

Ecosystem

B.Sc. Part-I, Paper-I, Group-B

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Introduction

An ecosystem is defined as a structural and functional unit of biosphere, which consist of community of living beings and the physical environment, their interaction and exchange of materials between them.

It includes plants, animals, microorganisms, soil, water etc.

The term ecosystem was first used by A. G. Tansley in 1935 who defined ecosystem as 'a particular category of physical systems, consisting of organisms and inorganic components in a relatively stable equilibrium, open and of various sizes and kinds

According to R. L. Lindeman (1942) the term ecosystem applies to 'any system composed of physical-chemical-biological processes, within a space-time unit of any magnitude'.

F. R. Fosberg (1963) has defined ecosystem as 'a functioning, interacting system composed of one or more living organisms and their effective environment, both physical and biological'.

Based on the contents of above definitions of ecosystem provided by various scientists it may be pointed out that 'ecosystems are

therefore unities of organisms connected to one another and to their environment'.

Ecosystem vary greatly in size and elements but each is a functioning unit of nature. Everything that lives in ecosystem is interdependent on other species and elements that are also part of ecological community. Any damage to any part of the ecosystem has impact on everything else.

When an ecosystem is healthy or sustainable it shows that all the components are living in balance and are capable of reproducing themselves. Ecosystem can be as small as a single tree and as large as entire forest.

Types of Ecosystem with Examples

I: Natural: Terrestrial



Grassland



Forest



Desert

Natural: Aquatic



a) Marine: Oceans



b) Freshwater: Lakes

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II: Artificial or Manmade

Aquarium



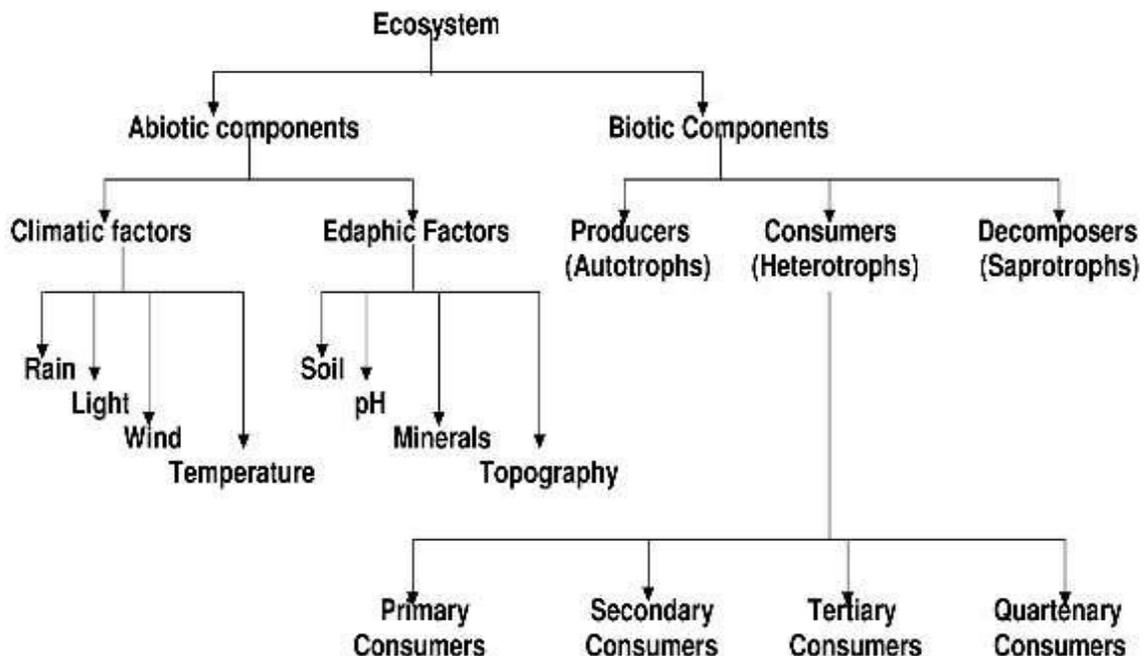
Crop field



Components of Ecosystem

There are two main components of an ecosystem. They are the abiotic and biotic components. Both these components are in constant communication with each other

Components of Ecosystem



- ❖ **Energy**- Energy from the sun is essential for maintenance of life. In the case of plants, the sun directly supplies the necessary energy. Since animals cannot use solar energy directly, they obtain it directly by eating plants and animals or both. Energy determines the distribution of organism in the environment.
- ❖ **Rainfall**- Water is essential for all living beings. Most of the biochemical reactions takes place in aqueous medium. It also helps to regulate body temperature. It provides habitat for many aquatic animals.
- ❖ **Temperature**- It is the critical factor which highly influence the survival of organism. Organism tolerate certain range of

temperature and many biological functions also operate at optimal temperature.

