- **Protect Exposed Persons or Workers:** The devices as ear plugs and ear muffs can be provided to workers of industries.
- **Through Law:** Legislation can ensure that sound production is minimized at various social functions. Unnecessary horn blowing should be restricted especially in vehicle-congested areas.
- **Tree Plantation:** Planting more trees having board leaves.

4.4.6 Radio-active Pollution

Radioactive pollution, like any other kind of pollution, is the release of something unwanted into the environment and, in this case, the unwanted thing is radioactive materials. It is also called radiological contamination.

Causes of Radioactive Pollution:

There are many causes of radioactive pollution, such as:

- **Production of nuclear weapons:** Radioactive materials used in this production have high health risks and release a small amount of pollution.
- **Decommissioning of Nuclear Weapons:** The decommissioning of nuclear weapons causes slightly more radioactive pollution than in the production, however, the waste (alpha particles) is still of low risk and not dangerous unless ingested.
- **Mining of radioactive ore:** Mining involves crushing and processing of the radioactive ores and this generates radioactive waste which emits alpha particles.
- **Coal ash:** It may come as a surprise that coal ash can be very dangerous. Some coal contains more radioactive material than usual and is often referred to as 'dirty' coal; when this is burnt the ash becomes more radioactive as the radioactive particles do not burn well.
- **Medical waste:** A number of radioactive isotopes are used in medicine, either for treatment or diagnostics. These can be left to decay over a short period after which they are able to be disposed of as normal waste.
- **Nuclear power plants:** Nuclear power plants under current standards produce little radioactive pollution due to safety precautions that must be adhered to.

Type of Radioactive Pollution

- **Continuous Pollution:** This type of condition exists in uranium

mines, nuclear reactors, test labs etc. where the humans are under continuous exposure to radioactive contaminants and protective clothing is required to avoid radiation exposure.

- **Accidental Pollution:** This type of condition exists during accidental exposure to radiations by virtue of equipment failure, radiation leak, faulty protective equipment etc.
- **Occasional Pollution:** This condition exists during isolated experiment or test of nuclear substance.

Effects of Radioactive Pollution:

When radiation passes through different living organisms, the following disorderness takes place:

- Radiation splits the molecules of the tissues into ions and free radicals and causes mutation by breaking DMA molecules in the nucleus.
- Radiation in bone marrow may cause leukaemia.
- Radiation may cause skin burns which may lead to skin cancer.
- Radiation at pelvic regions of pregnant ladies causes damage of the foetus.

Control of Radioactive Pollution:

Radioactive pollution may be controlled in the following ways:

- Care should be taken to check manmade radiation pollution at source.
- Nuclear reactor should be preferably maintained to avoid accidental leakage.
- Nuclear tests should be banned.



CHECK YOUR PROGRESS

Q 5: What are the sources of solid waste?

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Q 6: How to control radioactive pollution?

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4.5 LET US SUM UP

- Pollution is the process of making air, water, soil contaminated or dangerously dirty and not suitable for people to use.
- The classification of Environmental Pollution is a difficult task because the pollutants and the media through which the pollutants are transported are all interconnected and inter-related.
- In simple terms air pollution can be defined as any ambient condition in which substances are present at concentrations high enough above their normal levels to produce measurable effect.
- Water gets polluted by the contamination, of water bodies such as lakes, rivers, oceans, and groundwater, caused by human activities, which can be harmful to organisms and plants which live in these water bodies.
- Soil pollution, which can also be called soil contamination, is a result of acid rain, polluted water, fertilizers, deforestation, dumping of solid wastes etc., which leads to bad crops.
- All solid and semi-solid wastes arising from human and animal activities and are discarded as useless or unwanted are included in the term ‘solid wastes’. Solid waste is often called the third pollution after air and water pollution.
- Noise pollution is an excessive or annoying degree of noise in a particular area. High level noise is a disturbance to the human environment.
- Radioactive pollution, like any other kind of pollution, is the release of something unwanted into the environment and, in this case, the unwanted thing is radioactive material.



4.6 FURTHER READING

1) Akhtar, P. R. (2014). *Environmental and Population Education*. Guwahati: Assam Book Depot.

1) Gupta, K. R. (2010). *Environmental Education in India*. New Delhi: Atlantic Publishers and Distributors (P) Ltd.

3) Kaushik, A. and Kaushik, C.P. (2004). *Perspectives in Environmental Studies*. New Delhi: New Age International (P) Limited, Publishers.

4) Krishnamacharyulu, V. (2004). *Environmental Education*. Hyderabad: Neelkamal Publications Pvt. Ltd.

5) Pandey, V. C. (2005). *Environmental Education*. New Delhi: Isha Book Publishers.

6) Sharma, R. A. (2005). *Environmental Education*. Meerut: Surya Publication.



4.7 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Environmental pollution can be defined as any undesirable change in the physical, chemical or biological characteristics of any component of the environment (air, water, soil) which can cause harmful effects on various forms of life or property.

Ans to Q No 2: Different types of environmental pollution are air pollution, water pollution, land or soil pollution, solid waste pollution, noise pollution and radio-active pollution.

Ans to Q No 3: Regarding types, air pollution is divided on two bases. Such as

- On the basis of types of pollutants, and
- On the basis of types of sources of pollutants.

On the basis of types of pollutants air pollution can be further subdivided into two types such as-

- Gaseous pollution and
- Particulate air pollution.

Again on the basis of types of sources of pollutants, air pollution can be further subdivided into four types such as-

- Automobile air pollution
- Industrial air pollution
- Thermal power plants pollution
- Nuclear pollution.

Ans to Q No 4: Two causes of soil pollution are:

- **Industrial Activity:** Most industries are dependent on extracting minerals from the Earth. As a result, the industrial waste lingers in the soil surface for a long time and makes it unsuitable for use.
- **Acid Rain:** Acid rain is caused when pollutants present in the air mixes up with the rain and fall back on the ground. The polluted water could dissolve away some of the important nutrients found in soil and change the structure of the soil.

Ans to Q No 5: Different sources of solid wastes pollution are:

- **Domestic Wastes:** Waste that arises from household activities of human beings includes garbage, rubbish and Ashes.
- **Industrial Wastes:** Wastes which arises from industrial activities includes construction and demolition wastes, discarded equipment and tools, mining wastes etc.
- **Agricultural Wastes:** These include agricultural residues and poultry and dairy wastes. Further, agricultural wastes may also include packing and cans of fertilizers, pesticides and soil conditioners used in modern agricultural practices.
- **Commercial Wastes:** Wastes those arise from public places such as offices, markets, restaurants, streets etc. includes building wastes, garbage, hazardous waste, ashes and rubbish.

Ans to Q No 6: Radioactive pollution may be controlled in the following

ways:

- Care should be taken to check manmade radiation pollution at source.
- Nuclear reactor should be preferably maintained to avoid accidental leakage.
- Nuclear tests should be banned.



4.8 POSSIBLE QUESTIONS

A) Short Questions (Answer each question in about 150 words)

Q 1: Write the types of radioactive pollution.

Q 2: What are the major sources of soil pollution?

Q 3: Write the effects of noise pollution on human being.

Q 4: What are the sources of water pollution?

B) Long Questions (Answer each question in about 300-500 words)

Q 1: Give an account of the adverse effects of air pollution. Enumerate various measures for control air pollution.

Q 2: What adverse effects can solid wastes cause? How can the solid waste be managed?

Q 3: What types of environmental pollution have you experienced the most at your locality? Identify the causes of pollution at your locality and suggest remedies for it.

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UNIT 5 : PROGRAMMES OF ENVIRONMENTAL EDUCATION

UNIT STRUCTURE

5.1 Learning Objectives

5.2 Introduction

5.3 Objectives of Environmental Education Programme

5.4 Environmental Education Programme: Characteristics

5.5 Importance of Environmental Education Programme

5.6 Formal and Non-Formal Environmental Education Programme

5.7 Programmes of Environmental Education at Different Levels of Education

- 5.7.1 Programmes of Environmental Education at Primary level
- 5.7.2 Programmes of Environmental Education at Secondary level
- 5.7.3 Programmes of Environmental Education at College Education level
- 5.7.4 Programmes of Environmental Education at University Education level

5.8 Let s Sum up

5.9 Further Reading

5.10 Answers to Check your Progress

5.11 Possible Questions

5.1 LEARNING OBJECTIVES

After going through this unit, you will be able to -

- describe the concept and importance of Environmental Education Programme
- explain the formal and non-formal of Environmental Education Programme
- discuss the different programmes of Environmental education at primary, secondary, college and university level.

5.2 INTRODUCTION

You have learnt about the concept and importance of environmental education and related issues in previous units. In this unit you are going to get acquainted with the different environmental education programmes at various levels of education. You may be aware of the inclusion of Environmental Education as a subject of study at different levels of curriculum from the primary to university level. Following the directives issued by the Hon'ble Supreme Court of India, the MHRD and State Departments of HRD have included environmental education as a separate and compulsory subject in the NCERT education curricula at all levels of formal education, that is, primary, secondary, senior secondary, and college levels. SCERT, Assam has also developed the theme-based curriculum of Environmental Education in the light of NCF 2005. This unit will cover in depth the different environmental education programmes with its importance at different levels of education.

5.3 OBJECTIVES OF ENVIRONMENTAL EDUCATION PROGRAMME

Before going to discuss about environmental education programmes at various levels of education, it is important to know the objectives of environmental education programme. These are as follows:

- To provide children with knowledge, attitudes and skills on environment sustainability through hands-on experience in their immediate environment.
- To create awareness among the younger generation about various environmental issues and make them aware of their responsibilities towards nation.
- To expose students to the real-life world in which they live, both natural and social; to enable them to analyse and make conclusions regarding the environmental problems and concerns.
- To gain a better understanding of the 3 R's of waste management: reduce, reuse, and recycle.



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The curriculum may be based on:

- Learning about the environment (Knowledge)
- Learning through the environment (Resources)
- Learning for the environment (Values, Attitudes)

5.4 ENVIRONMENTAL EDUCATION PROGRAMME: CHARACTERISTICS

The chief characteristics as suggested by Ritz (1978) for an environmental education programme are as follows:

- **Basic Science-** The programme should cover basic science when needed, but it should not be dominated by science.
- **Appropriate for teachers-** The programme should be appropriate for teachers with a diverse range of experiences and interests.
- **Training in methods and contents-** There should be training in the methods as well as contents of environmental education.
- **Motivational impact-** The programme should have a major impact on the participants' motivation.
- **Encouragement to teachers-** The programme should encourage teachers to incorporate environmental stewardship into their teaching.
- **Involvement of teachers-**The programme should bring teachers into direct involvement with the actual environment.
- **Stimulation for teachers-** It should awaken teachers to engage themselves in exploring their personal assumptions, values, and sentiments about society and self, as well as their relationship to the natural environment.

5.5 IMPORTANCE OF ENVIRONMENTAL EDUCATION PROGRAMME

Environmental education programmes are important for educating people about sustainability. It is intended to equip people with the knowledge

and skills necessary to live an ecologically balanced life and sustain a society. These programmes demonstrate leadership in promoting sustainability and also contribute to the effort being made in the education sector to deliver learning programmes.

It is vital to educate people effectively about their relationship with the environment. It is important to assist each individual in developing a complete understanding of the environment, the issues that arise from the society's interaction with its surroundings, and the means accessible to the individual to effectively handle environmental problems. Environmental literacy guides students to develop environmental knowledge, attitudes, and behaviours. Therefore, environmental education programmes should be designed to instil knowledge, foster positive attitudes about the environment, and help individuals to develop their skills. Thus, an effective and precise environmental education programme will encompass a variety of perspectives and multidisciplinary issues.

5.6 FORMAL AND NON-FORMAL ENVIRONMENTAL EDUCATION PROGRAMME

A. **Formal Environmental Education Programme:** Environmental mechanisms are introduced at all levels of education, from school to university level with a well-defined and systematic curriculum. The medium of imparting environmental education programme is not only through books but also through first hand experiences.

B. **Non-Formal Environmental Education Programme:** The non-formal Environmental Education Programme is experience-based and involves environmental problem-solving exercises. Non-formal Environmental Education programmes engage students in the natural process of inquiring, exploring, and analysing environmental issues in their immediate area. In India, organisations such as the Centre for Environmental Education (CEE), the World-Wide Fund for Nature (WWF), and others are working to develop and promote educational programmes in schools in order to instil effective learning for environmental conservation.

Various Non-Formal Environmental Education Programme are as follows-

a. Eco school programme.

b. The National green corps.

c. Environmental awareness campaign

d. Workshop, Seminars, exhibitions, puppet show, street play, panel discussion etc.

5.7 PROGRAMMES OF ENVIRONMENTAL EDUCATION AT DIFFERENT LEVELS OF EDUCATION

The Education Commission (1964-66) and other committees proposed that various programmes of Environmental Education be included at various levels of education in the formal system of education. Children in primary school should be taught about plants, natural habitats, as well as how to reuse and recycle used materials. At advance levels awareness regarding bio-diversity conservation, environment conservation should be incorporated. At the university level, it is necessary to generate new information through research and development. Participating in environmental education programmes raises awareness of human-environment interactions and has the ability to safeguard the environment. Various campaigns (excursions, seminars, conferences, and workshops) must be planned on a local, regional, and national level with the aim of increasing student and teacher participation for the cause of sustainable development.

5.7.1 Programmes of Environmental Education at Primary Level

Formal Environmental Education Programme: At the lower Primary level, focus should be placed on cleanliness, the formation of health habits, and the development of observational skills. Environmental topics have been incorporated into the NCERT textbooks for science, social science and language. SCERT, Assam has also developed the theme-based curriculum of Environmental

Education and contents on environmental education integrated in subjects like- general science, social science and language for elementary level in Assam.

At lower primary level of education, emphasis should be given on the senses, colours, shapes, counting etc. Nature walks is important for primary school students. Nature walks are interactive, encouraging and helps in building confidence among students. Different activities should be organised at the primary level of education to help students become aware of their environment. They should be educated about how to take care of their own bodies, personal hygiene, sanitation etc. Primary school students should participate in programmes that promote hygiene and environmental awareness.

At Primary level, attempt should be made to sensitize the child about environment. Emphasis must be mostly on awareness building (75%), followed by real life situations (20%) and conservation (5%). Teaching about the environment must be done through audio-visual aids and field visits.

Following programmes can be imparted to the students.

a) Environmental Awareness Programmes:

- **Environmental Games:** Environmental education can be imparted effectively to the students with the help of environmental games. Games like 'Web of Life' help in inter-relating various aspects of nature and visually communicate the concept of 'Web of Life'.



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ENVIRONMENTAL GAME: 'WEB OF LIFE'

In this game, learners each represent a different organism in an environment. They build a web during the activity, and discover how all the players in an ecosystem depend on each other. As they play, learners will understand with the connections between different species and their environments.

- **Environmental Songs & Poems:** Songs and poems about nature, environment, living beings help to develop environmental awareness among students of primary schools.
- **Environmental Competitions:** Drawing & painting competitions, essay writing competition, debate competition, and poster competitions are various interesting and entertaining means of providing environmental education to students. Competitions help in realizing the desired objectives of environmental education.
- **Film Shows and Exhibitions:** Film shows and exhibitions are also active means of environmental awareness among students.

Non-Formal Environmental Education Programme: Different programmes offered by the Centre for Environment Education, under the Ministry of Environment Forests and Climate Change are discussed below

b) Eco Schools Programme: Eco schools is a global initiative aimed at encouraging environmental education and raising knowledge about sustainable development. This initiative was officially started in India in 2015. The Programme is based on a seven-step methodology and is being implemented at the primary level (classes 1-5). Eco-Schools offer an excellent opportunity for children to develop an understanding of environmental issues affecting their schools and communities. The programme is open for schools from any streams — state board, CBSE, ICSE and international schools. Registered schools receive a kit of resources and training to do action projects centred on five local environmental issues: biodiversity, waste, energy, healthy living, and water. The Programme encourages schools to use project-based learning to qualitatively increase their learning and to share their experiences.

c) Paryavaran Mitra Programme: Paryavaran Mitra is a national

programme that aims to develop a network of young leaders from around the country who possess the awareness, knowledge, dedication, and capability to address the challenges of environmental sustainability in their respective domains of influence. The Paryavaran Mitra programme is primarily targeted at students from classes 6–8. (age group 11-15). The programme provides schools with resources to do action projects concentrating on local environmental challenges within the five programmatic areas of water and sanitation, biodiversity and greening, energy and waste management, and culture and heritage.

d) Eco Club Programme : National Green Corps is a significant initiative launched in 2001-02 by the Ministry of Environment, Forest and Climate Change (MOEFCC) to raise environmental awareness. It intends to develop cadre of young children committed to environmental conservation and sustainable development. This curriculum exposes students to extensive field experiences and provides opportunity for them to put their ideas into action. The primary aim of Eco-Clubs is to promote and implement programmes aimed at educating youngsters about their immediate environment and fostering an understanding of the eco-system and its interdependence.

