

Shubra

Ecosystem (Forest & grassland)

Q → What is ecosystem & Describe forest or grassland ecosystem?

Ans → A. M. Tansley (1935) was the first to use the word ecosystem may be defined as the system resulting from the integration of all the living & non-living factors of the environment. According to E. P. Odum the ecosystem is the basic functional unit of organisms and their environmental interacting with each others and with their own components.

The vast ecosystem is a follows

Ecosystem

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Terrestrial

- Forest
- Grassland
- Desert
- Artificial
 - crop field
 - Garden

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Aquatic

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Fresh water

- Pond
- Lake

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Marine

- Sea coast
- Ocean

COMPONENTS OF ECOSYSTEM :-

According to Odum all ecosystem have the following two basic components :-

I. BIOTIC COMPONENT → These are of two types

(i) Autotrophic component

(ii) Heterotrophic "

The autotrophic component fixes the radiant energy of the sun

4. manufacturer's food.

The Autotrophic component takes food from autotrophic organisms it and finally decomposes the complex organic materials in simple inorganic forms. This includes :-

- (a) Macroorganisms
- (b) Microorganisms

(A) Macro-organisms

one of these types. Primary consumers which includes fish, birds, Secondary consumers and the tertiary or top consumer are carnivores or omnivores.

(b) Microorganisms → Are the decomposers which are saprotrophic eg → fungi, bacteria, virus. They break down the dead complex compound and release them to the ecosystem soil for reuse of autotrophs. In the ecosystem the autotrophic & heterotrophic components are arranged in layers or strata. The autotrophic metabolism is greater in the upper stratum when maximum light is available.

ABIOTIC COMPONENT →

It includes
air, water, solar energy, soil, &
its environment.
FOREST

FOREST ECOSYSTEM

Forest ecosystem is the best example of terrestrial ecosystem. It occupy 1/4 of the land. So 3/4 of the plant occupy roughly 1/10th includes the two main components

- (i) BIOTIC COMPONENT
- (ii) ABIOTIC

(1) Biotic Component →

These are three broad classes of biotic components.

(a) Producers

b) Consumers

(c) Decomposers or Transfers

(2) Producers: → All the green parts of forest are producers. They are the

main sources of food for all the

animals. There are several layers of

vegetation in the forest. The plants of

top stratum are angiospermic and

gymnospermic trees. These plants utilize

radiant energy of sun to the great

extent below the level of tree there is

extensive a layer of shrubs which consume

light energy of less intensity coming

through trees. Just below the shrubs

there are grasses, herbs, lichen and

mosses. There are also many ferns and

imp. examples are Tacca, grandis,

Butea, Jacaranda, Shorea, acaciata, Conifer

like Pinus, Thuja, Abies etc.

(3) CONSUMERS →

These are the one of consumers is an old dense forest.

- (i) Primary Consumers - Consumers of first order in the forest are grasshopper, rabbit, deer, monkey, birds and many other small herbivorous animals that utilize plants directly as their food.
- (ii) Secondary Consumers - are involved in the flesh of Jackals etc which consume the flesh of herbivores.
- (iii) Tertiary Consumers - Lion, Tiger are the consumers of top level. Bacteria etc. are the classes of consumers the parasites, disease & saprobes are also included in consumers.

[C] Decomposers Or Transformers :-

These are microorganisms chiefly bacteria and fungi which attack dead or producers and consumers and convert complex organic compound & elements. These few elements again return to the abiotic component by air, soil, water, etc. utilized by producers in their nutrition.

(ii) ABIOTIC COMPONENT

Here soil moisture, air & sunlight are release energy from the abiotic or physical component mineral salts etc. Carbon, nitrogen oxygen are the principal elements that requires a plant for its development and growth, water also take part in their metabolic activity such as photosynthesis, transpiration & Translocation of minerals.

On any ecosystem bring organism soil & different chemicals take part in a cycle order as such they are

also called bio-geochemical cycle.

It is now clear that there is a transfer of both energy & nutrients from producers to consumers & finally to decomposers.

The flow of energy is unidirectional. The two ecological processes energy flow and mineral cycling, which involve interaction between biotic & abiotic component lie at the heart of ecosystem dynamics.

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GRASSLAND ECOSYSTEM

We are concerned here with early grassland ecosystem. This grassland ecosystem covers an area of 13% of the total land. Most of the grassland have been disturbed due to grazing of animals and human being majority of grassland has been converted into agriculture fields and the conversion is still continuing.

It can be divided into the following two component

- (i) Biotic Component
- (ii) Abiotic Component

(1) BIOTIC COMPONENT → From the functional point of view, biotic component is

also divided into two parts :-

- (a) Autotrophic component → It includes the living organisms which take energy from sunlight and the help of water and CO₂ forming complex compound examples are green plants.

(b) Heterotrophic Component :- Such living organisms derive from complex compounds but depends on other organisms for their food examples are fungi, bacteria, and animals.

Grassland ecosystem can be divided into following three stages :-

- 1) Producers
- 2) Consumers
- 3) Decomposers & Frangifera

1) PRODUCERS → The important producers of grassland are cynodon, dactyloctenium, evolvulus, Nuttallia, Cyperus, Setaria, Desmodium, longifolium, Tridax procumbens, Like other ecosystems, they absorb solar energy & with the help of CO₂ & water from their food.

2) CONSUMERS → Consumers are of three types

A) Consumers of the first order or primary consumers:

Goat, sheep, buffalo, grass hoppers & other insects, termites & millipede are the main primary consumers. All these consumers depend on grass for their food.

B) Secondary Consumers →

Different kinds of snakes, Jackal, wild dogs & frogs are the secondary consumers of the grassland ecosystem. They depend for their food on primary consumers.

C) Tertiary Consumers →

Some times hawks feed on secondary consumers. They occupy tertiary consumer level. The food chain, vultures are also included in this class.

3) DECOMPOSERS → Fungi & bacteria which are found on soil comes in decomposers and they ~~deat~~ destroy dead plants and animals and form different

elements by the decomposition of complex
dead organic matter of both producer
as well as important role in the
return of animal element ^{again} to the
grass land.

Abiotic Component → same as forest.

