Assignment No-2
Class - 8th
Subject - Biology
Lesson - Ecosystems

THEME 3

Ecosystems

YOU WILL LEARN

Ecosystem

Factors of Ecosystem

- Biotic Factors
- Abiotic Factors

Study of Biotic Components

- Producers
- Consumers

Relation Between Abiotic and Biotic Factors

Relation Between Biotic Factors

Interdependence Between Biotic and Abiotic Factors

- Pond Ecosystem
- Forest Ecosystem

Energy Flow in an Ecosystem

Interdependence Between Different Organisms

- Commensalism
- Proto-Cooperation
- Symbiosis
- Predation
- Scavenging
- Parasitism

Read the whole chapter minutely.

If you observe minutely in your surroundings, you will find that all things in our environment depend on each other for their existence. For example, a pond contains varieties of plants and aquatic animals, microorganisms, underwater rocks, etc. These all cannot live separately, therefore, depend on each other.

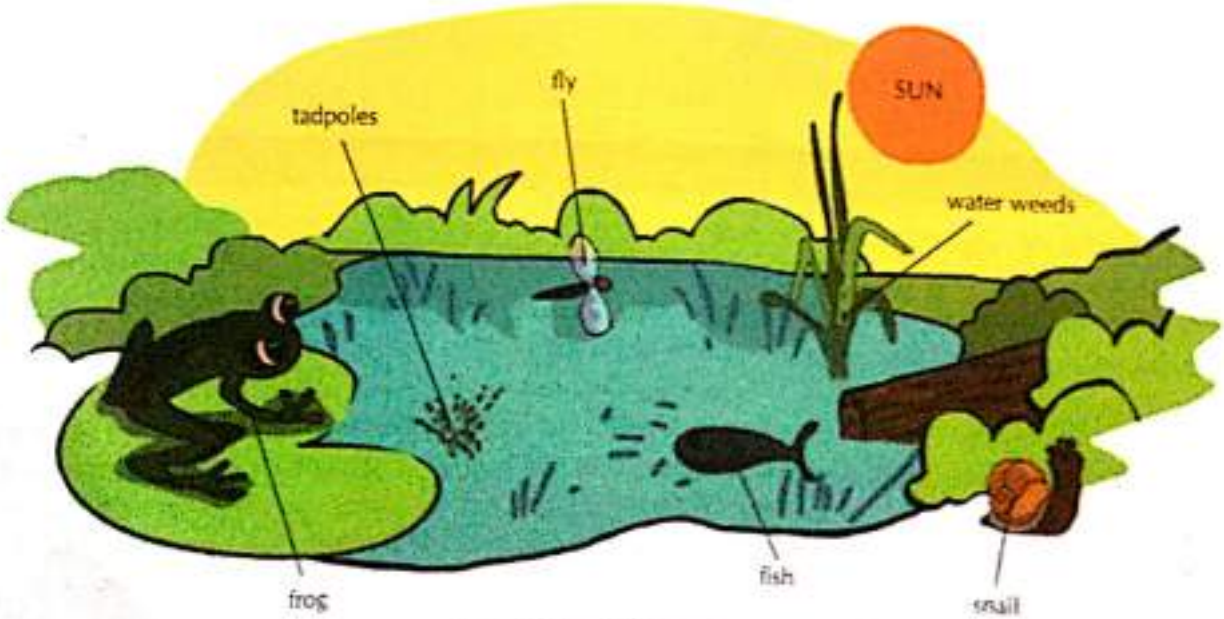

Fig. 3.1 Pond Ecosystem

ECOSYSTEM

Ecosystem can be defined as interdependence of plants and animals to their environment constituting a biological community and physical environment associated with it.

Fig. 3.2 An ecosystem

FACTORS OF ECOSYSTEM

An ecosystem consists of two factors or components – (a) biotic and (b) abiotic.

BIOTIC FACTORS

The living organisms are called biotic components or living components of the ecosystem. Examples– plants, animals and microorganisms.

Plants Animals Microorganisms

Fig. 3.3 Biotic factors of an ecosystem

ABIOTIC FACTORS

The non-living things are known as abiotic components or non-living components of the ecosystem. Examples– sunlight, air, water, soil, etc.

