

# BIODIVERSITY AND CONSEQUENCES OF ITS DEPLETION: AN INDIAN PERSPECTIVE

**Dr. Abhishekh Srivastava**

Guest Lecturer, Department of Botany  
Govt. Swami Vivekanand College Teonthar, District - Rewa (M.P.)

**ABSTRACT:-** Activities of human being are increasing environment problems in these days. Technology is also creating same problem due to no planned management. It is a basic need that environment should be saved. So, a dispute is arising between environment & human beings in whole world. The importance of conservation and preservation of ecosystems to protect environment Human desire is destroying environment. We are alive due to green. Green is environment. Environment is earth, air, water, soil, trees etc. Every element of environment is necessary & must to we people. We, the humans, had one world of nature & other one is man-made. Nature has earth, air, water, soil, trees etc. On the other hand, man-made has other than nature i.e. unnatural.

**KEYWORDS:-** Environmental Protection, Biodiversity and Depletion.

## **INTRODUCTION:-**

The term biological diversity was used first by wildlife scientist and conservationist Raymond F. Dasmann in the 1968 lay book, *A Different Kind of Country*. The scientific societies follow the definition of biodiversity given by Wilson (1992) as: all hereditarily based variation at all levels of organization, from the genes within a single local population, to the species composing all or part of a local community, and finally to the communities themselves that compose the living parts of the multifarious ecosystems of the world. “ It represents the most important working component of a natural ecosystem. It helps maintain ecological processes, creates soils, recycles nutrients, exerts considerable effect on climate, degrades waste, controls diseases and above all, provides an index of health of an ecosystem. It is the source of food, medicines and a variety of important products. Thus it exists as natural wealth in terrestrial and aquatic ecosystems.

**Levels of biodiversity:** Biodiversity is generally described at three levels: Ecosystem diversity, species diversity and genetic diversity.

### **1. Ecosystem diversity or habitat diversity:**

- It is the differences between ecosystem types and the diversity of habitats and ecological processes that occurs within each ecosystem type.
- Habitat diversity may be terrestrial habitat (forests and grass lands), marine habitat, fresh water habitat and wetlands.

### **2. Species Diversity:**

- This refers to the variety of species.
- It relates to the number of species in a defined area.
- The diversity of species can be measured through its richness, abundance and types.
- Areas rich in species diversity are called hotspots of diversity. Species diversity may be terrestrial diversity (plant and animal diversity), marine diversity and freshwater diversity.

### **3. Genetic Diversity:**

- Genetic biodiversity refers to the variation of genes within species.
- It is very crucial for healthy breeding of population of species.

### **India as a mega diverse country:-**

The mega diverse countries are a group of countries that harbor the majority of the Earth's species and are therefore considered extremely biodiversity. Conservation International identified 17 mega diverse countries in 1998. Together, these 17 countries harbor more than 70% of the earth's species (Kumar and Verma, 2017).

#### **A. Floral diversity in India:-**

Though India harbors more than 5% of the total known animals and species of the world, it encompasses only

**Impact Factor- 5.991**

2.4% of the total land area of the world. India has secured 10th position in the worldwide ranking on botanical diversity, 11th based on limited regional variations and 6th on crop production. India is a home to about 18,660 flower plants (angiosperm), 82 gymnosperm, 7411 algae, 15396 fungus, 1302 pteridophytes and 1223 viruses. Till now, nearly one third of all known angiosperms are present only in India. About 2200 varieties of mango, 50000 varieties of rice, 500 varieties of oats and pepper each are found in India, of which 167 crop species including rice, cane, banana, lime mustard, ginger, cardamom, turmeric, black pepper, etc were first grown in India. In addition, 51 different varieties of grain coarse cereals, 104 species of fruits, 55 species of vegetable and beans, 24 species of fibers containing cereals and 24 species of oilseed are found in India. Out of 109 varieties of spices widely used in the world, 75 are grown in India (Agnihotri *et al.*, 2020). With world's 34 leading biodiversity sites, the biodiversity of India is very sensitive. The Himalayas, the Sundarbans, the Western Ghats are some of the highly sensitive biodiversity areas of the world found in India. The north eastern region of India is considered as the home of world's most ancient native flowering plants (Agnihotri *et al.*, 2020).

