

Bio-Diversity: Classification, Threats to Biodiversity and Its Conservation

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Abstract: *Biodiversity is a term used to describe the enormous variety of life on Earth. It can be used more specifically to refer to all of the species in one region or ecosystem. Biodiversity refers to every living thing, including plants, bacteria, animals, and humans. Scientists have estimated that there are around 8.7 million species of plants and animals in existence. However, only around 1.2 million species have been identified and described so far, most of which are insects. This means that millions of other organisms remain a complete mystery. Over generations, all of the species that are currently alive today have evolved unique traits that make them distinct from other species. These differences are what scientists use to tell one species from another. Organisms that have evolved to be so different from one another that they can no longer reproduce with each other are considered different species. All organisms that can reproduce with each other fall into one species.*

Key words: Biodiversity, Environment, Generations, Organisms

1. Introduction

The term biodiversity or biological diversity refers to the variety and variability among living organisms and the ecological complexes in which they occur. Biodiversity includes not only species we consider rare, threatened, or endangered but also every living thing from humans to organisms we know little about, such as microbes, fungi, and invertebrates. At the Center for Biodiversity and Conservation, we include humans and human cultural diversity as a part of biodiversity (Anonymous, 2007). We use the term “biocultural” to describe the dynamic, continually evolving and interconnected nature of people and place, and the notion that social and biological dimensions are interrelated. This concept recognizes that human use, knowledge, and beliefs influence, and in turn are influenced, by the ecological systems of which human communities are a part. This relationship makes all of biodiversity, including the species, land and seascapes, and the cultural links to the places where we live right where we are or in distant lands important to our wellbeing as they all play a role in maintaining a diverse and healthy planet. Biodiversity has a very fundamental value to human and our very existence is intricately linked to it. On one hand, we are dependent on biodiversity for our very basic necessities and everyday sustenance, while on the other hand, we are also dependent on it for economic, cultural and environmental well-being. As the biotic component of any ecosystem, biodiversity forms the backbone for ecosystems to thrive and function efficiently (Kumar and Verma, 2017). A recent estimate of the number of species worldwide is 13 million, though only about 1.6 million have actually been described (Heywood and Watson 1995). Certain areas on the globe show exceptional concentrations of species with high levels of endemism and unusually rapid rates of depletion (Myers 1988). These areas are called ‘hot spots’ and are found in certain tropical forests, coral reefs and Mediterranean ecosystems (Myers 1988).

The three components or levels of biodiversity has been identified:

Genetic diversity: Genetic diversity refers to the variation at the level of individual genes. Tremendous amount of genetic diversity exists within individual species. This genetic variability is responsible for the different characters in species. Genetic diversity is the raw material from which new species arise through evolution.

Species diversity: The number of species of plants and animals that are present in a region constitutes its species diversity. This diversity is seen both in natural ecosystem and in agricultural ecosystem. Some areas are richer in species than others.

Ecosystem diversity: There are a large variety of different ecosystem on earth, each having their own complement of distinctive inter linked species based on differences in the habitat. Ecosystem diversity can be described for a specific geographical region or a political entity such as a country, a state or a taluk. Distinctive ecosystems include landscapes like forests, grasslands, deserts, mountains etc as well as aquatic ecosystems like rivers, lakes and seas.

Methods of measuring Biodiversity:

There are three perspectives measuring of diversity at the level of community. These are (i) Alpha diversity, (ii) beta diversity and (iii) gamma diversity. Community diversity refers to the variations in the biological communities in which species live.

- 1) **Alpha diversity** indicates diversity within the community. It refers to the diversity of organisms sharing the same community or habitat. A combination of species richness and equitability / evenness is used to represent diversity within a community or habitat.
- 2) **Beta diversity** indicates diversity between communities. Species frequently change when habitat or community changes. There are differences in species composition of communities along environmental gradients, e. g, altitudinal gradient, moisture gradient, etc. the higher heterogeneity in the habitats in a region or greater dissimilarity between communities exhibit higher beta diversity.

- 3) **Gamma diversity** refers to the diversity of the habitats over the total land scope or geographical area. The sum of alpha and beta diversities of the ecosystems is an expression of the biodiversity of landscape, which is considered as Gamma Diversity.

