

A Brief Overview about Environmental Science

Dr. Krishnappa Venkatesharaju

Assistant Professor, Department of Environmental Science And Engineering, Presidency University, Bangalore, India

Email Id- venkateshraj.k@presidencyuniversity.in

ABSTRACT:

The study of the natural environment, its processes, and the effects of human activity on ecosystems are all included in the interdisciplinary discipline of environmental science. An overview of environmental science, its application, and its significance in resolving environmental issues are given in this chapter. Ecology, atmospheric science, geology, and conservation biology are just a few of the important fields of study that are highlighted while also examining how multidisciplinary the discipline is. The importance of environmental science in advancing sustainable practises, assisting with policymaking, and encouraging a better understanding of the intricate relationships between people and the environment is also emphasised.

KEYWORDS:

Environment, Development, Human, Population, Physical, Social, Water.

I. INTRODUCTION

The science of Environment studies is a multi-disciplinary science Because it includes a variety of academic fields including chemistry, physics, medical science, life science, agriculture, public health, sanitary engineering, etc., environmental studies is a multi-disciplinary field of study [1], [2]. It is the study of physical occurrences in the natural world. It explores the origins, processes, movement, destiny, and occurrence of physical and biological species in the air, water, and soil as well as the impact of human activities on these. The term literary environment refers to the external elements that influence the growth or development of humans, animals, or plants as well as living and working environments [3]–[5]. Three inquiries are involved here:

1. The Environment

Mankind in particular, as well as other living things in general, are the answer to this question.

2. How Are You Surrounded?

The solution to this question, which results in environment, is the physical characteristics. In actuality, the environment of man is the focus of all education. Man, however, cannot exist or be understood in isolation from other living things or from the plant kingdom. The totality of the factors that surround a certain place in space and time is referred to as the environment. With time, the definition of the word environment has evolved and grown. In the prehistoric era, the environment was limited to the biological communities found in the air, water, and land on the cultivated ground. As time went on, man's social, economic, and political activities expanded his surroundings.

3. The Environment

The response to this query. The physical elements of the plant earth—land, air, water, etc.—support and influence life in the biosphere by their very nature. According to Goudie, the environment is a representation of the earth's physical elements, with man as a significant force influencing the environment.

Environmental Definitions: Following are some key definitions of environment:

1. Boring: A person's environment is the sum of the stimulation that he receives from the time of his conception until the time of his death. According to the description given above, environment is made up of a variety of factors, including those that are physical, intellectual, economic, political, cultural, social, moral, and emotional. The totality of all external factors, influences, and situations that have an impact on a living thing's character, behaviour, and rate of growth, development, and maturity constitutes its environment [6]. Secondly, Douglas and Holland the word environment is used to collectively define all external factors, influences, and situations that have an impact on the behaviour, nature, and growth, development, and maturation of living creatures.

Area of the Environment

The environment is divided into the following four sections:

1. Ambience: The term atmosphere refers to the protective layer of gases that envelops the earth:

- a) It keeps life on earth alive.
- b) It protects it from the hazardous atmosphere of space.
- c) It absorbs the majority of solar electromagnetic energy as well as the majority of cosmic rays from outer space.
- d) It only transmits radio waves, visible light, near-infrared radiation (between 300 and 2500 nm), and UV rays here. (0.14-0.40 m) while blocking tissue-damaging ultraviolet rays below 300 nm.
- e) Nitrogen and oxygen are the main elements in the atmosphere. Argon, carbon dioxide, and trace gases are additional.

2. Hydrosphere: The hydrosphere is made up of all forms of water resources, including groundwater, polar ice caps, glaciers, lakes, rivers, and streams. Nature 97% of the water on earth is found in the seas; the other 2% is found frozen in the polar icecaps and glaciers.

3. Lithosphere: The lithosphere is the outer mantle of the solid earth, and only approximately 1% of it is accessible as fresh surface water rivers, lakes, streams, and ground water—that is suitable for human consumption and other purposes. It is made up of minerals found in the soil and in the crusts of the earth, such as minerals, organic matter, air, and water.

4. Biosphere: The term biosphere refers to the area in which living things exist and interact with their surroundings, namely the atmosphere, hydrosphere, and lithosphere.

Elements of Environment

Environment is made up of interdependent systems of physical, biological, and cultural components that are connected in a variety of ways both individually and collectively. These components may be described as follows:

(1) Constituents of matter

Space, landscapes, water bodies, climate, soils, rocks, and minerals are examples of physical elements.

They determine the erratic nature of the human environment, as well as its possibilities and constraints.

(2) Natural Components

The biosphere is made up of biological components including plants, animals, bacteria, and people.