Sunlight Water Soil

Fig. 3.4 Abiotic factors of an ecosystem

The biotic and abiotic components of an ecosystems all work together in a balanced system.

STUDY OF BIOTIC COMPONENTS

- Biotic components or the living components of an ecosystems consists of various plants animals and microorganisms.
- All biotic components interact with each other and with the abiotic components in the biosphere.
- On the basis of their mode of nutrition, the biotic components are differentiated into producers, consumers and decomposes.

PRODUCERS

Plants are the only producers in this ecosystem. They are also called autotrophs. All living organisms that manufacture their own food in the presence of sunlight are **autotrophs** and only plants can do so. They make their food by the process of photosynthesis using Sun as an energy source.

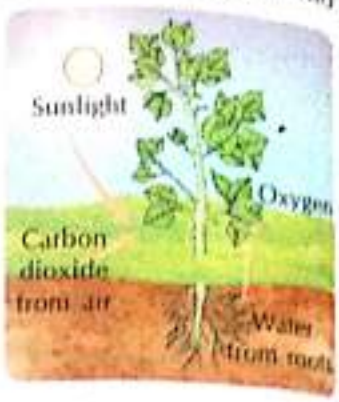

Fig. 3.5 Producers

CONSUMERS

Consumers are those who cannot manufacture their own food and are dependent on autotroph organisms for their food. Consumers can be further sub-divided into three groups depending on their food. These are– Herbivores, Carnivores and Omnivores.

1. **Herbivores** : These animals feed on plants and are called the **primary consumers**. Examples– Cow, Dear, Horse, Elephant, Zebra.
2. **Carnivores** : These animals feed on herbivores and are flesh-eaters. These animals catch their prey and then eat it. They are called **predators**.

Some carnivores like vultures eat leftovers by the predators.

3. **Decomposers:** Decomposers are living organisms that feed on the dead organisms and decompose them into nutrients, carbon dioxide and water. This process is called

Herbiovre

Carnivore

Decomposer

Fig. 3.6 Consumers

decomposition. Dead plants and animals along with faecal matter are called **detritus**. Examples– Bacteria, Fungi.

RELATION BETWEEN ABIOTIC AND BIOTIC FACTORS

All organisms are dependent on environment which in turn is influenced by the organisms it supports. All living and non-living components are interdependent. The abiotic factors play very important role for the survivals of plants and animals.

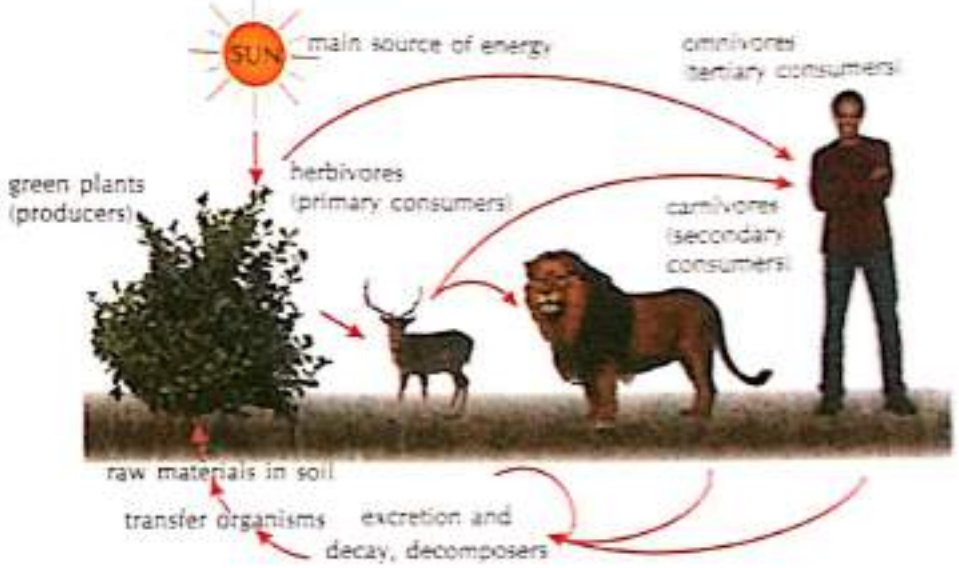

Fig. 3.7 Interdependence of living and non-living components

RELATION BETWEEN BIOTIC FACTORS *

These include interactions between plants and animals and decomposers. Interaction between plants and animals can be of various types-

- Predator–Prey relationship.
- Plants and animals depend on each other for pollination, dispersal of seed and food.
- Some plants and animals form association like ~~symbioses~~ symbiosis, parasitism and mutualism.

