

# Conservation of Biodiversity

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Conservation and sustainable use of biodiversity have been an integral part of Indian ethos. The varied eco-climatic conditions coupled with unique geological and cultural features have contributed to an astounding diversity of habitats, which harbor and sustain immense biological diversity at all levels. With only 2.4% of world's land area, India accounts for 7-8% of recorded species of the world. In terms of species richness, India ranks seventh in mammals, ninth in birds and fifth in reptiles. In terms of endemism of vertebrate groups, India's position is tenth in birds with 69 species, fifth in reptiles with 156 species and seventh in amphibians with 110 species. India's share of crops is 44% as compared to the world average of 11%. India also has 23.39% of its geographical area under forest and tree cover. Of the 34 globally identified biodiversity hotspots, India harbor 3 hotspots, i.e., Himalaya, Indo Burma, Western Ghats and Sri Lanka. Western Ghats are recently included in World Heritage list. It is very rich in flora and fauna and serves as cradle of biodiversity. One of the most pressing environmental issues today is the conservation of biodiversity. Many factors threaten the world's biological heritage. The challenge is for nations, government agencies, organisations and individuals to protect and enhance biological diversity, while continuing to meet people's needs for natural resources. Efforts have been initiated to save biodiversity both by ex-situ and in-situ conservation. International Biodiversity day is celebrated across the globe on 22<sup>nd</sup> May every year.

## **BIODIVERSITY ACT 2002**

The Biological Diversity Act, 2002 is a federal legislation enacted by the Parliament of India for preservation of biological diversity in India, and provides mechanism for equitable sharing of benefits arising out of use of traditional biological resources and knowledge. The Act was enacted to meet the obligations under Convention on Biological Diversity (CBD), to which India is a party. The National Biodiversity Authority (NBA) was established in 2003 to implement India's Biological Diversity Act (2002). The NBA is a Statutory, Autonomous Body and it performs facilitative, regulatory and advisory function for the Government of India on issues of conservation, sustainable use of biological resources and fair and equitable sharing of benefits arising out of the use of biological resources.

## **LEVELS OF BIODIVERSITY**

Marine Biodiversity refers to 'Life in the Seas and Oceans. The marine environment has a very high biodiversity because 32 out of the 33 described animal phyla are represented in there. Marine organisms contribute to many critical processes that have direct and indirect effects on the health of the oceans and humans. Forest biological diversity is a broad term that refers to all life forms found within forested areas and the ecological roles they perform. As such, forest biological diversity encompasses not just trees, but the multitude of plants, animals and micro-organisms that inhabit forest areas and their associated genetic diversity. Genetic diversity, refers to the total number of genetic characteristics in the genetic makeup of a species. Genetic diversity serves as a way for populations to adapt to changing environments. With more variation, it is more likely that some individuals in a population will possess variations of alleles that are suited for the environment. The population will continue for more generations because of the success of these individuals. Species Diversity is the effective number of different species that are represented in a collection of individuals (a dataset). Species diversity consists of two components: species richness and species evenness. Ecosystem Diversity refers to the combination of communities of living things with the physical environment in which they live. There are many different kinds of ecosystems like deserts, mountain slopes, the ocean floor, Antarctic etc., Each ecosystem provides many different kinds of habitats or living places. Agriculture Biodiversity includes all forms of life directly relevant to agriculture: rare seed varieties and animal breeds (farm biodiversity), but also many other organisms such as soil fauna, weeds, pests, predators, and all of the native plants and animals (wild biodiversity) existing on and flowing through the farm.

## **BIOSPHERES AND BIODIVERSITY RESERVES**

The Indian government has established 18 Biosphere Reserves in India, which protect larger areas of natural habitat and often include one or more National Parks and Reserves, along buffer zones that are open to some economic uses. Protection is granted not only to the flora and fauna of the protected region, but also to the human communities who inhabit these regions, and their ways of life. Animals are protected and saved here.

## **HOTSPOTS**

A biodiversity hotspot is a biogeography region with a significant reservoir of biodiversity that is under threat from humans. Around the world, 25 areas qualify under definition of hotspots. These sites support nearly 60% of the world's plant, bird, mammal, reptile, and amphibian species, with a very high share of endemic species. The biodiversity hotspots hold especially high numbers of endemic species, yet their combined area of remaining habitat covers only 2.3 percent of the Earth's land surface. Each hotspot faces extreme threats and has already lost at least 70 percent of its original natural vegetation. Over 50 percent of the world's plant species and 42 percent of all terrestrial vertebrate species are endemic to the 34 biodiversity hotspots.