(3) Cultural Components

Economic, social, and political aspects of culture are mostly artificial components that make up the cultural environment.

Environmental Studies

Studying the environment is important. Our indiscriminate discharge of pollutants into the environment has to be protected and conserved, as shown by the environmental research. Many environmental challenges are now posing a danger to human life on earth as they multiply and become more complicated. Along with practical solutions, we investigate these concerns in environmental studies. For the following reasons, environmental studies have gained importance:

1. Environmental Concerns having International Significance

Environmental problems including global warming, ozone depletion, acid rain, marine pollution, and biodiversity have long been acknowledged as being global problems that need worldwide collaboration and efforts to resolve.

2. Issues trimmed in The Aftermath of Development

Urbanization, industrial growth, transportation systems, agriculture, and housing were all born in the aftermath of development. However, in the industrialized world, it has started to go away. In order to better their own environment, the North has successfully moved the dirty manufacturing of the South. The West may have grown

without understanding how its actions might affect the environment. Evidently, even if the emerging world takes that course, it is not desirable nor possible [7]–[9].

3. A Dramatic Rise in Pollution

According to the most recent census, one in seven people on our planet reside in India. With just 2.4% of the world's land area and 16% of its people, there is obviously great pressure on all natural resources, especially land. Experts in agriculture have identified issues with soil salinity, lack of organic matter and micronutrients, and weakened soil structure.

4. The Need for a Different Approach

Finding other routes to an alternative objective is crucial, especially for poor nations. We need a target like follows:

- (1) Aiming for an ecologically friendly and sustainable development, which is ultimately the real purpose of development.
- (2) An aim shared by all people on our planet.
- (3) A purpose that is distinct from the developed world's excessively conspicuous consumption and wasteful cultures.

5. The Need to Prevent Humanity from Dying Out

We have a responsibility to prevent the extinction of mankind. due to the environment being restricted by human actions and the biosphere being depleted in the name of progress.

6. The Need for Intelligent Development Planning

Our ability to live depends on this. In any development plan, the removal of resources, processing of the product, and usage of the product must all be coordinated with ecological cycles. Our activities should be organized ecologically for the preservation of the environment and development.

7. Misra's Report

Misra (1991) identified the following four ecological fundamentals:

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

It has been said that ecology's true foundation is holism. Following are the hierarchical levels at which interacting ecological units are discussed: individual, population, community, ecosystem, biome, and biosphere. According to Misra (1991), there are four fundamental prerequisites for environmental management. Impact of human activity on the environment, value system, plan and design for sustainable development, and environment education are only a few of the topics covered. Planning for ecologically friendly growth is a priority. India participated in the United Nations Conference on Environment and Development (UNCED), commonly known as the Earth Summit, which took place in Rio de Janeiro, Brazil's capital, from June 3–14, 1992.

Need for Public Awareness

It is crucial to educate the people about the severe effects of environmental degradation, which, if not stopped and remedial action not done, would lead to the extinction of life. There are many environmental issues that we must address. It is crucial to educate the nation about these issues so that their actions will be environmentally beneficial. These are some examples of these difficulties:

1. Increase in Population

A population of almost a trillion people is increasing by 2.11 percent annually. Each year, the population grows by more over 17 million. It limits the benefits of growth and puts a lot of strain on the country's natural resources. So, the biggest problem we have is how to stop population increase. Although population management does inevitably result in development, this development also causes population growth rates to decline. Women's growth is crucial for this.

2. Slumber

India is sometimes said to be a prosperous country with destitute people. There is a connection between environmental deterioration and poverty. For their fundamental requirements of food, fuel, housing, and fodder, the great bulk of our population directly depends on the natural resources of the nation. About 40% of our population still lives in poverty. The poor, who rely on the resources in their local surroundings, have been negatively impacted by environmental deterioration. Therefore, the problems of poverty and environmental deterioration are two sides of the same problem. In essence, poverty is a result of population expansion. Because every kid is a source of income and assistance to the extremely poor, he has little need of worries about the rest of the world.

3. Agricultural Development

The strategies to maintain and expand agricultural development without harming the environment must be known to the populace. High yielding varieties have harmed the physical structure of the soil and increased soil salinity.

4. Require Groundwater

The rationalisation of groundwater usage is crucial. Our surface water has been contaminated by elements such as municipal garbage, industrial effluents, chemical fertilisers, and pesticides, which have also impacted the quality of the groundwater. Restoring the water quality of our rivers and other bodies of water, such as lakes, is a significant issue. Finding effective techniques for the severe difficulties of water consecration, providing safe drinking water, and maintaining clean water bodies are crucial.

