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Etymologically, Environment means surroundings.

Literally it is an English word (the word environment is derived from French word "Environ" which means "surrounding") formed by the combination of two words 'environ' and 'ment' which means 'encircle' or all around.

Environment is a complex of many variables which surrounds man as well as all living organism. Any external force, substance or condition which surrounds or affects the life of organism in any way becomes the factor of its environment.

The place where an organism lives is called habitat. It is also known as **'milieu'** which means 'total set of surroundings'

Definition

Anything and everything which affect the activity of the living being in anyway is called its Environment.

OR

Environmental study is the scientific study of all the components or factors that make or influence our life-supporting biophysical environment.

OR

Environmental study is the study of the interactions between the physical, chemical, and biological components of the natural world, including their effects on all types of organisms and how humans impact their surroundings.

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.



History of Environmental Science

Environmental Science is a multidisciplinary field that integrates physical, biological, and information sciences to study the environment and find solutions to environmental issues.

The history of environmental science can be traced back to ancient civilizations where people recognized the impact of their actions on the environment.

However, modern environmental science as a formal discipline emerged in the mid-20th century in response to growing concerns about pollution, resource depletion, and biodiversity loss.

Early Roots of Environmental Awareness

Ancient Civilizations:

Ancient civilizations such as the Mesopotamians, Egyptians, Greeks, and Romans understood the importance of natural resources for their survival. They developed practices like irrigation systems and forest conservation to sustain their societies.

Middle Ages:

During the Middle Ages, there was a shift towards more exploitation of natural resources for economic growth. This period saw deforestation, soil erosion, and pollution becoming more prevalent.

Emergence of Modern Environmental Science

Industrial Revolution:

The Industrial Revolution marked a turning point in environmental awareness. The rapid industrialization led to widespread *pollution, deforestation, and habitat destruction*. This period saw the birth of early environmental movements advocating for conservation and sustainable practices.

Silent Spring: Rachel Carson's book "Silent Spring," published in 1962, raised public awareness about the harmful effects of pesticides on the environment and human health. This seminal work is often credited with sparking the modern environmental movement.

First Earth Day: The first Earth Day was celebrated on April 22, 1970, mobilizing millions of Americans to demonstrate for a healthy, sustainable environment. This event helped catalyse legislative action leading to the creation of landmark environmental laws like the **Clean Air Act** and the **Clean Water Act**.

Development of Environmental Science as a Discipline Formation of Environmental Organizations:

In the latter half of the 20th century, numerous environmental organizations were established to address pressing environmental issues. Organizations like United Nations Environment Programme (UNEP), Global Environmental Monitoring System (GEMS), World Commission on Environment and Development (WCED), World Conservation Strategy (WCS), Scientific Committee on Problems of the Environment (SCOPE), Greenpeace, World Wildlife Fund (WWF), Friends of the Earth, Green Faith, Earth Justice, Rainforest Alliance, TheNature Conservancy, Ecology Action Committee, Bird Life, Earthworm, and NRDC played pivotal roles in advocating for environmental protection.

Major NGOs Focused on Environmental Protection in India

- ✤ Centre for Science and Environment (CSE),
- ✤ Greenpeace India,
- ✤ World Wildlife Fund (₩WF) India,
- ✤ The Energy and Resources Institute (TERI),
- ✤ Natural Resource Defence Council (NRDC) India,
- Ashoka Trust for Research in Ecology and the Environment (ATREE)

Academic Programs:

Universities began offering formal academic programs in environmental science in response to the growing demand for trained professionals in this field. These programs cover a wide range of topics including ecology, conservation biology, climate change, and sustainability.

Technological Advancements: Advances in technology have revolutionized environmental science by enabling scientists to monitor environmental changes on a global scale. **Remote sensing, Geographic Information Systems (GIS), and big data analytics** have enhanced our understanding of complex environmental systems.

Current Trends and Challenges

Climate Change: Climate change is one of the most pressing challenges facing environmental science today. Rising global temperatures, Sea-level rise, Extreme weather events, and Ocean acidification are all attributed to human activities.

Biodiversity Loss: The ongoing loss of biodiversity due to **habitat destruction**, **pollution**, **overexploitation**, **and climate change** poses a significant threat to ecosystems worldwide.

Sustainable Development: The concept of sustainable development aims to meet present needs without compromising the ability of future generations to meet their own needs. Balancing economic growth with environmental protection is crucial for long-term sustainability.

