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# Environmental Science : Definition, Scope and Importance

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## INTRODUCTION

The science of Environment studies is a multi-disciplinary science because it comprises various branches of studies like chemistry, physics, medical science, life science, agriculture, public health, sanitary engineering etc. It is the science of physical phenomena in the environment. It studies of the sources, reactions, transport, effect and fate of physical a biological species in the air, water and soil and the effect of from human activity upon these.

### Environment Explained

Literary environment means the surrounding external conditions influencing development or growth of people, animal or plants; living or working conditions etc. This involves three questions:

#### 1. *What is Surrounded*

The answer to this question is living objects in general and man in particular.

#### 2. *By what Surrounded*

The physical attributes are the answer to this question, which become environment. In fact, the concern of all education is the environment of man. However, man cannot exist or be understood in isolation from the other forms of life and from plant life. Hence, environment refers to the sum total of condition, which surround point in space and time. The scope of the term Environment has been changing and widening by the passage of time. In the primitive age, the environment consisted of only physical aspects of the planted earth' land, air and water as biological communities. As the time passed on man extended his environment through his social, economic and political functions.

#### 3. *Where Surrounded*

The answer to this question. It is in nature that physical component of the plant earth, viz land, air, water etc., support and affect life in the biosphere. According to a Goudie

environment is the representative of physical components of the earth where in man is an important factor affecting the environment.

(i) **Definitions of Environment :** Some important definitions of environment are as under:

1. **Boring:** 'A person's environment consists of the sum total of the stimulation which he receives from his conception until his death.'

It can be concluded from the above definition that Environment comprises various types of forces such as physical, intellectual, economic, political, cultural, social, moral and emotional. Environment is the sum total of all the external forces, influences and conditions, which affect the life, nature, behaviour and the growth, development and maturation of living organisms.

2. **Douglas and Holland:** 'The term environment is used to describe, in the aggregate, all the external forces, influences and conditions, which affect the life, nature, behaviour and the growth, development and maturity of living organisms.'

(ii) **Scope of Environment:** The environment consists of four segments as under:

1. **Atmosphere:** The atmosphere implies the protective blanket of gases, surrounding the earth:
  - (a) It sustains life on the earth.
  - (b) It saves it from the hostile environment of outer space.
  - (c) It absorbs most of the cosmic rays from outer space and a major portion of the electromagnetic radiation from the sun.
  - (d) It transmits only here ultraviolet, visible, near infrared radiation (300 to 2500 nm) and radio waves. (0.14 to 40 m) while filtering out tissue-damaging ultraviolet waves below about 300 nm.

The atmosphere is composed of nitrogen and oxygen. Besides, argon, carbon dioxide, and trace gases.

2. **Hydrosphere:** The Hydrosphere comprises all types of water resources oceans, seas, lakes, rivers, streams, reservoir, polar icecaps, glaciers, and ground water.

- (i) Nature 97% of the earth's water supply is in the oceans,
- (ii) About 2% of the water resources is locked in the polar icecaps and glaciers.
- (iii) Only about 1% is available as fresh surface water-rivers, lakes streams, and ground water fit to be used for human consumption and other uses.

3. **Lithosphere:** Lithosphere is the outer mantle of the solid earth. It consists of minerals occurring in the earth's crusts and the soil e.g. minerals, organic matter, air and water.

4. **Biosphere:** Biosphere indicates the realm of living organisms and their interactions with environment, viz atmosphere, hydrosphere and lithosphere.

## **Element of Environment**

Environment is constituted by the interacting systems of physical, biological and cultural elements inter-related in various ways, individually as well as collectively. These elements may be explained as under:

### *(1) Physical elements*

Physical elements are as space, landforms, water bodies, climate soils, rocks and minerals. They determine the variable character of the human habitat, its opportunities as well as limitations.

### *(2) Biological elements*

Biological elements such as plants, animals, microorganisms and men constitute the biosphere.

### *(3) Cultural elements*

Cultural elements such as economic, social and political elements are essentially man-made features, which make cultural milieu.