**B. Animal diversity in India:-**

India is also one of the leading countries in the world in terms of diversity of fauna. So far, about 89317 types of animals have been identified in India, including 390 types of mammals, 1225 types of birds, 456 types of snakes, 2546 types of fishes, 2577 types of protozoa, 68389 types of insects and arthropodes, and 8329 species of other animals. Two third of the world's tiger population, 60% of wild buffalos and one horned rhinoceros are found in India only. The Gir sanctuary in Gujarat is the only habitat of Asiatic lion. Many species of birds are also found only in India (Agnihotri *et al.*, 2020).

**Loss of biodiversity:-**

The biological wealth of the planet has been declining rapidly. Important causes are as follow (Kumar and Verma, 2017):

1. Natural causes like floods, earthquakes and other natural disasters.
2. **Habitat loss and fragmentation:** It is considered as the principal reason leading to extinction of animals

and plants. Tropical rain forests are the best examples of the habitat loss. Once covering more than 14% of the earth's land surface, these rain forests now cover no more than 6%. Besides total loss, pollution related degradation of many habitats causes serious threat to the survival of many species. With the broken up of large habitats into small fragments due to various human interventions, mammals and birds requiring large territories and many animals with migratory habits are being badly affected, resulting in the decline of their population. The reasons of habitat loss are deforestation, over population, pollution, global warming etc.

3. **Over-exploitation:-** Over-hunting, over-fishing or over-collecting of a species can quickly result in its decline and even extinction. Many species like Steller's sea cow, passenger pigeon have now become extinct because of the changing consumption behaviour of humans, which is considered as one of the key reason for unsustainable exploitation of natural resources.
4. **Alien species invasions:-** When alien species are introduced, some of them turn invasive, causing depletion or extinction of indigenous species.
5. **Co-extinctions:** When a species becomes extinct, the plant and animal species having associated with it in an obligatory way also become extinct. When a host species becomes extinct, its unique assemblage of parasites also experiences the same destiny.
6. **Global climate change:** Changes in climate and climate variability have been found to cause biodiversity loss.
7. **Hunting and Poaching:** Hunting and poaching pose great threat of extinction not only to a particular species but also the other species dependent on that species.

**Consequences of Biodiversity Loss:-**

1. **Impacts on the Ecosystems:** One major consequence of biodiversity loss is the alteration and decline in species compositions, which may in turn lead to local and global extinctions (*unesco.org*). Large scale ecosystem changes may occur due to the removal of key herbivore and predator species. For instance, removal of triggerfish was found to result in the outburst in their prey population such as

**Impact Factor- 5.991**

burrowing urchin, which subsequently accelerates reef erosion through feeding activities ([unesco.org](http://unesco.org)). Furthermore, the loss of top predators or dominant herbivores of any region is mostly damaging as it can lead to a cascade of disruptions in the ecological relationships among species that maintain diversity and proper functioning of ecosystems. Loss of biodiversity through bioinvasion of exotics also has a serious consequence as it could trigger loss or alteration of genetic purity or genetic uniformity. Exotics can pose a kind of internal threat to natives as they may cause the mixing of genetic stocks ([unesco.org](http://unesco.org)). Such genetic invasions can weaken the uniqueness or stability of a native population by swamping in it foreign genes. Biodiversity loss on different Indian floral and faunal population has been summarized below.