Activities under Eco Club Programme-

- Organize environmental seminars, debates, lectures and popular talks on environmental issues in the school.
- Organize rallies, marches, human chains and street theatre at public places to raise environmental awareness.
- Take up activities like tree plantation, cleanliness drives both within and outside the school campus.
- To make people aware of the need of maintaining public places like parks, gardens both within and outside the school campus.

e) **National Nature Camping Programme:** The National Nature Camps Programme aimed at creating greater awareness, understanding and empathy of children with and for the environment. It is hoped that every child in middle school (classes VI to VIII) will get at least one opportunity for a 2–3-day camping experience during these years. The 'Nature experience' for children has huge potential to arouse their sensitivity towards nature appreciation and conservation, leading to positive environmental actions.

f) **Nature Conservation Programme:** Activities such as massive plantation, cleaning of water bodies, conservation of natural resources can help in developing the spirit of Environmental awareness among students.



CHECK YOUR PROGRESS

Q 1: Write two objectives of Programmes of Environmental Education.

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Q 2: Write three activities of Eco Club programme.

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Q 3: What are the activities included in Nature Conservation Programme?

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5.7.2 Programmes of Environmental Education at Secondary Level

Formal Environmental Education Programme: Secondary school students must explore the diverse ways of interacting with the environment. They must observe the immediate surroundings in order to understand how living things are inter-related and are dependent upon each other. Through environmental Education Programme, the secondary school students will be motivated to develop the value of environment by conserving neighbourhood resources, civilizing environmental health etc. Students should receive training through environmental programmes in order to understand the behaviours of individuals and group to develop the environment. The environmental Education programmes encourage students to investigate their local environment, develop positive attitudes towards it and actively participate in its preservation**.**

At secondary level emphasis must be given in involving children in out-of-school activities, problem solving and community activities related to environmental problems. At this level objective must be real life experience, awareness and problem identification. The contents must be supplemented with general science. Teaching, practical and field visits must be part of the course content. At higher secondary stage emphasis must be on environmental protection, management, conservation, assimilation of knowledge, problem identification and action skills. Contents may be science-based and action-oriented work. The secondary schools should include action related assignment and workshop for the students. The teachers should organize community service programme, debate competitions, group discussions in the classroom to enlighten the students. Visit to dense forest should be organised so that students develop a taste for natural beauty and acquire knowledge of flora and fauna.

Non-Formal Environmental Education Programme: Non-

Formal Environmental Education Programme for secondary school students are -

a. **The Young Conservationist Programme (YCP):** The purpose of this programme is to provide high school students with specially designed participatory leadership modules that will help them in the future. Simultaneously, participants can use these skills to reach out to a wider audience and raise funds for WWF India's conservation efforts.

b. **WWF's India's one Earth one Home programme:** On September 10, 2020, WWF, India started the one Earth one Home programme to motivate youngsters to adopt pro-conservation attitudes and sustainable household practises toward a greener life. Students from class I to VIII from government or government-aided schools around the country can participate on a week-long guided digital journey to ensure that learning, wellness, and action are all interconnected.

c. **Awareness programme under MOEFCC:** Rallies • Mini - marathon • Door-to- Door Campaigns • Knowledge Workshops • Environment Film Festival • Cleanliness drives • Plantation drives.

d. **National Green Corps Programme:** To inspire and motivate school children to participate in various environmental conservation activities in their communities, the Government of India launched a school programme called National Green Crops. Under this programme, eco-clubs were formed by student members from classes VI to X. These school-based eco-clubs engage in a variety of activities aimed at protecting and improving the environment. The principal focus of NGC programme is to introduce students to action-oriented studies of environmental problems at various levels and to assist them in identifying easy solutions of these problems under the guidance and supervision of their teachers.



CHECK YOUR PROGRESS

Q 4: What should be the emphasis of teaching environmental education at higher secondary stage?

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Q 5: Write five activities of Awareness programme under Ministry of Environment, Forest and Climate Change.

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Q 6: What is the principal focus of the NGC Programme?

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5.7.3 Programmes of Environmental Education at College Education Level

Formal Environmental Education Programmes: At the college level, emphasis should be on sustainable development and conservation. The content must be scientific and technological in nature. Course content should include teaching, practical, and action-oriented field work.

a) **Environmental awareness programmes:** Eco development camps and lecture series make students aware about various environmental aspects. Film shows and exhibitions are active means of environmental awareness.

b) **Research Project:** Research projects that deal with environmental problems can be conducted by the students of colleges.

c) **Action Research:** Action Research on local environmental problems can also be conducted by the students of colleges.

d) **Eco school projects:** Through the eco-school projects, learners may attend field trips, observation and take part in bird watching activities. Students might be involved in cleaning up, recycling, planting etc.

e) **Environmental Discussions:** Conducting various group discussions, seminars, workshops, conferences, symposia, interaction meets in college helps in developing wide outlook towards environmental awareness.

Non-Formal Environmental Education Programme: At college level non-formal environmental programmes include-

a) **WWF-India's Youth for Nature Conservation Programme:** The WWF India's Youth for Nature Conservation Programme is a six-week virtual youth leadership training programme for students enrolled in any undergraduate degree. The programme is structured in such a way that it will continue to extend:

- A learning platform enabling students to explore into the field of conservation and become acquainted with the efforts and challenges involved in protecting India's most endangered ecosystems and species.
- Possibility of acquiring and developing relevant knowledge, skills, commitments, attitudes, and behaviours related to environmental protection and sustainability.



CHECK YOUR PROGRESS

Q 7: At the college education level, maximum emphasis must be given on knowledge regarding…..……(Fill in the blanks)

Q 8: Mention any two programmes offered by colleges on environmental education.

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Q 9: Write three environmental awareness activities for college students.

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5.7.4 Programmes of Environmental Education at University Education Level

Formal Environmental Education Programmes: At University level, Environmental Education is being looked after by the UGC. At post graduate level, four major areas are recognised environmental engineering, conservation and management, environmental health, social ecology. Universities can help to establish sustainable development through following aspects: a) Teaching programmes b) Research c) Outreach Programme.

a. **Teaching Programmes:** In the teaching programme, the framework of the curricula should include the relevant information on environmental issues. The learners should become familiar with all environmental skills and information. The curriculum should encourage pupils to participate and work to solve the environmental issues. Besides classroom studies, young learners have the ability to raise public awareness about environmental issues through street plays, rallies, and exhibitions at the grassroots level. Direct nature experiences are well known for enhancing individuals' environmental awareness and fostering positive attitudes toward the environment. The teaching programme for environmental awareness includes applied research projects, lecture series,

documentary shows, celebration of environmental days, competitions, exhibitions, nature visits, nature clubs, seminars and conferences.

b. **Research:** Research is a necessary part of higher education. It is an analytical parameter for obtaining new knowledge or generating new ideas for the development of the society. Globally, in higher education research is regarded as one of the most effective tools for the development of healthy environment. Environmental aspects, particularly those relating to renewable and non-renewable resources, pollution monitoring and control, and biodiversity conservation, are the significant areas of research. At PG level, applied environmental projects can be taken up by the students which will give actual field experience and improve the quality of research work. Moreover, different National level Research Institutes in India such as UGC, NEERI, NCL, NIO, IIT, MOEF etc. are trying to solve many environmental problems as well as some of them act as funding agencies for such projects.

c. **Outreach Programme*:*** The purpose of outreach programme is to create relationship between academic institutions and communities with the objective of increasing capacity to solve an issue in society and enhancing the research and teaching capacities of participating colleges and universities. Higher education institutions play an important role in shaping communities' development. Higher education institutions must engage in community outreach-based research in order to contribute to the development of a strong knowledge-based economy in the country. These activities can increase wages and productivity, enabling countries to achieve major advances in social, economic, scientific, technical, and political development. Higher educational institutions and non-governmental organisations can collaborate to promote environmental conservation and awareness. The educational institutions can share their knowledge to solve the

environmental problem. Simultaneously, the Environmental NGO's can also disseminate the information about the solution to the needy society.

Non-Formal Environmental Education Programmes: At University level non-formal Environmental Education Programmes include -

- ***Environmental Awareness Campaigning*:** University may organise environmental awareness campaigning for the people on various themes like environmental pollution, environment protection, plastic waste management, etc. to raise awareness and motivate the community to protect and conserve the environment.
- ***Community Development Programme:*** Community development programmes may be conducted by higher educational institution for community people. The programme components may include social and environmental aspects.
- ***Rain-Water Harvesting Practice (Green Practice*):** It is an important environment friendly approach. This green practice can be encouraged in the form of community development programme by the higher educational institutions.
- ***Lecture Programme:*** Students as well as community people can actively participate in lecture programme by asking questions related to the theme being discussed. Online lectures have shown to be an effective way for students to gain an overview of the topic at hand while also interacting directly with the resource person.



LET US KNOW

Rainwater harvesting is the collection and storage of rain, rather than allowing it to run off. Rainwater is collected from a roof-like surface and redirected to a tank, cistern, deep pit, aquifer, or a reservoir with percolation, so that it seeps down and restores the ground water.



CHECK YOUR PROGRESS

Q 10: Environmental Education at the University education stage is looked after by the ……(Fill in the blanks)

Q 11: What are the four major areas recognized at the post graduate level?

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.....

.....

Q 12: What are the programmes of Environmental Education at University level?

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5.8 LET US SUM UP

- Environmental education programmes are important for educating people about sustainability. It is intended to equip people with the knowledge and skills necessary to live an environmentally balanced life and sustain a community. These programmes demonstrate leadership in promoting sustainability and also contribute to the effort being made in the education sector to deliver learning programmes.
- In order to instil effective learning for environmental conservation, educational institutions must design both formal and non-formal environmental education programmes.
- At primary level, children should be made aware about plants, animal needs, their natural habitats; reuse and recycle of materials that have been used. At advance levels awareness regarding bio-diversity conservation, environment conservation, alternative sources of energy

and global climate change etc should be taught. At university level new knowledge need to be produced through research and development.

- Different programmes offered by the Centre for Environment Education for primary level students are- Eco schools programme, Paryavaran Mitra Programme, Eco club programme, National Nature camping programme etc.
- At secondary level emphasis must be given on involving children in out-of-school activities, problem solving and community activities related to environmental problems. At this level objective must be real life experience, awareness and problem identification. The contents must be supplemented with general science. Teaching, practical and field visits must be part of the course content.
- At higher secondary stage emphasis must be on environmental protection, management, conservation, assimilation of knowledge, problem identification and action skills. Contents may be science-based and action-oriented work.
- Different non-formal programmes of Environmental Education at secondary level are The Young Conservationist Programme (YCP), WWF's India's one Earth one Home programme, National Green Corps Programme etc.
- Awareness programme under MOEFCC for secondary level of education are: Rallies, Mini - marathon, Door-to- Door Campaigns, Knowledge Workshops, Environment Film Festival, Cleanliness drives, Plantation drives, etc.
- At the college level, emphasis should be on sustainable development and conservation. The content must be scientific and technological in nature. Course content should include teaching and action-oriented field work.
- Environmental awareness programmes, WWF-India's Youth for Nature Conservation Programme, Research Project, Action Research, Environmental Discussions are different programmes can be imparted to college level students.

- At post graduate level, four major areas are recognised environmental engineering, conservation and management, environmental health, social ecology. Universities can help to establish the sustainable development through following aspects: a) Teaching programmes b) Research c) Outreach Programme.



5.9 FURTHER READING

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5.10 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Two objectives of Programmes of Environmental Education are as follows:

a) To provide children with knowledge, attitudes and skills on environment sustainability through hands-on experience in their immediate environment.

b) To create awareness among the younger generation about various environmental issues and make them aware of their

responsibilities towards nation.

Ans to Q No 2: Three activities of eco club programme are as follows-

a. Organize seminars, debates, lectures and popular talks on environmental issues in schools.

b. Organize rallies, marches, human chains and street theatre at public places with a view to spread environmental awareness.

c. Take up activities like tree plantation, cleanliness drives both within and outside the school campus.

Ans to Q No 3: Activities such as massive plantation, cleaning of water bodies, conservation of natural resources can help in developing the spirit of environmental awareness among students.

Ans to Q No 4: • At higher secondary stage emphasis must be on environmental protection, management, conservation, assimilation of knowledge, problem identification and action skills. Contents may be science-based and action-oriented work.

Ans to Q No 5: Five activities of awareness programme under Ministry of Environment, Forest and Climate Change are: Rallies, Mini - Workshops, Environment Film Festival, Cleanliness drives, Plantation drives, etc.

Ans to Q No 6: The principal focus of the NGC Programme is to introduce students to action-oriented studies of environmental problems at various levels and to assist them in identifying easy solutions of these problems under the guidance and supervision of their teachers.

Ans to Q No 7: Sustainable development and conservation.

Ans to Q No 8: Two programmes offered by colleges on environmental education are as follows:

a) Environmental awareness programmes

b) WWF-India's Youth for Nature Conservation Programme

Ans to Q No 9: Three environmental awareness activities for college students are as follows:

a. Eco development camps

b. Lecture series

c. Film shows and exhibitions

Ans to Q No 10: University Grant Commission.

Ans to Q No 11: The four major areas recognized at the post graduate level are as follows:

a. Environmental engineering,

b. Conservation and management,

c. Environmental health,

d. Social ecology.

Ans to Q No 12: The Programmes of Environmental Education at University level are a) Teaching programmes b) Research c) Outreach Programme



5.11 POSSIBLE QUESTIONS

A) Short Questions (Answer each question in about 150 words)

Q 1: Write four objectives of Environmental Education Programme.

Q 2: Write five characteristics of environmental education programmes suggested by Ritz in 1978.

Q 3: What are formal and non-formal environmental education programme?

Q 4: State the importance of Environmental Education Programme.

Q 5: Write a short note on Eco-club Programme.

B) Long Questions (Answer each question in about 300-500 words)

Q 1: Discuss about the programmes of Environmental Education at Primary Level of Education.

Q 2: What programmes should be included at the secondary level to impart environmental Education?

Q 3: Discuss how Environmental Education can be made effective at college level in India.

Q 4: Discuss the programmes of Environmental Education for University students.

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UNIT 6 : CONSERVATION AND PROTECTION OF ENVIRONMENT

UNIT STRUCTURE

6.1 Learning Objectives

6.2 Introduction

6.3 Meaning of Conservation and Protection of Environment

- 6.3.1 Characteristics of Conservation and Protection of Environment
- 6.3.2 Categories of Conservation and Protection of Environment
- 6.3.3 Need and Importance of Conservation and Protection of Environment

6.4 Legal Provisions for Conservation and Protection of Environment

6.5 Constitutional Provisions for Conservation and Protection of Environment

6.6 Role of Individual and Society Towards Environmental Conservation

6.7 Let Us Sum Up

6.8 Further Reading

6.9 Answers To Check Your Progress

6.10 Possible Questions

6.1 LEARNING OBJECTIVES

After going through this unit, you will be able to -

- describe the concept of conservation and protection of environment
- explain the need of conservation and protection of environment
- discuss the various means and methods of conserving the environment
- tell the legal provisions for the conservation and protection of environment
- explain the constitutional provisions for environmental protection

- discuss the role of individual and society towards environmental conservation.