5. Forests and Development

River catchments are provided by forests. Due to the rising need for water, plans were created to use the powerful river for extensive irrigation projects. These would undoubtedly sink forests, evict locals, and harm the ecology and animals. As a result, there is now political and scholarly discussion around the construction of dams on the Narmada, Bhagirathi, and other rivers. India's forests have been declining for many centuries as a result of pressure from agriculture and other usage. Huge regions that were once lush are become deserts [10]. These places must be covered up with vegetation once again. The tribal tribes who live in woods have a reverence for the trees, birds, and other animals that provide them with food. We must acknowledge their contribution to the preservation and restoration of forests. The traditional wisdom and experience of the local people should be combined with the contemporary skills and expertise of the forest department. The development of the strategies for the cooperative management of forests should be well thought out.

6. Land Degradation

Currently, only 266 mha of the entire 329 mha of land have any potential for productivity. Nearly 143 mha of this area is used for agriculture, and 85 of it has different levels of soil degradation. 40 of the 123 mha that are left are wholly unproductive. Over half of the remaining 83 mha, which are categorized as forest land, have some degree of deforestation. 13 mha, or less than 4% of the area designated as pasture land, must sustain about 406 million head of cattle, the majority of which is overgrazed. Thus, out of 226 mha, 175 mha or 66% are to varied degrees deteriorated. An additional 150 mha of damage is brought on by water and wind erosion. It is best to prevent this degeneration.

7. Institutional Reorientation

To adjust institutions, attitudes, and infrastructures to the realities and requirements of the present, the populace should be encouraged. The reform must be implemented while taking into account India's traditions about resource usage management, education, etc. Education, attitudes, administrative practises, and institutions all need to change. because it influences how people interpret the resources and advancement of technology.

8. Less Genetic Diversity

It is necessary to take the right steps to preserve genetic variety. The majority of wild genetic populations are now being lost to nature. The lack of genetic variety is an issue for wild animals, especially Asiatic lions. Populations are being isolated by the network of protected places, such as sanctuaries, national parks, and biosphere reserves. Therefore, the likelihood of one group mating with another is decreasing. To stop the genetic variety from declining, corrective action must be performed.

9. Negative Effects of Urbanization

Indians reside in urban areas at a rate of over 27%. Numerous environmental issues have arisen as a result of urbanization and industrialization and need immediate action. Out of India's 3,245 towns and cities, just 21 have partial or complete sewage and treatment facilities, while more than 30% of urban Indians live in slums. Consequently, adapting to fast urbanization is a difficult task.

10. Population of air and water

Most of our industrial facilities use rudimentary, outmoded technology and temporary structures without any means of waste treatment. There are several industrial zones and cities that have been rated as having the worst air and water pollution. Although laws are upheld throughout the nation, carrying them out is not always simple. The rationale is that its execution requires significant financial support, technical know-how, and political and societal will. Once again, the public must be made aware of these regulations. Their assistance is essential to putting these laws into effect.

Various Types of Environments

Kurt Lewin said that there are three different sorts of environments that affect a person's personality: the physical environment, the social and cultural environment, and the psychological environment. These may be described as follows:

1. The Physical World

The phrase physical environment refers to the geographic climate, weather, or other physical circumstances in which a person resides. The climate has a big impact on the different human races. Here are a few instances:

- i. The majority of the population of Europe's colder nations is white. Similar to this, individuals have darker skin in hotter nations like those in Asia and Africa.
- ii. As a person strives to adapt to his physical surroundings, the physique of that person relies on the climate.
- iii. The efficiency of human labour is also influenced by environmental factors.

2. Social Setting

An individual's social, economic, and political surroundings make up his or her social environment. The life and character of individual actions are influenced by moral, cultural, and emotional causes. The two sorts of society are as follows. An open society is particularly conducive to individual development. A closed society does not promote development very well.

3. Environmental Psychology

Even when the person in a particular scenario has similar physical and social surroundings. However, each person lives in a unique psychological environment. Kurt Lewin used the phrase life space to describe the psychological setting. The psychological environment makes it possible for us to comprehend a person's personality. Both the individual and his objective create a psychological environment. A person may get dissatisfied or decide to shift his aim in search of a different psychological environment if he is unable to get beyond the obstacles. However, by using this method, the person is assisted in making the necessary adjustments to his surroundings.

Structure of Environment

Physical and biological factors make up the environment. It consists of both live and non-living parts.

The Physical Setting

Solids, liquids, and gases make up the first three basic groups of the physical environment. The following spheres are represented by these the hydrosphere, the atmosphere, and the lithosphere. As a result, the three components of the physical environment may be defined as follows Environments of the lithospheric, hydrosphere and atmospheric. Based on various geographic scales, the scientists have divided them into smaller units, for example.

Mountainous

- i. Glacial.
- ii. Plateau.

