

Board –CBSE

Class –10<sup>th</sup>

Topic – Our Environment

## Introduction

An ecosystem includes both living (biotic) and non-living (abiotic) components.

## Ecosystem

“All the interacting organisms in an area together with the non-living constituents of the environment form an ecosystem”. Eg: forest, pond, etc.

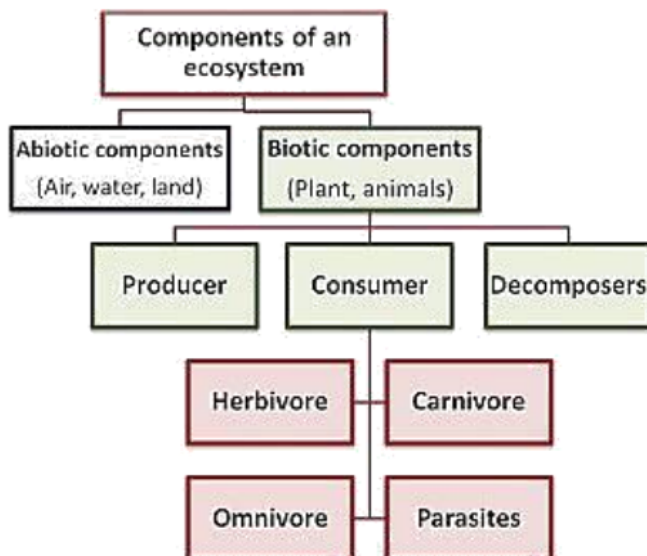
## Types of ecosystem

(i) **Natural ecosystem:** The ecosystem which exists in nature on its own.

Example: forest, lake, ocean.

(ii) **Artificial ecosystem:** Man-made ecosystems are called an artificial ecosystem.

Example: crop field, aquarium, garden.



(i) **Abiotic Components:** Non-living components such as air, water, land, light, temperature, etc.

(ii) **Biotic Components:** Living components such as plants, animals, bacteria, fungi, etc.

Based on nutrition, biotic components are further divided into:

- **Producers:** All green plants and blue-green algae can produce their own food using abiotic components (photosynthesis), hence called producers.

- **Consumers:** Include all animals which depend on producers directly or indirectly for their food.

## Division of Consumers

(i) **Herbivores:** Plant eaters. Example: goat, deer.

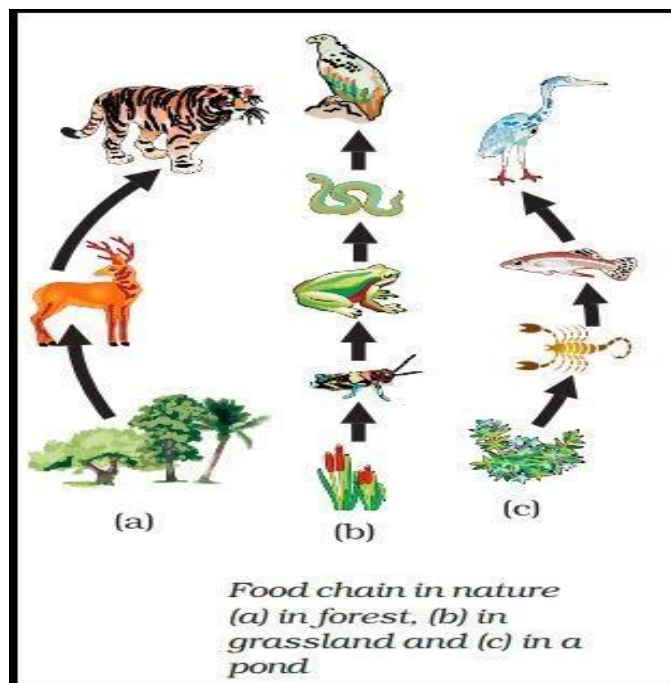
(ii) **Carnivores:** Flesh eaters. Example: tiger, crocodile.

(iii) **Omnivores:** Eats both plants and animals. Example: human.

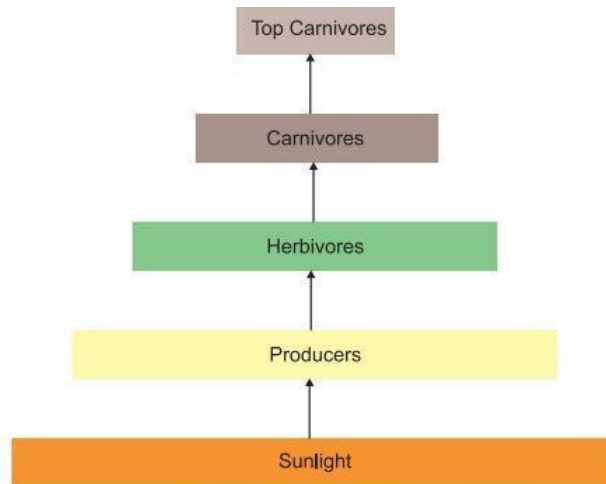
(iv) **Parasites:** Live on the body of the host and take food from it. Example: lice, Cuscuta.