6.2 INTRODUCTION

We know that the environment comprises almost everything around us. It includes humans, plants, animals as well as invisible micro-organism, surface water, ground water, land, minerals and oil and all other elements from the earth. We, the living beings are the major part of the environment. Our survival depends on the environment. From the discussion of the previous units, it is clear to you that the environment gives us enough to live comfortably but we, the selfish human beings on the earth, to fulfill our greed, are destroying our beautiful and green earth. Excessive use of fossil fuel for energy or power, industrial waste material increases the numbers of pollutants causing danger to the environment and destroys its equilibrium. If this goes on, one day will come when we will have to buy oxygen for survival. For our safe and easy living, we have to protect our Earth, our environment. In this unit, we will discuss the conservation and protection of the environment and various legal and constitutional provisions for environmental protection. Let's proceed-

6.3 MEANING OF CONSERVATION AND PROTECTION OF ENVIRONMENT

Environmental conservation and protection means the planning and management of resources so as to secure their waste use and continuity of supply while maintaining and enhancing their quality, value and diversity. The resources of the environment may be man-made or natural. Conservation of environment includes preservation of all these resources. It includes the preservation from destructive influences, natural decay or waste.

Conservation and protection of the environment simply means the careful use of land, air, water, minerals and other natural resources. It is a planned environment using all planning, foresight and cooperation that man

can do. It is actually the intelligent use of natural and man-made resources. It is again important to note that conservation or protection of the environment includes the use of agriculture, energy flow, waste management, wildlife management, natural parks, sanctuaries, water management as well as it emphasizes on non-pollution energy development. One important thing about conservation of environment is that it not only emphasizes on intelligent use of resources but also emphasizes on the utilization of the resources for future generations.

Definition of Environmental Conservation

According to Whyte, "Environmental Conservation has been defined as the management for the benefit of all life including mankind of the biosphere so that it may yield sustainable benefit to the present generation which maintaining its potential to meet the needs and aspiration of the future generations".

Environmental conservation is a global issue and a matter of concern. It is important not only for the biosphere but also for mankind. We can exist only when the environment exists. Celebration of Environmental Day on 5th June is an example of making people aware about the conservation and protection of Environment. While discussing conservation of environment it is essential to understand that the function of environmental conservation mainly rests on the perceptual level of the individual. Each individual must develop a special concern for environmental protection, and then only its goal can be reached.



LET US KNOW

Conservation and protection of environment simply means the careful use of land, air, water minerals and other natural resources. It is a planned use of environment using all planning foresight and cooperation that man can do.

6.3.1 Characteristics of Conservation and Protection of Environment

The following characteristics will help you to have a clear understanding of conservation and protection of environment-

- Conservation and protection of environment is the careful use of natural resources.
- It means planning and management of the environment
- It implies the consciousness of people towards the environment.
- It includes the use of land, water, minerals, agriculture, energy flow, waste management, wildlife management, Natural Park, sanctuaries, water management etc.
- It emphasizes on the development of non-pollution renewal energy.
- It means conservation of environment or all the resources not only for the present but also for the future.



LET US KNOW

The major features of Environmental conservation are-

- Conservation and protection of environment is the careful use of natural resources
- It means the planning and management of the environment
- It implies the consciousness of people towards the environment

6.3.2 Categories of Conservation and Protection of Environment

In the discussion of environmental conservation and protection, it is very much essential to know the categories of conservation. There are mainly two categories of conservation. They are:

- **In situ Conservation**
- **Ex situ Conservation**

1. In Situ Conservation

This is the conservation of genetic resources through their maintenance within natural or even human made eco-system in which they occur. This is an ideal system for genetic resources conservation. This type includes a system of protected areas of different categories, managed with different objectives to bring benefit to the society.

In situ conservation includes- Natural parks, sanctuaries, Natural monuments, Cultural landscape, biosphere reserves, Nature reserves etc. They are maintained and protected as they are. For example-Taj Mahal is well maintained by the Government of India, Kaziranga National Park etc. These are maintained and conserved as well as protected within the natural as well as human made eco-system. This is called In situ conservation.

2. Ex situ Conservation

This kind of conservation is made outside their habitant. The conservation is made by perpetuating sample population in genetic resource centers like-zoo, botanical garden, Cultural collection etc. The resources are preserved in the form of gene pool or gamete storage for fish, germplasm banks for seeds, pollen, semen, ova etc. Plants are maintained and preserved more carefully than animal. In the Zoo or botanical garden or in the museum, we often see some of these resources which are protected very carefully.



ACTIVITY 6.1

Mention some examples of means of In situ and Ex situ conservations. What initiative can you take for ex situ conservation at your home?

6.3.3 Need and Importance of Conservation and Protection of Environment

The importance of conservation and protection of environment can be realized through the following points-

- **For maintenance of essential ecological processes and life support system:** Conservation of environment is very much essential to maintain ecological balance which directly or indirectly leads to a life support system of all living beings in the environment.
- **For preservation of the biological diversity:** We know that our environment is enriched with biological diversity. We all living beings make our environment richer in biological variety. It not only adds beauty to nature but also helps to maintain the biological balance. As such through preservation and conservation, we can transmit it from generation to generation.
- **Ensuring sustainable development:** We know that sustainable development is a world-centric goal. What we have today, it must be sustained for the future generation to survive. Without conservation of environment, the goal of sustainable development is impossible to achieve.
- **Ensuring proper utilization of species and eco-system:** As our environment is rich with a variety of species, it is essential for us to make use of these species to maintain proper ecological balance, which again enriches the eco-system. This is possible only through conservation of the environment.
- **Preservation of the natural resources not only for present but also for future:** Natural resources are not only resources but future assets. Excessive use of natural resources is warning the global balance leading to global warming and many environmental threats. As such, besides making wise use of these resources, we must conserve it for future generations.
- **It helps to make wise use of land, water, air, forest and minerals:** Conservation and protection of the environment is essential to develop an awareness and attitude in the mind of people about the wise and intelligent use of the resources in the form of land, water and minerals. A protective attitude in individuals can only bring ecological balance.

- **Helps in maintaining an equilibrium in all the spheres of Earth:** We know that there are multi spheres of earth with their unique importance and functionality. Equilibrium can only be maintained if there is balance among these spheres. Threats destroy the balance in the spheres leading to major environmental hazards.
- **Helps in preventing the environmental stressors and hazards:** There are different stressors and hazards in the environment like natural disasters including storms, earthquakes which are the result of disequilibrium of ecology. Conservation and protection of the environment is the preventing measures to all these stressors and hazards.

Thus, it can be said that conservation of the environment is a must for our existence in the world. It finally helps in maintaining the earth and its greenery for all biotic and abiotic components to live peacefully.



CHECK YOUR PROGRESS

Q 1: Which day is celebrated as Environmental Day?

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Q 2: Why environmental conservation is considered essential?

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Q 3: What do you mean by In situ Conservation?

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6.4 LEGAL PROVISIONS FOR CONSERVATION AND PROTECTION OF ENVIRONMENT

From the above discussion, it is clear that environmental protection and conservation is very essential. Therefore, we all must strive to protect

our environment. It is important to note that the first international conference on environment was held in Stockholm, the Swedish Capital on 5th June, 1971. Therefore, 5Th June is celebrated as UN Environmental Day every year. This is known as United Nations Conference of Human Environment. You all know that our country got its independence in 1947. Several environment protection initiatives had been taken before the independence, as such there existed environmental legislation before independence. But, after the Stockholm Conference, the conception of Environmental Conservation and Awareness has got tremendous attention all over the world. Here, we are going to discuss about the different legal provision adopted by Indian Government for Environmental Conservation and Protection---

1. **National Council of Environmental Policy and Planning in 1972**

   The first landmark in the field of environmental protection was setting up of the National Council of Environmental Policy and Planning in 1972 within Department of Science and technology. It was a regulatory body to look after all matters related to environment.



LET US KNOW

The first international conference on environment was held in Stockholm in June, 1971.

2. **The Water Prevention and Control of Pollution Act 1974**

   This is an act that was adopted keeping in view the conservation and preservation of Environment. This Act prohibits discharge of pollutants into water bodies beyond a given standard and lays down the penalties for non-compliance with its provisions. There is another body under this. That was set up as CENTRAL POLLUTION CONTROLL BOARD (CPCB). This body emphasizes on prevention and control of water at centre. For conservation of water in the state, there is another body i.e., STATE POLLUTION CONTROLL BOARD under the CPCB.

3. **The Air Prevention and Control of Pollution Act 1981**

   We have already discussed about Article 253 of the Constitution under

the directive policies. This is the act that was enacted under Article 253 to implement the decision taken in the Stockholm Conference. The main function of this act is to control air pollution and its abatement as well as ensure the quality of air. Under this Act, central and State Boards are established to look after the activities in concerned areas. Therefore, each industrial operator must obtain a permit from the State Boards within a declared air pollution area.

4. MoE 1985

The National council of environmental policy and planning evolved into a full-fledged body named as Ministry of Environment and Forest. Today it is an apex body in India to regulate and ensure environmental protection and conservation. It lays down various legal and regulatory framework and policies for the sake of environmental protection.

5. Department of Environment, Forest and Wildlife (D.O.En 1985)

The present integrated department of Environment, Forest and Wildlife in the Ministry of Environmental and Forest was created in September 1985. This Ministry serves as the focal point in the administrative structure of the central Government for the planning, promotion and coordination of Environmental and Forestry program. Its main activities are to do survey and conservation of flora and fauna, forest and wildlife, prevention and control of pollution, afforestation and regeneration of the degraded areas of the environment.

6. The Environmental (Protection) Act 1986

This Act authorizes the central government to protect and improve the quality as well as control and reduce all forms of pollution from all the sources that may cause pollution. It also prohibits the setting and operation of any industrial facility on environmental grounds.

7. The Municipal Solid Waste (Management and Handling) Rules 2000

This Act or rule was set by the Government to apply to every municipal authority for the collection, segregation, transportation and disposal of municipal solid waste to keep the place hygienic and ecologically safe.

8. The Noise pollution (Regulation and Control Amendment) Rules 2002

This rule set by the Government lay down some terms and condition that are essential to reduce noise pollution- like permission of using loud speakers or public address system during night hours (between 10.00pm to 12.00am) during the cultural or religious festivals or occasions.

9. The Biological Diversity Act, 2002

The Biological Diversity Act, which was adopted in 2002, is the result of an attempt to realize the objectives of United Nations Convention on Biological Diversity (1992). The main objective of this act is to conserve the biological resources and associated knowledge. It also lays emphasis on facilitating access to them in sustainable manner. To realize these objectives of this Act, the National Biodiversity Authority has been established in Chennai.

10. The National Green Tribunal Act, 2010

The aim of enacting this act is for effective and expeditious disposal of cases relating to environment protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property.

11. E-Waste/ Management and Handling Rules, 2011

The primary objective of this rule or act is to reduce the use of hazardous substances in electrical equipments and channelize the e-waste generated in the country for sound environmental recycling.

12. Coastal Regulation Zone Notification, 2011

This notification was issued by The Ministry of Environment and Forest on 2011, January 6. Its major objective is to ensure livelihood security to the fishing communities and other communities who live in the coastal areas. It again aims at conserving and preserving the coastal stretches and promotes development in a sustainable manner based on scientific principles.



ACTIVITY 6.2

What activities would you like to perform in your locality for environmental Conservation?

6.5 CONSTITUTIONAL PROVISIONS FOR CONSERVATION AND PROTECTION OF ENVIRONMENT

As already mentioned there are various organizations, government and non-government, who are trying their best for the environmental protection. Even our Indian Constitution has also given special emphasis on the environmental conservation; hence it has guaranteed some environmental right to the people. Here we will discuss the constitutional provisions for conservation and protection of Environmental and ecological security.

As per the 42nd Amendment act 1976, the Constitution lay down in the Directive Principles of State Policy as well as Fundamental Rights where environmental protection and improvement were explicitly incorporated into the constitution. It is again important for you to know that the amendment has introduced certain changes in the Seventh Schedule of the Constitution. The subject **"Forest"** and **"Wildlife"** are transferred to the Concurrent list (Joint responsibility of Centre and State) from the state list. This has put the matter of environmental protection in National Agenda.

Following are the constitutional provisions for Environmental protection under directive principles and fundamental duties-

1. **According to Article 48A:** "The state shall endeavour to protect and improve the environment and to safeguard the forest and wild life of the country".
2. **According to Article 51-A:** "It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lake, rivers and wildlife and to have compassion for living creatures".(Fundamental Duty)
3. **According to Article 253:** " Notwithstanding anything in the foregoing provisions of this Chapter, Parliament has power to make any law for

the whole or any part of the territory of India for implementing any treaty, agreement or convention with any other country or countries or any decision made at any international conference, association or other body"

Hence, **the Article 253 empowers the parliament-**

- to make laws implementing India's International obligations as well as any decision made at International conference, association or other body.
- to enact the Air Prevention and Control Pollution Act of 1981 and Environment Protection Act 1986.
- to legislate on all matters related to the preservation of natural resources

Fundamental Right and Environmental Conservation

There are some Fundamental Rights guaranteed by the Constitution to the citizen of India which has relation to the Ecological security. These are discussed below---

1. Right to Wholesome Environment (Article 21): "No person shall be deprived of his life or personal liberty exists according to procedure established by law".

   This article extended to include the right to a wholesome environment which warrants environmental protection.

   According to this, courts are entitled to forbid all acts of the state and citizen from upsetting the environmental balance.
2. Right to livelihood (Article 21): This right potentially checks Government's action with an environmental impact that threatens to overlook poor people and disrupts their lifestyle.
3. Right to Equality (Article 14): "The state shall not deny to any person equality before law or the equal protection of law".

   This right also may be infringed by Government decision that has an impact on the Environment.
4. Right to freedom to Trade {Article 19(1) (g)}: "All citizens shall have the right to practice any profession or to carry on any occupation; trade or business".

While availing this right, individual need to maintain balance environmental interest.



LET US KNOW

As per the 42nd Amendment act 1976, the Constitution lay down in the Directive Principles of State Policy as well as Fundamental Right where environmental protection and improvement were explicitly incorporated into the constitution.



CHECK YOUR PROGRESS

Q 4: Fill in the blank

I. The Air Prevention and Control of Pollution Act 1981 was enacted under Article ……of …….. Indian Constitution.

II. The subject "Forest" and "Wildlife" are transferred to the …….. from the state list.

III. Right to Wholesome Environment is listed in Article .....……

Q 5: What is the prime objective of The Biodiversity Act 2002?

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Q 6: Mention some of the legal provisions in India for water preservation.

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Q 7: Where is National Biodiversity Authority established in India?

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Q 8: What are the fundamental rights related to Environment?

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6.6 ROLE OF INDIVIDUAL AND SOCIETY TOWARDS ENVIRONMENTAL CONSERVATION

Individuals are the most significant agents of environmental conservation and protection. Most of the environmental problems are caused by human actions on the environment. Therefore, they should orient and educate themselves towards the issues and concerns of conservation of environment and nature. Individual role as consumer is also of great significance in the field of conservation of natural and environmental resources. A brief outline of individual contribution towards natural conservation and protection may be presented below-

- **Conservation of Water**

  Water is said to be a life giving and life saving resource for man. The process of rapid industrialization and urbanization has severely affected water pollution. Uneconomic and careless use of drinking water has often created a water crisis in the cities. Lack of consciousness and bad habits of individuals are also responsible for wastage and pollution of water. So, the steps to be taken in this regard may be presented below:

  - Taps should not be kept open after washing, bathing and brushing etc.
  - Water leakage should be checked and immediately repaired.
  - Water control device of the taps should be used for economic conservation of water at home.
  - System for collecting rain water for use should be adopted. In other words, rain water harvesting should be encouraged.
  - Water should be economized while using in the garden.
  - Soapy water should be reused for washing of clothes.

- **Conservation of Soil**

  All forms of biological growth and development are possible on the soil. So, conservation of soil from its pollutants and degradation is the vital responsibility of man who owns it. But owing to the lack of knowledge in scientific ways and means of conservation of soil by the

agricultural people, soil pollution appears to be a problem. In this regard specific role of individual may be presented below:

- While constructing individual houses, the existing trees should not be uprooted.
- We must grow different types of ornamental trees, herbs and trees in the garden and also grass in the open areas which will preserve the soil and prevent its erosion.
- Individual should develop the habit of planting shady trees on the roadside.
- Biological manure rather than chemical fertilizer should be used for agricultural purpose.
- Examination of soil before cultivation is necessary.

- **Conservation of Energy**

Energy is the main resource for development of human civilization. Most of the activities of present day and large and growing population require massive energy inputs. Hence the need for conservation of energy becomes all the more essential. Energy conservation is an attempt to reduce the amount of energy used for domestic and industrial purposes, particularly in the developed countries.

