

UNIT I

MULTI DISCIPLINARY NATURE

OF

ENVIRONMENTAL STUDIES

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INTRODUCTION

- ✓ The word 'Environment' is derived from the French word 'Environner' which means to encircle, around or surround.
- ✓ The biologist Jacob Van Uerkal (1864-1944) introduced the term 'environment' in Ecology.
- ✓ Ecology is the study of the interactions between an organism of some kind and its environment.
- ✓ Environmental Science is the interdisciplinary field and requires the study of the interactions among the physical, chemical and biological components of the Environment with a focus on environmental pollution and degradation.

- ✓ The science of Environment studies comprises various branches of studies like chemistry, physics, life science, medical science, agriculture, public health, sanitary engineering, geography, geology, atmospheric science, etc.
- ✓ It is the science of physical phenomena in the environment. It studies the sources, reactions, transport, effect and fate of a biological species in the air, water and soil and the effect of and from human activity upon these.
- ✓ Environmental Science deals with the study of processes in soil, water, air and organisms which lead to pollution or environmental damages and the scientific basis for the establishment of a standard which can be considered acceptably clean, safe and healthy for human beings and natural ecosystems.

- The Environment is about the surrounding external conditions influencing development or growth of people, animal or plants; living or working conditions etc.
- This involves three questions ie., what is surrounded, by what surrounded and where surrounded.
- The answer to the first is living objects in general and man in particular.
- The answer to the question what surrounded is that human life is concerned to be the main in the study of environment, however it cannot exist or be understood in isolation from the other forms of life like animal life and from plant life.

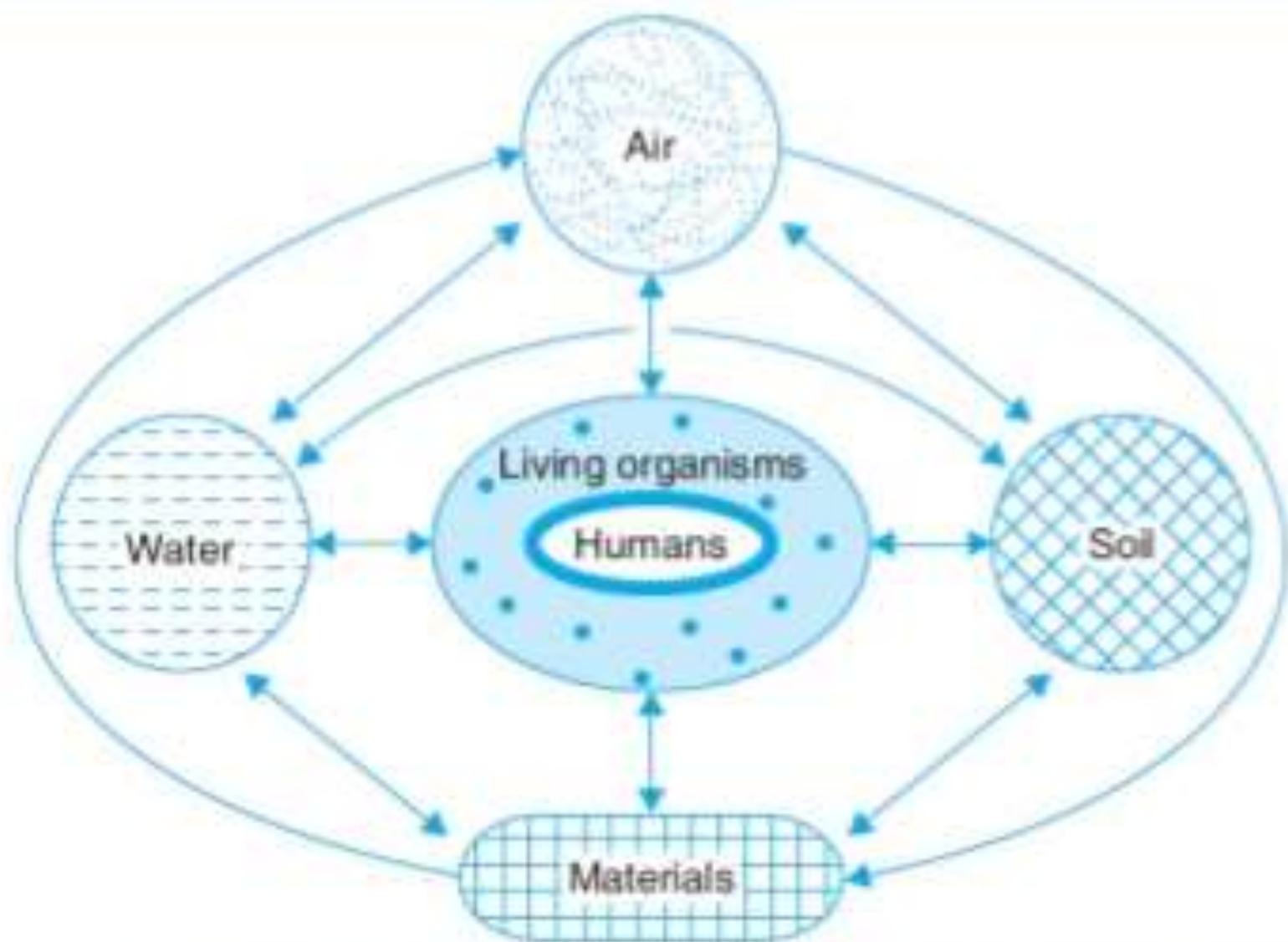
- Environment belongs to all living beings and is thus important for all.
- Hence, environment refers to the sum total of conditions surround in space and time.
- In the primitive age, the environment consisted of only physical aspects of the planet earth ie., land, water and air as biological communities. As of now, it includes social, economic and political conditions also.
- The answer for the question where surrounded is in nature that physical component of the planet earth, viz land, air, water etc., support and affect life in the biosphere..