INTERDEPENDENCE BETWEEN BIOTIC AND ABIOTIC FACTORS

To understand relationship between biotic and abiotic factors, let us study the pond ecosystem. A pond ecosystems is full of varieties of aquatic plants and animals as well as water, air, soil and minerals.

POND ECOSYSTEM

- The plants or flora found in pond ecosystems includes submerged plants, floating plants and algae.
- These autotrophs are producers who trap sunlight and by the process of photosynthesis gives out oxygen and purify the pond.

- These plants also host plenty of bacteria and fungi which act as decomposers.
- The fauna or animals found in the ecosystem includes small and variety of fishes, insects, snakes, frogs, snails, etc. The smaller ones feed on the plants where as the larger organisms feed on small fishes and insects.
- All biotic factors of pond ecosystem produce organic waste. The dead and decay organic matter is decomposed by decomposers like bacteria.

FOREST ECOSYSTEM

A forest ecosystem is a complete ecosystem which includes–

- Herbs, shrubs and trees.
- Animals, plants and decomposers or microorganisms.
- Dead things such as logs, twigs, trees, animals and birds.
- Rocks, water and soil.
- Plants are producers while animals and birds are consumers.

Fig. 3.8 Pond Ecosystem

Fig. 3.9 Forest Ecosystem

ENERGY FLOW IN AN ECOSYSTEM

All living organisms require energy for their vital functions. Sun is the ultimate source of energy. Energy enters in the ecosystem through plants. Green plants produce their own food so they are called **autotrophs or producers.** The small animals those consume plants are called **primary consumers.** The animals that in turn feed on primary consumers are called **secondary consumers.** The large animals that feed on secondary consumers are called **tertiary consumers.**

All waste produce by living organisms and dead and decay animals and plants are then consumed by microorganisms are called **decomposers.**

Food chain starts with Sun, the energy and passes through one level to another.

The chain of food dependance is called the food chain.

Examples– Grass → Rabbit → Tiger

Grass → Grasshopper → Lizard → Kite

Grass → Insects → Frog → Snake → Peacock

All food chains are interconnected with each other and form food web. **A food web is a set of interconnected food chains circulating energy in the ecosystem.**

When we arrange the food web according to their different level, it will form a shape of pyramid.