Every individual may help to minimize the problem through formation of good habit of saving energy at home. Individual role in this regard may be mentioned below:

- Lights and electrical gadgets should be turned off habitually when not in use.
- Energy of heat should be used from the natural resources like the sunshine when available.
- High voltage energy from heater should be used only when it is indispensable.
- LPG expenses should be reduced in cooking food by using solar cooker.
- To cut down intense heat in summer shady trees should be planted.
- Practice of using air condition in the winter season should be

avoided by using woollen clothes.

- **Conservation of Wildlife**

  A natural harmony and ecological balance need to be established between human and animal world. Destruction of life of the wild animals by men must be stopped. So, conservation of wildlife is a moral responsibility of individual and society. Some of the responsibilities of individual towards the animals may be described below:

  - Man should bring attitudinal changes in behaviour for love of the animals.
  - Killing of wild animals by the poachers should be considered as illegal act that should be punished.
  - Instead of killing the wild animals, they should be caught alive and kept in the zoo.
  - Product derived out of the animal body like skin should be commercially banned.

- **Conservation of forest resources**

  Forests wealth is the invaluable resources of nature for economic development of a country. It can be conserved and preserved through responsible behaviour of man. Industrial needs of men can comprehensively be served by the forest resources. For conservation and utilization of them, the individual and society should play their responsible role as mentioned below:

  - Programme of plantation of trees in the forest should be undertaken with necessary aid and assistance of the government.
  - Strict vigilance should be maintained individually and collectively for protection of the forest resources.
  - Individuals should be aware of the rules and laws framed by the government on conservation of the forest products and should abide by them.
  - Local community people and the forest department should cooperate in conserving the forest resources from the anti-social elements.
  - People should be trained by the forest department how to

conserve and preserve the forest resources.

- Forest security guards should be well trained and they should be well equipped with arms to detect illegal poachers and smugglers of the woods.

The role of the society in conserving and protecting the environment is very significant. It is important for us to realize that we are all part of the environment and it is we who have to take more care of flora and fauna both because they are beautiful and useful to us. So every one of us living on this earth must try to save animal and plant life. If we carefully look after our environment, then it will last as long as there is life on earth.

There are numerous examples of society playing vital role for the cause of environmental conservation and protection through various measures. The 'Chipko' movement by the people of Uttarakhand region of India is an extra ordinary movement of the poor for the conservation of resources. Chipko meaning 'to hug' in Hindi, was started as movement of woman determinedly hugging trees to prevent them from being cut. It accomplished great success in national as well as international level. The 'Narmada Bachao Andolan' lead by Ms. Medha Patkar is another brilliant example of society movement playing great role in conservation of resources.

Thus, the society can play very important role in conservation and protection of our environment for sustainable development and meaningful existence of man on earth.



6.7 LET US SUM UP

- Environmental conservation and protection means the planning and management of resources so as to secure their waste use and continuity of supply while maintaining and enhancing their quality, value and diversity.
- Conservation and protection of environment simply means the careful use of land, air, water, minerals and other natural resources.

- According to Whyte, "Environmental Conservation has been defined as the management for the benefit of all life including mankind of the biosphere so that it may yield sustainable benefit to the present generation while maintaining its potential to meet the needs and aspiration of the future generations".
- The World/UN Environmental Day is celebrated on 5th June.
- The main feature of Environmental Conservation is that- it emphasizes on the development of non-pollution renewal energy, it means conservation of environment or all the resources not only for the present but also for the future.
- The objective of Environmental conservation is- to maintain essential ecological processes and life support system, to preserve the biological diversity, to ensure sustainable development.
- There are mainly two categories of conservation- In situ Conservation and Ex situ Conservation.
- In situ conservation is the conservation of genetic resources through their maintenance within natural or even human made eco-system in which they occur.
- The ex situ conservation is made by perpetuating sample population in genetic resource centers like- zoo, botanical garden, Cultural collection etc.
- The first international conference on environment was held in Stockholm, the Swedish Capital on 5th June, 1971.
- The various legal provisions in India for environmental conservation and protection are--National Council of Environmental Policy and Planning in 1972, The Water Prevention and Control of Pollution Act 1974, The Air Prevention and Control of Pollution Act 1981, MoE(The ministry of Environment and Forest) 1985, Department of Environment, Forest and Wildlife (D.O.En 1985), The Environmental (Protection) Act 1986, The Municipal Solid Waste (Management and Handling)Rules 2000, The Noise pollution (Regulation and Control Amendment) Rules 2002, The Biological Diversity Act, 2002, The National Green Tribunal Act, 2010, E-Waste/ Management and

Handling Rules, 2011 , Coastal Regulation Zone Notification, 2011.

- There are various constitutional provisions too for conservation and protection of Environment
- As per the 42nd Amendment act 1976, the Constitution lay down in the Directive Principles of State Policy as well as Fundamental Right where Environmental protection and improvement were explicitly incorporated into the constitution.
- The subject "Forest" and "Wildlife" are transferred to the Concurrent list (Joint responsibility of Centre and State) from the state list.
- The various articles are- According to Article 48A, According to Article 51-A, According to Article 253
- The Fundamental Right and Environmental Conservation are- Right to Wholesome Environment (Article 21), Right to livelihood (Article 21), Right to Equality (Article 14), Right to freedom to Trade {Article 19(1)(g)}.
- Society has to play a crucial role in the maintenance of the balance of nature and in the conservation of its resources for sustainable development.



6.8 FURTHER READING

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6.9 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: 5th June.

Ans to Q No 2: Environmental conservation is essential -

- To maintain essential ecological processes and life support system
- To preserve the biological diversity
- To ensure sustainable development.

Ans to Q No 3: This is the conservation of genetic resources through their maintenance within natural or even human made eco-system in which they occur.

Ans to Q No 4:

i. Article 253, Directive Policy of Indian Constitution
ii. Concurrent list
iii. Article 21

Ans to Q No 5: This main objective of this act is to conserve the biological resources and associated knowledge. It also lays emphasis on facilitating access to them in sustainable manner.

Ans to Q No 6: The Water Prevention and Control of Pollution Act 1974, the Biological Diversity Act, 2002 etc.

Ans to Q No 7: In Chennai in India.

Ans to Q No 8: The fundamental rights related to the Environment are:

1. Right to Wholesome Environment (Article 21): "No person shall be deprived of his life or personal liberty exists according to procedure established by law".
2. Right to livelihood (Article 21): This right potentially checks Government's action with an environmental impact that threatens to overlook poor people and disrupts their lifestyle.
3. Right to Equality (Article 14): "The state shall not deny to any person equality before law or the equal protection of law".

4. Right to freedom to Trade {Article 19(1)(g)}: " All citizen shall have the right to practice any profession or to carry on any occupation; trade or business".



6.10 POSSIBLE QUESTIONS

A) Short Questions (Answer each question in about 150 words)

Q 1: What do you mean by the term Environmental conservation and protection?

Q 2: Why 5th June is celebrated as World Environment Day? Give your own opinion?

Q 3: Discuss the categories of Environmental Conservation and preservation with examples.

Q 4: Why 42nd Amendment of Indian Constitution is significant from Environmental protection point of view?

B) Long Questions (Answer each question in about 300-500 words)

Q 1: Discuss the legal provisions made by Indian Government for environmental conservation.

Q 2: Enumerate the Constitutional provisions of Environmental Conservation and Protection.

Q 3: Discuss the role of the individual and society in conserving and protecting the environment.

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UNIT 7 : AGENCIES OF ENVIRONMENTAL EDUCATION

UNIT STRUCTURE

7.1 Learning Objectives
7.2 Introduction
7.3 Agencies of Formal Environmental Education
7.4 Agencies of Non-formal Environmental Education
7.5 Government / National Environmental Agencies
  7.5.1 Ministry of Environment, Forest and Climate Change (MoEFCC)
7.6 Non-Government Environmental Agencies
  7.6.1 National Level Not-for-Profit Institutes/NGOs/Other Agencies
  7.6.2 State Level Not-for-Profit Institutes/NGOs/Other Agencies
7.7 International Environmental Agencies
7.8 Let Us Sum Up
7.9 Further Reading
7.10 Answer To Check Your Progress
7.11 Possible Questions

7.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- identify the agencies of formal and non-formal environmental education
- explain the activities of the government or national environmental organisations of India
- discuss the activities of some of the well-known national level NGOs of India
- discuss some of the noted state level environmental NGOs of Assam
- highlight the activities of some of the important international environmental organisations.

7.2 INTRODUCTION

The term 'Environmental Education' is usually used to imply education within the formal education system, from primary to university level. However, in the wider perspective, the term is used more broadly to include all the efforts, both formal and non-formal, including print materials, websites, media campaigns, etc. to sensitise and educate general masses regarding the various issues related to the natural environment so that people can have a better understanding of the world around them and know how to take care of it properly in order to make the world a better place.

In this connection, an in-depth discussion on the various programmes of Environmental Education, both formal and non-formal with their importance at different levels of education - primary, secondary, college and university has been carried out in unit 5 of this course.

The present unit particularly focuses on the different agencies or organisations -government, non-government; regional, national, international etc. involved in protection of environment and providing education to students and general masses in connection with the environment through formal and non-formal means and methods.

7.3 AGENCIES OF FORMAL ENVIRONMENTAL EDUCATION

You may be aware of the fact that environmental education has become an integral component of primary, secondary and tertiary level education. This inclusion of environment education in the formal education system plays a very important role in creating awareness among the younger generation of the society by exposing them to the diverse issues related to the conservation and protection of the environment. ***(Please refer to Unit-5: Programmes of Environmental Education of this course, where programmes of environmental education imparted at various levels of education at schools, colleges and universities are being discussed in detail.)***

The formal education institutions like schools, colleges, universities,

and other professional institutions which provide formal environmental education following a well-defined and systematic curriculum. In order to strengthen the curriculum of environmental education in the formal sector, the Ministry of Environment, Forest and Climate Change, GOI (formerly known as Ministry of Environment and Forest, GOI) has been closely interacting with the Ministry of Human Resource Development (MHRD), National Council of Education Research and Training (NCERT), University Grant Commission (UGC), the All-India Council for Technical Education (AICTE) and the State Education Departments so as to ensure effective integration of environmental concept into the curricula of formal education.

For various stages of school education, NCERT has been playing vital role in designing and developing syllabi, text-books, TLMs related to the environmental education at the national level. At the state level, the same has been carried out by the SCERTs of individual states.

At the college and university level, environmental education is being looked after by the UGC. There is a high-powered committee to suggest areas of environmental education at post-graduate level.

It has been reported that there are nearly two hundred departments of environmental studies in the universities and colleges across India. They offer degree or diploma programs covering all aspects of environmental sciences and engineering. There are also diplomas, bachelor's degree, M.Sc., M.Phil. and Ph.D. programs in Environmental Sciences or Environmental Studies. Besides these, M.E., M.Tech, and Ph.D. programs in environmental engineering are offered by Civil Engineering and Chemical Engineering departments. Postgraduate degree programs in Environmental Management and courses that lead to M.Sc. in Environmental Chemistry/ Biology/Geology or Environmental Toxicology, are also available. Environmental Education at the doctoral level is also available in a large number of autonomous Research and Development (R & D) institutions founded by the central government, state governments, and agencies such as CSIR, ICAR, and ICMR i.e. formal education in environmental science or engineering is available in India up to the highest possible level. (Source: https://lotusarise.com/environmental-education-in-india-upsc/)



CHECK YOUR PROGRESS

Q 1: What is implied by the tern 'formal agencies of environmental education'?

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Q 2: Name the Ministry that looks after the curriculum of formal environmental education at various levels. Name the organisation with which the Ministry interacts with regard to curricula of environmental education for various stages of school education at the national level?

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7.4 AGENCIES OF NON-FORMAL ENVIRONMENTAL EDUCATION

Environmental education is not only limited to students belonging to formal education system. It is a lifelong process essential for welfare of mankind and development of the society. Therefore, it is designed for any age group participating in social, economic, cultural development of the communities. Since the environmental scenario of India is very wide and is highly diverse in nature - climatically, geographically, edaphically, ethnically, socially and economically, therefore, Environmental Education has also to be essentially location-specific. As such, different communities, institutions and individuals choose methods and practices that best suit their local needs and capacities.

Agencies of non-formal environmental education include various community-based groups, service organisations, government and non-government agencies, boys' and girls' clubs, parks and reserves, state and national forests, residential centres, nature centres, zoos, museums, scouting organisations, etc. All such type of organisations is involved in non-

formal Environmental Education.

Environmental Education, awareness and training play a very significant role in encouraging and enhancing participation of general masses in activities aimed at conservation, protection and management of the environment that is essential for achieving sustainable development. Accordingly, utmost priority is being accorded by the Ministry for promotion of non-formal Environmental Education to create awareness among all the sections of the society through diverse activities using traditional and modern media of communication. The programmes like National Environmental Awareness Campaign (NEAC), Green India Mission (GIN) etc. undertaken by the GOI also come under the non-formal sector of environmental education.



LET US KNOW

The **National Environmental Awareness Campaign (NEAC)** programme was started in the year 1986 for creating environmental awareness at the National Level. An action component was introduced in the awareness campaign in the year 2001-02. The programme continued throughout the year with the main theme of "Solid Waste Management". The sub-themes of the campaign included household waste and composite or vermi-composing, municipal waste, bio-medical waste plastic waste, waste management at higher altitude, electronic or e-waste and industrial waste including flash.

Some other major activities undertaken under the non-formal environmental education activities include the following:

- **Environmental Awareness Through Informal Agencies of Education:** Special events, lectures, field trips, seminars, periodicals, posters, films, etc. organised by both the Government and Non-Government organisations serves the purpose of sensitising general public to the need of environmental actions.
- **Environmental Awareness and Extension Programmes:** Various programmes for environmental awareness including campaigns,

community mobile education and extension programmes, audio/visual programmes, billboards with conservation messages, street theatres, etc. organised at local level, particularly for celebration of days like World Environmental Day, World Forestry Day, World Wetland Day, Wildlife Week, Biodiversity Day, etc. helps to create environmental awareness among the local communities. These special days which are celebrated by students, teachers, local NGOs and community-based organisations prove to be effective for disseminating information about the importance of biodiversity, its conservation and sustainability.

- **Awareness Through Mass-Media:** Mass-media, including electronic media can play a vital role in making people aware about environment and conservation of natural resources by means of its multi-channel services. ***(Please refer to the next unit, i.e., Unit 8: Media of Environmental Education in which a detailed discussion regarding the use of various media for environmental awareness and education has been carried out.)***



LET US KNOW

Content of Non-Formal Environmental Education

- **Adult Education:** Adults may influence the other members of the society to protect the precious environments by generating posters, slides, audio-visual and information pictures in regional languages.
- **Tribals / Forest Dwellers:** They are an important media to protect the forest wealth. The programmes of education can be taken by involving community leaders, women and youth of the locality.
- **Public Representatives:** There are Environmental Forums in India for MPs and MLAs to discuss environmental problems of the country. They may build up sound public opinion and stimulate public interest as well.
- **Training Executives/Administrators:** Regular courses should be arranged for various institutes imparting such training. These

are environmental management, industry-specific environmental management, etc.

- **Research and Development Programmes:** Such Research and Development efforts are supported by Department of Environment in Biosphere and Man.
- **Foundation Courses:** The courses for the probationers selected for the IAS, IFS, IPS and cadets of three wings of Armed Forces need to be supplemented with foundation courses on environment relevant to their area of specialisation.
- **Centres of Excellence:** Department of Environment has established two Centres of Excellence in the country. They generate knowledge, methodology and training in areas of Tropical Ecology (in Bengaluru) and Environmental Education (in Ahmedabad).
- **Development of Educational Material and Teaching Aids:** Materials for media (T.V, radio, films, newspapers etc.), audio, mobile exhibitions, audio-visual materials must be designed by competent manpower. One such centre is Centre of Environmental Education, Ahmedabad.
- **World Environment Day:** All the State Government, UTs, universities, schools, colleges, academic institutions and voluntary organisations organise suitable activities on World Environment Day, i.e., 5th June of each year. Department of Environment supports the functions financially.
- **Children Activities:** Department of Education with the help of United Schools Organisations of India organises various events for children. On the spot painting, modelling and poster design competitions, etc. are organised for children by the National Museum of Natural History (NMNH).
- **Eco-development Camps:** These camps help in forming sound rural development involving youth. In this regard, a set of a guidelines has been prepared by the Department of Environment in 1984 to create awareness among students

and other youth as well as to acquaint them with the practices of sustainable development.