- ❖ **Atmosphere-** The earth's atmosphere is responsible for creating conditions suitable for the existence of healthy biosphere.
- ❖ **Soil-** land is covered by soil and it provide habitat and support life.
- ❖ **Materials-** organic compounds such as protein, carbohydrate and lipids are formed of inorganic compounds.
- ❖ Inorganic compounds like carbon dioxide hydrogen, nitrogen phosphates etc. are essential for organism to survive.
- ❖ **Latitude-**Latitude has a strong influence on an area's temperature, responsible for change of climates such as polar, tropical and temperate. The climate determines different natural biomes.
- ❖ **Altitude-** From sea level to highest peaks, wild life is influenced by altitude. As the altitude increases, the air become colder and drier and affect wildlife accordingly.

Biotic Components

The living components of an ecosystem are called the biotic components. They are classified according to their functional attribute. Some of these factors include plants, animals, as well as microorganism. These biotic components can be further classified, based on the energy requirement source. Producers, consumers, and decomposers are the three broad categories of biotic components.

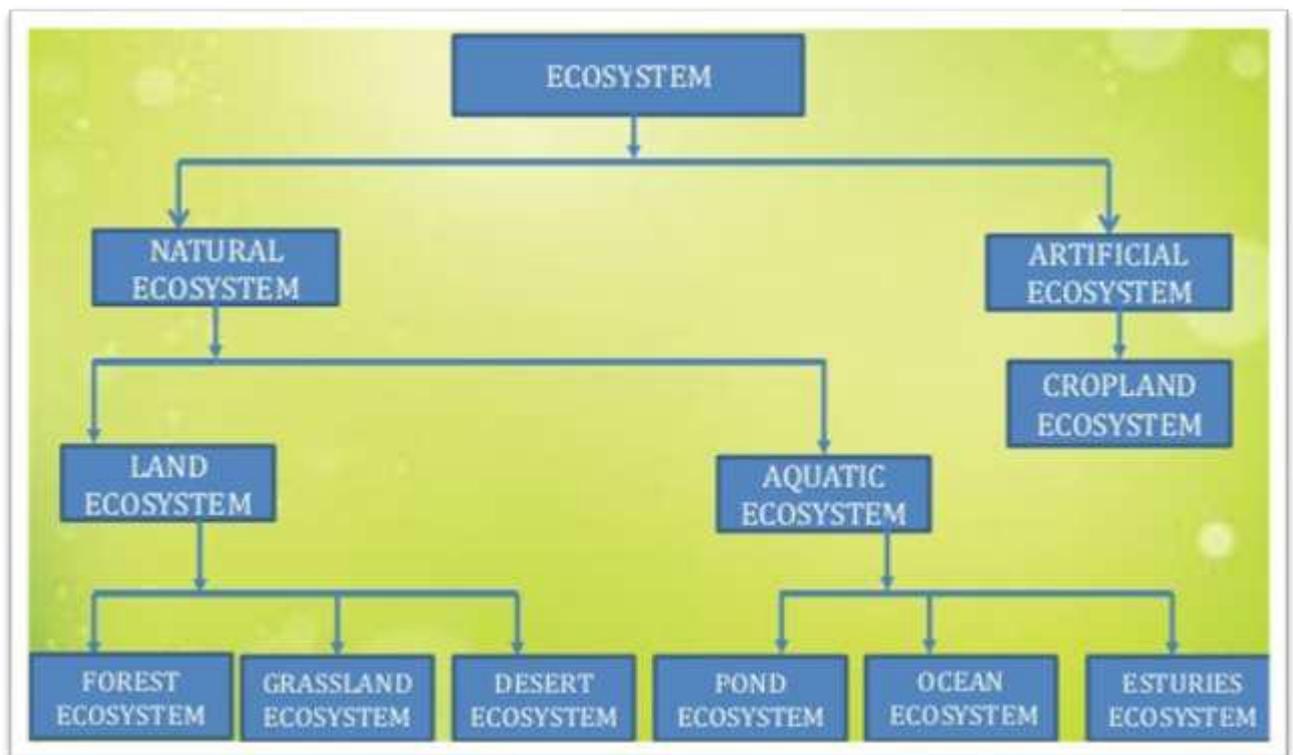
- ❖ **Producers-** are the plants in the ecosystem, which can generate their own energy requirement through photosynthesis, in the presence of sunlight and chlorophyll. All

other living beings are dependent on plants for their energy requirement of food as well as oxygen.

❖ **Consumers**- Include herbivores, carnivores, and omnivores. The herbivores are the living organism that feed on plants. Carnivores eat other living organisms. Omnivores are animals that can eat both plants and animals

❖ **Decomposers**- they consist of fungi and bacteria, which belongs to saprophytes. They feed on the decaying organic matter and convert this matter into nitrogen and carbon dioxide. The saprophytes play a vital role in recycling the nutrients so that the producers i.e. plants can use them once again.

Classification of Ecosystem



The detailed study of types of ecosystem will be dealt in next lecture notes