DEFINITION:

Environment is the sum total of land, water, air, interrelationships among themselves and also with the human beings and other living organisms.

(OR)

The sum total of all surroundings of a living organism, including natural forces and other living things, which provide conditions for development and growth as well as of danger and damage.

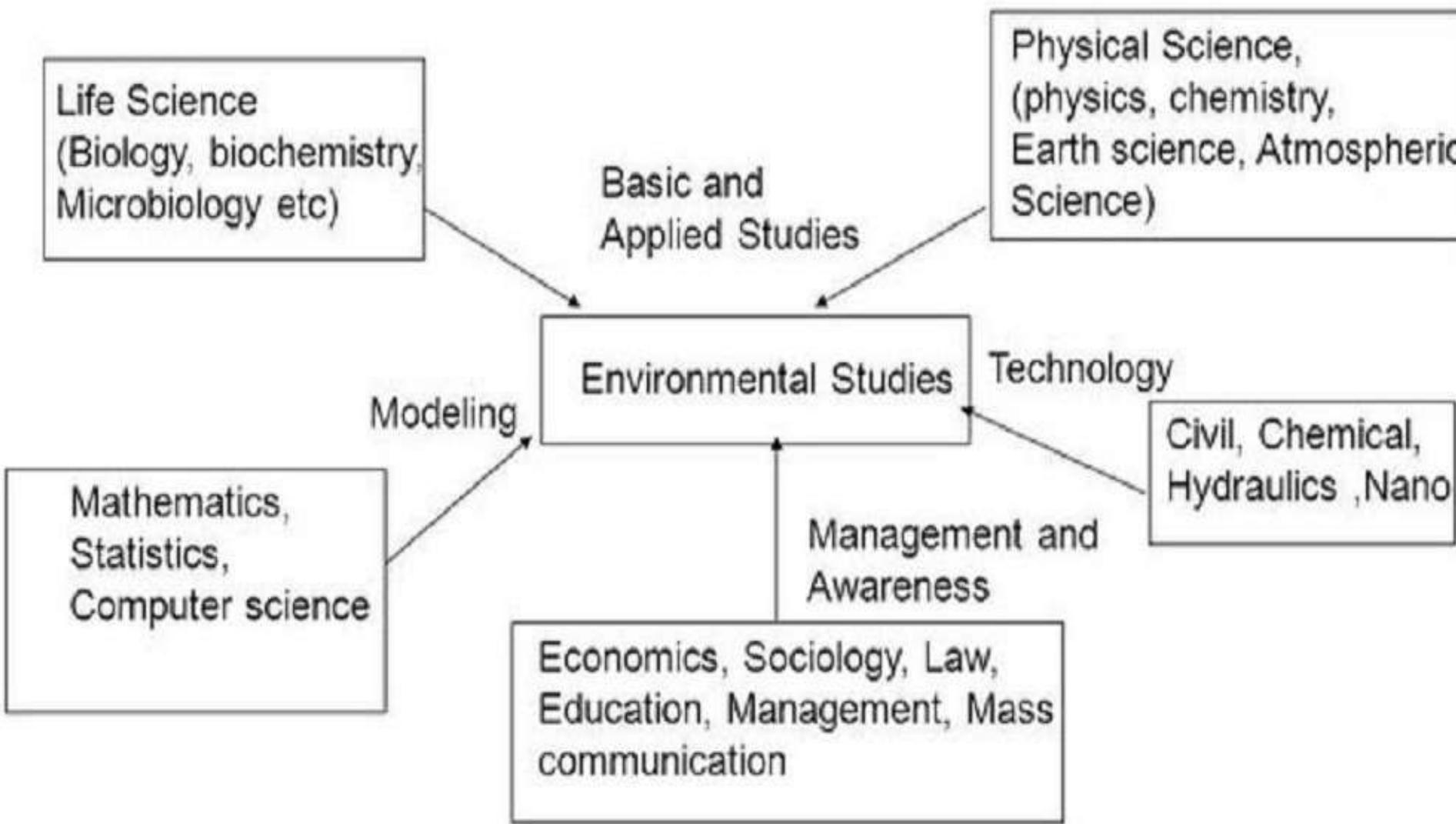


Concept of Environment: air, water, land, living organisms and materials surrounding us and their interactions together constitute environment.

Multidisciplinary Nature of Environmental Studies



- The study of environmental components is multidisciplinary in nature. Since it includes all disciplines such as science, humanities, commerce, meteorology, climatology, geography and other disciplines.
- Environmental studies is a multidisciplinary programme created to promote the study of our natural surroundings.





- Life sciences including botany, zoology, microbiology, genetics, biochemistry, biotechnology help in understanding the biotic components and their interactions.
- The physical and chemical structure of the biotic components and energy transfer and flow are understood with the help of basic concept of physics, chemistry, atmospheric science and oceanography.
- Mathematics, statistics and computer science serve as effective tools in environmental modelling and management.



- Economics, sociology and mass communication provides the input for dealing with socio economic aspects associated with various developmental activities.
- A synthesis with environmental engineering, civil engineering and chemical engineering form the basis for various technologies dealing with the control of environmental pollution, waste treatment and development of cleaner technologies that are important for protection of environment.
- Environmental laws provide the tools for effective management and protection of the environment.

OBJECTIVES OF ENVIRONMENTAL STUDIES

- ❑ Creating the awareness about environmental problems in the students.
- ❑ Giving basic knowledge about the environment and its related problems to the students.
- ❑ Developing an attitude of concern for the environment amongst the students.
- ❑ Motivating students to participate in environment protection and environment improvement.
- ❑ Acquiring skills to help the concerned individuals in identifying and solving environmental problems.

SCOPE OF THE ENVIRONMENTAL STUDIES



Scope of the environmental studies is broad based and it encompasses a large no of areas and aspects broadly listed below.