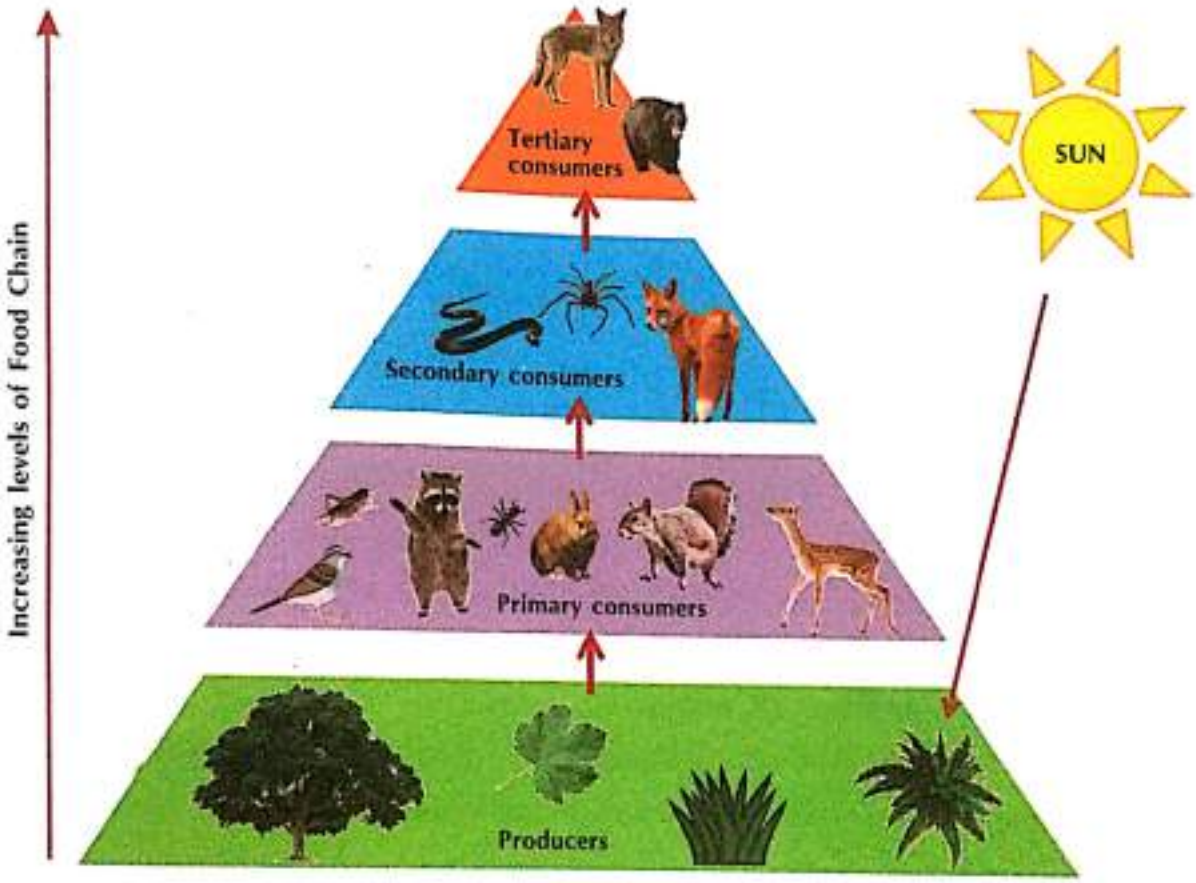

Fig. 3.10 Ecological Pyramid

INTERDEPENDENCE BETWEEN DIFFERENT ORGANISMS

Relations between the organisms of same species is called **intraspecific relationship** and when two or more different species depend on each other, it is called **interspecific relationship.**

Interspecific relationship may be positive or negative. When one species help another species or when one or both the species are benefitted, the interaction is called positive. For example, commensalism and symbiosis are some examples of positive interactions.

Know This Learn

Lichens show partnership in nature between algae and fungi. Algal cells are given shelter on fungal hyphae. On return, algal cells provide food to fungi.

On the other hand, when members of one population compete for food, depend on others are called negative interaction. For example, competition, predation and parasitism.

COMMENSALISM (Learn with examples)

It is an association between two organisms in which one is always benefitted but the other is neither benefitted nor harmed. Examples–Liana, Epiphyte, Epizoans.

PROTO-COOPERATION

It is an interaction between two different species which is favourable but no obligatory to both. Examples– Association of Hermit crab and Sea anemone.

Fig. 3.11 Hermit crab and Sea Anemone

SYMBIOSIS

It is an interaction between two species in which both are benefitted. Examples– Lichens, Mycorrhizae, nitrogen fixers in legume plants.

PREDATION

Predation is a kind of direct food relationship between two species of animals in which one is called predator. They capture prey and eat. Example - Lion and deer

SCAVENGING

Scavengers play very important role in ecosystem as they clean the environment. Scavengers eats the dead and decay bodies of other animals. Example - Vulture

Fig. 3.12 Scavenger

PARASITISM

A typical parasite lives inside the host. Parasitism is an interaction between two species in which one obtain its food from host body. Example – Dodder

Know This Learn

Lichens are called natural indicators. They glow only in pollution free areas. Litmus is made up of lichen cells which helps to detect acid and base.

TERMS TO LEARN

Ecosystem	:	Relation ship between living and non-living factors of an environment.
Biotic	:	Living organisms.
Produces	:	Plants who can prepare their own food.
Consumers	:	Depend on plants or animals.
Decomposers	:	Microorganisms who decompose dead and decay organisms.
Food web	:	A set of interconnected food chain.
Food Chain	:	The chain of food dependence.
Detritus	:	Dead plants and animals along with faecal matter.