- iii. Climate Change.
- iv. Environment of the Coast.

Biological Environment

The biological of the environment consists of:

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

Thus, the floral environment and the faunal environment are additional divisions of the biotic environment. At various levels, all species collaborate to create their social groupings and organisations. The social environment is created in this way. The creatures in this social context strive to get nutrients for growth and maintenance from the physical environment. The economic environment is born as a result of this process. The idea that man is the most intelligent and civilized species is widely held. His social structure is the most organized because of this. The three facets of man physical, social, and economic perform as follows in the biotic environment.

(i) The Physical Man

One of the communities of creatures, or biological community, is the Physical Man. He need fundamental physical environment components including habitat, air, water, and nourishment. And he pollutes the biosphere, just like other biological species, by releasing garbage.

(ii) The Social Man

The 'Social Man' carries out the following tasks:

- a) Creating social institutions.
- b) Creating social organizations.
- c) Creating laws, principles, and policies.
- d) Taking action to protect his existence, interests, and social welfare.

(iii) The Economic Man

The economic man uses his abilities and tools to extract and make use of resources from the biotic and physical surroundings. Man is an environmental geomorphic process because of his economic role, which involves moving matter and energy from one ecosystem component to another. Any of the following two scenarios is possible. His exploitative activities can be compatible with the surroundings. Such functions may or may not result in changes to how the ecosystem works. The critical limit may be exceeded by these functions. As a result, the environment/ecosystem's balance is upset, and several environmental and ecological issues arise. These are harmful not just to the individual human beings but also to the whole human population within a specific environment.

II. CONCLUSION

Understanding and tackling the environmental difficulties affecting our world depend heavily on the subject of environmental science. It offers insightful information regarding the complex interactions between people and the natural world because to its multidisciplinary approach. Environmental science assists in creating long-term solutions to urgent environmental problems by researching and examining a variety of environmental elements, such as ecosystems, climate systems, and natural resources. Ecology, atmospheric science, geology, and conservation biology are just a few of the many fields that make up the area of environmental science. These several fields of research help us better comprehend the effects of human activity on the environment and complicated environmental systems. Environmental scientists may evaluate ecosystem health, identify environmental threats, and suggest solutions for environmental management and conservation by combining information from several fields.

REFERENCES

- [1] D. Costa, P. Quinteiro, and A. C. Dias, 'A systematic review of life cycle sustainability assessment: Current state, methodological challenges, and implementation issues', *Science of the Total Environment*. 2019. doi: 10.1016/j.scitotenv.2019.05.435.
- [2] S. M. Goodday et al., 'U-Flourish university students well-being and academic success longitudinal study: A study protocol', *BMJ Open*, 2019, doi: 10.1136/bmjopen-2019-029854.
- [3] M. M. Rahardjo, 'How to use Loose-Parts in STEAM? Early Childhood Educators Focus Group discussion in

- Indonesia', JPUD - J. Pendidik. Usia Dini, 2019, doi: 10.21009/jpud.132.08.
- [4] A. Knapezyk, S. Francik, J. Fraczek, and Z. Slipek, 'Analysis of research trends in production of solid biofuels', in *Engineering for Rural Development*, 2019. doi: 10.22616/ERDev2019.18.N415.
- [5] G. Samarasinghe et al., 'A visualized overview of systematic reviews and meta-analyses on low-carbon built environments: An evidence review map', *Sol. Energy*, 2019, doi: 10.1016/j.solener.2019.04.062.
- [6] G. Cano-Sancho et al., 'Human epidemiological evidence about the associations between exposure to organochlorine chemicals and endometriosis: Systematic review and meta-analysis', *Environment International*. 2019. doi: 10.1016/j.envint.2018.11.065.
- [7] R. Michael, 'Out of Time: Time-Travel Tropes Write (through) Climate Change', *M/C J.*, 2019, doi: 10.5204/mcj.1603.
- [8] J. F. Moreno-Alvarez, A. Peña-Godino, J. A. Rodriguez-Manfredi, and E. Cordoba, 'Meda, the new instrument for MARS environment analysis for the MARS 2020 mission', in *European Space Agency, (Special Publication) ESA SP*, 2016.
- [9] A. R. Goncalves, R. S. Costa, F. R. Martins, and E. B. Pereira, 'Cenários De Expansão Da Geração Solar E Eólica Na Matriz Elétrica Brasileira', *VII Congr. Bras. Energ. Sol.*, 2018.
- [10] M. Caballero-Anthony, A. D. B. Cook, G. Gayle, H. Amul, and A. Sharma, 'Centre for Non-Traditional Security Studies (NTS) Health Governance and Dengue in Southeast Asia', *Heal. Gov. Dengue Southeast Asia*, 2015.