- 1. Natural resources—their conservation and management
- 2. Ecology and biodiversity
- 3. Environmental pollution and control
- 4. Social issues in relation to development and environment
- 5. Human population and environment



- **Natural resources-conservation:-** Natural aspects such as forests contribute towards maintaining a balance in the environment, managing and maintaining of forests and wild life is an important task under natural resources conservation.
- **Ecosystem structure and function:-** The study of the ecosystem mainly consists of the study of the processes that link with the biotic components to the non living (or) abiotic components.



- Environmental pollution and control:- With the knowledge of the environmental science one can look for methods to control pollution and manage waste effectively.
- Environmental management:- There are several independent environmental consultants working with the central and state pollution control boards. These consultants offer advice related to environment problems and their solutions. The consultants involved in policy making, pollution control and maintenance of ecological balance



- **Research and development:-** With increase in public awareness, regarding environment issues, there is tremendous scope for research and development in this field. They conduct research studies in order to develop theories of monitoring and controlling environment.
- **Environmental journalism:-** There is an increasing demand for people who can report on environment issues to generate awareness among people. Environmental journalism is an emerging field which helps in bringing environmental problems to public notice.



- **Industry:-** Environmental scientists work towards maintaining ecological balance, conservation of bio diversity and preserve the natural resources. Rapid industrialization is increasingly degrading the environment to minimize this, there is a growing trend towards manufacturing of “green” goods and products.

IMPORTANCE OF ENVIRONMENTAL STUDIES



- 1) Environmental studies helps maintain ecological balance by providing a basic operating knowledge of environmental system and processes.
- 2) It gives information regarding the changes that takes place due to anthropogenic factors and helps gain skills of analysing various environmental system and the effect of human activities on them.
- 3) Environmental studies help to achieve sustainable development and understand the relationship between development and the environment.
- 4) This discipline helps to educate people regarding their duties towards environmental protection.



- 5) Environment is one subject that is actually global in nature.
- 6) Environmental study deals with the analysis of the processes in water, air, land, soil, and organism which leads to pollution (or) environment degradation.
- 7) It also deals with the most important issues like safe and clean drinking water, hygienic living conditions, clean and fresh air, healthy food for man and for development.
- 8) The discipline provides us with basic knowledge of the environment and various environmental issues. It examines the scientific basic for environmental and social concerns about our present energy needs, global climate changes, toxic emission and waste disposal.



- 9) It also provide knowledge about the development and utilisation of energy resources and the role of public policy there in.
- 10) Environmental law, business administration and environmental engineering are emerging as new career opportunities for environment protection and management.

OPTION VALUE

- ▣ That is keeping options for the future and simply knowing that certain species exist .
- ▣ A species potential to provide an economic benefit to human society at some point in the future is its option value.
- ▣ As the needs of the society change , so must the methods of satisfying those needs.
- ▣ The option value of species could be only recently utilized by human beings

SOME EXAMPLES

- Health agencies and pharmaceutical companies are making a major effort to collect and screen species for compounds that have the ability to fight cancer.
- In some cases well known species have been found to have exactly those properties needed to deal with a significant human problem

Aesthetic Value

- The appreciation of the presence of biodiversity for its inherent value and beauty, as well as for the contribution it makes to our knowledge-our aesthetic, imagination and creativity- are some reasons to preserve it.
- Quite apart from killing wildlife for food, it is important as a tourist attraction.
- Biodiversity is a beautiful and wonderful aspect of nature. Sit in a forest and listen to the birds. Watch a spider weave its complex web. Observe a fish feeding. Its just magnificent and fascinating.
- In India, particularly , our history and culture is replete with plant and animal image.
- Symbols from wild species such as the lion of Hinduism, the elephant of Buddhism and the vehicles of several deities are animals, that have been venerated for thousands of year.
- The sacred Basil or the '*Tulsi*' has grown in the courtyards of each household for centuries.

