

Introduction to environmental sciences

MEANING, NATURE
AND
COMPONENTS OF
ENVIRONMENT

MEANING OF ENVIRONMENT

- The word environment is derived from the French word “environ”. The meaning of the French word is somewhat related to “encompass” “encircle” etc. It is believed to have been introduced into the subject by biologist Jacob Van Erkul in the early 1900s.
- With environment being such a generalized term, its classification and an understanding of its composition becomes a necessity.

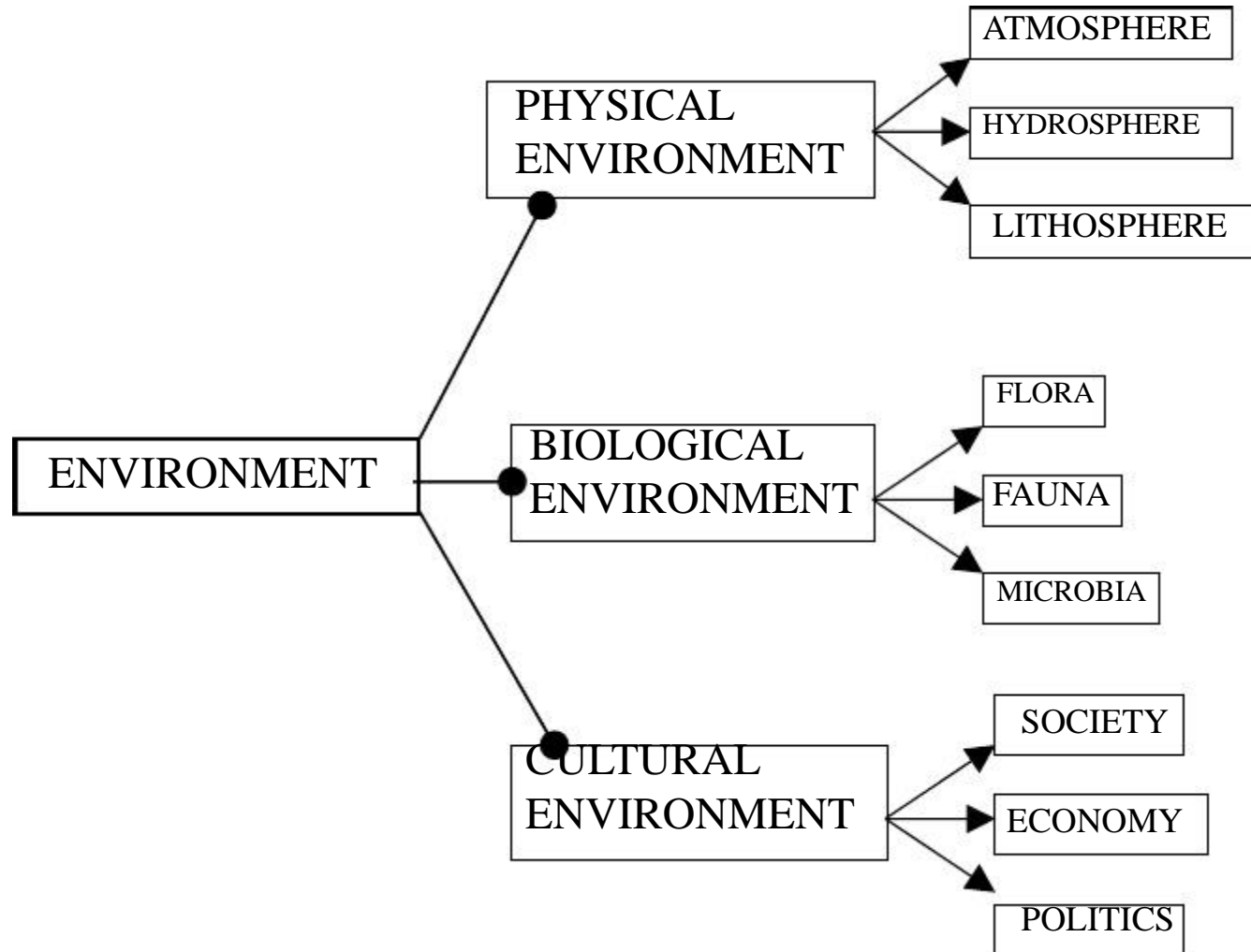
ENVIRONMENT

- The surroundings or conditions in which a person, animal, or plant live or operate is called environment.
- Every organism in this earth is surrounded by a lot of things; say other organisms, plants, water, air, light, land etc.