## **ENVIRONMENT STUDIES: IMPORTANCE**

Importance of Environment Studies: The environment studies enlighten us, about the importance of protection and conservation of our indiscriminate release of pollution into the environment.

At present a great number of environment issues, have grown in size and complexity day by day, threatening the survival of mankind on earth. We study about these issues besides and effective suggestions in the Environment Studies. Environment studies have become significant for the following reasons:

### **1. Environment Issues Being of International Importance**

It has been well recognised that environment issues like global warming and ozone depletion, acid rain, marine pollution and biodiversity are not merely national issues but are global issues and hence must be tackled with international efforts and cooperation.

### **2. Problems Cropped in The Wake of Development**

Development, in its wake gave birth to Urbanization, Industrial Growth, Transportation Systems, Agriculture and Housing etc. However, it has become phased out in the developed world. The North, to cleanse their own environment has, fact fully, managed to move 'dirty' factories of South. When the West developed, it did so perhaps in ignorance of the environmental impact of its activities. Evidently such a path is neither practicable nor desirable, even if developing world follows that.

### **3. Explosively Increase in Pollution**

World census reflects that one in every seven persons in this planted lives in India. Evidently with 16 per cent of the world's population and only 2.4 per cent of its land area, there is a heavy pressure on the natural resources including land. Agricultural experts have recognized soils health problems like deficiency of micronutrients and organic matter, soil salinity and damage of soil structure.

#### 4. Need for An Alternative Solution

It is essential, specially for developing countries to find alternative paths to an alternative goal. We need a goal as under:

- (1) A goal, which ultimately is the true goal of development an environmentally sound and sustainable development.
- (2) A goal common to all citizens of our earth.
- (3) A goal distant from the developing world in the manner it is from the over-consuming wasteful societies of the “developed” world.

#### 5. Need To Save Humanity From Extinction

It is incumbent upon us to save the humanity from exinction. Consequent to our activities constricting the environment and depleting the biosphere, in the name of development.

#### 6. Need For Wise Planning of Development

Our survival and sustenance depend. Resources withdraw, processing and use of the product have all to by synchronised with the ecological cycles in any plan of development our actions should be planned ecologically for the sustenance of the environment and development.

#### 7. Misra’s Report

Misra (1991) recognized four basic principles of ecology, as under:

- (i) Holism
- (ii) Ecosystem
- (iii) Succession
- (iv) Conversation.

Holism has been considered as the real base of ecology. In hierarchical levels at which interacting units of ecology are discussed, are as under:

Individual<population<community<ecosystem<biome<biosphere.

Misra (1991) has recognised four basic requirements of environmental management as under:

- (i) Impact of human activities on the environment,
- (ii) Value system,
- (iii) Plan and design for sustainable development,
- (iv) Environment education.

Keeping in view the of goal of planning for environmentally sustainable development India contributed to the United Nations Conference on Environment and Development (UNCED), also referred to as “Earth Summit” held at Rio de Janciro, the Capital of Brazil, 3rd-14th June, 1992.

#### NEED FOR PUBLIC AWARENESS

It is essential to make the public aware of the formidable consequences of the Environmental Degradation, if not retorted and reformative measures undertaken, would

result in the extinction of life. We are facing various environmental challenges. It is essential to get the country acquainted with these challenges so that their acts may be eco-friendly. Some of these challenges are as under:

### **1. Growing Population**

A population of over thousands of millions is growing at 2.11 per cent every year. Over 17 million people are added each year. It puts considerable pressure on its natural resources and reduces the gains of development. Hence, the greatest challenge before us is to limit the population growth. Although population control does not automatically lead to development, yet the development leads to a decrease in population growth rates. For this development of the women is essential.

### **2. Poverty**

India has often been described a rich land with poor people. The poverty and environmental degradation have a nexus between them. The vast majority of our people are directly dependent on the nature resources of the country for their basic needs of food, fuel shelter and fodder. About 40% of our people are still below the poverty line. Environment degradation has adversely affected the poor who depend upon the resources of their immediate surroundings. Thus, the challenge of poverty and the challenge environment degradation are two facets of the same challenge. The population growth is essentially a function of poverty. Because, to the very poor, every child is an earner and helper and global concerns have little relevance for him.