Productive Values

- These are the commercially usable values where the product is marketed and sold. It may include number of wild gene resources that can be traded for use by scientists for introducing desirable traits in the crops and domesticated animals.
- These may include the animal products like tusks of elephants, musk from musk deer, silk from silkworm, wool from sheep, fur of many animals, lac from lac insects etc, all of which are traded in the market. Many industries are dependent upon the productive use values of biodiversity e.g. the paper industry, plywood industry, railway sleeper industry, silk industry, textile industry, ivory-works, leather industry, pearl industry etc.

SEGMENTS OF ENVIRONMENT

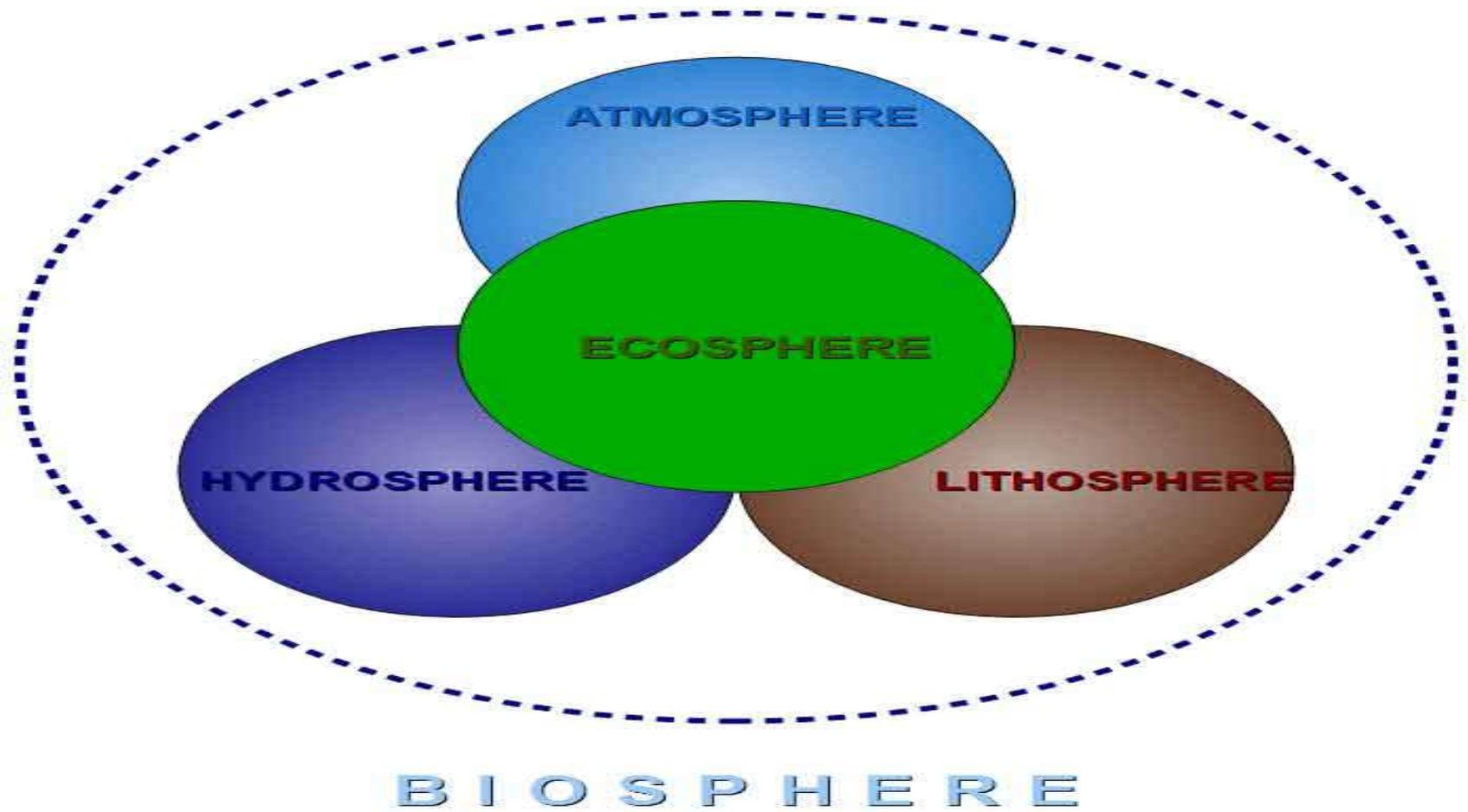
The four important segments are

1) Atmosphere

2) Hydrosphere

3) Lithosphere

4) Biosphere



1. Atmosphere:

- The Atmosphere forms a distinctive protective layer about 100 km thick around the earth.
- A blanket of gases called the atmosphere surrounds the earth and protects the surface of earth from the Sun's harmful, ultraviolet rays.
- It also regulates temperature, preventing the earth from becoming too hot or too cold.
- It saves it from the hostile environment of outer space.
- The atmosphere is composed of nitrogen and oxygen besides, argon, carbon dioxide and trace gases.
- It absorbs most of the cosmic rays from outer space and a major portion of the electromagnetic radiation from the sun.

2. Hydrosphere:

- The Hydrosphere comprises all types of water resources oceans, seas, lakes, rivers, streams, reservoirs, polar icecaps, glaciers, and ground water.
- Oceans represent 97% of the earth's water and about 2% of the water resources is locked in the polar icecaps and glaciers.
- Only about 1% is available as fresh water as surface water in rivers, lakes, streams, and as ground water for human use.

3. Lithosphere:

It means the mantle of rocks constituting the earth's crust. The solid component of the earth is called Lithosphere, which includes soil, earth, rocks and mountains etc. The lithosphere mainly contains three layers –

(a) Inner and Outer Core:

Central fluid or vaporised sphere of diameter of about 2500km from the centre.

(b) Mantle:

It is about 2900-3000 km above the core in molten state.

(c) Crust:

Outermost solid zone about 8-40 km above mantle.

4. Biosphere:

This segment of environment consists of atmosphere (air- O₂, N₂, CO₂). Lithosphere (land- minerals, salts, food, nutrients) and hydrosphere (water- dissolved oxygen, Salts) which influences and support the entire biotic and abiotic life systems.

NEED FOR PUBLIC AWARENESS



- Environmental pollution is effecting on plant, animals and human life. The soil, minerals, water, fuel, plants and animal resources are being depleted and climatic changes, desertification and floods are becoming drastic.
- More over, the human population is growing faster than ever and creating more pressure on the environment.
- More of the environmental problems are global in nature therefore every citizen of the world needs to be aware and actively participate in protecting in protecting global environment for participation, public awareness is essential.

OBJECTIVES OF PUBLIC AWARENESS



- It can be introduced as a course in school and colleges. It is the most successful method of propagating environmental awareness.
- This course spread awareness regarding the protection of the environment.
- A government at its own level cant achieve the goals of sustainable development until the public has a participatory role in it.
- The public has to be educated about the fact that if we degrading our environment we are actually harming our own selves.

THROUGH MASS MEDIA



- Mass media as news papers, magazines, radios, t v etc., can play an important role in educating the masses regarding environmental problems and issues.
- Through organizing seminars and conferences, organizing meeting seminars, and conferences at various levels help in spreading environmental information to general public.
- Awareness can also be spread by organizing various competitions on environmental problems, non conventional energy sources etc., such competitions may also help in disseminating information regarding various environmental issues.

ENTERTAINMENT



- Environmental awareness can also be propagating through folk songs, street plays, documentaries etc.,

OUTCOMES OF ENVIRONMENTAL STUDIES



- ❑ Illustrate Depleting Nature of Environmental Resources, Global Environmental Crisis and the concept of Ecosystem
- ❑ Adapt to the concept of 3R (Reuse, Recovery, Recycle).
- ❑ Suggest different control measures related to Environmental Pollution.
- ❑ Illustrate and analyse various Case Studies related to Environmental Legislation.
- ❑ Demonstrate the working of Renewable Energy sources.
- ❑ Illustrate the Techniques of Disaster Management and Green Building

THANK YOU



Go Green...

Save Environment, Save
Life.....