Unit 2: Ecosystem

Introduction:

The term ecosystem is made up of two words, "Eco" means ecological sphere or hourse or place of living or surrounding or environment, where living organism exist while "system" means "group of organism joined in regular and interdependent manner".

Definition: A group of organism which are interacting among themselves and also interacting with environment is called as an Eco-system.

Classification of Ecosystem:

The ecosystem can be generally classified into two types:

1. Natural Ecosystem
2. Artificial Ecosystem

Natural Ecosystem:

- A natural ecosystem is developed and governed by nature.
- These are capable of operating and maintaining themselves without any major interference by man.
- Types of natural ecosystem based on their habitat are:
    1. Terrestrial Ecosystem
    2. Aquatic Ecosystem

Terrestrial Ecosystem:

- These ecosystems are related to land.

Examples: Grassland ecosystem, forest ecosystem and desert ecosystem.

Aquatic Ecosystem:

- This ecosystem is related to water, it is further subdivided based on salt content.
    1. Fresh water Ecosystem
        - Running water Ecosystem: Example: River, streams (small narrow rivers).
        - Standing water Ecosystems: Example: Pond, lake and well
    2. Marine Ecosystem: Example: sea and sea shores

Man Made or Artificial Ecosystem:

- An artificial ecosystem is created and maintained by man for his different needs.
- Examples: Reservoirs, Artificial lakes and gardens, aquarium etc.,

Structure or Components of an Ecosystem:

The components of Ecosystem are

1. Abiotic Component
    a) Climate Factors
        i. Rain
        ii. Light
        iii. Wind
        iv. Temperature
    b) Edaphic Components
        i. Soil

ii. pH
iii. minerals
iv. Topography

2. Biotic Components
   a) Producers (Autotrophs)
   b) Consumers (Heterotrophs)
      i. Primary Consumers
      ii. Secondary Consumers
      iii. Tertiary Consumers
      iv. Quaternary Consumers
   c) Decomposers (Saprotrophs)

Biotic Components:

The living components of an ecosystem is called "Biotic Components".

Classification of Biotic Components:

They are three types based on how they get their food.
Producers (Autotrophs): Plants
Consumers (Heterotrophs) : Animals
Decomposers (Saprotrophs): Micro-organisms.

Producers or Autotrophs (Auto = self, Troph = Feeder)

- Self food producing food organisms are called autotrophs.

Examples: All green plants and Trees.

- Producers synthesize their food themselves through photosynthesis. Hence they are called "Photo autotrophs" (Photo = light)

Consumers or Heterotrophs (Hetero = other, Troph = Feeder)

- Consumers are organism, which cannot prepare their own food and depend directly or indirectly on the producres.
  Example: Insects, rabbit, goat, deer, cow, lion, fish, tiger etc.,
- Classification of consumers
  Depending upon the food habits the consumers are divided into four types:
  1. Herbivores or primary consumers (Plant eaters)
  2. Carnivores or secondary consumers (meat eaters)
  3. Omnivores or tertiary consumers (with plant and meat eaters)
  4. Detritivores (Dead organism eaters)

Herbivores: (Herbi = the green plant & vorare = to devour)

- Animals that eat only plants are called Herbivores
- They directly depend on the plants for their food, so they are called Plant eaters.
- Example: Insects, goat, deer, cow, horse etc.,

Carnivores: (Carne = Flesh meat, & vorare = to devour)

- Animals that eat other animals are called Carnivores.
- They directly depend on the herbivores for their food.
- Example: tigers, lions, fox, wolf, cheetah , etc.,

Omnivores (Omni = whole comes from "ohm" & vorare = devour)

- Animals that eat both plants and animals are called Omnivores.
- They are depend on both Herbivores and carnivores for their food.
- Example: humans, bear, birds, dogs etc.,

Detritivores: (Detritifeeder)

- Animals that eat dead organism and waste of living are called detritivores.
- Example: beetles, termites, ants, crabs, earthworms etc.,

Decomposers or Saptrotrophs (Sapros = rotten, Trophos = Feeders)

- Decomposers attack the dead bodies of producers and consumers and decompose them into simple compounds.
- During decomposition inorganic nutrients are released.
- The organisms which break down the complex compound into simple compound are called decomposers or reducers.
- Example: micro-organism such as bacteria, fungi, etc.,

Abiotic Components:

- The non-living component of an ecosystem is called abiotic component.
- These non-living components enter the body of living organism, take part in metabolic activities and return to the environment.
- The abiotic component of the ecosystem divided into three portions.
    1. Climate Factor: Solar radiation, temperature, wind, water current, rainfall etc.,
    2. Physical Factors: light, fire, soil, air etc.,
    3. Chemical Factor: Organic and inorganic substances.

