Biodiversity and Conservation

13 Chapter

1. Name the three important components of biodiversity.

Ans. Biodiversity consists of variability among life forms from all sources including land, air, and water. Three important components of biodiversity are:

(a) Genetic diversity

(b) Species diversity

(c) Ecosystem diversity

2. How do ecologists estimate the total number of species present in the world?

Ans. The calculation of the total number of species present in the world was done by Ecologists with the help of statistical comparison which was made between the richness of group of insects of tropical and temperate regions and thus these ratios are decided with other groups of animals and plants to calculate the total species richness present on the Earth.

An estimation was made by researchers that it is about seven million which indicates that on the earth, there is a vast variety of living organisms.

3. Give three hypotheses for explaining why tropics show greatest levels of species richness.

Ans. Scientists proposed three different hypotheses for explaining species richness within the tropics.

i) More solar energy reaches tropical latitudes than temperate regions, which results in high productivity and high species diversity.

ii) In the tropical regions, less seasonal variation and a less constant environment are seen which helps in the promotion of high species richness.

iii) During the ice age, temperate regions were subjected to glaciations while tropical regions remained undisturbed which resulted in an increase in the species diversity in this region.

4. What is the significance of the slope of regression in a species -area relationship?

Ans. To find a species-area relationship, the slope of regression (z) has great significance. Thus, it provides an estimation of the species richness of the area. It is independent of taxonomic category or sort of area studied. In smaller areas, it has been found that where the species-area relationship is analyzed, the slope of regression is analogous no matter the taxonomic category or the region. However, when in larger areas, a similar analysis is completed, then the slope of regression is far steeper.

5. What are the major causes of species losses in a geographical region?

Ans. Species losses in geographical regions are majority due to human activities. Thus, its causes are:

i) Habitat loss and fragmentation.
ii) Over-exploitation
iii) Alien species invasions
iv) Co-extinction

6. How is biodiversity important for ecosystem functioning?

Ans. An ecosystem with high species diversity is far more stable than an ecosystem with low species diversity. In terms of productivity and more resistance towards disturbances like alien species invasions and floods, the ecosystem becomes more stable. The ecological balance would not get hampered if an ecosystem is rich in biodiversity. In an ecosystem, all the trophic levels are connected via food chains. If any organism or all organisms of any one trophic level is killed, then the entire food chain will be disturbed. For example, if all plants are killed in a food chain, then all deer will die due to the lack of food. Soon the tigers will also die if the death of deer occurs. Thus, Other food alternatives would be there at each trophic level which might not allow an organism to die because of the absence of their food resource if an ecosystem is rich in species. Hence, a crucial role is played by biodiversity in maintaining the health and ecological balance of an ecosystem.

7. What are sacred groves? What is their role in conservation?

Ans. Sacred groves are forest patches that are exhilarated around places of worship. In India, such groves are common and are found in Rajasthan, Western Ghats of Karnataka and Maharashtra, Meghalaya, and Madhya Pradesh.

Sacred groves provide protection of many rare, threatened, and endemic species of plants and animals found in an area. In this region, the process of deforestation is strictly prohibited by tribal communities. Thus, it is a rich biodiversity area.

8. Among the ecosystem services are control of floods and soil erosion. How is this achieved by the biotic components of the ecosystem?

Ans. In an ecosystem, the biotic components consist of living organisms like plants and animals. A crucial role is played by plants in controlling floods and soil erosion. The soil particles are held together by the roots of plants, hence to avoid the erosion of the soil by wind or water, protection is provided. to the topsoil. The soil is also porous by the roots, thereby allowing groundwater infiltration and preventing floods.

Hence, prevention of soil erosion and natural calamities like floods and droughts. Thus, the fertility of soil and biodiversity increases.

9. The species diversity of plants (22 per cent) is much less than that of animals (72 per cent). What could be the explanations for how animals achieved greater diversification?

Ans. On the Earth, it is recorded that more than 70 percent of species are animals and only 22 percent of species are planted. A large difference is seen in their percentage. As in comparison to plants, animals have adapted themselves to ensure their survival in changing environments. In the case of insects and other animals. a complex nervous system is being developed by them to control and coordinate their body structure. Also, Insects are made versatile by their repeated body segments with paired appendages and external cuticles, and as compared to other life forms, they have been given the ability to survive in various habitats.

10. Can you think of a situation where we deliberately want to make a species extinct? How would you justify it?

Ans. Yes, there are sorts of parasites and disease-causing microbes that we deliberately want to eradicate from the world. Hard work is done by the Scientists to fight against these microorganisms. as these are harmful to human beings.

Through the use of vaccinations, Scientists were able to eliminate the smallpox virus from the world. Thus, it can be concluded that we humans purposely want to make these species extinct. Several other eradication programs like polio and Hepatitis B vaccinations are aimed to eliminate these disease-causing microbes.