

# ECOSYSTEMS

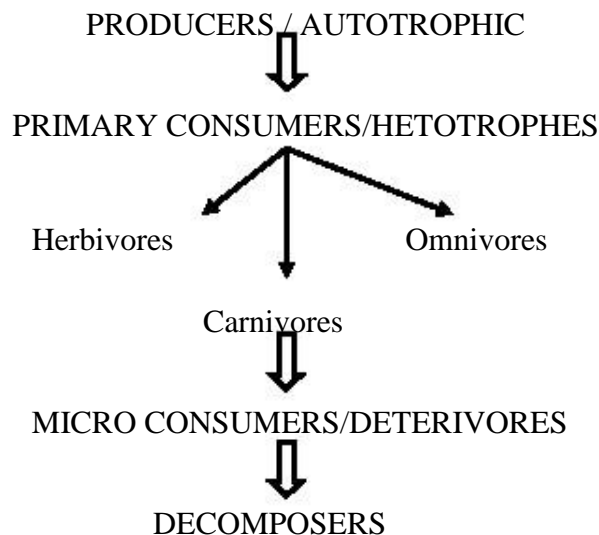
The term ecosystem was coined in 1930 by Roy Clapham to mean the combined physical and biological components of the environment. Ecosystem is the integrated study of biotic and abiotic components of the environment and their interaction within the given ecosystem framework.

An ecosystem is a biological environment consisting of all the organisms living in a particular area, as well as all the nonliving (abiotic) or physical components of the environment with which the organisms interact, such as air, soil, water and sunlight.

## 11.2.1 Structure and functions of ecosystem:

The ecosystem is broadly divided into physical or abiotic ecosystem comprising of soil, water, sunlight, climate, minerals etc and biotic or living eco systems where plants, animals, microorganisms form a system of survival and interdependence. Biotic components are further divided into four parts i.e.

Figure 11.2



1. Producers/ Autotrophes- They are self nourishing organisms who make their own food in the presence of sunlight with the process of photosynthesis. for e.g. Green plants.

2. Primary consumers/Heterotrophes- The consumers are directly or indirectly dependant on the producers for the food. They are further classified as:

- a) Herbivores dependent on green plants or grass for e.g. cow or rabbit.
- b) Carnivores- Those animals who consume herbivores. For e.g. tiger or lion
- c) Omnivores- Those species who consume both plants as well as animals. For.e.g. Humans.

11. Micro consumers/detrivores- The species that feed on dead animals or dead organic matter. For e.g. eagle

4. Decomposers- They are small living beings such as bacteria, fungi or insects. They break down the complex compound and dead material and release nutrients in the soil. This nourishment from the soil then transfers to the plants and the cycle gets completed.

Functions of ecosystem:

It helps to maintain the energy flow in the components of the environment through cycles, food chains and food webs.

It maintains the energy cycles, nutrient cycle and biochemical cycles in the environment

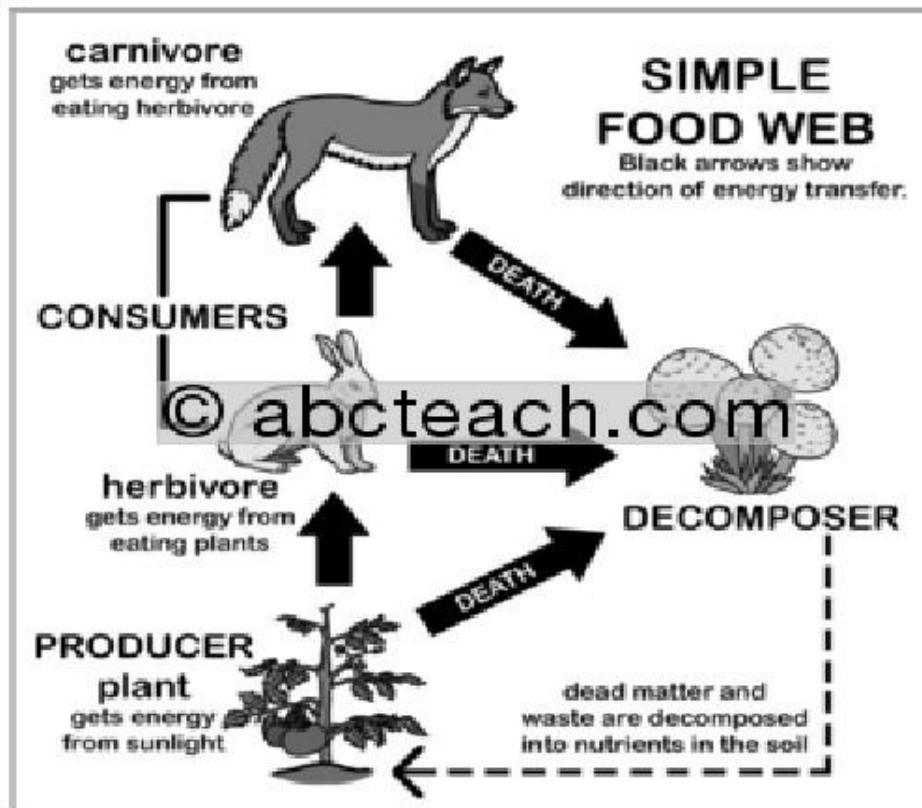
It helps to maintain the diversity of the species through the process of evolution, adaptation and extinction.