**Decomposers:** Include organisms that decompose the dead plants and animals. Example: bacteria, fungi. These help in the replenishment of natural resources.

## Food Chain

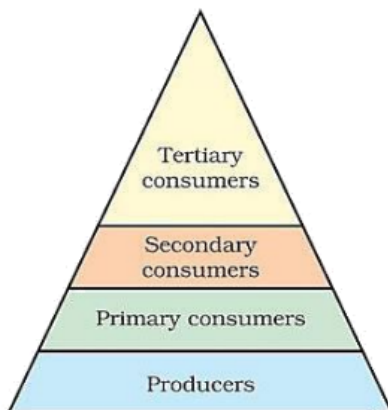


- “Food chain is a series of organisms in which one organism eats another organism as food”. For example, Grass → Deer → Lion.
- In a food chain, various steps where transfer of energy takes place is called a trophic level.



## The flow of energy between trophic levels

- **The flow of energy** in a food chain is unidirectional.
- **Green plants capture 1% of sunlight** and convert it into food energy.
  - **Only 10% of energy is transferred to the next trophic level.** The remaining 90% of energy is used in life processes (digestion, growth, reproduction, etc.) by the present trophic level.



### Trophic levels

Decrease in energy at each trophic level

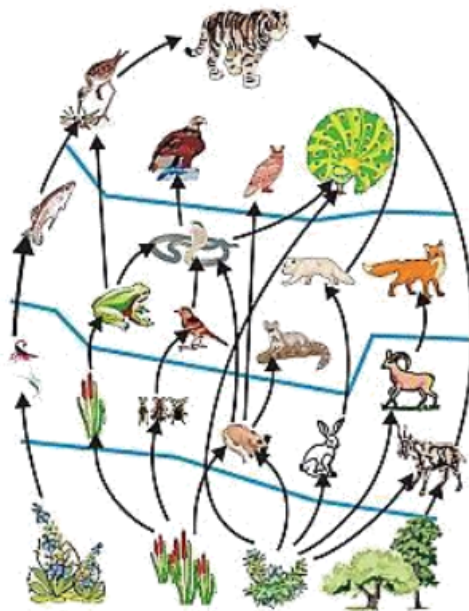
1 kJ → 10 kJ → 100 kJ → 1000 kJ

**Biological magnification:** “The concentration of harmful chemicals increases with every next trophic level in a food chain. This is called biological magnification”.

The maximum concentration of such chemicals gets accumulated in human bodies as humans occupy the top level in any food chain.

## Food web

In nature, large numbers of food chains are interconnected forming a food web.



**Environmental problems:** Changes in the environment affect us and our activities change the environment around us. Human activities lead to pollution, deforestation, etc.

## Ozone layer

- The ozone layer is a protective blanket around the earth that absorbs most of the harmful UV (ultraviolet) radiation of the sunlight.
- The ozone (O<sub>3</sub>) layer is present at higher levels of the atmosphere (i.e. stratosphere). It is a deadly poison at ground level.

## Formation of the ozone molecule

- The high-energy UV radiations break down the O<sub>2</sub> molecules into free oxygen (O) atoms. O<sub>2</sub> + UV → O + O (atoms)

- These oxygen atoms then combine with oxygen (O<sub>2</sub>) molecules to form the ozone molecule.  
 $O_2 + O \rightarrow O_3$  (ozone)

## Depletion of the ozone layer

- This decrease was due to excessive use of chemicals like chlorofluorocarbons (CFCs) which are used in refrigerators, ACs, fire-extinguishers, aerosols sprays, etc.
- United Nations Environment Programme (UNEP) succeeded in forging an agreement to stop CFC production at 1986 levels (KYOTO PROTOCOL) by all countries.

## Garbage disposal

### Types of materials in Garbage

- **Biodegradable:** Substances that can be decomposed by the action of microorganisms are called biodegradable wastes. Example: fruit and vegetable peels, cotton, dung, paper, etc.
- **Non-biodegradable wastes:** Substances that cannot be decomposed by the action of micro-organisms are called non-biodegradable wastes. Example: plastic, polythenes, metals, synthetic fibers, radioactive wastes, pesticides, etc.

### Methods of waste disposal

- **Biogas plant:** Biodegradable waste can be used in a biogas plant to produce biogas and manure.
- **Sewage treatment plant:** The drain water can be cleaned in the sewage treatment plant before adding it to rivers.
- **Land fillings:** The wastes are buried in low-lying areas and are compacted by rolling with bulldozers. **Composting:** Organic wastes are filled in a compost pit and covered with a layer of soil, after about three months' garbage changes to manure.
- **Recycling:** Non-biodegradable wastes are recycled to make new items.
- **Reuse:** It is a conventional technique to use an item again. Eg: newspaper for making envelopes.