- A. Floral Species:** India is blessed with wide variety of floral species. With increasing biodiversity depletion, several floral species have become endangered and are moving towards extinction.
- B. Wild life:** The illustrates the reported endangered wild life in India (Anil *et al.*, 2014).
- C. Birds:** In India Birds play important role in the traditional lifestyle and dressing habits of many tribes. The describes some endangered Indian birds (Anil *et al.*, 2014).
- D. Insects and Amphibians:** Among the insects, butterflies occupy a vital position in ecosystems and their occurrence and diversity are considered as good indicators of the health of any given terrestrial biotope (Thomas, 2005). Recent reports reveal that about 100 out of 1500 butterfly species occurring in India are on the verge of extinction (Raju and Rao, 2002).
- E. Mammals:** The important large mammals facing extirpation in Himalaya are black bear (*Ursus thibetanus*), musk deer (*Moschus sp.*), bharal (*Pseudois schaeferi*), Himalayan tahr (*Hemitragus jemlahicus*), serow (*Capricornis sumatraensis*) and common leopard (*Uncia uncia*) (Pandit *et al.* 2007). In Kudremukha, at least 26 species of mammals

were hunted and facing extinction. In Nagarahole, 6 out of 9 focal species of large mammals were present at considerably lower densities at the heavily hunted site (Anil *et al.*, 2014).

**2. Impacts on humankind:-**

As a result of continuous loss of terrestrial, freshwater and marine biodiversity, fish, grains and other food and medicinal products which are derived from the ecosystems are also under increasing pressure. Loss of biodiversity is often associated with a decrease in the quality of diet and/ or intake of food for the poor, causing incidence of malnutrition and sickness, especially amongst children. In addition, the rich biodiversity of the world is the source of a number of medicinal and industrial products for human civilization. With the loss of plant and animal species having medicinal properties, primary healthcare for millions of people across the region, and in particular the poor, is at risk (Campbell and Schlarbaum, 1994).

**CONCLUSION:-**

A stable biodiversity is very much important for human survival, its economic security as well as for the ecosystem function and stability. Large scale public awareness regarding the importance biodiversity as well the impact of its depletion both at regional and global levels is of great importance. For the conservation of biodiversity, active public participation is needed which is lacking in many cases. Despite such shortcomings, India has a rich tradition of conservation, and with increasing contribution from the Government, scientists and NGOs should come forward in developing appropriate methodologies and strategies for assessment of biodiversity and its conservation.

**REFERENCES:-**

1. Agnihotri N., Dassani S., Sharma T.K. 2020. Present status and conservation strategies of biodiversity in India. International Research Journal on Advanced Science Hub (IRJASH); 2 (8): 251-255.
2. Anil M.N.V., Kumari K., Wate S.R. 2014. Loss of biodiversity and conservation strategies: An outlook of Indian scenario. Asian Journal of Conservation Biology; 3 (2): 105-114.

3. Campbell F.T. and Schlarbaum S.E. 1994. Fading forests North American trees and the threat of exotic pests. Natural Resources Defense Council, Washington, D.C. 47 pp.
4. Kamalappa and Ramakrishnappa. 2003. Impact of cultivation and gathering of medicinal plants on biodiversity. Food and agricultural organisation of United Nations corporate document repository; ISBN 9251049173.
5. Kumar A and Verma A.K. 2017. Biodiversity loss and its ecological impact in India; International journal on Biological Sciences, 8 (2): 156-160.
6. Mellon, M., Rissler, J. Transgenic Crops: USDA data on small scale tests contribute little to commercial risk assessment. Nat Biotechnol 13, 96 (1995). <https://doi.org/10.1038/nbt0195>
7. Myers., Norman., Russell A.. Mittermeier., Cristina G., Mittermeier, Gustavo AB Da Fonseca., Jennifer Kent. 2000. Biodiversity hotspots for conservation priorities. Nature 403, no. 6772, pp: 853-858.
8. Raju, A.J.S. and Rao, S.P. 2002. A case study on the decline of butterfly colonies in degraded habitats of Visakhapatnam. In Bull Andhra University Res Forum, (Vol 7 pp 57-59).
9. Thomas J.A. 2005. Monitoring change in the abundance and distribution of insects using butterflies and other indicator groups. Philosophical Transactions of the Royal Society B: Biological Sciences 360.
10. Upreti D.K., Divakar P.K., Nayaka, S. 2005. Commercial and ethnic use of lichens in India. Economic botany; 59 (3): 269-273.
11. Wilson, E.O. 1992. The Diversity of Life. Cambridge MA: Belknap press, 424 pp.