- **Non-government Organisations:** There are a large number of NGOs throughout the country engaged in Environmental Education covering various dimensions of environmental issues, viz., raising awareness, nature conservation, pollution control, afforestation and social forestry floristic and faunal studies, rural development, wildlife conservation, waste utilisation, eco-development, etc..



CHECK YOUR PROGRESS

Q 3: Mention some of the agencies involved in non-formal environmental education.

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Q 4: Name a non-formal environmental awareness programme undertaken by the Government of India.

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7.5 GOVERNMENT/ NATIONAL ENVIRONMENTAL ORGANISATIONS

Most of the governmental bodies involved in environmental studies in India are either put directly under the administrative control of, or assisted by the Ministry of Environment, Forest and Climate Change, Government of India (MoEFCC). Initially, Department of Environment was set up in 1980 to serve as the focal point in the administrative structure of the Central Government for planning, promotion and coordination of programmes related to environment, which later turned into Ministry of Environment and Forests in 1985. The Ministry was renamed again to the current title of Ministry of Environment, Forest and Climate Change in the year 2014.

Let us briefly go through the Ministry in the following sub-sections.

7.5.1 Ministry of Environment, Forest and Climate Change (MoEFCC)

The Ministry of Environment, Forest and Climate Change (MoEFCC) serves as the nodal agency in the administrative structure of the Central Government for the planning, promotion, co-ordination and overseeing of the implementation of India's environmental and forestry policies and programmes.

The broad objectives of the Ministry are:

- Conservation and survey of flora, fauna, forests and wildlife
- Prevention and control of pollution
- Afforestation and regeneration of degraded areas
- Protection of the environment
- Ensuring the welfare of animals

These objectives of the Ministry are well supported by a set of legislative and regulatory measures, aimed at the preservation, conservation and protection of the environment.

The Ministry serves as the nodal agency in the country for the United Nations Environment Programme (UNEP), South Asia Co-operative Environment Programme (SACEP), International Centre for Integrated Mountain Development (ICIMOD) and for the follow-up of the United Nations Conference on Environment and Development (UNCED). The Ministry is also entrusted with issues relating to multilateral bodies such as the Commission on Sustainable Development (CSD), Global Environment Facility (GEF) and of regional bodies like Economic and Social Council for Asia and Pacific (ESCAP) and South Asian Association for Regional Co-operation (SAARC) on matters pertaining to the environment.

There are **19 Regional Offices** of the Ministry throughout the country covering all the states and union territories.

The various organisations under the Ministry of Environment, Forest and Climate Change are given below:

Sub-ordinates offices:

There are 7 sub-ordinate offices, which are:

1. Forest Survey of India
2. Botanical Survey of India
3. Zoological Survey of India
4. Indira Gandhi National Forest Academy
5. Directorate of Forest Education
6. National Zoological Park
7. National Museum of Natural History

Autonomous Organisations:

1. Govind Ballabh Pant National Institute of Himalayan Environment
2. Indian Council of Forestry Research and Education
3. Indian Institute of Forest Management
4. Indian Plywood Industries Research and Training
5. Wildlife Institute of India

Authorities/ Tribunals:

1. Central Zoo Authority
2. National Biodiversity Authority
3. National Tiger Conservation Authority
4. National Green Tribunal

Boards:

1. Central Pollution Control Board
2. National Afforestation and Eco Development Board
3. Society of Integrated Coastal Management
4. Wildlife Crime Control Board

Institute:

There is one institute, named National Centre for Sustainable Coastal Management under the MoEFCC, GOI with the following vision and mission:

Vision: Promote sustainable coasts through increased partnerships, conservation practices, scientific research and knowledge management for the benefit and well-being of current

and future generations

Mission and Role: Support integrated management of coastal and marine environment for livelihood security, sustainable development and hazard risk management by enhancing -

- Knowledge
- Research and Advisory Support
- Partnerships and Network
- Coastal Community Interface

7.5.2 Other National Agencies

Some other important organisations created and funded by Government of India involved in environmental issues are as follows:

- Industrial Toxicology Research Centre (ITRC), Lucknow
- National Environmental Engineering Research Institute (NEERI), Nagpur
- National Natural Research Management System (NNRMS)
- Centre for Wetland Conservation and Management (CWCM)
- Several Research Institutes under I.C.A.R. including I.G.F.R.I., Jhansi, Central Soil Salinity Research Institute, Karnal.



CHECK YOUR PROGRESS

Q 5: Fill in the blanks:

i. The Ministry of Environment and Forests was renamed in the year 2014 with the current name of .....

ii. There are ..... Regional Offices of the Ministry throughout the country covering all the states and union territories.

iii. There is one institute, titled ..... under the MoEFCC, GOI.

iv. The full form of NEERI is .....

7.6 NON-GOVERNMENT ORGANISATIONS

Non-Government Organisations (NGOs) are very effective agents as far as environmental education is concerned. The problems pertaining to environment cannot be handled by the Government agencies alone. Moreover, in a vast country like India, the Government departments cannot reach out to every nook and corner of the country. Further, in a democratic country like India, where one of the most effective ways of convincing people is by making them aware and responsible for their actions; when it comes to environmental education, it has a limited scope as a substantial section of population of the country is still out of the formal education system. The NGOs, on the other hand have the advantage over Governmental agencies as they are in direct contact with the general masses. NGOs can persuade the general public, educate them through various means and do their part for the protection of environment. Moreover, NGOs can also serve as a link between the local community and the government agencies by informing the concerned departments regarding the problems of local environment. There are many NGOs working at various levels - international, national, state and even local levels to make people aware of the environmental issues.

7.6.1 National Level Not-for-Profit Institutes/NGOs/Other Agencies

- **Centre for Environmental Education (CEE):** Centre for Environmental Education was set up in the year 1984. The head office of CEE is based at Ahmedabad and they have offices across the country. The main aim of CEE is to create environmental awareness in the communities. They conduct widespread environmental education and training programmes through a very vast network. They also take up projects related to conservation of biodiversity and eco-development.
- **Bombay Natural History Society (BNHS):** Bombay Natural History Society started its work in September 1883 at Mumbai.

The society aims to disseminate knowledge of flora and fauna by means of lectures, field trips, literature and expeditions. It also conducts field research projects on bird migration, studies on the movement and population structure of Indian avifauna and certain endangered species of wildlife. It has undertaken a wide range of projects in conjunction with both local and overseas counterpart organisations on birds, reptiles, mammals etc.

- **The Energy and Resources Institute (TERI):** TERI is an independent not-for-profit research institute established in 1974. Its mission is to develop and promote technologies, policies and institutions for efficient and sustainable use of natural resources. It has been imparting environmental education through projects, workshops, audio-visual aids and quiz competitions. TERI also has a major programme in biotechnology, the applications of which are oriented towards increased biomass production, conversion of waste into useful products and mitigating the harmful environmental impacts of several economic activities.
- **Development Alternatives group (DAG):** It is a non-profit organisation engaged in research and action for sustainable development. It was established in 1983. The activities of DAG broadly cover the three primary areas that underlie any form of sustainable development process; they are: design and large-scale dissemination of appropriate technologies, environmental management systems and effective people-oriented institutions and policies. The mission of the Development Alternatives Group is to promote sustainable national development.
- **CPR Environmental Education Centre (C.P. Ramaswami Aiyar Foundation):** CPR Environmental Education Centre is based at Chennai and was set up in 1989 with an aim - to promote environmental awareness, to produce and

disseminate basic educational and reference material on environment and to take up environmental projects. It provides guidance on environmental laws, environmental impacts and management studies.

- **Vanarai:** Vanarai is based in Pune and was first set up in 1982 to promote environmental protection, afforestation and sustainable integrated rural development. Their activities are spread over the states of Maharashtra, Gujarat and Rajasthan. They are working in the area of Environmental Education for school children and teachers and help them in forming eco-clubs.
- **Centre for Science and Environment (CSE):** Centre for Science and Environment is based in New Delhi. It was founded in 1980 as an independent public interest organisation that aims to increase public awareness on science, technology, environment and development. CSE has been actively involved in searching for solutions that people and communities can implement by themselves, challenging India to confront its problems, inspiring it to take action, pushing the government to create frameworks for people and communities to act on their own.
- **Kalpavriksh:** It is a voluntary group started in 1979 and has been working on Environmental Education, research, campaigns and direct action. Kalpavriksh believes that a country can develop meaningfully only if ecological sustainability and social equity are guaranteed. As such, its activities are directed to ensuring conservation of biological diversity, challenging the current destructive path of development, helping in the search for alternative forms of livelihoods and development, assisting local people in empowering themselves to manage their natural resources, and reviving a sense of oneness with nature.
- **World Wide Fund for Nature, India:** Established as a

Charitable Trust on 27 November, 1969, World Wildlife Fund in India (WWF, India) began with the aim of reducing the degradation of Earth's natural environment and building a future in which humans live in harmony with nature. The organisation changed its name from the World Wildlife Fund to World Wide Fund for Nature India in 1987. This organisation has been working in the field of biodiversity conservation including field projects, consultancy and research and support to other organisations, forest management, wildlife trade monitoring, tiger conservation programme, fresh-water and wetlands programme, river dolphin conservation programme and Environmental Education and awareness. Over the years, its perspective has broadened to reflect a more holistic understanding of the various conservation issues facing the country and seeks to proactively encourage environmental conservation by working with different stakeholders- Governments, NGOs, schools and colleges, corporates, students and other individuals.

7.6.2 State Level Not-for-Profit Institutes/NGOs/Other Agencies

- **Assam Science Society (ASS):** It is a voluntary organisation established in the year 1953 as "Gauhati Science Society", which was later renamed as "Assam Science Society" in the year 1956 in order to encompass the entire state of Assam. In addition to working for popularisation of Science and Mathematics throughout the state by publishing various types of literatures in Assamese language, organising workshops, popular talks, seminars, exhibitions, symposiums, talent search competitions, etc., the Assam Science Society also impart environmental education and training to both teachers and students through camps and conduct surveys on environment.
- **Kaziranga Wildlife Society (KWS):** It is a nature conservation

organisation founded in the year 1969 with Dr. Robin Banerjee as the founder president of the society. The Society works for protection, preservation and promotion of wildlife and their habitat not only in Kaziranga National Park but in the entire NE India.

- **Nature's Backon:** It is an environmental activist group established in the year 1982 by Soumyadeep Dutta, an Ashoka Fellow and was registered under the Registration of Societies Act, India in 1991. The head office of the organisation is located in Dhubri, Assam. In addition to working for the conservation of wildlife, the organisation has also been working in the area of environmental awareness and education, scientific research and documentation and socio-economic development of the rural masses of the region.
- **Centre for Environment Education, North East (CEE, NE):** CEE, NE organisation located in Chenikuthi, Guwahati is the regional branch of CEE Ahmedabad which was established in 1984 under the aegis of Nehru Foundation for development. It was during the same time that Ministry of Environment and Forest (MoEF) came which was more action and policy oriented. So, a need was felt to have an organisation that would look after the educational aspect of the environment. The organisation started promoting the objectives of the Ministry by providing educational training and material. The main thrust of CEE is education for sustainable development. Its activities comprised three major components: capacity building, field study demonstration, and policy intervention. CEE-NE's main work has been in the field of Environment Education and it generally works in collaboration with government departments such as, MoEF / MoEFCC, MoT etc., as well as with other international agencies.
- **Aaranyak:** Aaranyak is a Guwahati based leading wildlife NGO. It was started by a group of young environment enthusiasts in



Ashoka Fellow

An Ashoka Fellow is a person who has been recognised as one of the World's leading social entrepreneurs and changemaker by an international organisation with the same name, i.e., **Ashoka** (branded **Ashoka: Innovators for the public**).

the year 1989. They started with a nature club with a mission to foster conservation of biodiversity in Northeast India through research, environmental education, capacity building and advocacy for legal and policy reform to usher a new era of ecological security. They formulated a number of conservation strategies or divisions specific to North East India to address crucial environment issues. There are 14 major divisions that form the core of Aaranyak's conservation strategy, out of which 8 revolves around some of the key threatened species of North East India. The other divisions undertake various focussed approaches for biodiversity research and conservation in the region.

- ENVIRON: ENVIRON was founded with an effort to address issues of environmental degradation and economic development of North-eastern region of India in 2003. ENVIRON is amalgamation of students, researchers and think-tanks who believe that proper management and utilisation of renewable natural resource is the key to sustainable development of this region. Dr. Amarjyoti Kashyap, an environment and solid waste management scientist is the founder & chief functionary of ENVIRON. The major objective of ENVIRON involves survey of natural resources and utilisation of natural resources in a sustainable way. It claims to be the sole organisation which works in the area of solid waste management in urban areas. To tackle this problem, it focuses on resource base of trained personnel who can take leadership role in waste management in particular and environmental protection in general. The organisation is strongly dependent on bonafide students to take up different initiatives in this regard. Organisation of awareness camps is one of its regular activities.



CHECK YOUR PROGRESS

Q 6: Name any five well-known national level Non-Government Environmental Organisations of India.

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Q 7: Name any five well-known state level Non-Government Environmental Organisations of Assam.

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Q 8: What are the various types of works undertaken by the Assam Science Society (ASS)?

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7.7 INTERNATIONAL ENVIRONMENTAL AGENCIES

Some of the important international bodies involved with different areas of environment, forestry, wildlife and other relevant aspects of environment are discussed below:

- **United Nations Environment Programme (UNEP):** It is a UN agency, responsible for cooperation of inter-governmental measures for environmental monitoring and protection. It was set up in 1972. Its Headquarters are in Nairobi, Kenya. UNEP was founded to study and formulate international guidelines for management of the environment. UNEP is assisting many such programmes in India too.
- **International Union for Conservation of Nature and Natural Resources (IUCN):** It is an autonomous body, founded in 1948 with its Headquarters at Morges, Switzerland for initiating and promoting scientifically based conservation measures. It also cooperates with United Nations and other intergovernmental agencies and sister bodies

of World-Wide Fund for Nature (WWF).

- **World Wildlife Fund (WWF) / World Wide Fund for Nature:** It is an international non-governmental organisation with its headquarters at Gland, Switzerland founded in 1961 that works in the field of wilderness preservation and the reduction of human impact on the environment. WWF is one of the world's largest conservation organisations working in more than 100 countries. It was initially named the World Wildlife Fund, which remains its official name in Canada and the United States.
- **European Economic Community (EEC):** It is community of 12 European nations with sound political, economic and legal base. It has programmes of framing and implementation of coordinated policy for environmental improvement and conservation of natural resources. Central Pollution Control Board, India has taken up projects on air quality monitoring with assistance of EEC.
- **Convention on International Trade in Endangered Species (CITES):** It is an international forum, whose membership for agreement is open to all countries. For India, the Ministry of Environment, Forest and Climate Change functions as nodal agency for participation in international agreements.
- **United Nations Educational, Scientific and Cultural Organisation (UNESCO):** It is a United Nations agency, founded in 1945 to support and implement the efforts of member states to promote education, scientific research and information, and the arts to develop the cultural aspects of world relations. Its Headquarters are in Paris. Independently as well as in collaboration with other agencies like UNEP, it supports activities related to environmental quality, human settlements, training to environmental engineers and other socio-cultural programmes related to the environment.
- **South Asia Co-operative Environment Programme (SACEP):** This organisation has been set up for exchange of professional knowledge and expertise on environmental issues among member countries - Afghanistan, Bangladesh, Bhutan, India, Iran, Pakistan and Sri Lanka.
- **Environmental Protection Agency (EPA):** This is an independent

Federal Agency of the U.S. Government established in 1970. It deals with protection of air, water, solid wastes and management of radiation, pesticides, noise etc.

- **Human Exposure Assessment Location (HEAL):** The project is a part of the Health-Related Monitoring Programme by WHO in co-operation with UNEP.
- **World Commission on Environment and Development (WCED):** This is a 23-member commission, set up in 1984 in pursuance with a UN General Assembly resolution in 1983 to re-examine the critical environmental and development issues and to formulate proposals for them. The commission makes an assessment of the level of understanding and commitment of individuals, voluntary organisations and governmental bodies on environmental issues.
- **Earth Watch Programme (EWP):** It is a worldwide programme, established in 1972 under the terms of the Declaration on the Human Environment. It monitors trends in the environment, based on a series of monitoring stations. Its activities are coordinated by UNEP.
- **Project Earth:** It is developed in collaboration with UNEP to inspire and educate young people worldwide on the crucial issues facing the Earth's Environment.
- **Man and the Biosphere Programme (MAB):** MAB was conceived as an outcome of International Biological Conference of UNESCO in 1968, where it was realised that collaboration of natural and social scientists, planners and managers and the local people are necessary to solve environmental issues. It was formally launched by UNESCO in November 1971.