Function of an Ecosystem:

The functions of ecosystem are

1. Cycling of material (matter)
2. Flow of energy

Types of Functions

Functions of an ecosystem are of the three types:

1. Primary Function: The producers (plants) can make their food themselves through photosynthesis. This process is called primary function of ecosystem.
   Example: all green plants and trees.

2. Secondary functions: The consumers (animals or humans) cannot make their own food. They are always depending upon the producers for their energy. This is called secondary function of ecosystem.

3. Tertiary function: Decomposers attack the dead bodies of consumers and producers and decompose them into simpler compounds. During the decomposition inorganic nutrients are released.
   Example: Micro-organism like bacteria, fungi etc.,

Multiple Choice Questions:

1. Energy _____ in an Ecosystem.
   a. is released
   b. is absorbed
   c. flows
   d. None of the above
2. **The following is an example of Terrestrial Biome**
a. Tropical rain forest
b. Rivers
c. Streams
d. All of the above
3. Terrestrial biomes has a rapid exchange of
   a. Carbon dioxide
   b. Oxygen
   c. Water
   d. **All of the above**
4. In an aquatic ecosystem the zooplanktons can be considered as
   a. Producer
   b. Consumer
   c. Decomposer
   d. None of the above
5. The organism which feed on dead and decaying matter are called
   a. Omnivores
   b. Detrivorous
   c. Carnivorous
   d. Herbivorous
6. The substance which results from decay of plants or animals matter is
   a. Enzyme
   b. Humus
   c. Hormone
   d. None of the above
7. The following is an example of marine biome
   a. River
   b. Lakes
   c. Oceans
   d. All of the above

8. The smallest artificial ecosystem that have been known to sustain life over a long period of time are
   a. Folsom Bottles
   b. Folsom pond
   c. Folsom Stream
   d. None of the above
9. Ecosystem rely on the following major sources of energy
   a. Sun
   b. Chemical or Nuclear Fuel
   c. Both (a) and (b)
   d. None of the above
10. Every Ecosystem has _____ major component(s)
   a. One
   b. Two
   c. Three
   d. Four
11. The following is (are) abiotic components of the ecosystem
   a. Soil
   b. Carbon
   c. Protein
   d. All of the above
12. Humus is _____ factor of an ecosystem
   a. Physical
   b. Chemical
   c. Both (a) and (b)
   d. None of the above
13. The following is (are) producer(s)
   a. Algae
   b. Green plants
   c. Photosynthetic bacteria
   d. All of the above
14. The autotrops
   a. Are self nourishing organism
   b. Derive energy from sunlight
   c. Make organic compounds from inorganic compounds
   d. All of the above
15. Who proposed the term ecosystem?
   a. Grinnel
   b. Turesson
   c. A G Tansley
   d. Lindeman
16. Earthworms and bacteria are called

a. Producers
b. Consumers
c. Decomposers
d. None of these

17. Region where fresh water meets salt water is called
a. Sea
b. Lake
c. River
d. Estuarine

18. Important abiotic factor in ecosystem include which of the following?
a. Temperature
b. Water
c. Wind
d. All of the above

19. The green plants are also called
a. Producers
b. Consumers
c. Reducers
d. Detritivores

20. The three major living components of an ecosystem are
a. Producers, Consumers and Decomposers
b. Producers, Autotrophs and Decomposers
c. Heterotrophs, consumers and reducers
d. Detritivores, Consumers and Phototrophs

21. Examples of Omnivores is
a. Lion
b. Hawk
c. Human
d. Snake

22. The most important organism of an ecosystem are
a. Herbivores
b. Producers
c. Carnivores
d. Protozon

23. Consumers are also called
a. Photoautotrophs
b. Saprotrophs
c. Heterotrophs
d. Reducers

24. The flow of energy is
a. One way
b. Cyclic

c. Linear and one way
d. None of these

25. An ecosystem comprises of
a. Living organism
b. Non-living organism
c. Both living and and non-living
d. Only plants