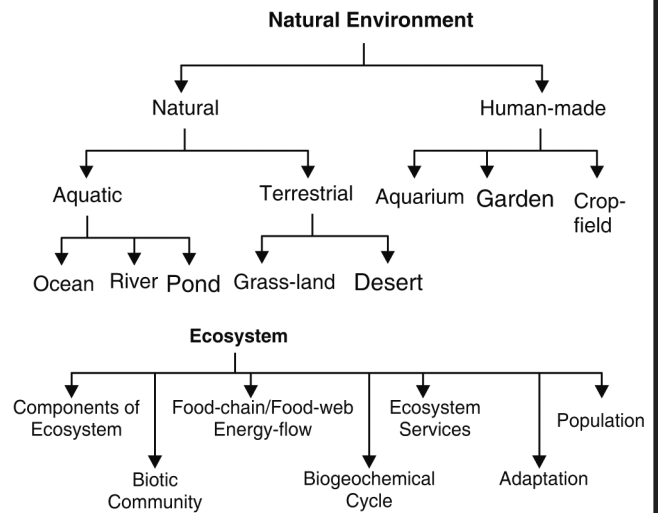


29. Natural Environment

In an ecosystem, living organisms interact among themselves and also with the surroundings continuously and yet maintain a balance. Ecosystem is very complex and to make its study easy, it is divided into two basic categories namely terrestrial and aquatic. Humans can also make ecosystems. For example, aquarium, gardens and agricultural fields are examples of man-made ecosystem.

The various components of an ecosystem function as a complete unit and have definite relationships with each other. The living organisms are directly or indirectly dependent on each other and use various natural resources for their survival. However, because of the growing human population there is a tremendous pressure on

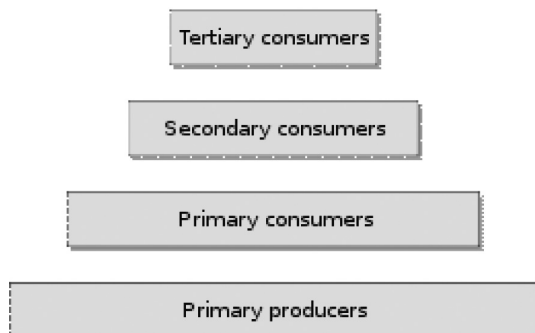
natural resources. The need of the hour, thus, is to check the overuse of our natural resources.



Build Your Understanding

Ecosystem = Non-living Component (Abiotic) + Living Component (Biotic)
 e.g. sunlight, air (write two more abiotic components yourself) (List the biotic components yourself)

- All components of a biotic community are connected through food (see figure), and energy available. They also form a web of inter-relationships



Components of any Food Chain

- A number of controlled processes occur in an ecosystem. Plants use nutrients from the soil. Their availability is largely dependent upon decomposition and mineralization of organic detritus. Animals found in an ecosystem are delicately balanced by the number of herbivores and the degree to which they are being eaten.
- Nutrients like carbon, nitrogen, water, sulphur and phosphorus are present in definite amounts in the ecosystem.
- Saprophytes help in recycling the nutrients back into the atmosphere by feeding on the dead and decaying organic matter and in the process also help in cleaning the environment.
- Energy flow is unidirectional. Only part of the energy is transferred to the next trophic level.
- Ecosystem provides us free service but we are overexploiting its resources.
- The **three important functions** of an ecosystem are:

1. Productivity and energy flow
2. Nutrient cycling
3. Development and stabilization

When two species use the same resource at the same time, the result is **Competition** and neither species does as well as it would in the absence of the other species. **Mutualism** is a relationship between two different species which benefits both species. **Commensalism** is when a species benefits by living in or on another species but has no effect on its host. A close interaction between two or more different organisms of different

species living in close physical association is **symbiosis**.

An understanding of how populations interact is important for **Conservation** and **Management** because this information can be used to:

1. Monitor changes in structure of a biological community.
2. Understand how human activities that affect one species may also have indirect effects on other species.
3. Determine the impact of introduced species on populations.

★ Stretch Yourself

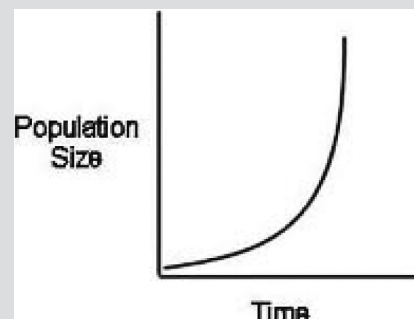
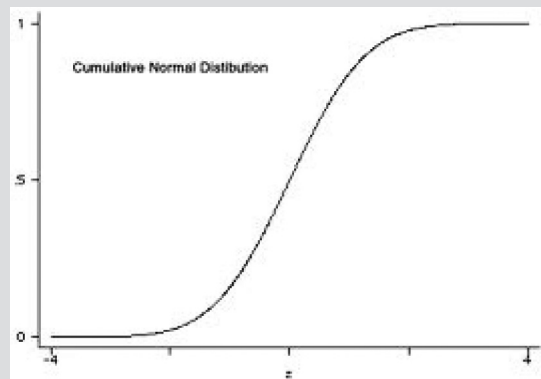
1. Difference between acclimatisation and adaptation?
2. Acclimatisation is a process of becoming accustomed to different environments over short periods. The changes which take place during acclimatisation are temporary and can be reversed.
3. Adaptation is the adjustment or change in behaviour, physiology and structure of an organism to become more suited to an environment. The changes that take place are permanent and cannot be reversed.
4. Draw arrows to connect the blocks and explain the two concepts you understand from this figure.

Autotrophs	Herbivores	Primary Carnivorous	Secondary Carnivorous
10,000 k cal	1000 k cal	100 k cal	10 k cal

? Test Yourself

1. An animal has a round body with small ears. The body is covered by fur. It also has a thick layer of fat beneath its skin.
 - a. Name the habitat of this animal
 - b. What is the advantage of having a thick layer of fat beneath its skin?

- c. How is the round body and small ear advantageous to the animal?
2. Maithi is eating curd. Michael tells Githa that Maithi is eating curd and thus he occupies the second trophic level. Do you think Githa is correct? Give reasons in support of your answer.
 3. Given below are two graphs. What can you conclude from the two graphs? Explain



4. Which one is the correctly depicted food chain?
- eagle → snake → grasshopper → grass → frog
 - frog → snake → eagle → grasshopper → grass
 - grasshopper → grass → frog → eagle → snake
 - grass → grasshopper → frog → snake → eagle
5. Importance of ecosystem lies in:
- Flow of energy
 - Recycling of nutrients
 - Both a and b
 - Neither a nor b
6. A young crocodile has eaten a lamb. A hawk attacks the crocodile and eats it. In ecological terms, hawk is:
- Producer
 - Primary consumer
 - Secondary consumer
 - Tertiary consumer

7. Role of bacteria in carbon cycle is
- Photosynthesis
 - Breakdown of organic compounds
 - Assimilation of nitrogen compounds
 - Chemosynthesis
8. How does the nutrient content of an ecosystem increase?
9. With the help of suitable examples distinguish between the grazing food chain and detritus food chain. How is the detritus food chain ecologically important?
10. There are two plants. One of them (a) is a tall tree with needle like leaves, the other plant (b) is medium sized whose leaves have thorns, has long deep roots and the stem is covered with cuticle
- What is the most likely habitat of a and b?
 - What is the advantage for the tree in “a” in having needle shaped leaves?
 - How is the plant “b” benefitted by having long deep roots?
11. In an ecosystem the movement of nutrients is called cycling and the term flow is used for energy. Why?