CHECK YOUR PROGRESS

Q 9: Name any five important International Environmental Organisations.

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Q 10: Write the full form of SACEP. What are the member countries of SACEP.

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7.8 LET US SUM UP

- Environmental Education offered by the formal education sector plays a very important role with regard to the education and awareness of younger generation of the society by exposing them to the diverse issues related to the conservation and protection of environment.
- Environmental education is a lifelong process essential for welfare of mankind and development of the society. Therefore, it is designed for any age group participating in social, economic, cultural development of the communities.
- Some major activities undertaken under the non-formal environmental education activities include awareness through various informal agencies of education, organisation of environmental awareness and extension programmes and awareness through mass-media.
- Most of the governmental bodies involved in environmental studies in India are either put directly under the administrative control of, or assisted by the Ministry of Environment, Forest and Climate Change, Government of India (MoEFCC). There are 19 Regional Offices of the Ministry throughout the country covering all the states and union territories, 7 sub-ordinate offices, 5 autonomous organisations, 4 authorities or tribunals, 4 boards and 1 institute.
- Non-Government Organisations (NGOs) are very effective agent as far as environmental education is concerned. They have the advantage over Governmental agencies as they are in direct contact with the general masses.

- There are many NGOs working at various levels - international, national, state and even local levels to make people aware of the environmental issues.
- State level well-known NGOs of Assam discussed in this unit are - Assam Science Society (ASS), Kaziranga Wildlife Society (KWS), Nature's Bacon, Centre for Environment Education, North East (CEE, NE), Aaranyak and ENVIRON
- There are many important international bodies involved with different areas of environment, forestry, wildlife and other relevant aspects of environment.



7.9 FURTHER READING

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7.10 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: The term formal agencies of environmental education implies the educational institutions, such as, schools, colleges, universities, and other professional bodies which provide formal environmental education following a well-defined and systematic curriculum.

Ans to Q No 2: Ministry of Environment, Forest and Climate Change, GOI,

was formerly known as Ministry of Environment and Forest, GOI. The Ministry interacts with the NCERT for school level environmental education curricula.

Ans to Q No 3: Agencies of non-formal environmental education include various community-based groups, service organisations, government and non-government agencies, boys' and girls' clubs, parks and reserves, state and national forests, residential centres, nature centres, zoos, museums, scouting organisations, etc

Ans to Q No 4: National Environmental Awareness Campaign (NEAC)

Ans to Q No 5:

i. Ministry of Environment, Forest and Climate Change
ii. 19
iii. National Centre for Sustainable Coastal Management
iv. National Environmental Engineering Research Institute

Ans to Q No 6: Five of the well-known national level environmental NGOs of India are: (i) Centre of Environmental Education (CEE), (ii) The Energy and Resources Institute (TERI), (iii) CPR Environmental Education Centre, (iv) Centre for Science and Environment (CSE) and (v) World-Wide Fund for Nature (WWF), India.

Ans to Q No 7: Five of the well-known state level environmental NGOs of Assam are: (i) Kaziranga Wildlife Society (KWS), (ii) Nature's Backon, (iii) Aaranyak, (iv) CEE, NE and (v) ENVIRON

Ans to Q No 8: Assam Science Society basically works for the popularisation of Science and Mathematics throughout the state of Assam by publishing various types of literatures in Assamese language, organising workshops, popular talks, seminars, exhibitions, symposiums, talent search competitions, etc. Further, the society also imparts environmental education and training to both teachers and students through camps and conduct surveys on environment.

Ans to Q No 9: Five of the important international environmental organisations are: (i) United Nations Environment Programmes (UNEP), (ii) International Union for Conservation of Nature and Natural Resources (IUCN), (iii) Environment Protection Agency (EPA),

(iv)World Commission on Environment and Development (WCED) and (v) Earth Watch Programme (EWP).

Ans to Q No 10: The full form of SACEP is South Asia co-operative Environment Programme. The member countries of SACEP are: Afghanistan, Bangladesh, Bhutan, India, Iran, Pakistan and Sri Lanka.



7.11 POSSIBLE QUESTIONS

A. Short Questions (Answer each question in about 150 words)

Q 1: What is meant by the term formal agencies of environmental education? Name the organisations involved with the framing of environmental education curricula at various levels of formal education system.

Q 2: "Environmental education is not only limited to students belonging to formal education system" - explain.

Q 3: Mention some of the agencies of non-formal environmental education. What type of major activities are generally undertaken by the agencies of non-formal environmental education?

Q 4: What is the full form of MoEFCC? Write the board objectives of MoEFCC.

Q 5: Mention the various sub-ordinate offices, autonomous organisations, tribunals, boards and institutions working under the Ministry of Environment, Forest and Climate Change, GOI.

Q 6: How do the Non-Government Organisations have advantages over the Government Organisations in connection with environmental education of general people? Explain.

Q 7: What is the full form of TERI? Write briefly about its activities in the field of environment.

Q 8: Write a short note on Narmada Bachao Andolan.

Q 9: Write shortly on any two of the well-known state level environmental NGOs of Assam.

Q 10: What is the full form of UNESCO? State the activities of UNESCO.

B. Long Questions (Answer each question in around 300- 500 words)

Q 1: Discuss in detail the agencies of formal and non-formal environmental education.

Q 2: Write a note on the role of Ministry of Environment, Forest and Climate Change (MoEFCC) with regard to the environmental education in the country.

Q 3: Discuss any five of the noted environmental NGOs working either at the national level or at the state level of Assam with special focus on their activities related to environmental issues.

Q 4: Discuss some of the important international bodies working in the field of environmental issues.

Q 5: Critically evaluate the role of Non-Government Organisations in raising environmental awareness among the common masses. Write from your own point of view.

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UNIT 8 : MEDIA OF ENVIRONMENTAL EDUCATION

UNIT STRUCTURE

8.1 Learning Objectives

8.2 Introduction

8.3 Concept of Instructional Media

8.4 Magazine

8.5 Seminar

- 8.5.1 Steps for Organising Seminar
- 8.5.2 Advantages of a Seminar

8.6 Workshop

- 8.6.1 Functions of Workshop
- 8.6.2 Procedure for Organising Workshop
- 8.6.3 Advantages of Workshop

8.7 Exhibitions

8.8 Models

8.9 Audio-visual Aids

- 8.9.1 Educational Radio
- 8.9.2 Educational Television
- 8.9.3 Educational Films

8.10 Let Us Sum Up

8.11 Further Reading

8.12 Answers To Check Your Progress

8.13 Possible Questions

8.1 LEARNING OBJECTIVES

After going through this unit you will be able to -

- discuss the concept of educational media
- explain how a magazine can be used as a medium of environmental education
- acquaint yourself with the procedure for organising a seminar and workshop

- describe how exhibitions and models can be used for teaching purpose
- discuss the role of audio visual aids for environmental education.

8.2 INTRODUCTION

In Unit 1 of this course you have studied the concepts, objectives, scope and methods of teaching environmental education. You have understood that the basic objective of teaching environmental education is not simply to study the environment but to generate the concerns for the environmental related problems. As such, the activities which can create concerns for the environment related problems should be inculcated through different forms of education. For this, we can take the help of media as channels of education to disseminate information in the classroom as well as among the common people (masses) and thereby make the educational programmes more effective and meaningful. This unit deals with different types of media that can be used effectively in the teaching learning processes of environmental education.

8.3 CONCEPT OF INSTRUCTIONAL MEDIA

The use of instructional media is an essential component in the teaching learning process. It contributes to the efficiency as well as effectiveness of the teaching learning process. Media is a supplementary devices by which the teacher, through the use of more than one sensory channel, can clarify concepts, establish and correlate accuracy, interprete and appreciate. It increases knowledge, arouses interest and enriches the imagination of children. Different media serves different functions. Media may be classified into two general categories:

(i) Print media and

(ii) Non print or modern electronic media

The print media include books, newspapers, magazines etc. Print media is the most important medium in the mass education scheme. The chief advantage of print media is that it is adaptable to many different learning

environments. Besides, it is economical and is traditionally used for pedagogical purposes. But the biggest disadvantage is that it demands the skills of literacy.

While, the non-print media include different audio-visual aids like the radio, television, computer, films etc, mass media education is now largely dependent on electronic media which facilitates diverse learning objectives. They can cater to individual needs and thus reduce the burden of a teacher.

Besides the print and non print media, there are some other methods like seminars, workshops, symposia etc. which are often used by teachers. In the following sections of this unit, we will discuss some of these media through which environmental education can be taught in a more effective way.

8.4 MAGAZINES

We know that a newspaper brings all the happenings of the world within the reach of the public. It is a very effective instrument for influencing the mind of the general public and mould public opinions. Along with the newspapers, popular magazines can also serve as a means of education for enhancing the horizon of knowledge of the general public regarding environmental education.

A magazine unlike a book is published periodically in a series, i.e., weekly, fortnightly, monthly, yearly etc. A magazine differs from a newspaper also. The reporting of day-to-day happenings is not the main concern of a magazine. Its main objective is to inform, instruct and entertain through comments on chosen news and features on subjects of interest. Articles related to environment, education, economics, religious, social and cultural matters are regularly published in a general magazine. All these have a great educative influence upon the people in general and students in particular.

From the point of view of environmental education, a magazine may create awareness among the masses by publishing series of articles on problems on environment, conservation of wild life, environmental pollution

and degradation, deforestation and aforestation etc. Thus, a popular magazine serves a great purpose as educators of the masses.

A school or a college magazine is similarly an important part of the social life of the school or college. It creates a literary atmosphere and both encourages and develops writing habits among the student community. Every educational institution should have a magazine for the development of literary abilities of the students. The magazine should be properly planned and published under the supervision of teachers. A magazine can be a very effective instrument in-

- enriching the learner with news about the outside world, heritage and culture of the society he or she lives in;
- spreading messages of environmental education;
- fostering moral and spiritual values among the students;
- providing the means of proper utilisation of leisure time;
- developing national and international understanding and
- acting as the source of entertainment by exposing the children to puzzles, riddles etc., which are also helpful to develop critical thinking and reasoning power.

Thus, magazines are very important media which are read and reread and circulated or stored away for further reference.

8.5 SEMINARS

A seminar is both a method and a medium of teaching. In conventional lecture methods, the interaction flows from the teachers to the learners in an un-directional manner. But, in a seminar, each member of the group, whether he is a teacher or a student, has the scope to interact with each other. Overt verbal interaction among the members of the group is a must for all the participants in a seminar. A lecture may be good or bad depending on the skill of a teacher. Similarly, interaction sessions of a seminar also require skillful display on the part of a teacher in its organisation and conduct, if it has to achieve the objectives for which it is organised.

8.5.1 Steps for Organising Seminar

(i) Identifying the Theme: For a seminar, generally the theme of discussion and its objectives are announced in advance so that the participants who want to participate can prepare for it, gather their thoughts, collect data etc. For e.g. to organise a seminar on environmental education, the theme may be selected as—"Role of education in creating environmental awareness." The subthemes of the seminar may be classified as:

- Environmental degradation
- Preservation of bio-diversity
- Global warming
- Climate change
- Destruction of tropical forest etc.

(ii) Motivating the participants: The authority can request the participants to prepare papers which can be presented and submitted to the organisers much before the seminar starts. In other words, they should try to involve the participants and make them think and feel about the topic before the actual discussion starts. Involvement and motivation thus allow each of the participants to share his or her views without fear.

If it is a class seminar meant for students, paper presentation should be made mandatory. If the students are not aware about how to write or prepare a seminar paper, the teacher should help them out.

(iii) Notification: Advance intimation of date, time and venue will help the participants not only to get the paper ready on time but also to get psychologically set for the occasion. Notifications also help the participants to do their homework and come prepared for the session. It increases not only the quality of presentation but also the quality of participation.

(iv) Circulation of write ups: Advance circulation of write ups help to ensure that enough time is provided for study.

Participants can give independent thoughts to the content of the write ups and concretize their reactions to it, clarify the doubts, if any, consult others who have expertise and so on. This increases the quality of participation in a seminar.

8.5.2 Advantages of Seminar as a Medium of Environmental Education

Seminars are essential and suitable for developing higher cognitive abilities like application, analysis, synthesis, evaluation, problem solving and decision making. Its advantages may be summarised in the following manner:

- A general seminar provides the opportunity to assemble a good number of experts from different fields of education and various aspects of environment, and may help in finding some methods to tackle the problems.
- The students can present their thoughts clearly, concisely and logically in an academic setting which may prove very effective and can create tremendous impact on managing the environmental problems at the local or regional level.
- By participating in a seminar one can learn how to work in small groups and make the people aware about how to save the environment.
- A school seminar of students and teachers can play a very important role in influencing the young minds on how to behave responsibly to save the environment and follow healthy practices, to control pollution, to save water, to recycle waste material, to use natural resources judiciously and so on.



CHECK YOUR PROGRESS

Q 1: What is meant by the term media?

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Q 2: Name the types of media you are aware of.

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Q 3: How does a magazine differ from a newspaper?

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Q 4: What are the functions of a school magazine?

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Q 5: What are the steps for organising a seminar?

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Q 6: What are the issues a school seminar should take up?

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8.6 WORKSHOP

A workshop is an interactive form of learning, where students work in groups, usually as part of a specific set of task. The term workshop has been borrowed from the engineering field. In workshops, the participants have to do some hands-on activities to produce something.

Workshop is one of the main techniques used in higher learning. This method relies heavily on the involvement of the learners in formulating or constructing knowledge through small groups and individual explorations. Workshop method is very useful in teaching environmental education. Workshop may be organised on areas like controlling environmental pollution, plantation, awareness campaign to improve man and environment relationship, appraisal of existing environmental conditions etc.

Every workshop is organised to achieve certain objectives. These objectives are related to cognitive and psychomotor aspects. In the cognitive objectives attempts are made to provide knowledge on theoretical aspects. Psychomotor objectives are related to practical aspects like skill development

to perform a task independently, to train persons for using different techniques, approaches etc.

8.6.1 Functions of Workshop

(i) Workshop is used to seek, explore and identify the solution of a problem, to permit extensive study of a situation, its background and social implications.

(ii) It is used for giving awareness and training of new practices and innovations in different fields.

(iii) It provides an opportunity to prepare specific professional, vocational or community service functions.

8.6.2 Procedure for Organising Workshop

The procedure for organising workshop can be divided into two phases—pre-active and active. The steps of both the phases are as the following:

Pre-Active:

(i) Define the goals: Every workshop must have a goal. Without a clear goal, there is no point in getting people together.

(ii) Decide the target group: Decisions regarding the target group is very important because it directly relates to the objective. It is expected that workshop participants contribute actively to the workshop discussion and tasks.

(iii) Points to be discussed: A list of the main points for discussion should be prepared. These points should break down into details. Time allotment for each exercise should be fixed.

(iv) Develop a follow-up plan: The only way to find out if the workshop was a success is to have an effective follow up plan.

Active Phase:

(i) In the first stage, the theme is presented to the participants. A resource person or expert provides the theoretical and practical aspects of the theme. The participants are given opportunities

to seek clarification.

(ii) In the second stage, the group is divided into small groups. The groups are formed on the basis of subjects, topics. An expert provides guidance for the work to be performed. Every group has to work independently and complete the task within the given time.

(iii) At the round up of the workshop, the representative of each group will be asked to present the findings. Following the presentation by all the groups, the workshop participants discuss the findings. The participants are given opportunities to comment and give suggestions. Finally, the report of the workshop is prepared by adding or eliminating points.

8.6.3 Advantages of Workshop

- Workshop can be used to realise the higher cognitive and psychomotor objectives.
- The workshop method enables the learner to explore or master relatively abstract ideas.
- It can be effectively used for developing understanding and proficiency for different practices of education.
- It also provides opportunities and situation to develop individual capacities of a teacher.
- It develops feelings of cooperation, group work, and team spirit.
- It focuses on participatory approach, small group activity, problem solving etc. As a result, because of the 'active' nature of experiences, a large number of learners are motivated to participate and learn.