Scope of Environmental Studies

The scope of environmental studies is very vast. During the past, few decades there has been fundamental change in the attitude of man towards environment.

The scope of the environmental study is diverse dealing with the areas such as:

- ✤ The ecosystem as study unit,
- The functioning of ecosystem including flow of energy and matter and ecosystem productivity,
- Temporal changes in ecosystem,
- Evolution of plants and animals; and ecological succession,
- ✤ Spatial ecological changes,
- Distribution and dispersal of plants and animals,
- Global environmental problems,
- Environmental hazards and disasters,
- ✤ Man and environmental processes,
- Environmental degradation and
- Pollution and Environmental Management.

Environment studies have become significant because of its international importance due to the environmental issues like

Global warming,

Greenhouse effect,

Ozone layer depletion,

- > Acid rain,
- Marine pollution, and
- > Loss of biodiversity.

Environmental studies are also necessary because of the problems arising out due to development and its phenomenon like

- Urbanization,
- Industrial growth,
- Construction of expressways, Dams and Canals.

The subject Environmental Studies is very much essential as it aims at saving the integrity of the life-supporting environment of earth.

Importance of Environmental Studies can be described in terms of the various objectives that it fulfils for saving our surrounding.

Environmental Studies guides us how to create a pollution free environment by adopting different methods of prevention and control. It guides us to utilise our natural resources in sustainable manner. It also guides common man to lead an eco-friendly lifestyle.

<u>APPROACHES TO ENVIRONMENTAL STUDIES</u>

An approach is a way of getting closer.

The study of relationships between man and environment has always been, in one way or another, a focal theme in environmental study. But the facets of man-environment relationship change through time with the development of human society and the dimension of environment. Man bySocial, Economic and Technological development altered his surrounding for better life.

Anthropocentrism, Animal liberation/Rights theory, Biocentrism, and Ecocentrism all provide unique and somewhat plausible ethical justifications for environmental protection. All these have different approaches with broadly same goals and agree that protecting the environment is everyone's duty.

Ecocentrism: This approach focuses on the intrinsic value of nature and ecosystems, emphasizing the importance of preserving biodiversity and natural resources for their own sake.

Anthropocentrism: Anthropocentric approaches prioritize human interests and wellbeing above all else. They view nature as a resource to be used for human benefit.

Techno-centrism: Technocentric perspectives rely on technological solutions to environmental issues, often emphasizing innovation and human ingenuity in addressing environmental challenges.

1. Deterministic Approach

This is one of the oldest approaches to study environment. According to this approach physical environment controls the course of human action. In other words, the belief that variation in human behaviour around the world can be explained by the differences in the natural environment is the crux of this man-environment relationship **philosophy.**The deterministic school of thought is of the opinion that the history, culture, living style and the stages of development of a social group or nation are largely governed and controlled by physical factors of the environment.

This philosophy supports the idea that the highest achievement of civilizations like Egyptians, Mesopotamians, Indus-valley, disappeared because of the climatic change.

It is also believed that the attack of central Asian nomads on other civilization is because of change in climate because it was climate change which resulted into the drying up of their pastures which forced them move in different direction during 13th century.

Though this deterministic or environmentalist approach blossomed in the writings of E.C. Semple (1910) in the second decade of the 20th century but its seeds were already sown in the second half of the nineteenth century. In fact the publication of **'The Origin of Species'** of Charles Darwin in 1859 laid the foundation stone of the concept of environmental influences on man and other organisms and even before that the seeds of determinism was found in the works of Aristotle, Strabo, Al-Masudi, Ibn-Khaldun, Carl Ritter, Alexander Von Humboldt, Ellsworth Huntington and Patrick Geddes.

There is no doubt that environment influence man and man in turn influence his environment. This interaction between man and his environment is so intricate that it becomes almost impossible to find out that when one's effect ceases and the other's effect begins.

Many landscapes that appear natural to us are in truth the work of man.

Wheat, barley, olive, and wine, which dominate the Mediterranean countries, are entirely the products of human effort.

Apple and Almond orchards of Indian states e.g. Kashmir, Himachal Pradesh and Kumaun division of Uttarakhand are the creations of man.