### **3. Agricultural Growth**

The people must be acquainted with the methods to sustain and increase agricultural growth with damaging the environment. High yielding varieties have caused soil salinity and damage to physical structure of soil.

### **4. Need to Ground water**

It is essential of rationalizing the use of groundwater. Factors like community wastes, industrial effluents and chemical fertilizers and pesticides have polluted our surface water and affected quality of the groundwater. It is essential to restore the water quality of our rivers and other water bodies as lakes is an important challenge. It so finding our suitable strategies for consecration of water, provision of safe drinking water and keeping water bodies clean which are difficult challenges is essential.

### **5. Development And Forests**

Forests serve catchments for the rivers. With increasing demand of water, plan to harness the mighty river through large irrigation projects were made. Certainly, these would submerge forests; displace local people, damage flora and fauna. As such, the dams on the river Narmada, Bhagirathi and elsewhere have become areas of political and scientific debate.

Forests in India have been shrinking for several centuries owing to pressures of agriculture and other uses. Vast areas that were once green, stand today as wastelands. These areas are to be brought back under vegetative cover. The tribal communities inhabiting forests respects the trees and birds and animal that gives them sustenance. We must recognise

the role of these people in restoring and conserving forests. The modern knowledge and skills of the forest deptt. should be integrated with the traditional knowledge and experience of the local communities. The strategies for the joint management of forests should be evolved in a well planned way.

## **6. Degradation of Land**

At present out of the total 329 mha of land, only 266 mha possess any potential for production. Of this, 143 mha is agricultural land nearly and 85 suffers from varying degrees of soil degradation. Of the remaining 123 mha, 40 are completely unproductive. The remaining 83 mha is classified as forest land, of which over half is denuded to various degrees. Nearly 406 million head of livestock have to be supported on 13 mha, or less than 4 per cent of the land classified as pasture land, most of which is overgrazed. Thus, out of 226 mha, about 175 mha or 66 per cent is degraded to varying degrees. Water and wind erosion causes further degradation of almost 150 mha This degradation is to be avoided.

## **7. Reorientation of Institutions**

The people should be roused to orient institutions, attitudes and infrastructures, to suit conditions and needs today. The change has to be brought in keeping in view India's traditions for resources use managements and education etc. Change should be brought in education, in attitudes, in administrative procedures and in institutions. Because it affects way people view technology resources and development.

## **8. Reduction of Genetic Diversity**

Proper measures to conserve genetic diversity need to be taken. At present most wild genetic stocks have been disappearing from nature. Wilding including the Asiatic Lion are facing problem of loss of genetic diversity. The protected areas network like sanctuaries, national parks, biosphere reserves are isolating populations. So, they are decreasing changes of one group breeding with another. Remedial steps are to be taken to check decreasing genetic diversity.

## **9. Evil Consequences of Urbanisation**

Nearly 27 per cent Indians live in urban areas. Urbanisation and industrialisation has given birth to a great number of environmental problem that need urgent attention. Over 30 percent of urban Indians live in slums. Out of India's 3,245 towns and cities, only 21 have partial or full sewerage and treatment facilities. Hence, coping with rapid urbanization is a major challenge.

## **10. Air and water Population**

Majority of our industrial plants are using outdated and population technologies and makeshift facilities devoid of any provision of treating their wastes. A great number of cities and industrial areas that have been identified as the worst in terms of air and water pollution. Acts are enforced in the country, but their implement is not so easy. The reason is their implementation needs great resources, technical expertise, political and social will. Again the people are to be made aware of these rules. Their support is indispensable to implement these rules.

## VARIOUS TYPES OF ENVIRONMENT

According to Kurt Lewin, environment is of three types which influence the personality of an individual as under:

- (a) Physical Environment,
- (b) Social and Cultural Environment, and
- (c) Psychological Environment.

