

## Chapter: Biodiversity and Conservation

### Exercise

**Question 1. Name the three important components of biodiversity.**

**Answer:**

Biodiversity refers to the variety of living organisms found in different habitats. It encompasses variation in all types of life, including those found on land, in the air, and the water. The following are three significant aspects of biodiversity:

- Genetic diversity
- Species diversity
- Ecosystem diversity

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

**Answer:**

The diversity of living species on the planet is enormous. It is estimated to be around seven million people, according to academics. Ecologists compute the total number of species in the world based on a statistical comparison of the species richness of a well-studied collection of insects from temperate and tropical regions. The total species richness on Earth is then calculated by extrapolating these ratios with additional groups of plants and animals.

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

**Answer:**

Scientists have offered three main ideas to explain the diversity of organisms in the tropics.

- Tropical latitudes receive more solar energy than temperate locations, resulting in great productivity and a diverse range of species.
- Tropical locations experience fewer seasonal changes and a more or less steady climate. This encourages niche specialization and, as a result, significant species diversity.
- During the ice age, temperate regions were subjected to glaciations, but tropical regions remained unaffected, resulting in an increase in biological richness in this region.

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

**Answer:**

To identify a species-area link, the slope of regression ( $z$ ) is quite important. The value of slopes of regression in smaller regions (where the species-area relationship is studied) is found to be similar independent of taxonomic category or region. When a comparable analysis is performed over a broader area, the regression slope is substantially steeper.

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

Answer:

Biodiversity refers to the variety of living organisms found in different habitats. It encompasses variation in all types of life, including those found on land, in the air, and the water. Biodiversity is rapidly dwindling throughout the world. The key causes of biodiversity loss around the world are listed below.

**Habitat loss and fragmentation:** Uncontrolled and unsustainable human activities such as deforestation, slash-and-burn agriculture, mining, and urbanization change or destroy the habitats of numerous creatures. This causes the habitat to be broken up into small parts, which affects the migration of migratory animals and reduces genetic exchange between populations, resulting in species decline.

**Over-exploitation:** Many species have become endangered or extinct as a result of human over-hunting and exploitation of diverse plants and animals (such as the tiger and the passenger pigeon).

**Alien species Invasions:** The introduction of non-native species into an ecosystem, whether by accident or design, has resulted in the decline or extinction of indigenous species. The introduction of the Nile perch into Kenya's Lake Victoria resulted in the demise of over 200 species of native fish in the lake.

**Co-extinction:** One species is connected to the other in a complex network in its natural habitat. The extinction of one species necessitates the extinction of other species that are inextricably linked to it. The extinction of the host, for example, will result in the extinction of its parasites.

**Question 6. How is biodiversity important for ecosystem functioning?**

Answer:

An ecosystem with a large diversity of species is significantly more stable than one with a low diversity of species. Furthermore, a high level of biodiversity makes the ecosystem more productive and resistant to disruptions like alien species invasions and floods.

The ecological balance will not be harmed if an ecosystem is rich in species. Various trophic levels are related by food chains, as we all know. If one organism, or all species in one trophic level, is killed, the entire food chain is disrupted. In a food chain, for example, if all plants are eliminated, all deer will perish due to a lack of food. If all the deer are dead, the tigers will follow suit. As a result, it may be stated that if an ecosystem is diverse in terms of species, there will be other food options at each trophic level, ensuring that no organism would perish due to a lack of food.

As a result, biodiversity is critical for preserving an ecosystem's health and ecological equilibrium.

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

Answer:

Sacred groves are regenerated woodland areas that surround places of worship. Rajasthan, the Western Ghats of Karnataka and Maharashtra, Meghalaya, and Madhya Pradesh all have sacred groves. Sacred groves aid in the preservation of numerous unique, endangered, and indigenous plant and animal species found in a certain location. Tribals in this area firmly forbid the practice of deforestation. As a result, the sacred grove fauna is diverse.

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

Answer:

Living organisms such as plants and animals make up the biotic components of an ecosystem. Plants serve a critical role in preventing flooding and soil erosion. Plant roots bind soil particles together, preventing the top layer of the soil from being eroded by wind or running water. The roots also make the soil permeable, which allows groundwater to infiltrate and prevents flooding. Plants can thereby reduce soil erosion and natural disasters like floods and droughts. They improve soil fertility and biodiversity as well.

**Question 9. What measures, as an individual, you would take to reduce environmental pollution?**

Answer:

Environmental pollution can be avoided by taking the following steps:

Measures for preventing Air pollution:

- Increasing the number of trees planted.
- Clean and renewable energy sources, such as compressed natural gas (CNG) and biofuels.
- Reducing our reliance on fossil fuels.
- Automobiles with catalytic converters.

Measures for preventing water pollution:

- Making the best use of water.
- Gardening and other household use for kitchen wastewater.

Measures for controlling Noise pollution

- Don't light crackers on Diwali.
- Increased tree planting.

Measures for decreasing solid waste generation:

- Waste separation is important.
- Plastic and paper recycling and reuse.
- Biodegradable kitchen waste composting.
- Plastics are being used less frequently.

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

Answer:

Yes, there are a variety of parasites and disease-causing bacteria that we aim to eradicate from the planet. Scientists are working hard to combat these microorganisms since they are dangerous to humans. Through the use of vaccinations, scientists have been able to eradicate the smallpox virus from the earth. This demonstrates that humans are attempting to extirpate these species. Other eradication programs, such as polio and Hepatitis B immunizations, aim to eradicate disease-causing germs.