Other definitions

- Environment can be defined as the natural surroundings of that organism which directly or indirectly influences the growth and development of the organism.
- Environment is defined as the surroundings in which an organization operates including air, water, land and natural resources, flora, fauna, humans and their inter relations” – ISO Definition
- Environment is the sum total of all living and non living factors that compose the surroundings of man.

CLASSIFICATION/TYPES OF ENVIRONMENT



CLASSIFICATION OF ENVIRONMENT

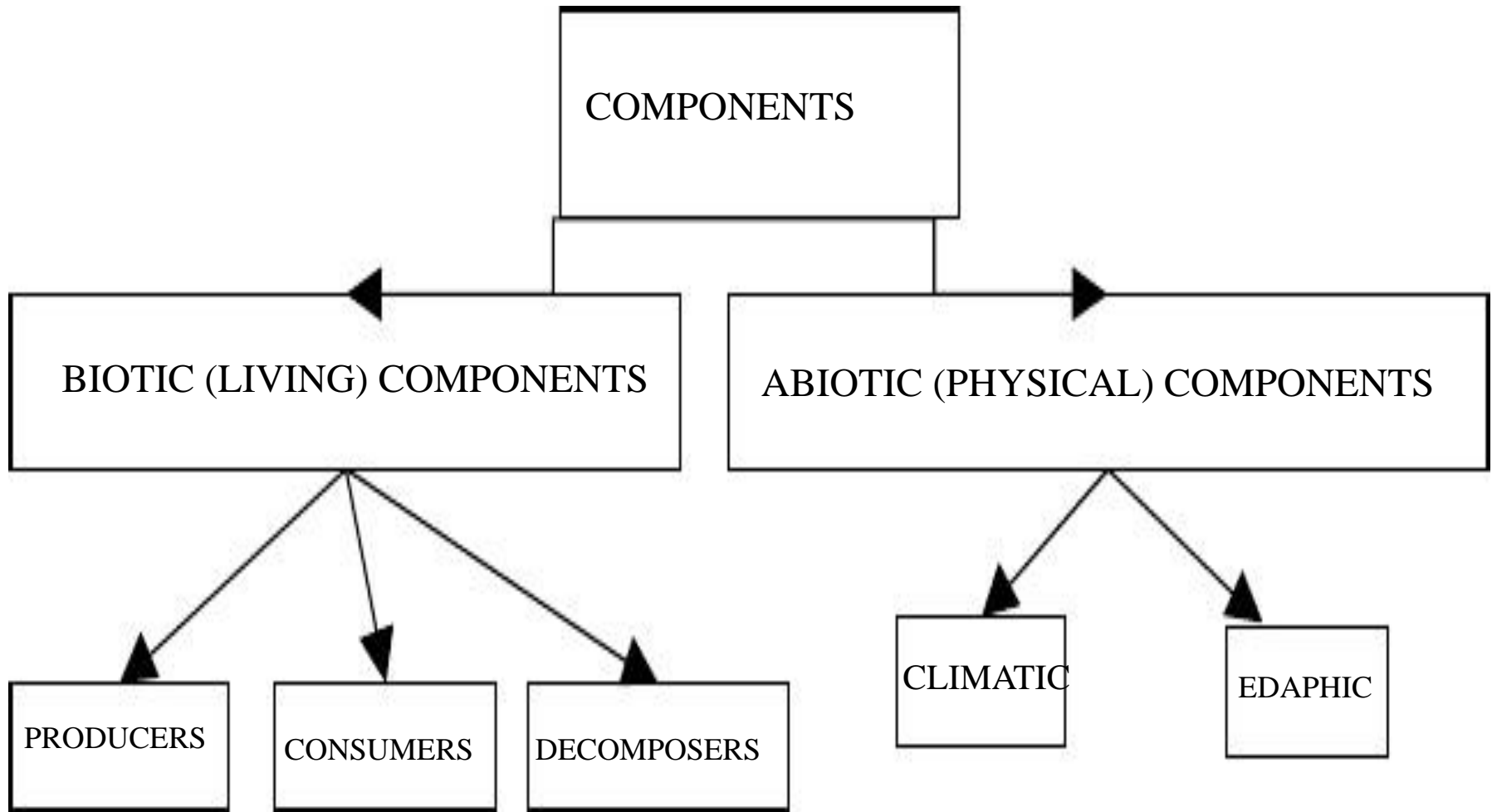
- We are more concerned with the physical environment from our perspective as the cultural environment and biological environment are left to specialists like economists and biologists.
- The Cultural Environment gives an idea of learned behavioral traits those are clear and shared by members of society.