11.2.2 Food chains, food webs and energy pyramids:

The movement of organic matter from the producer level through various consumer levels by the process of eating and being eaten is called food chain. In the process of photosynthesis, in the presence of sun, producers produce food, which is consumed by heterotrophes especially the herbivores who are further consumed by carnivores or omnivores. Detrivores and decomposers then release energy in the form of nutrients by feeding on the dead animals or dead organic matter. With these nutrients plants grow in the soil resulting in a complete energy or nutrient cycle. This is called the food chain.

For e.g. Sun → Grass → grasshopper/  
Rabbit → Snakes/  
Wolf → Hawk/  
Bacteria

Figure 11.3

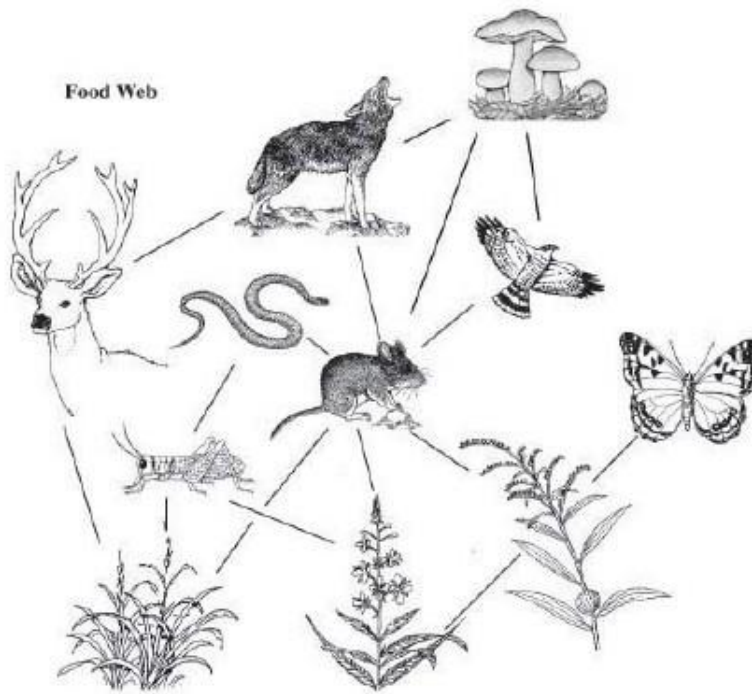


Food webs:

In many cases the food chains of the ecosystems do not exist as individual units. They overlap and interconnect, forming what are known as food webs. In nature there are several food webs interlinked and existing at the same time in different habitats. The different food chains that of varying lengths, those that form loops and others that branch out into a network together create food webs or the webs of life within ecosystems.

For instance in the chain mentioned above, hawk might directly decompose the grasshopper or bacteria might consume rabbit without waiting for the wolf to consume the rabbit. Here is an example of interlinked food chains. i.e. a food web.

Figure 11.4



### Energy pyramids:

An ecological pyramid also known as tropical pyramid or energy pyramid is a graphical presentation designed to show the biomass productivity at each tropical level in a given ecosystem. Biomass is the amount of living organic matter present in the organism. At the bottom of the pyramid is producers and decomposers are at the top of the pyramid. As one goes higher the biomass in an ecological pyramid reduces due to release of energy and nutrients at each level