2. Teleological Approach

Teachings of Judeo Christian religious tradition promulgated the superiority of man to nature and all other creation and that *everything is created for his/her use and enjoyment.*

This idea fostered an inconsiderate exploitation by man of his natural environment. Environment today holds this religious tradition responsible for the environmental crisis. *Teleological approach is based on religious faith of man being superior to nature and all other creatures. This approach to environmental studies (man-environment relationship) led to excessive and rapid rate of exploitation of natural resources in North America and Western Europe as well as in other parts of the world which were their colonies.* A host of scientists and environmentalists have held this religious tradition responsible for present-day ecological crisis.

This approach of man towards nature and environment stimulated Europeans to spread all over the world in search of unexplored land and resources. Consequently numerous colonies were established in all of the inhabited continents. After 1750, there began a race for rapacious exploitation of natural resources and widespread industrialization in Europe and America. The process continued for the last three centuries and created most of the present-day environmental problems.

3. Possibilistic Approach

Possibilistic Approach to environmental studies was born in the beginning of 20th century. *The concept of determinism which was conservative cannot be accepted by a society which is civilised and advanced.* The reason behind this is that man with the help of technological development has modified the nature for example he has created canals for making the water available in the extreme desert areas for making it suitable for living, like Indira Gandhi Canal in Indian desert.

The concept of Possibilism says that nature provide a number of opportunities and possibilities from among which man is free to select or choose.

The philosophy states that man with the help of his mind and will changes the influence of *nature on him*. The philosophy of Possibilism attempts to explain the man and environment relationship in different way taking man as an active agent.

The philosophy further states that nature provides opportunities and the number of opportunities increases as the knowledge and technology of a cultural group increases.

The hypothesis of Possibilism was put forwarded by Lucian Febvre who is of the opinion that *man is the most powerful agent who modifies the terrestrial surface of the earth*. Lucian said that 'there are no necessities but everywhere possibilities' for example man invented iron and it was up to him that how he make the use of that iron. It was up to him whether he uses the iron for making Arms, Bike, a Car, or a Plane, it depends on his technological development.

So the example proves that there are possibilities everywhere but there are no necessities. *Prior to the invention of iron though there was no necessity for a plane ship or a car but possibilities were still there.*

For example wheat does not have high yield where it was first domesticated (south-west Asia). Thus after the Second World War the philosophy of environmentalism was attacked.

4. Economic Deterministic Approach

This approach is based on the basic ideology of the man's mastery over environment and continued economic and industrial expansion through the application of modern technologies. Economy decides the fate of man's interaction with environment. This approach suggests an economic growth is essential for political, social and economic stability, the quality of environment normally assumes lower priority in planning.

This approach based itself on two assumptions firstly; positive correlation between the population of a green region and the level of economic development, secondly; the interaction of people resources and society are governed by universal economic principles.

5. Ecological Approach

Ecological approach of environmental studies is based on the basic concept of ecology. Ecology is a study of mutual interactions between organisms and physical environment on one hand and interactions among organism in a given ecosystem. This approach suggests man as an individual part of the ecosystem and his action should be symbiotic and not exploitative nor suppressive.

This school recognizes man, being most skilled and intelligent, as the leader of all biota of the earth.

This approach further lays emphasis on wise and restrained use of natural resources, application of appropriate environmental management programmers, policies and strategies keeping in view the ecological principles so that already depleted natural resources are replenished, degraded environment is set right and ecological balance is maintained.

6. System Approach

The systems approach in environmental science focuses on viewing the environment as a complex system with interconnected components. This approach emphasizes the interactions between different elements such as Atmosphere, Hydrosphere, Lithosphere and Biosphere.



{All Systems surrounding an organism constitute its Environment}



7. Interdisciplinary Approach

The interdisciplinary approach involves integrating knowledge and methods from multiple disciplines to address environmental issues comprehensively. A pictorial representation of this approach could feature overlapping circles or Venn diagrams showing how disciplines like biology, chemistry, physics, sociology, economics, and others intersect to provide a holistic understanding of environmental problems.

8. Holistic Approach

The holistic approach in environmental science considers the environment as a whole entity rather than focusing on individual parts separately.



9. Sustainability Approach

The sustainability approach aims to balance environmental, social, and economic factors to ensure long-term well-being for current and future generations. A pictorial representation of this approach could include a three-legged stool symbolizing the three pillars of sustainability – environmental protection, social equity, and economic prosperity – all supporting each other for stability.

10.Risk Assessment Approach

The risk assessment approach involves evaluating potential risks and uncertainties associated with human activities on the environment.









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