- The cultural environment can be divided into three sub-heads namely the social environment reflects the traditions that he or she was grown, lives in, and the community with whom the individual interacts.
- The economic environment refers to the set of factors that surrounds the organism involving monetary, natural, and human resources that influence the behavior of that particular organism.
- The political environment involves the environment involving conflicting interactions, between other organisms, often resulting in the formation of alliances or coalitions and used to resolve the conflict and achieve the goals of the allies or their influential members.
- The most important thing about the cultural environment is that it cannot be physically represented, but it is there anyway.

COMPONENTS OF ENVIRONMENT

- The conflict of words and thoughts between scientists of European origin and American origin has had its toll on the subject of environment.
- Though air, water and land are the components of environment, the British and American scientists put in two different manners.

COMPONENTS OF ENVIRONMENT AS PER BRITISH LITERATURE



Components of Environment as per British literature

- components are classified in terms of biotic and abiotic based upon life.
- The biotic components are further listed as producers, consumers and decomposers and the abiotic components are classified as climatic (water, air) and edaphic (land).
- It is from this component system that the study of structure of ecosystem was evolved.

Abiotic Component

- In biology, abiotic components are non-living chemical and physical factors in the environment.
- Abiotic phenomena underlie all of biology.
- Abiotic factors, while generally downplayed, can have enormous impact on evolution.
- Abiotic components are aspects of geodiversity. They can also be recognized as "abiotic pathogens"
- From the viewpoint of biology, abiotic influences may be classified as light or more generally radiation, temperature, water, the chemical surrounding composed of the terrestrial atmospheric gases, as well as soil. The macroscopic climate often influences each of the above. Not to mention pressure and even sound wave if working with marine, or deep underground, biome.

Biotic Component

- Biotic components are the living things that shape an ecosystem.
- A biotic factor is any living component that affects another organism, including animals that consume the organism in question, and the living food that the organism consumes. Biotic factors include human influence.
- Biotic components are contrasted to abiotic components, which are non-living components of an organism's environment, such as temperature, light, moisture, air currents, etc.
- Biotic components usually include:
 - Producers, i.e. autotrophs: e.g. plants; they convert the energy (from the sun, or other sources such as hydrothermal vents) into food.
 - Consumers, i.e. heterotrophs: e.g. animals; they depend upon producers for food.
 - Decomposers, i.e. detritivores: e.g. fungi and bacteria; they break down chemicals from producers and consumers into simpler form which can be reused.

Components of Environment as per American literature

The components of environment are listed as

- ▶ 1. Hydrosphere (Water)
- ▶ 2. Atmosphere (Air)
- ▶ 3. Lithosphere (Land)
- ▶ 4. Biosphere (Flora/Fauna/Microbes)
- ▶ 5. Anthrosphere (man made things)

1. Hydrosphere (Water)

Hydrosphere is a discontinuous layer of water at or near earth surface. It include all liquid and frozen surface water, ground water held in soil and rock, and atmosphere water vapor as well as the, oceans, seas, river, lakes and other water bodies.

2. Atmosphere (Air)

The envelope of gases surrounding the earth or another planet is called atmosphere.

The atmosphere of Earth is composed of nitrogen (about 78%), oxygen (about 21%), argon (about 0.9%), carbon dioxide (0.04%) and other gases in trace amounts. Oxygen is used by most organisms for respiration; nitrogen is fixed by bacteria and lightning to produce ammonia used in the construction of nucleotides and amino acids; and carbon dioxide is used by plants, bacteria for photosynthesis. The atmosphere helps to protect living organisms from genetic damage by solar ultraviolet radiation, solar wind and cosmic rays.

3. Lithosphere (Land)

Lithosphere is the rigid, outermost shell of a terrestrial-type planet, or natural satellite, that is defined by its rigid mechanical properties. On Earth, it is composed of the crust and the portion of the upper mantle that behaves elastically on time scales of thousands of years or greater. The outermost shell of a rocky planet, the crust, is defined on the basis of its chemistry and mineralogy.

4. Biosphere (Flora/Fauna/Microbes)

The biosphere is the worldwide sum of all ecosystems. It can also be termed the zone of life on Earth, a closed system (apart from solar and cosmic radiation and heat from the interior of the Earth), and largely self-regulating. By the most general biological definition, the biosphere is the global ecological system integrating all living beings and their relationships, including their interaction with the elements of the lithosphere, hydrosphere, and atmosphere.

Anthrosphere (man made things)

The anthrosphere or anthroposphere (sometimes also called the techno sphere) refers to the part of the environment that is made or modified by humans and is used for human activity. It is one of the earth's spheres. Other major spheres include the atmosphere, lithosphere, cry sphere, biosphere and hydrosphere.

Thank you