8.7 EXHIBITIONS

In exhibitions a group of objects and materials are displayed according to a deliberate plan. The exhibitions that are arranged in schools are usually planned to communicate something to parents, public and students.

Through exhibitions environmental issues and problems can be highlighted. It can be displayed with the help of still pictures, illustrations, charts, maps, models, diagrams, etc. A well designed exhibition may act as a motivating and vitalizing factor for actively participating in environment improvement and protection.

Exhibition should be an annual affair of the school and the idea of holding an exhibition should be planned at the beginning of the year. Teachers must guide and lead the pupils in the preparation of possible exhibits. Subject-wise arrangements of the items and effective labeling are very important.

The following points should be taken into consideration while arranging objects of exhibition –

- Too many exhibits should not be kept crowded in a room.
- The exhibits must be kept in a well-lighted place.
- It is better to put one single idea in an exhibit.
- Labels should be short and simple, easily understood.
- Explanations for the exhibits must be brief as far as possible.
- Colourful and moving exhibits attract attention of the people.

The Values of exhibition can be listed as the following (Sampath, 1987) :

(i) It is one of the effective modes of mass communication and instruction on a large scale.

(ii) Self activity is fostered on the part of those who take part in the exhibition. Special talents become known and creativity is fostered.

(iii) The outcomes of different activities and processes are very well understood by pupils.

(iv) Pupils learn the art of expression while explaining exhibits and they become good at expressing themselves.

(v) Team spirit is encouraged as an exhibition is a co-operative effort.

(vi) Values like a vocational value, aesthetic value, cultural value, disciplinary value and ethical values are realised in the conduct of an exhibition in varying degrees.

(vii) Parents and visitors can have an idea of the work turn out by the pupils and as such it fosters parent – school contacts.

8.8 MODELS

Models are substitutes for the real objects. Models are used for teaching because due to several reasons it may not be possible to bring the real objects to the classroom. The real objects may be too large or too small to be seen for a group of students.

Models are the replicas or copies of the original object. It is a three-dimensional representation of a real object. Models are concrete objects to explain clearly the structure or functions of real things. Models may be working or static. A working model attracts immediate attention and serve as motivation to learn.

Preparation of different models could form a topic for project work. It is necessary to create interest in creative activity in children. For preparation of models, several types of materials, such as, cardboard, plastic, clay, thermocole, plaster of paris, wood, metal etc. are used.

The use of models for teaching purpose is highly effective because it serves the following purposes—

- Models simplify reality. As they are three dimensional, they evoke greater interest.
- It helps to explain clearly the structure and functions of the original object.
- Models enable to reduce or enlarge objects to an observable size.
- A model can provide correct concepts of a large industrial unit or even a larger machine.
- A working model attracts the attention of students easily and stimulates interest which could be utilised to the fullest advantage.
- Model preparation develops creative ability of the students. Any student constructing a model will definitely learn more than what he will learn if exposed to a similar model prepared by a teacher, because of the direct experience involved.

In environmental education, a number of projects for preparing models can be assigned to students in school situations, such as—making herbarium, making models of domestic and wild animals, mountains, course

of a river etc. Thus, the teacher can sensitize the students for improving the quality of environment by preparing models of different objects which are related to environment.



CHECK YOUR PROGRESS

Q 7: What is a workshop?

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Q 8: Mention the necessary steps of a workshop in pre-active phase.

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Q 9: List the points necessary for arranging exhibits for exhibition.

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Q10: List five values of an exhibition.

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Q 11: In what way can models be effective in teaching?

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8.9 AUDIO-VISUAL AIDS

Audio-visual aids or technological media are instructional devices which can be heard as well as seen. The aim of teaching with technological media is to clear the channel between the learner and the things that are worth learning. It helps in completing the triangular process of learning, i.e., motivation, clarification, and stimulation. Audio-visual aids provide significant gains in informational learning, retention and recall, thinking and reasoning, activity, interest, imagination and better assimilation of ideas (Aggarwal, 2005). Let us discuss some of the audio-visual media which can help in learning about environmental education in a more effective way:

8.9.1 Educational Radio

The Radio has been playing a vital role in the field of communication since its origin. It works with sound only but has the power to stimulate values, stir imagination and to increase knowledge and understanding. Radio is a powerful medium for mass communication. Communication from any part of the world to any other place, however remote it may be or wherever located, is possible through radio.

The radio also plays a major role in imparting instruction to the school children. This type of broadcast is known as educational broadcast which are made during specific days at specific school hours, mainly for the benefit of the educational institutions. These broadcasts are on curricular subjects based on the prescribed syllabus. Educational broadcasts considerably help the teacher to supplement his classroom instruction. But, to get the maximum benefit the teacher should prepare his students to listen to a specific broadcast and also prepare a suitable follow up work for consolidation.

Environmental education can be given through radio broadcasts. To make a programme for radio broadcast the following steps should be taken:

- The subject expert should choose the topic according to the course content prescribed for the students.
- The objective of the lesson should be clearly defined.
- The expert should prepare lessons in such a way that all concepts can be easily understood by the students through listening.
- Presentation of the lesson should be made attractive.
- Lessons on environmental education can be easily broadcasted in the form of questions and answers, where the subject experts and the students both come together and discuss the subject.
- A radio broadcast once recorded can be retained in the library and can be repeatedly aired whenever needed.

Merits:

- Radio is a popular media. It is less expensive as compared to other means and is available throughout the country.
- Radio helps in the development of both formal and non formal education.
- As an agency of adult education, radio is of immense importance for a nation. Through radio programmes many illiterate adults of the rural areas have been made literate.
- To spread awareness among the people, through programmes on health and hygiene, agriculture, environmental education etc., radio programmes are very helpful.
- Radio programmes can be prepared in the local languages according to local needs and background of the people.
- Radio broadcast can be listened to even while one is doing some manual work. Distance learners can listen to programmes from wherever they desire to do so.
- Radio technology is comparatively cheap. Production of programmes is simpler compared to other electronic media.
- The programmes can be repeated whenever needed.

Limitations:

- Radio broadcast is a one way communication. The educational value of radio broadcasting depends on the sense of hearing.
- As there is no face-to-face interaction between the listener and the broadcaster, if the student does not understand some concepts, it cannot be immediately clarified.
- It may not be an effective medium for all types of subjects, especially for the subject which need demonstration, visual illustration etc.
- The broadcasting time of educational radio programmes may not be appropriate or convenient to the learners as they have to make themselves available during the scheduled time whatever might be their engagement.
- In a country like India, the educators have to plan programmes

for the heterogeneous audience like illiterates, school drop-outs, unemployed etc. Therefore, it becomes difficult to produce a radio programme of common utility.

8.9.2 Educational Television

Television is one of the major means of mass communication. Unlike radio broadcast, where only the sound is transmitted, television transmission has the added advantage of visual experience which has made it more dynamic and meaningful. It has revolutionized the lives of people in the world and has become a major source of information and entertainment for a large number of our people. Next to home and school, television has a more profound influence on the education of a child.

Educational Television (ETV) is a system that presents learning contents in various subjects produced by an agency. It includes programmes whose primary purpose is to educate rather than entertain. ETV generally includes instructional television and non- commercialised television programmes. Instructional television includes programmes which are related directly to organized programmes of formal instruction as well as continuing education.

Advantages of Educational Television

- Television is the most potent instrument for educating the masses. India is large country with varied climatic conditions, a large and ever growing population and vast tracts of inaccessible remote locations. Television as a mass media can play a major role in the educational set up of our country.
- Television reduces dependency on teacher. The students can learn from television with their own efforts and they need minimum help from teacher.
- ETV makes educational opportunities equal throughout the country. The students in the rural and backward areas of the country can get the same quality education as their counterparts in the urban areas.

- If television is used in a large scale, it can provide education throughout the country at a minimum cost.
- Different problems of environmental education can be presented nicely through a television programme. It may also be used for developing awareness about the environment among the common people.
- Educational television can be used for the in-service training of teachers in non-school hours. NCERT is telecasting their programmes per week for the teachers to improve their skills.
- It brings live demonstration of objects, events and natural disasters like earthquake, tsunami, volcanic eruptions etc. to the classroom immediately after they occur.
- It saves time and effort as no special classroom preparation like a dark room, projection equipments etc. are necessary for telecasts.

Limitations:

- Television is essentially a one-way communication from teacher. It does not provide the facility of interaction or discussion, and hence does not provide for immediate feedback on learners' reactions, queries or doubts.
- The cost of teaching by television is more than normal classroom instructions unless it is used to teach a large number of students at a time.
- Individual differences of students are not taken into consideration in a TV lesson.
- Instruction through TV is not learner centered and lessons are not flexible.
- Due to the absence of a uniform syllabus, absence of trained teachers, suitable timings etc. there are difficulties in building television as a part and parcel of classroom instruction.

8.9.3 Educational Films

A film is a multiple media of communication. It presents the facts in a realistic way. Educational films can create a very powerful influence in the minds of children. Therefore, it may be used for communication of ideas, attitudes, scientific knowledge and experiences to the students. It is a very effective medium of both formal and non-formal education.

The films put before us the learning situations which look quite real and actual. A film on environmental pollution can be prepared to inculcate ideas about different sources of pollution and how to minimise them. A number of films on different aspects of environmental education, such as— inter-relation of plants and animals with their environment, environmental degradation, hazards, disaster etc. can be prepared to educate people about the environment.

Educational films motivate teaching as the child may take great interest in that. It is very difficult to give an adequate idea of a mountain, ocean, desert etc. to a child. The film is a wonderful medium for this. It can bring the ocean, the mountains, the deserts all into the class room or auditorium and create a vivid picture in the minds of the learners.

Educational films are specially planned to achieve certain educational objectives and are made in specific subject areas for teaching purposes. These films can be background films or direct teaching films. They help to promote a skill, an attitude or to convey certain facts, information, phenomenon or theory.

Role of a teacher in using films as a media:

(i) The teacher selects the Film: The teacher should take care to select a film which would help him to realise his objectives. It should be integrated with other learning experiences he/she is providing. For that, he should select the best film available and must be familiar with the content of the film.

(ii) **Arrangement of the Screening:** The teacher should make proper seating arrangement, check lighting, and ventilation, and test the projector of the film, in advance.

(iii) **Preview Film:** The teacher should go through the instructional manual and guidebook, which accompany the film. He should prepare the students by providing the necessary background information and keep the student ready.

(iv) **Presenting the Film:** The film should be presented at the right moment integrating it with classroom teaching. If necessary, the screening could be stopped to just recapitulate in between. At the end of the film, a brief conclusion with the students interaction should be conducted.

(v) **Evaluation and Feedback:** There should be immediate evaluation, either oral or written feedback. The teacher should immediately correct the misconceptions or errors, if any, in the light of the information obtained from the students.



CHECK YOUR PROGRESS

Q 12: Audio-visual aids are devices which can be ..... as well as .....

Q 13: Radio has been playing a major role in the field of .....

Q 14: Radio broadcast is a ..... communication.

Q 15: State five advantages of radio broadcast.

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Q 16: What is educational TV?

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Q 17: List the limitations of ETV.

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Q 18: A film is a ..... media of communication.



8.10 LET US SUM UP

- This unit has dealt with different types of media.
- Media is an essential component of teaching learning process.
- There are mainly two types of media i.e. print and non print media. There are some other Medias also like seminar and workshop.
- A magazine is a non print media which is very effective in influencing the general public.
- Articles related to environment education, social and cultural matters are regularly published in a magazine.
- A school or college magazine creates a literary atmosphere and encourages the writing habit among the students.
- A seminar is both a method and a medium of teaching. In a seminar, every member of the group finds a scope to interact with each other. To organize a seminar, one should identify the theme first and motivate the participants to participate and share their views with others. Seminars are essential for developing higher cognitive abilities like application, analysis and synthesis.
- A workshop is an interactive form of learning. It gives importance on the involvement of learner in formulating or constructing knowledge through small groups and individual explorations.
- In exhibitions different objects are displayed according to a deliberate plan. Through exhibitions environmental issues can be highlighted. A well designed exhibition may act as a motivating factor for actively participating in the improvement and protection of the environment.
- Models are three-dimensional representation of the real thing which is very helpful to explain the structure and functions of original things. It simplifies reality and evokes greater interest. It is helpful in providing correct concepts. Model preparation develops creative ability of the students.
- Audio visual aids are instructional devices which can be heard as well

as seen. It helps in completing the triangular process of learning, i.e., motivation, clarification and stimulation. Radio plays a major role in imparting instruction to school children.

- School broadcasts should be on curricular subjects based on prescribed syllabus. Radio helps in the development of both formal and non-formal education.
- Educational television presents the learning contents in various subjects. TV is the most potential instrument for educating the masses. The students in the rural and backward areas can get the same quality education as their counterpart in urban the areas.
- A film is a multiple media of communication. It presents facts in a realistic way. Educational films motivate teaching. Films are specially planned to achieve certain educational objectives.
- The teacher should take care to select a film which would help him to realise his objectives.



8.11 FURTHER READING

1) Aggarwal, J. C. (2005). *Essentials of Educational Technology: Teaching Learning*. New Delhi: Vikas Publishing House.

2) Sampath, K et al. (1987). *Introduction to Educational Technology*. New Delhi: Sterling Publishers.

3) Shrivastava, K. K. (2004). *Environmental Education: Principles Concepts and Management.* New Delhi: Kanishka Publishing and Distributors.



8.12 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Medias are supplementary devices through which the teacher uses more than one sensory channels to arouse interest, clarify concepts and enrich the imagination of the students.

Ans to Q No 2: Print media and non print media.

Ans to Q No 3: Newspaper reports day-to-day happenings. But, the main objective of a magazine is to inform, instruct and entertain through chosen news and features on different subjects.

Ans to Q No 4: To foster moral and spiritual values, spread messages of environmental education, to develop national and international understanding and to act as a source of entertainment.

Ans to Q No 5: Identify the theme, notification, motivating the participants and circulation of write up during the seminar.

Ans to Q No 6: Health awareness, plantation, gardening, preservation of bio dervisity etc.

Ans to Q No 7: A workshop is an interactive form of learning where students work in groups to perform a specific task.

Ans to Q No 8: Define the goals, decide the target group, shortlist the points to be discussed, develop a follow up plan.

Ans to Q No 9: Too many exhibits should be avoided in a single room, place should be well lighted, single idea in an exhibit and label should be short and simple.

Ans to Q No 10: It is effective mode of communication, creativity is fostered, pupils can learn the art of expression, team spirit is encouraged and different values are realised through exhibition.

Ans to Q No 11: Models simplify reality, evoke interest, provide correct concepts and model preparation develops creativity.

Ans to Q No 12: heard, seen

Ans to Q No 13: communication

Ans to Q No 14: one way

Ans to Q No 15: It is less expensive, useful for both formal and non formal education, spread awareness among the people, programmes can be prepared in the local language and it can be repeated whenever needed.

Ans to Q No 16: ETV is a system that present learning content in various subjects produced by an agency.

Ans to Q No 17: It is essentially a one way communication, the cost of teaching is more, individual differences are not taken into consideration, lessons are not flexible etc.

Ans to Q No 18: multiple.



8.13 POSSIBLE QUESTIONS

A) Short Questions (Answer each question in about 150 words)

Q 1: What are the advantages and limitations of educational television as a medium of mass-awareness?

Q 2: What are the procedural steps for organizing exhibition? Discuss.

Q 3: Why do you think that educational films play the dominant role for creating awareness among the masses in a society?

Q 4: Discuss the need and importance of Model for an effective teaching.

B) Short Questions (Answer each question in about 300-500 words)

Q 1: What is a seminar? State briefly the steps for organising a seminar. What are the advantages of a seminar as a media?

Q 2: What are the functions of a workshop? Is it an appropriate media for environmental education?

Q 3: Explain the steps that should be taken to prepare audio programme. Discuss the merits and demerits of radio broadcasts.

Q 4: Discuss the role of television as a medium for educating the masses.

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UNIT 9 : CHALLENGS OF ENVIRONMENTAL EDUCATION

UNIT STRUCTURE

9.1 Learning Objectives

9.2 Introduction

9.3 Problems of Environmental Education

9.3.1 Specific Environmental Problems in Assam

9.3.2 Prospects of Environmental Education

9.3.3 Provisions of Environmental Education in Assam

9.4 Let Us Sum Up

9.5 Further Reading

9.6 Answers To Check Your Progress

9.7 Possible Questions

9.1 LEARNING OBJECTIVES

After going through this unit, you will be able to -

- identify the problems of Environmental Education
- explore the prospects of Environmental Education
- explain the need of Environmental Education in Assam
- discuss the problems of imparting Environmental Education in Assam.

