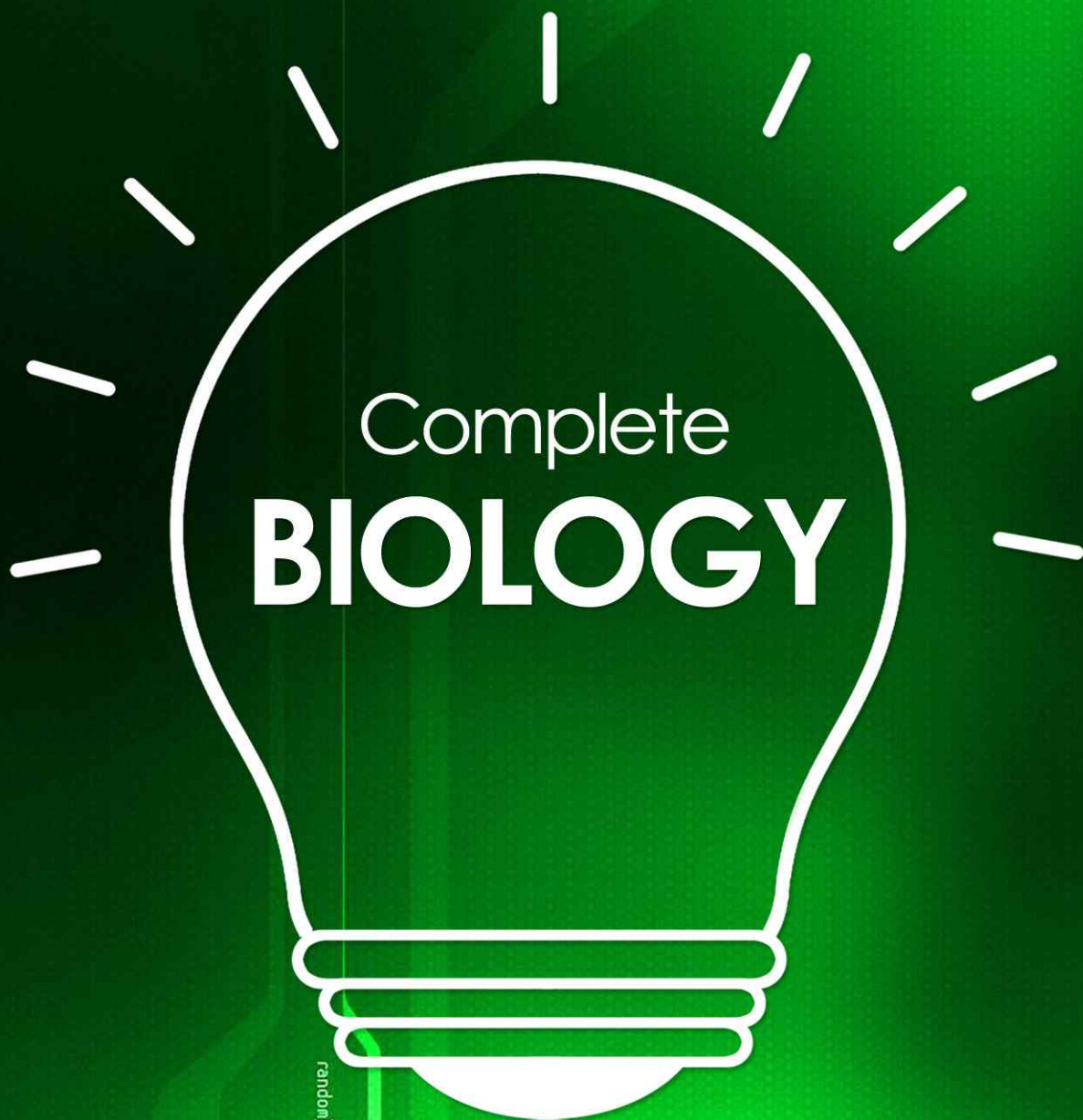




NEET · CBSE eBOOKS

CLASS 11 & 12th



Learning Inquiry
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CLASS 12th

Ecosystem

misostudy



01. Introduction

A.G. Tansley – The term “**Ecosystem**” first of all coined by A.G. Tansley.

