

Biodiversity, Ecosystems and Conservation

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ABSTRACT

Biodiversity refers to biological diversity on several levels, including genetic diversity, species diversity, and ecological diversity. We rely on other species and the ecosystems they generate, thus biodiversity is critical. We require ecosystem services such as fresh air, clean water, and productive soils, which biodiversity provides. Biodiversity Conservation is becoming increasingly vital as the international economy becomes more globalised, as well as for the earth's existence as a balanced environment. Only the quantity and diversity of nature allow humans to coexist. In birth, death, and regeneration, all living things are closely intertwined. Humans are only a small part of this vast and colourful mosaic, yet they are exerting growing strain and suffering on other species and the environment. As a result, many plants and animals are endangered or extinction-threatened. They are worthy of our protection.

I. INTRODUCTION

The degree of variation in life on Earth is characterised as biodiversity. The term "biodiversity" refers to the amount of different creatures that live in a given ecosystem. Biodiversity, on the other hand, is not evenly distributed around the globe, but is higher at the equator and in the Western Pacific Ocean, where warmer sea surface temperatures attract life. Scientists believe that there are between 10 and 14 million distinct species of life on the globe right now. This is despite the fact that nearly all species that have ever lived on Earth have been extinct. Several large mass extinction events have occurred throughout Earth's history, the most recent being the 65 million-year-old extinction event that took off the dinosaurs. Conservation The term "Biological Diversity" was created by Raymond Dasmann in 1968, but it was not until the 1980s that the abbreviated word "Biodiversity" became popular among scientists and the general public. There are now four levels of biodiversity on the earth, according to scientists.

1. Taxonomic heterogeneity (the number of speices)
2. The diversity of the environment (diversity of place)
3. Morphological variation (diversity in genetics)
4. Molecular variation

The loss of biodiversity on the world, which is connected to climate change, has major consequences for the planet's future life. Collectors have been motivated to collect, artists have been inspired to paint, globe travellers have been inspired to explore the world, and researchers have been inspired to do study. The infinite variety of life has always captivated humans, inspiring wonder as well as a desire to describe it, but ultimately also a drive to better comprehend it. This is how biology began. Scientists have sought to record or organise the diversity of species in a systematic manner since the time of Swadeshi naturalist Carl on Linne, yet by the past century it appeared that this endeavour was no longer a pariority. After all, toxonomy and systematics had to be

considered archaic and outdated while life scientists developed new approaches that offered answers to enthralling issues concerning the general functioning principles of life and its propagation, biochemistry, psychology, and genetics.

II. REASONS FOR THE LOSS OF BIODIVERSITY ARE

The measure reasons for the loss of biodiversity are

- Species that have recently been introduced to the ecosystem.
- Pollution
- The effects of global warming
- Devastation of natural habitat
- Degradation of the environment
- Inept management
- Urbanization
- Excessive use of natural resources
- Agriculture that isn't proper

III. WORLD WIDE FUND FOR NATURE

WWF's works (1994) to conserve biological through following strategy.

1. Establishing effective protected zones.
2. Promoting long-term development strategies that link conservation and human well-being.
3. Species of exceptional concern conservation
4. Changing public policies to reduce pollution.
5. Encourage the signing of international treaties and national policies.
6. Encouraging environmental education in order to better manage natural resources.

IV. OPEN QUESTION AND THE ROLE OF SCIENCE

Since then, much has been said about various implementation methods, consequent duties, and economic ramifications. However, one crucial factor is at risk of being overlooked. First and foremost, awareness of biological variety and a comprehension of its functional relationships are requirements for successful conservation and sustainable usage. This is where science enters the picture. Because there are still too many unanswered questions; just a fraction of the incomprehensible variety of life is known, and we have only recently begun to comprehend the complicated ways in which they are interconnected. What is biodiversity's purpose? What is the purpose of diversity? Is it true that biotic ecosystems with many species are more stable? The list of unanswered questions goes on and on, and answers are few.

SAILENT FEATURES OF BIOLOGICAL DIVERSITY ACT, 2002 (INDIA)

- To protect and preserve biological variety.
- To safeguard local communities' knowledge.

- Threatened species protection and restoration.
- To maintain and govern the country's biological resources

INDIA –THE MEGA BIODIVERSITY COUNTRY

India is one of the world's 12 megabiodiversity countries. Endangered species abound in India. With only 2.5 percent of the world's geographical area, India already has 7.8% of the world's documented species. Traditional and indigenous knowledge, both codified and uncoded, abound throughout India.

THE FORMATION OF BIODIVERSITY HOTSPOTS

According to experts, the region's history since the raising of the Andes in the Tertiary Period is the reason for its rich biodiversity. Glaciation during the ice ages and dry conditions during warm eras, both accompanied by large changes in flora, clearly prevented species from moving, resulting in improved species evolution. In Ecuador, four areas with a very high number of indigenous plant species have been identified, one of which includes the project's core area.

All stages of forest growth coexist in tropical forests, which are generally in a state of dynamic balance. Experts call to this as a mosaic climax, and they perceive this dynamic as yet another explanation for the diverse biodiversity. Another distinctive aspect of the study region is the high frequency of landslides, which are thought to be produced by the forest's sheer weight and the instability of the water-saturated soil on the steep slopes.