These may be explained as under:

### 1. Physical Environment

Physical environment, refers to geographical climate and weather or physical conditions wherein and individual lives. The human races are greatly influenced by the climate. Some examples are as under:

- (a) In the cold countries i.e. European countries the people are of white colour. Likewise, in Asian and African countries, that is, in hot countries people are of dark complexion.
- (b) The physique of an individual depends on climate conditions as the individual tries to adjust in his physical environment.
- (d) The human working efficiency also depends on the climatic conditions.

### 2. Social Environment

Social Environment includes an individual's social, economic and political condition wherein he lives. The moral, cultural and emotional forces influence the life and nature of individual behaviour. Society may be classified into two categories as under:

- (i) An open society is very conducive for the individual development.
- (ii) A closed society is not very conducive for the development.

### 3. Psychological Environment

Although physical and social environment are common to the individual in a specific situation. Yet every individual has his own psychological environment, in which he lives. Kurt Lewin has used the term 'life space' for explaining psychological environment. The Psychological environment enables us to understand the personality of an individual. Both the person and his goal form psychological environment.

If a person is unable to overcome the barriers, he can either get frustrated or completed to change his goal for a new psychological environment. But adopting this mechanism, the individual is helped in his adjustment to the environment.

## STRUCTURE OF ENVIRONMENT

Environment is both physical and biological. It includes both living and non-living components.

### (i) Physical Environment

The Physical Environment is classified into three broad categories viz.

- (i) Solid,
- (ii) Liquid
- (iii) Gas.

These represent the following spheres:

- (i) The lithosphere (solid earth)
- (ii) The hydrosphere (water component) and
- (iii) The atmosphere

As such, the three basic of physical environment may be termed as under:

- (i) Lithospheric Environment
- (ii) Hydrospheric Environment
- (iii) Atmospheric Environment

The scientists have classified them into smaller units based on different spatial scales, *e.g.*

- (i) Mountain Environment
- (ii) Glacier Environment
- (iii) Plateau Environment
- (iv) Coastal Environment

## **(ii) Biological Environment**

The biological of the environment consists of:

- (i) Plants (flora)
- (ii) Animals (fauna).

Thus, the biotic environment further be divided into floral environment and faunal environment. All the organisms work to form their social groups and organizations at several levels. Thus, the social environment is formed. In this social environment the organisms work to derive matter from the physical environment for their sustenance and development. This process gives birth to economic environment. Man claims to be most skilled and civilized of all the organisms. This is the reason why his social organisation is most systematic. The three aspects of man, *e.g.* physical, social and economic, function in the biotic environment as under:

### **(i) The Physical Man**

The 'Physical Man' is one of the organisms populations or biological community. He is in need of basic elements of the physical environment like habitat (space), air, water and food. Besides, like other biological populations, he releases wastes into the ecosystem.

### **(ii) The Social Man**

The 'Social Man' performs the following functions:

- (a) Establishing social institutions,
- (b) Forming social organisations,

- (c) Formulating laws, principles and policies,
- (d) Taking steps to safeguard his existence, interest and social welfare.

### (iii) The Economic Man

The economic man derives and utilises resources from the physical and biotic environment with his skills and technologies. The economic function makes the man an environment/geomorphic process as he transports matter and energy from one component of the ecosystem to the other. There may be any following two situations:

- (a) His exploitative functions may be in harmony with the natural environment. Such, functions do not necessarily involve change in the working of the ecosystem.
- (b) These functions may exceed the critical limit. Consequently, the equilibrium of the environment/ecosystem is disturbed and a great number of environment and ecological problems crop up. These are detrimental to man him besides to whole population of human species in a given ecosystem.

### QUESTIONS

1. What is Environment? Discuss the scope of Environment.
2. Describe the importance of environment studies.
3. "The need for public awareness about environment is of vital importance." Discuss.
4. Discuss the various types of environment.

### Short Answer Type Questions

1. Define environments.
2. Discuss the scope of environment.
3. Write a note on the importance of environment studies.
4. Write a note on the need of public awareness about environment.
5. Write a note on physical environment.
6. Write a note on biological environment.