

## THE ECOSYSTEM CONCEPT

The term “eco” implies environment; while the term “system” implies an interacting, interdependent complex.

The word ecosystem was proposed by an English ecologist, Arthur George Tansley in 1935. It is the central concept of ecology and the biologically rational management of forest resources. The ecosystem as a concept is often described as the basic unit of ecology and it embraces every level of organization.

An ecosystem (i.e. the contraction of the phrase ‘ecological system’) is a discrete structural-functional life sustaining system. It is a network of interactions between living organisms and physical, chemical, biological and social environments.

There are two basic components of the ecosystem: first, the biotic part, which is living, and second, the abiotic part, which is non-living. Both of these components are equally important to the ecosystem because without one of them the system would not function. The biotic and abiotic components in a habitat constitute an interacting environmental system in which inorganic constituents are synthesized into organic structure and through energy exchange processes, life of various forms exists in the system. Such a dynamic environmental system is known as ECOSYSTEM. i. e a contraction of the phrase ‘ecological system’.

A system implies coordinated functioning of different components. Ecosystems are the subject matter of ecology, and an understanding of their structure and function is the concern of the ecologist.

Simply defined, an ecosystem is a natural system consisting of living communities and their environment interacting to form a stable unit.

In an ecosystem the abiotic components which include all the factors of the non-living environment such as light, air, water, minerals provide the matrix for the synthesis and perpetuation of organic component (protoplasm).

The synthesis and perpetuation processes involve energy exchange and this energy comes from the sun in the form of light. Thus, in any ecosystem there must be:

1. Inorganic constituents. i. e. the abiotic component (air, water, mineral salts – nutrient elements).
2. Organisms (plants and animals) i.e. the biotic component, and
3. Energy input.

These three interact and form an environmental system. Based on their functions, organisms .  
i. e. the biotic component can be divided into three parts:

- a) Producers
- b) Consumers
- c) Decomposers

The inorganic constituents are synthesized into organic structures by the green plants (primary producers) through photosynthesis and solar energy is utilized in the process. The green plants become the source of energy for the animals (herbivores – primary consumers), these animals become source of energy for the flesh eating animals (carnivores – secondary consumers). Animals of all types grow and add organic matter to their body weight and their source of energy is the complex organic compounds taken as food, are known as secondary producers. All these living organisms whether plants or animals have definite life span and die. The dead organic structures provide food for the bacteria, fungi and lots of microbes which ultimately decompose the organic structure and break the complex molecules and liberate the inorganic components into the environment. These organisms are known as **decomposers**. During the process of decomposition of the organic molecules the energy which kept the inorganic components bound together in the form of organic molecules gets liberated and dissipated in the environment as heat energy. Thus, in an ecosystem the inorganic materials (air, water, mineral salts) keep on circulating from the abiotic environment to the biotic components and back to the abiotic state. This circulatory cycle is known as BIOGEOCHEMICAL CYCLE. The energy, unlike abiotic components, has a unidirectional and non-cyclic passage in the ecosystem. It enters into the ecosystem in the form of light (solar energy), flows through the ecosystem and ultimately passes out in the form of heat.