Learn

1. All things in our environment depend on each other for their existence.
2. Ecosystem can be defined as interdependence of plants and animals to their environment constituting a biological community and physical environment associated with it.
3. The living organisms are called biotic components or living components of the ecosystem.
4. The non-living things are known as abiotic components or non-living components of the ecosystem.
5. Plants are the only producers in ecosystem.
6. Consumers are those who cannot manufacture their own food and are dependent on autotroph organisms for their food.
7. The chain of food dependance is called the food chain.
8. A food web is a set of interconnected food chains circulating energy in the ecosystem.
9. Relations between the organisms of same specials is called intraspecific relationship.
10. Interspecific relationship may be positive or negative.
11. Commensalism is an association between two organisms in which one is always benefitted but the other is neither benefitted nor harmed.
12. Parasitism is an interaction between two species in which one obtain its food from host body.

MEMORY TIPS

PROBLEMS TO SOLVE

A. Answer the following question briefly: Do in your notebooks.

1. Define ecosystem and write its components.
2. Make a diagrammatic representation of a pond ecosystem.
3. How do biotic components interact with each other in forest ecosystem?
4. Draw a ray diagram of any food web of your choice.
5. How do biotic factors of an ecosystem affected by abiotic factors?

B. Answer the following question in detail: Do in your notebooks

1. How do different organisms depend on each other?
2. Describe the flow of energy in an ecosystem.
3. Describe biotic and abiotic factors of an ecosystem.
4. What are producers and consumers? Describe by giving examples of each.

C. Fill in the blanks with suitable words. Do in your Text book.

1. _____ are producers.
2. _____ play very important role in decomposition of dead organisms.
3. _____ is the ultimate source of energy.
4. The animals those feed on plants are called _____ consumers.
5. The chain of food dependance is called _____.

D. Write the suitable names for the following: Do in your text book.

1. Ecosystems are influenced by these. _____
2. Living component of ecosystem. _____
3. Plants who can produce their own food. _____
4. Interconnected food chain. _____
5. Example of territory consumers. _____

E. Differentiate between the following: Do in your notebooks

1. Autotrophs and Heterotrophs
2. Predators and Scavengers
3. Food chain and Food web
4. Biotic and Abioctic factors
5. Scavengers and Saprophytes

EXPLANATION

* Relation between biotic factors include interaction between plants and animals and decomposers. Interaction between plants and animals can be of following types :-

a) Predator-Prey relationship: In this type of relationship one organism kills another organism and feeds on it.

E.g. : Relation between lion and deer

b) Plants and animals depend on each other for pollination, dispersal of seed and food.

E.g. : Butterflies help to carry pollen grains from one flower to another. Some of the seeds which have hooks stick to the fur of animals and they help them in dispersal. We eat fruits and throw seeds which later on germinate into new plants.

c)Some plants and animals form association like symbiosis (E.g.: lichen, rhizobium), parasitism(E.g. : dodder)

SOLVED QUESTION ANSWERS(TO BE DONE IN THE NOTEBOOK)

Q) How do biotic components interact with each other in forest ecosystem?

A) A forest ecosystem is a complete ecosystem. Green plants and trees produce their own food, so they are called autotrophs or producers. The small animals that consume plants are called primary consumers Eg: Rabbit, deer etc. The animals that in turn feed on primary consumers are called secondary consumers or carnivores. The large animals that feed on secondary consumers are called tertiary consumers.

All waste produced by living organisms and dead and decay animals and plants are then consumed by microorganisms called decomposers and then decompose into simpler forms.

Q) How do different organisms depend on each other?

A) Relations between the organisms of same species is called intraspecific relationship and when two or more different species depend on each other ,it is called interspecific relationship.

Interspecific relationship may be positive or negative

a) Positive interaction: When one species help another species or benefit from each other (Eg: commensalism and symbiosis).
b) Negative interaction : When they compete for food or depend on each other Eg: competition, predation and parasitism

Q) Make a diagrammatic representation of a pond ecosystem
A) Draw fig-3.1

EXTRA QUESTIONS(TO BE DONE IN NOTEBOOK)

Q) **Define the following terms**:-
1) Food chain
2) Food web
3) Commensalism
4) Proto-cooperation
5) Symbiosis
6) Predation
7) Scavenging
8) Parasitism
9) Detritus

Q) Draw the following diagrams and label them-
1) Interdependence of living and non living components (fig-3.7)
2) Ecological pyramid (fig-3.10)

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