

BIODIVERSITY-VARIETY OF LIFE ON EARTH

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ABSTRACT

Biodiversity is the variety of life on Earth. Since humans are directly dependent on the products of biodiversity from which they are benefited commercially, socially and economically. However the impact of anthropogenic activities on biodiversity is increasing day by day. Thus effecting the stability of an ecosystem in turn reducing biodiversity. Therefore it is important to protect the existing biodiversity which is essential for the survival of human race.

KEYWORDS: Endangered species; Poaching; Extinction; Conservation; Keystone species.

INTRODUCTION

Biodiversity refers to the existence of various types of ecosystems along with diverse species which exists as communities of different populations occupying a specific area, interacting with each other and with their environment.^[1]

Biodiversity exists at three levels:

1. **Genetic Diversity:** Genetic diversity at its finer level includes the genetic variation within species, both among geographically parted inhabitants and among individuals within a single population.^[2] This variation is caused by either the change in the genetic material that is transferred from generation after generation or change due to the influence of environmental factors on an individual organism.^[3] Occurrence of novel chromosomal or DNA mutation in sexually reproducing individuals is mostly transmitted in the progeny during cell division.^[4]
2. **Species Diversity:** Biodiversity at its most basic level includes the whole range of species on earth from micro-organisms such as viruses, bacteria to the multicellular kingdom of plants, animals and fungi. Thus, it refers to the variety of species in a region.^[5] It has been measured on the basis of the number of species in the region. The richness of the species varies geographically. Out of an estimated 30 million species on Earth, only one sixth has been identified and authenticated in the last 200 years.^[6] Only 250,000 species of the total stock are plants. Keystone species play an important role in

maintaining the diversity of an entire community of other species.^[7] Keystone species include pollinators, top predators and decomposer organisms, and so on.^[8] Wildlife presents an important prospective in medicine, agriculture and industry as a potential source of food, fuel, fibre, aromatic compounds, anti-microbial agents and food additives.^[9]

3. **Ecosystem diversity:** It defines the assembly and collaboration of species with one another and with their abiotic surroundings.^[10] It includes the study of habitat dependent species varieties, energy flow at various trophic levels, measurement of ecological efficiency, diversity within the ecosystem, placement and size of various ecosystems (e.g. grasslands, deserts, mountains, etc), diversity of niches, trophic levels, biogeochemical cycles, and biotic interactions.^[11,12,13] Biodiversity at ecosystem level is more productive and stable ecosystems.^[14]

Biodiversity proves to be useful for humans full filling their everyday necessities such as shelter, clothing's food, medicines etc.^[15] Some of biodiversity benefits to humans is enlisted below:

- **Productive value:** Biodiversity offers numerous economic benefits including water conservation, natural pest control, soil protection, climate stability, ecosystem protection, nutrient recycling, systematic research and recreation.^[16]
- **Consumable goods:** Humans could take advantage of products provided by biodiversity such as

medicinal products, forest products, woods, food, fibers etc.^[17]

- **Ecosystems stability:** Biodiversity contributes towards the stability of an ecosystem. By reducing global warming and minimizing the effects of acid rain to protect the surrounding.^[18]
- **Aesthetic importance:** Establishment of zoological and botanical gardens are of aesthetic values to humans and an approach to conserve biodiversity.^[19]
- **Conservation of species:** Biodiversity is a mean through which endangered species could be conserved to protect its rapid extinction.^[20]
- **Economic value:** Economic development of a country depends on the efficient management of its biotic resources. Thus, it is essential to protect the surrounding biodiversity for better economic development and for the survival of human race.^[21]

Pressures to Biodiversity

Biodiversity is considered to be potential for human survival. However due to rapid population growth, biodiversity is progressively being exhausted.^[22] Numerous animal and plants species have already extinct and many are recognized as endangered.^[23]

Few of the causes that poses threat to biodiversity is given below:

- **Habitat destruction:** Loss of biodiversity is mainly because of the destruction of the natural habitats by humans for industrial and commercial needs such as irrigation, dam construction, mining, fishing, urbanization etc [24].
- **Habitat disintegration:** As populations increase, habitats are apportioned by fields, power lines, canals, roads, cities etc. Thus the isolated habitat limits the dispersal and colonization potential of the species. And also effects the surrounding abiotic factors.^[25]
- **Pollution:** Environmental pollution such as water pollution, radioactive waste pollution, air and soil pollution produced as a result of numerous man made activities is the major cause of loss of biodiversity. And if such activities continued without regulatory restrictions ,biodiversity will soon be depleted.^[26]
- **Infectious diseases:** Anthropological activities can increase the incidence of disease in wildlife, leading to extinction.^[27]
- **Poaching of wild life:** High rate of illegal hunting is responsible for the extinction of a number of animal species in various countries such as mountain sheep, snow leopard, green turtle etc.^[28] Thus biodiversity should be preserved by minimizing anthropological activities that effects the natural habitats of living organisms.^[29] Biological conservation should be adopted to protect the ecosystem and to maintain biodiversity at its optimal level.^[30]

Preservation of Biodiversity includes the following strategies

- Economically important species of animals and plants in the natural habitat should be identified and conserved. Along with the protection of their natural habitat as well.^[31]
- Resources should be wisely utilized.^[32]
- Regulation of international trade in wildlife should be imposed.^[33]
- Poaching and hunting of wildlife should be restricted.^[34]
- Environmental pollution should be minimized by monitoring and regulating anthropogenic activities.^[35]
- Public awareness should be created with respect to biodiversity and its importance to living organisms.^[36]
- Wildlife Conservation Programs should be launched for the protection of threatened species.^[37]
- Environmental laws should be strictly observed.^[38]

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