Lesson-2 Living Beings and Environment



The natural environment is composed of air, water, soil, sun-light, heat, plants and animals present around us. Each of them are the components of the environment. Among these, air, water, soil, heat and light from the sun are the abiotic components whereas plants, animals, birds, micro-organisms are the biotic components. All these biotic and abiotic components have their own role in maintaining the environment.

The chlorophyll present in the green leaves can extract solar energy. Plants can take carbondi-oxide from the air and the roots can absorb water from the soil. The food is produced by the leaves as a result of the reaction between carbondioxide and water with the help of the solar energy. This process of plants preparing their food is called photosynthesis. Since the plants can produce their own food, they are producers. While preparing their food, plants use the abiotic components of the environment, such as air, water and solar energy.



Photosynthesis

Plants depend on air, water and solar energy for preparing their food. The oxygen produced during the process of food preparation by the plants is released into the atmosphere. In this way, the biotic and abiotic components in the same environment inter-depends on each other, exchanging the substances and as a result form the ecosystem.

The eco-system is formed due to the inter-dependence of biotic and abiotic components of environment.



Organisms take one another as food. For example, grass is eaten by grasshopper, frog eats grasshopper, snake eats frog, kite eats snake. In this way, the organisms can be arranged in a systematic order. Observe the given picture. In this way, organisms form the food-chain by depending on one another for food.

Grass \rightarrow Grasshopper \rightarrow Frog \rightarrow Snake \rightarrow Kite

Plant is always present at the begining of a food-chain. Since plants are eaten only by the herbivores, therefore, in a food chain, herbivores are always placed after the plants. The herbivores are eaten by the carnivores, hence the carnivores are placed after the herbivores in a food-chain. This is a natural phenomenon taking place frequently. Every organism acquire from plants directly or indirectly in order to survive. Since animals take plants as their food, therefore animals are **consumers.**

Some animals get food from green plants directly. These animals are **primary consumers.** For example– herbivores such as cow, buffalo, goat, deer, rabbit, etc. Again, some animals take primary consumers as food. These are **secondary consumers**. These animals take plants as food indirectly by eating herbivores. For example carnivorous animals such as lion, tiger, fox, etc. Some other animals eat both producers and consumers, that means both herbivorous animals and different parts of plants. These are **omnivorous animals** such as man, dog, crow etc. Like this, all animals occupy a definite position in the food chain. There are various types of eco-systems in our environment. For example, grassland, pond, crop-field,



Pond is a good example of an eco-system. The aquatic plants of a pond such as algae, water hyacinth, water lily, aquatic grass etc. produce food in sun-light. Therefore, these are **producers**. Can you imagine, which of the animals living in a pond eat these plants? Plants are taken as food by different kinds of insects, small fishes, snails, etc. Hence these are **primary consumers**. Now, which animals eat these primary consumers? Big fishes, frogs, crabs etc. living in the ponds eat them. Therefore, these are **secondary consumers**. Which animals eat these secondary consumers?

Frogs, crabs, fishes etc. are eaten by snakes, cranes, kingfishers etc. These are **tertiary consumers.** The tertiary consumers are the highest level of consumers of the eco-system. For what reason does the animals of an eco-system depend on each other? Definitely for food.

Think and say-

What would happen if there were no algae, grass, etc. in a pond?



Now we understand that different biotic components of a food-chain are– Producers, Primary, Secondary and Tertiary consumers. All these components in an eco-system are dependent on each other. If the number of any of the components increases or decreases then it has an influence on the other components of the environment. For example, if the number of herbivores decrease in the environment then there will be no food for the carnivores. Then the balance in nature will be hampered.



Solar energy is transmitted to the primary, secondary and tertiary consumers by the food produced by the plants (producer).

If an animal or a plant dies, the body decomposes after a few days. This is because some bacteria and fungus living in the soil decomposes the body of dead

plants and animals to smaller parts and help in rotting. These rotten parts are taken as food by some micro-organisms. The remaining parts get mixed with the soil as organic manure. The roots absorb the organic manure from the soil to help the plants in growth. Since bacteria and fungus help in decomposition of organic components hence they are known as decomposers. In this way, as a result of the



interdependence of biotic and abiotic components the eco-system is formed.



Grassland

Like ponds, the biotic and abiotic components maintain inter-relationship in the grassland too and form the food-chain. Therefore, grassland is another kind of eco-system.

Observe the above picture of grassland and write down the names of the animals in appropriate places-

Producers-

Primary consumers-

Secondary consumers-

Field visit

Observe a crop field or a garden and make a list of the animals you see there and also write down three food-chains on your notebook.

The food-web formed in a crop field-



Let us make some food-chains formed in 'Crop-field eco-system' by observing the above picture-



By observing the food-chain we understand that the same food is eaten by different animals. For example- plant is eaten by rabbit, mouse, grasshopper and grain-eating birds. Like wise, mouse is eaten by snake and kite. Again, kite eats rabbit, mouse, snake, grasshopper and grain eating birds. Therefore, it is seen that one animal can take part in more than one food-chain. In this manner, several food-chains combine together to form a network in the eco-system. This network of food-chains is called the **food-web**.

Other than the above example, there are different types of food-chains in our environment. All the living beings of grassland, forest, crop-field pond eco-system etc. occupy a definite position in the food-chain. As a result of one living being taking part in more than one food-chain, the food-web is formed. Food-web helps to maintain balance in the environment.

Classify the following-

Identify the following animals as primary, secondary and tertiary classes of consumers and write down on your notebooks.



Excercise

- 1. Write answers-
 - (a) What are the biotic and abiotic components of the environment?
 - (b) Why are plants called as producers?
 - (c) How many types of consumers are there and what are they?
 - (d) How do decomposers help us?
 - (e) Write down the names of three eco-systems.
- 2. Fill in the blanks-
 - (a) Snail is a ——— consumer.
 - (b) The **food-web** is formed by combining one or more-
 - (c) Kite is a ——— consumer.
 - (d) There is———— than one food-chain in a food-web.
- 3. Find out the correct answers-
 - (a) There is always a plant/animal/micro-organism at the beginning of a foodchain.
 - (b) Decomposer/producer/consumer prepares food.
 - (c) Producers/decomposers/consumers help in rotting of dead bodies.
- 4. What is food-chain? Explain with examples.
- 5. Is pond an eco-system? Justify your answer.
- 6. What do you mean by 'Photosynthesis'?
- 7. Write the differences between-
 - (a) Producers and Decomposers.
 - (b) Herbivorous and Carnivorous animals.
 - (c) Food-chain and Food-web.
- 8. What would happen if there is no primary consumer in an eco-system?
- 9. Why is food-web formed?
- 10. Why do the dead plants and animals lying on the ground decompose?