Threats to Biodiversity:

Due to unsustainable resource - use, once productive forests and grasslands have been turned into deserts and wastelands have increased all over world. Biodiversity is under serious threat as a result of human activities. According to Jenkins (1992), rates of habitat modification are currently so high that virtually all natural terrestrial habitats and protected areas are destined to become ecological 'islands' in surrounding 'oceans' of habitat much altered. Some of the main threats to biodiversity are -

- 1) **Human activities and loss of habitat:** Human activities are causing a loss of biological diversity among animals and plants. Forests and grasslands are changed to agriculture lands. Natural wetlands are drained to established crop lands leading to loss of aquatic species. Grasslands are changed to other forms, degraded by overgrazing. Loss to cattle, goat and sheep. Natural forests are being deforested for timber and replanted for teak, sal *etc.* Such monoculture does not support biodiversity as in forests which has closed canopy and rich undergrowth. Excess collection of fire wood by lopping of branches of trees canopy is opened up altering the local biodiversity.
- 2) **Deforestation and Desertification:** Deforestation and desertification are the main cause of biodiversity losses. Both processes are decisively influenced by the extension of agriculture. The direct cost of deforestation is reflected in the loss of valuable plants and animal species. Desertification process is the result of poor land management which can be aggravated by climatic variations.
- 3) **Poaching:** Specific threats to certain animals are related to large economic benefits. The skin and bones from tigers, ivory from elephants, horns from rhinos and perfume from the musk deer are extensively used abroad. Bears are killed for their gall bladders. Corals and shells are also collected for export or sold on the beaches of Chennai, Kanyakumari and the Andaman and Nicobar islands. Tortoises, exotic birds and other small animals are packed into tiny containers and smuggled abroad for the pet trade. A variety of wild plants with real or sometimes, dubious medicinal values are being overharvested. The commonly collected plants include *Rauwolfia*, *Nux vomica*, *Datura*, *etc.* The garden plants collected for illegal trade include orchids, ferns and mosses.
- 4) **Man wild life conflicts:** Conflicting situations with wild life starts causing immense damage and danger to man. Ex: In Sambalpur, Orissa 195 humans are killed in last 5 years by elephants and in retaliation villagers killed 98 elephants and badly injured more than 30 elephants. Similarly, incidents with tigers, leopards *etc.* are in news. Shrinking forest cover, human encroachment, ill and weak animals, lack of food (one adult elephant needs 200 kg green fodder and 150 kg of clean water) for animals, protecting villagers by putting electric fence are the main reasons for such happenings.

As the compensation by government. is not enough, conflicts occur between forest department and villagers.

Conservation of biodiversity:

Conservation of biodiversity is of two types *i. e.*, *In situ* and *Ex situ*

In situ conservation: Conserving a species in its own environment by creating national parks and wildlife sanctuaries. Habit is protected with all the other spp that in it in nature Biodiversity at all levels can be best preserved in situ by setting aside wildness as protected areas (in national parks and wildlife sanctuaries) with distinctive ecosystem included in the network. Such net work preserve the total diversity of life of the region. Biologists view point is to deal with areas which are 1) Species rich 2) Rare/threatened/endangered species / endemic species are found should be given imp as the respp would easily become extinct due to human activity. For eg. Elephants utilize open grasslands after the rains (when it is nutritious) but move into forest to feed on foliage indry season. Hence a PA for elephant must be large to include a diverse habitat that supports a complete complement of interlinked species.

Ex situ conservation: Conserving the species outside the natural habitat in a carefully controlled situation, such as botanical garden for plants or zoological parks for animals, expertise exists to multiply species under artificially managed condition. Gemplasm is preserved in a gene bank for future need, this is taken up for expensive endangered extinct species. Care is taken to avoid inbreeding such that weak offspring would not develop. Breeding programmes in zoos provide animal needs including enclosures that simulate their wild habitat. Modern zoo's function is to breed endangered species as a conservation. Successful examples are 1. Madras crocodile trust bank has successfully bred the 3 crocodiles. Here crocodiles lay two clutches of eggs in one year instead of one in wild.2. Guchali zoo has bred pigmy hog and 3. Delhi zoo has bred the rare Manipur brow antlered deer.

References

- [1] Jenkins M (1992) Species Extinction. In: Groombridge B (ed) Global Biodiversity: Status of the Earth's Living Resources, pp 192–205. Compiled by the World Conservation Monitoring Centre (WCMC), Chapman and Hall, London.
- [2] Heywood VH and Watson RT (eds) (1995) Global Biodiversity Assessment. UNEP. Cambridge University Press, Cambridge, UK.
- [3] Myers N (1988) Threatened biotas: 'Hot spots' in tropical forests. *The Environmentalist* 8: 187–208.
- [4] Anonymous (2007). Biodiversity and Climate Change: Convention on Biological Diversity: www.biodiv.org accessed on 30 - 7 - 2010.
- [5] Kumar Ajay and Verma A. K. (2017). Biodiversity loss and its Ecological impact in India. *International Journal on Biological Sciences*. 8 (2): 156 - 160.