## **UNO EFFORTS FOR CONSERVING BIODIVERSITY**

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was signed in Washington, DC, on 3 March 1973. In August 2000, 152 States were parties to this Convention. The aim of CITES is to put a ban on international trade in wildlife. The World Conservation Union IUCN brings together States, government agencies and a diverse range of non-governmental organizations in a unique world partnership. IUCN seeks to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and sustainable use of natural resources. International Treaty on Plant Genetic Resources for Food and Agriculture was adopted in Rome in November 2001 to create a legally binding framework for the protection and sustainable use of all plant genetic resources for food and agriculture. The United Nations Convention on Biological Diversity (CBD), 1992 known informally as the Biodiversity Convention, is a multilateral treaty. The Convention has three main goals like conservation of biological diversity (or biodiversity); sustainable use of its components; and fair and equitable sharing of benefits arising from genetic resources. The most significant feature of 1972 World heritage Convention is that it links together in a single document the concepts of nature conservation and preservation of cultural properties. The Convention recognises the way in which people interact with nature and fundamental need to preserve the balance between the two. The law of sea 1982, envisaged by UNO aims at protecting marine biodiversity and to control marine pollution.

## **DESERT NATIONAL PARK**

Desert National Park is a unique biosphere reserve for conservation and development of biodiversity in India. It is situated in the West Indian state of Rajasthan near the town of Jaisalmer. This is one of the largest national parks, covering an area of 3162 km<sup>2</sup>. The Desert National Park is an excellent example of the ecosystem of the Thar Desert. Sand dunes form around 20% of the Park.

## **ROLE OF WILDLIFE CORRIDORS IN BIODIVERSITY CONSERVATION**

A habitat corridor, wildlife corridor or green corridor is an area of habitat connecting wildlife populations separated by human activities such as roads, development, or logging. This allows an exchange of individuals between populations, which may help prevent the negative effects of inbreeding and reduced genetic diversity that often occur within isolated populations.

## **WETLANDS REPOSITORIES OF BIODIVERSITY**

Wetlands are complex ecosystems and encompass a wide range of inland, coastal and marine habitats. They include flood plains, swamps, marshes, fishponds, tidal marshes natural and man-made wetlands. The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

## **BENEFITS OF BIODIVERSITY**

Biodiversity provides food from crops, livestock, forestry and fish. Biodiversity is of use to modern agriculture as a source of new crops, as a source material for breeding improved varieties and as a source of new biodegradable pesticides. Biodiversity is a rich source of substances with therapeutic properties. Several important pharmaceuticals have originated as plant-based substances, which are of incalculable value to human health. The industrial products like timber, oils, lubricants, food flavours, industrial enzymes, cosmetics, perfumes, fragrances, dyes, paper, waxes, rubber, latexes, resins, poisons and cork can all be derived from various plant species. Biodiversity is a source of economical wealth for many areas, such as many parks and forests, where wild nature and animals are a source of beauty and joy, attract many visitors. Ecotourism in particular, is a growing outdoor recreational activity. Biodiversity has also great aesthetic value. Examples of aesthetic rewards include ecotourism, bird watching, wildlife, pet keeping, gardening, etc. Biodiversity is also essential for the maintenance and sustainable utilization of goods and services from ecological systems as well as from the individual species. These services include maintenance of gaseous composition of the atmosphere, climate control by forests and oceanic systems, natural pest control, pollination of plants by insects and birds, formation and protection of soil.

## **THREATS TO BIODIVERSITY**

The destruction of habitats is the primary reason for the loss of biodiversity in terrestrial and coastal ecosystems. Habitat loss could be attributed to conversion, habitat degradation and fragmentation. When people cut down trees, fill a wetland, plough grassland or burn a forest, the natural habitat of a species is changed or destroyed. Introduction of invasive species may cause disappearance of native species through biotic interactions. Invasive species are considered second only to habitat destruction as a major cause of extinction of species. Communities are affected by natural disturbances, such as fire, tree fall, and defoliation by insects. Man-made disturbances differ from natural disturbances in intensity, rate and spatial extent. For example, man by using fire more frequently may change species richness of a community. Exploitation, including hunting, collecting, fisheries and fisheries by-catch, and the impacts of trade in species and species' parts, constitute a major threat for globally threatened birds (30% of all), mammals (33% of all), amphibians (6% of those assessed), reptiles and marine fishes (Baillie et al. 2004). Trade affects 13% of both threatened birds and mammals. Extinction is a natural process. Species have disappeared and new ones have evolved to take their place over the long geological history of the earth. It is useful to distinguish three types of extinction processes. Over-fishing, habitat destruction, widespread marine pollution and human induced climate change threaten the survival of marine biodiversity. Pollution, oil and gas drilling and oil spills may increase the risks of extinction by increasing mortality of marine organisms. The Silent Valley Project in Kerala was abandoned because it was considered as a threat to biodiversity in the region.

## **BIODIVERSITY AND FOOD SECURITY**

In a recent estimate it was speculated that over 25 per cent of the world's plant species might be lost by the year 2025 AD, if the current rate of plant genetic erosion continues. Preserving this germ pool is an integral part of food security. It is evident that preservation of wide range of germ pool is an integral part of breeding programme. If we are unable to combat the problems of genetic erosion, it may lead to losing sources of resistance to pests, diseases and climatic stress and, finally, leading to crop failure in future. It is well-known that out of over 20,000 edible species only a few dozen of plants are domesticated and now feed most of the people. All types of protected area constitute over 12% of the total forest area of the country. This network of protected areas covers most of the representative habitat types in the country and affords protection both to the wild flora and fauna.

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(Source: PIB)