Importance of Biodiversity :- Biodiversity refers to the genetic and structural differences that exist between individuals, as well as within and between species. There are 1,263,500 plant and animal species in the globe, however only 51,828 species are found in India (table-1) It provides us with all of our basic needs, as well as supports and nourishes us. Climate control is directly influenced by biodiversity. Climate change is unavoidable, resulting in species evolution. Biodiversity is beneficial in the following ways:

- 1) **Pest control**:- 99 percent of potential agricultural pests can be controlled by protecting biodiversity.
- 2) **Pollination and crop production** :- Pollination will be impossible without plant-animal interactions, resulting in a decrease in agricultural output.
- 3) **Soil formation and maintenance of soil quality**:- Microbes and animals in soil break down organic materials, produce soil, and prevent soil erosion through their activities.
- 4) **Maintain water quality**:- Trees and forest soils filter water and reduce river and reservoir siltation caused by soil erosion and landslides.
- 5) **Maintain air quality**:- By taking in CO₂ during photosynthesis and releasing oxygen into the atmosphere, plants clean the air and control the composition of the environment.
- 6) **Climate stabilization**:- Oceans, soil, and plants are all large carbon sinks that assist to lower CO₂ levels in the atmosphere. The surface temperature of rainforests is maintained by frequent rains, but the temperature of frigid places is managed by woods functioning as insulators and windbreaks.
- 7) **Provision of food security**:- In terms of plants and animals, biodiversity is the ultimate source of food, fibre, fuel, and shelter. Ecosystem resilience will be strengthened as a result of biodiversity protection, and ecosystems will be better able to deliver critical functions in the face of growing climatic stresses.

8) **Prevention and mitigation of natural disasters:-** In terms of plants and animals, biodiversity is the ultimate source of food, fibre, fuel, and shelter. Ecosystem resilience will be strengthened as a result of biodiversity protection, and ecosystems will be better able to deliver critical functions in the face of growing climatic stresses.

9) **Detoxification and decomposition of wastes:-** Erosion, nutrient loss, landslides, floods, and storm damage are all prevented by ecosystem biodiversity.

IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY

i. **Vegetation:-** The vegetation is exhibiting the following changes;

A. Migration of vegetation Towards a higher attitude:- Berberis asiatica, Taraxacum officinale, Jasminum officinale, and other plants have moved from 1000 to 2000 metres in Nanital. Teak-dominated forests are expected to supplant Sal trees in central India, while deciduous kinds may supplant conifers. Temperature increases of 3 degrees Celsius, according to climatologists and palynologists, may result in forest movement of 250 kilometres per year at a pace of 2.5 kilometres per year, which is 10 times the rate of natural forest movement.

B. Invasive species:- invasive species' are a threat to native species being more tolerant to climatic variations .

C. Changes in phenological behavior:- The plant's regular life cycle is influenced by the weather and seasons (4). Early blooming and maturity of the crops has resulted in a shorter grain fill time and yield.

D. Increase in the pest attacks:- Pests have risen in quantity as a result of climate change. Droughts and floods are more likely when temperature and precipitation patterns change, leaving native plants more prone to pests and disease.

E. Forests fires:- Forests fires have increased in number due to high temperature conditions.

ii. **Animals:-** As in the instance of the golden toad, species' sensitivity to even little changes in the climate leads to extinction. The melting of Arctic ice poses a threat to polar bears. Planktons, the North Atlantic right whale's primary food source, are declining as a result of climate change. Living corals on Australia's Great Barrier Reef are being lost due to changes in water temperature.

FOREST: A NATURAL ASSET OF GREAT VALUE

Forests are energy-rich, self-sufficient ecosystems. They aren't just clumps of trees; they're huge communities of varied species that interact with both living and non-living elements of the environment. We rely on forests for every aspect of our lives and all of our fundamental needs. Forests continue to provide us with essential natural resources, such as oxygen, carbon dioxide absorption, and soil erosion prevention. Not just for food, medicine, housing, fuel, and other items, but also for wild life, we rely on them.

Forests are an important part of environmental protection and have a significant impact on climate. They look after the animals' well-being. They boost local precipitation, nourish soil with fallen leaves, control water flow in slopes, and prevent soil erosion. They provide timber, pulp wood, and support a variety of industrial operations, as well as providing jobs and serving as gene reserves for both flora and fauna.

V.WILDLIFE: OUR BIOLOGICAL HERITAGE

Wildlife is a phrase used to describe non-domesticated creatures that live in their natural habitat. However, in its broadest meaning, it refers to all of the natural habitat's vegetation and wildlife. Our country has a very diverse biological heritage. It is a fantastic natural resource. The powerful elephant, the spotted deer, the blackbuck, the one-horned rhinoceros, and the famous lion and tiger are only a few of them. However, our wildlife richness is now lower than it has ever been. Only by putting meaningful economic management in place for our wildlife resources will we be able to construct a solid foundation on which to develop our conservation programme.

VI.CONCLUSION

It is an excellent opportunity to collaborate, contribute, and pay close attention to ensure that biological resource usage is both sustainable today and in the future, for the benefit of all species on the planet. It is our responsibility to promote an integrated strategy to all biological resource uses. We must educate the public and aggressively support pollution reduction and biological resource conservation.

The demand-supply gap can only be bridged via honest effort, competent managerial skills, and strict adherence to policy choices in letter and spirit; we will need to invest more resources in order to achieve long-term growth. Environmentally friendly productive technologies that may serve and increase the resource base of agriculture, animal husbandry, forestry, and inland and marine fisheries demand a lot of attention.

Because we all live on the same planet, any damage to one area of it affects us all. Every minute, forces are at work that endanger the planet's health. As a result, we should all take care of it.

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