

NCERT Solutions for Class 12 Biology

Chapter 13 – Biodiversity and Conservation

13.1

Name the three important components of biodiversity.

Ans: Variability among all life forms from the air, sea, and land is a component of biodiversity.

- a. Genetic diversity,
- b. Species diversity
- c. Ecosystem diversity

Are three crucial elements of biodiversity.

13.2

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

Ans: By analyzing the diversity of species of a few extensively researched categories across two distinct regions (tropical, temperate, or arctic), ecologists can determine the overall number of organisms on the planet. Several ecologists have used the biodiversity of species as a metric for diversity. The most widely used metric to quantify the diversity of species was species density, or the total number of species for each m^2 . Other alternate methods for measuring diversity include species number and indices built around species proportionate prevalence.

13.3

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

Ans: Compared to regions with moderate temperatures, the environmental conditions in tropical regions are less volatile. When there are no unforeseen events, indigenous species tend to survive. The vast range of tropical regions consists of warm temperatures along with massive quantities of moisture levels, which support the creation & existence of a wide variety of organisms. Since tropical regions tend to get more solar radiation throughout the year, their ecological system are more resilient and can sustain a wide range of living organisms.

13.4

What is the significance of the slope of regression in a species – area relationship?

Ans: Measuring the diversity of species throughout a region is made simpler by calculating the regression coefficient or gradient of regression analysis. Regardless of the taxonomic category or geographical area, it provides an annual range of 0.1 to 0.2 for a restricted region, such as an entire nation. Interestingly, it stays the same for each of these little areas. Conversely, when assessing the species-area connection across vast regions, such as whole continents, the regression's gradient falls between 0.6 and 1.2.

13.5

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

Ans: The disappearance of an animal species when no viable specimens remain elsewhere is known as global extinction. Any species' mortality results in an irrevocable reduction of the Earth's ecosystem diversity. The end of human life can only occur naturally due to the long-term environmental aftereffects, unforeseen natural disasters, or degrading ecological relationships, including severe illnesses, nationwide rivalry, or unexpected predation. Natural disasters such as sudden blazes in forests, food starvation, soil dryness, and human-based ecological disruptions like over-replanting, harmful calamities to living habitat, ecological relocation, additional specialization, agricultural expansion, and environmental sabotage, cause the extinction of endangered living creatures in specific regions of the globe.

13.6

How is biodiversity important for ecosystem functioning?

Ans: The ecosystem sustainability depends on biological diversity due to the following factors,

- (1) It increases production.
- (2) It results in more effective recycling of both energy and matter.
- (3) It offers numerous alternate routes for surviving in a variety of settings.
- (4) Every level of the trophic hierarchy has possibilities thanks to the abundance of biodiversity. In order to maintain biological processes and create self-sustaining ecological systems, all species are connected in food networks and communicate through their abiotic variables. The natural environment won't be impacted if a single connection in a food web disappears, given that there are various other options.

13.7

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

Ans: Forest clumps surrounding houses of devotion that are highly valued by indigenous peoples are known as holy forests or holy groves. These are the widely unexplored woodland regions that are often trapped by hazardous, deteriorated terrain features. Some prominent states like Karnataka, Maharashtra, Rajasthan (Aravalli), Madhya Pradesh (Sarguja, Bastar), Kerala & Meghalaya are among the common areas in India where these instances are witnessed quite often. Tribal shrines can be found among Meghalaya's Jaintias, especially Khasjas, and in the Kumaon region, encircled by deodar woods. It is forbidden to cut any branches from these woodlands. This has led to the flourishing of numerous indigenous species that are either uncommon or endangered outside. Prosopis cineraria & Black Buck are carefully protected by Rajasthani Bishnois. In other locations, such as Khecheopalri in Sikkim, particular sources of water are additionally revered. They have naturally maintained watery plants and animals.

13.8

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

Ans: Ecosystem services refer to the goods or advantages that ecosystem operations provide to the outside world so that it is cleaner, more beautiful, more biodiverse, protects natural assets, provides shelter for wildlife & tribal people, protects soils, maintains a proper equilibrium of CO₂ and O₂, and retains water from storms, droughts, and contamination. Plants are essential for preventing soil erosion, landslides, and flooding. They prevent the top layer of soil from being carried aside by gusts or water that flows by binding soil granules securely with the roots that surround them. The roots of plants additionally permit water to enter the ground while rendering it permeable.

13.9

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

Ans: The term "species diversity" describes the range of organisms found in an area, with a greater proportion of mammals than vegetation. This happens because there are more living offspring and a wider spread. The neural systems of most animals, whether basic or intricate, are used to control and organize a variety of actions. They have receivers that allow vibrations to be received. Most of their behaviors are adaptable and guarantee their continued existence in

environments that vary. Consequently, compared to plants without nerve systems, which react significantly to their surroundings' stimuli, their bodies have come to exhibit a far greater species variation.

13.10

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

Ans: Using multiple tested approaches, humans may contribute to the annihilation of endangered organisms. Everyone around the globe wants to lead a disease-free life, and we are working towards that mission by eradicating harmful microorganisms that can produce illness, like the prominent virus that can result in deadly polio disease. Meanwhile, an endeavor is warranted, since these germs are detrimental to our human civilization. Furthermore, the loss of one or a small number of these microorganisms wouldn't have an impact on the ecosystem's ability to operate because they are not necessary providers or decomposing agents.