E.P. Odum – Father of ecosystem ecology.

Definition – Total living (biotic) and non living (abiotic) components of the environment present in a particular area is called ecosystem.

In any ecosystem, communities or living organisms interact with their physical environment in such a way that there is a well defined flow of energy forming clear **trophic (food) levels** and **material cycles** within this ecosystem.

Ecosystem is normally an open system because there is continuous and variable entry and loss of **energy** and **materials**.

Any ecosystem must have the following peculiarities.:

- There is an energy source for all living organisms in an ecosystem.
- Adequate amount of food and essential nutritional element should be present for living organisms in an ecosystem.
- There should be a continuous cyclic flow of energy and materials in form of food chains between organisms and environment.
- There are regular changes in the climatic conditions (temperature, humidity, light etc.) in an ecosystem.

Cybernetics – A science of self control as (homeostasis) in an ecosystem is called cybernetics.

02. Types of Ecosystem

(i) Natural Ecosystem :

(a) Terrestrial Ecosystem – eg. forest, grassland, tree, desert ecosystems.

(b) Aquatic ecosystem -

- Lentic ecosystem – Stagnant fresh water, lake, pond, swamp.
- Lotic – Running fresh water ecosystem. eg., rivers

(ii) Artificial Ecosystem : Man made eg., cropland, Gardens etc.

On the basis of size, type of ecosystem :

(a) Mega ecosystem- Ocean/Sea

(b) Macroecosystem – Forest

(c) Microecosystem – Pond

(d) Nanoecosystem – Drop of water

03. Component of Ecosystem

(i) Abiotic component :

- Temperature
- Light
- Soil
- Climate
- Rainfall etc.

(ii) **Biotic component :**

- Formed by living things. eg., plants, animals, microbes.

Type of Biotic components :**(a) Producers -**

- All the autotrophs of ecosystem are called producers. They prepare their own food. The green plants are the main producers. In the process of photosynthesis, producers absorb solar energy and convert it into chemical energy so producers are also called **transducers** or **converters**.
- The **solar energy** is the only ultimate source of energy in ecosystem.
- **Chemoautotrophs** : (iron bacteria, sulphur bacteria, nitrifying bacteria)
- **In aquatic ecosystem** : Floating plant called **phytoplankton** are the major autotrophs.

(b) Consumer -

- All the heterotrophs of the ecosystem are known as consumers. They directly (herbivores) or indirectly (Carnivores) depend on the producers for food.

Type of consumer

- **Macro consumers : Macro consumers (Phagotrophs or holozoic)**
- They digest their food inside the body. ie., first **ingestion** then **digestion**.

Macro consumers are of following types.

- **Primary consumers** – Such living organisms which obtain food directly from producers or plants are known as primary consumers. eg., **herbivores** of ecosystem, Cow, Grazing Cattle, Rabbit.
- They are also known as secondary producers as they synthesize complex materials in the cells, by the digestion of food which is obtained from the plant.
- **Secondary consumers or primary carnivores** – Animals which feed upon primary consumers and obtain food. Those carnivores which kill and eat the herbivores, are called predator. eg., Dog, Cat, Snake
- The organism which completely depends on **dead animals** are not example of predators but they are the scavengers or detritivores. eg., Vulture, Crow, Fox.
- All the herbivores are predators.
- All the carnivores are not predators like crow.
- **Top Consumers** – Those animals which kill other animals and eat them, but they are **not killed** & **eaten** by other animal in the nature. eg., Lion, Man, Hawk, Peacock.
- **Micro consumers : Micro Consumers/Decomposers or Saprotrophs/osmotrophs**
- Those living organisms which decompose the dead body of producers and consumers are known as **decomposer** or **reducers** or **transformer** or **osmotrophs**.
- The main decomposers in ecosystem are **bacteria** and **fungi**.
- Decomposers play a significant role in **mineral cycle**. Decomposers are responsible for converting complex organic material of dead animals or plants into simpler organic matter through the process of decomposition and release mineral substances into the soil where these are reused by the producers.
- In aquatic system **whale** is **secondary consumer**. It is an example of **filter feeder** because it feeds on plankton.
- **Vulture** is a **scavenger not predator** because it never kills any animal. Vulture is also a decomposer.