9.2 INTRODUCTION

Environmental Education, in its broader perspective covers a wide variety of elements, things, matters and beings from the biosphere or the eco-system. The term bio-sphere is the combination of two terms, viz. bio and sphere. The term bio originated from the Greek term *bios*, which means human life. Similarly, the term sphere also originated from another Greek term *sphaira* which means a globe or ball. Hence, in brief the term biosphere means the portion of the earth occupied by living organisms.

Man has always been dependent on the environment. Initially, when the size of the population on earth was small and limited resources were required to satisfy their needs, human activities did not severely affect the environment. But, the gradual increase of population on earth led to over exploitation of nature and its resources to such an extent that the natural balance of our environment got destroyed. Environmental problems across the world have reached such a stage that the entire human race has come under serious threat from environmental problems. It was being gradually realized that educating people about environmental problems and the issues related to the effects of their actions against the environment, is of grave importance. This realization of mankind led to the emergence and development of the concept of environmental education. This unit introduces you to the challenges of Environmental Education by discussing its problems and prospects with special reference to Assam.

9.3 PROBLEMS OF ENVIRONMENTAL EDUCATION

The importance and necessity of Environmental Education has been increasingly realized at the local, national and the international level. Although there are specific problems in the implementation of Environmental Education our attention may be focused to the following points-

- Environmental Education is a subject-matter which is comprehensive in nature. It comprises variety and multiplicity of elements and constituent components. This has created a problem in designing courses for Environmental Education.
- Success of any scheme of education always depends on the quality and performance of teachers concerned. One of the problems related to Environmental Education is the lack of proper training of the teacher.
- Environmental Education is a multi-disciplinary and inter-disciplinary subject. It calls for **unprecedented** collaboration in teaching which is difficult to achieve practically.
- Environmental Education programmes require certain infrastructure facilities, but in Assam there is a dearth of these facilities. This has caused some problem in imparting Environmental Education in Assam.

- Curriculum load for students is another problem of Environmental Education. The curriculum load for students is so heavy that it leads to mental stress among the students. Such overcrowded curriculum prevents the schools from introducing more field based activities on environment for their pupils.
- Though Environmental Education has been made compulsory in our country, the sense of urgency required for the **restoration** of environmental balance is lacking among pupils, teachers and all the concerned stakeholders.
- At present, the study of any specialised subject is largely influenced by the scope provided for the employment avenues to students. Unless Environmental Education as a subject is made job oriented, the students are unlikely to be motivated for its higher study and research.
- There has been very limited research in the field of Environmental Education in India and in Assam particularly.
- Lack of political will and government priorities for Environmental Education have been the major problems. Environmental Education in our country gets least priority because other developmental and educational aspects become more important for the government.
- Environmental Education projects and activities require the involvement of large amount of funds and supply of suitable materials.
- Lack of timely information relating to the environment is another problem of environmental education in India and in Assam. There is lack of co-ordination and communication among the different agencies involved in the task of collection and management of data and information on the environment.
- There is a shortage of properly trained education officers in the government to make plans, organize and implement activities and supervise environmental education in schools. This has created problems for the implementation of the environmental education programme.

9.3.1 Specific environmental problems in Assam

Assam is better known for its rich natural environmental potentials and resources. We have the enviable position so far as the state's water resources, forest resources, mineral resources and power resources are concerned. In spite of the abundance of the natural resources, the people and the state as a whole remain economically poor, backward and industrially under-developed. The obvious reason is that the natural resources of the state could not be effectively utilized owing to the lack of man-power resources and many other reasons. In the previous section we have discussed some of the problems faced by environmental education. Our state Assam has been facing some peculiar problems in the field of environmental education in addition to the problems discussed above. Our immediate attention needs to be drawn to the following problems-

- **Rapid growth of population**

  Growth of population in Assam is said to be unusually high that has a terrible effect on the natural resources. The total population of Assam, as per 2011 census is 31,205,576 of which 15,939,443 are male and 15,266,133 are female respectively. The population of Assam forms 2.58 percent of India in 2011.

- **Large scale migration and infiltration**

  It is an established fact that there is large scale infiltration of foreigners from the neighbouring country like Bangladesh. This infiltration is quite instrumental not only in the destruction of the natural resources, but also in the change in the demographic pattern of the indigenous people of the state.

- **Destruction of the forest resources**

  Assam's valuable forest resources are fast deteriorating due to desperately cutting down of trees and smuggling out of the woods outside the state in convenience with the forest officials.

- **Unplanned growth of industries**

  Industrial growth in Assam is on the rise but has been taking place in an unplanned way. As such, it has created the problem of air, water and soil pollution and degradation at a large scale.

- **Problem of the automobiles**

  In the city areas, more particularly in the Metropolitan city of Guwahati, automobile problem is assuming a greater dimension. It is creating air and noise pollution in the densely populated areas of the city, endangering physical health and hygiene of the people.

- **Solid Waste problem**

  Owing to irresponsible behaviour of the high standard of living in the cities, solid waste and garbage problem have become very critical. It causes harmful effect of air, water and soil pollution endangering people's health and hygiene. Poor drainage system creates the problem of water-logging, resulting in artificial flood in the city like Guwahati.

- **Flood and erosion**

  Another nature-made serious environmental problem in the state is that of flood and erosion. It causes heavy loss of life and property during the summer season every year. The Central government was urged to declare flood and erosion of the Brahmaputra River a national problem.

- **Man-animal conflict**

  A typical environmental problem has been created in Assam owing to conflict and confrontation between men and animals like tigers and elephants, resulting in the death of one or the other in the recent years. Deforestation, blasting of the rocks, and consequently gradual contraction of the forest areas has compelled the wild animals to come out of their natural habitat and destroy human life and property.

- **Unauthorized cutting and grabbing of land**

  With the explosion of human population in the city areas cutting

the hilly land, filling of the marshy land, and constructing unauthorized houses are common features. This has created the problem of land pollution and land erosion in the habitable areas.



LET US KNOW

The specific problem of environmental education are-

- Lack of trained teachers
- Lack of proper infrastructure facilities
- Too much of curriculum load
- Very limited research
- Lack of political will
- Lack of funds
- Shortage of properly trained education officers etc.

Apart from these, specific environmental problems with special reference to Assam are-

- Destruction of the forest resources
- Growth of the Industries
- Problem of the wild animals etc
- Use of Plastic Bags



CHECK YOUR PROGRESS

Q 1: Mention the specific environmental problems with special reference to Assam.

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9.3.2 Prospects of Environmental Education

Every new subject at its initial stage is likely to be confronted with certain organisational and instructional problems. Environmental education is also not an exception to this. But keeping in view possible impact on the welfare and wellbeing of our future generation, the

importance and prospects of this subject can be easily comprehended. Attention may be focused on certain vital issues of the world which are explained below:

- **Scope for developing and underdeveloped countries**

  It should be understood that environmental education is a subject closely associated with the problem of socio-economic development of both the developing and under-developed countries of the world and its people. These countries are confronted with the major problems like population explosion, illiteracy, cultural and religious conservatism, economic poverty and unemployment etc. that lead them to environmental pollution and degradation. Environmental Education is therefore an eye opener to most of the countries of the world in raising their grade and standard.

- **Realisation of the need of man's inter-relatedness**

  Environmental Education is a bold step towards the path of sanity and man's own behaviour towards international understanding. The UNESCO in 1970 has observed: "Environmental education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among men, his culture and his big physical surroundings." Environmental problem is a global problem. So, initiative taken by the international organizations like the UNESCO at the global level may definitely give a ray of hope to the developing and the underdeveloped countries of the world.

- **Strengthening of the ethical and moral values**

  Environmental Education urges men to apply their ethical senses, moral and aesthetic values to discipline themselves in their thought, activity and behaviour towards the environment in which they live and grow. The arousal of the moral senses among the people of different nations of the world through this education may indeed act as a moral booster to solve

many of the problems confronted by the whole world today.

- **Solution to Socio-Economic Problems**

  Environmental Education can ensure solution to the major socio-economic problems confronted by modern man in society. Solution to problems like population explosion, depletion of power resources, deforestation and destruction of man's natural habitat, pollution of air, water and land, landslides, global warming etc lie with the Environmental Education to the people. Socio-economic problems of a country cannot be solved unilaterally.

- **Maintaining health and hygiene**

  Environmental Education is at present related to the vital problem of keeping health and hygiene of people. Many of the serious diseases like cancer and formation of tumour etc, have been found to have originated from environmental pollution of air and water in the biosphere and stratosphere. It has therefore, thrown a formidable challenge to be met by modern men through the use of medical science. Environmental study provides scope for studying man's physiological science today at its higher level.

- **Providing scope for new creativity**

  Environmental education provides necessary scope and incentive to the creative genius in undertaking higher studies and research on various issues and problems relating to environment. Serious people can undertake higher studies and research on various environmental issues and problems. This education can infact, bring in the creative geniuses together to think, feel and act for a better life and environment for the future.

  The Indian Constitution too, has given adequate importance to environmental education and values -

  Article 48-A of Indian constitution states that -

  "The state shall endeavour to protect and improve the

environment and to safeguard the forests and wild life in the country"

Again, Article 51 (g) states that -

"It shall be the duty of every citizen to protect and improve the natural environment, including, forests, lakes, rivers and wild life and to have compassion for living creatures."

National policy on education, 1986 also highlighted the importance of Environmental Education in the following lines: "There is paramount need to create a consciousness of the environment. It must permeate all ages and all section of the society, beginning with the child environmental consciousness should inform teaching in schools and in colleges. This aspect will be integrated in the entire educational process."

Various commissions, reports and policies on education have been emphasising the need and importance of environmental education. Inspite of all these provisions, environmental education had not received proper attention and importance in our formal system of education until very recent times.

Assam is considered one of the bio-diversity hot spots in India. The state is gifted with plenty of natural resources. It is rich in floral and faunal bio-diversity spread in more than twenty wild life sanctuaries. But, lack of awareness regarding conservation and over exploitation of resources led to large scale destruction of forests and wild life in the region.

9.3.3 Provisions of Environmental Education in Assam

- **Role of the NGOs**

  Non-Government Organisation (NGO) working in different parts of the state may also effectively undertake organisational responsibility on creating environmental awareness. More particularly the NGOs like Save Guwahati and Build Guwahati (SGBG) has demanded the survey of hills, wetlands and plain lands of the Guwahati city. Some of these organizations like

Assam Science Society have their programmes of giving science education to people on environment. These organizations can act as a link between the government and the people in regard to environmental problem and their solution. The State government may offer financial assistance to the NGO's in promoting this education.

- **Agricultural Extension Education**

  The Agricultural University in the state can offer extension service to the rural agricultural people as a part of environmental education. The University may organize training centres in the agricultural areas of the state and give education to people in respect of the use of fertilizer, chemicals, conservation of soil and irrigation system etc. The government Agricultural Department may also offer necessary help and guidance to people in this regard.

- **Role of the Government**

  The department of environment and forest, Government of Assam, has made various provisions for conservation and protection of natural resources. It organizes activities like elephant festival, forest festival etc. to sensitize people about environmental issues and problems. The Govt. of Assam constituted **Pollution Control Board of Assam (PCBA)** with the purpose of protecting the environment and preventing and controlling pollution in the state. The Department of environment and Forest and the PCBA can play important role in bringing about environmental awareness and understanding among the people of the state.

- **Role of the University authorities**

  In the context of the present environmental degradation, this education to people is an urgent necessity in the state. The existing formal education has not given due attention to this area of education. Recognizing the basic need of its study, the Supreme Court in 2003, redirected all the states and

educational authorities to take steps to introduce environmental studies in all classes from 2004-05. The court asked the NCERT and UGC to frame model syllabus for environmental studies at school and College level respectively. Accordingly, Environmental studies have now become compulsory for all stages of education in our country.

- **Role of the Scientific Research Centres and Organizations**

  In Assam there are certain scientific research centres, organizations and institutions that are already playing the useful role in giving environmental education to the people. They are the Regional Research Laboratory (RRL) of Jorhat, Nalgahori Research Centre of Basistha, Regional Science Centre of Khanapara, Assam Voluntary Health Association, Assam Science and Technological Education Council (ASTEC) etc, are worth mentioning.



LET US KNOW

Provisions of Environmental education in Assam are-

- Role of the non-Govt. Organization
- Agricultural extension training centre
- Role of the environment and forest department
- Role of the University authorities



CHECK YOUR PROGRESS

Q 2: Briefly explain two provisions of Environmental Education in Assam.

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.....

Q 3: Write about the "Prospects of environmental education - Write within 50 words.

.....

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ACTIVITY 9.1

How can public awareness on environment be generated? Give your comments.

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9.4 LET US SUM UP

- Environmental Education covers a wide variety of elements, things, matters and beings from the biosphere or the eco-system. The term bio-sphere is the combination of two terms, viz. bio and sphere. The term bio is originated from the Greek term *bios*, which means human life. Similarly, the term sphere is also originated from another Greek term *sphaira* which means a globe or ball. In brief the term biosphere means those parts of the earth occupied by living organisms.
- Environmental Education is a programme dealing with the processes of the inter-relationship of man and his environment.
- There is no doubt that Environmental Education Programmes generates awareness and sensitivity. But such programmes may not be effective unless they do not focus on the necessary skills and attitudes of the people.
- Various problems affecting the present system of Environmental Education Programme may include - lack of trained teachers, lack of proper infrastructure facilities, too much of curriculum load, very limited research, lack of political will, lack of funds, shortage of properly trained education officers etc.
- The specific environmental problems of Assam are- rapid growth of population, large scale migration and infiltration, destruction of the forest resources, unplanned growth of industries, problem of automobile, solid waste problem, flood and erosion, man-animal

conflict, and unauthorised cutting and grabbing of land, etc.

- The Indian constitution has given adequate importance to environmental education and values:

  Article 48-A of Indian constitution states that –**"**The state shall endeavour to protect and improve the environment and to safeguard the forests and wild life in the country"

  Article 51 (g) states that -"It shall be the duty of every citizen to protect and improve the natural environment, including, forests, lakes, rivers and wild life and to have compassion for living creatures."
- The main provisions of Environmental education in Assam are - Role of the non-Govt. Organization, Agricultural extension education, role of government, role of the university authorities, role of the scientific research centres and organizations etc.



9.5 FURTHER READING

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2) Sharma, R.A. (2005). *Environmental Education*. Meerut: R. Lall Book depot.



9.6 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: The specific environmental problems of Assam are -

- Rapid growth of population
- Large Scale migration and infiltration.
- Destruction of the forest resources.
- Unplanned growth of industries.

- Problem of automobiles.
- Solid Waste Problem
- Flood and erosion
- Man-animal conflict
- Unauthorized cutting and grabbing of land

Ans to Q No 2: The two Provisions of Environmental education in Assam are-

- The Agricultural University in the state can offer extension service to therural agricultural people as a part of environmental education. The University may organize training centres in the agricultural areas of the state and give education to people in respect of the use of fertilizer, chemicals, conservation of soil and variegation system etc.
- Various Govt. and Non-Government Organisation (NGO) working in the field of environmental education through the non-formal mode of education. More particularly the NGO Save Guwahati and Build Guwahati (SGBG) has demanded survey of the hills, wetlands and plain lands of the Guwahati city.

Ans to Q No 3: Environmental Education is a subject closely associated with the problem of socio-economic development of the developing and under-developed countries of the world and its people. These countries are confronted with the major problems of population explosion, illiteracy, cultural and religious conservatism, economic poverty and unemployment etc. that have lead them to environmental pollution and degradation.



9.7 MODEL QUESTIONS

A) Short Questions (Answer each question in about 150 words)

Q 1: Mention any five important problems of Environmental Education.

Q 2: Explain the role of NGO in providing Environmental Education.

Q 3: Discuss in brief the specific environmental problems with special reference to Assam.

B) Long Questions ((Answer each question in about 300 words)

Q 1: Discuss in detail the important environmental problems with special reference to Assam.

Q 2: Elaborate the various prospects of Environmental Education.

Q 3: Discuss the provision of Environmental Education with special reference to Assam.

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