

# BIODIVERSITY AND SUSTAINABLE DEVELOPMENT

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## Abstract

Biodiversity offers people with basic eco system goods and services. It provides goods such as food, fiber and medicine, and services such as air and water purification, climate regulation, erosion control and nutrient cycling. Biodiversity is an important role to play for economic production and it brings fruitful development. It also brings development in agriculture, forestry, fisheries and tourism development. More than three billion people rely on marine and coastal biodiversity, and 1.6 billion people rely on forests and non-timber forest products for their livelihoods. Many people depend directly on the availability of usable land, water, plants and animals to support their families. In fact, eco systems are the base of all economies. But, in between 1970 and 2010, the planet has lost 52 per cent of its biodiversity. The challenge is for nations, government agencies, organizations and individuals to protect and enhance biological diversity, while continuing to meet people's needs for natural resources. The need of the hour is all possible efforts should be initiated to save biodiversity.

**Key words:** Biodiversity, sustainable development, climate change, environmental sustainability, etc.

## 1. Introduction

Biodiversity is varieties of living things on earth and it is very important to socio-economic development, and is certainly fundamental to our continued existence. Environment, or more specifically biodiversity and its invaluable and often irreplaceable eco system services, from the air we breathe to the water we drink, are the very foundation on which practicable long-term development rests. Former themes for the International Day for Biological Diversity have captured this fact in snippets. The challenge before India to imbibe and translate the theme of 'Biodiversity for Sustainable Development' is essential in the light of our privileged status as a mega bio-diverse country, past and projected demographic transitions and commitment to democracy as a political principle. India is also a recognized centre of crop diversity, and harbors many wild and domesticated animals, fish and millions of microbes and insects. The eco system diversity is also unparalleled. These are the strengths to draw upon to meet the goals of ending poverty and hunger; achieving food security and improved nutrition and promoting sustainable agriculture; ensuring healthy lives and promoting well-being for all at all ages; ensuring availability and sustainable management of water and sanitation for all and in making cities and human settlements inclusive, safe, resilient and sustainable.

The economically poor in India and the world over face the negative fallouts of depleting and degraded natural resources in disproportionate measure to those who are responsible for such depletion and degradation. Sustainable development rests on a viable and sound natural resource base. The future we want thus depends heavily on the restorative and ameliorative action that we engage with, in relation to our wealth in biodiversity today. This challenge can only be met with broad stakeholder participation. From the right information, to the right resources and the right spirit of working together for the common good, might celebrated the International Day for Biological Diversity 2015 help us draw on synergies and strengths across areas to achieve the vision of biodiversity for sustainable development. In this context, the present study discusses on importance of biodiversity, issues related to biodiversity and its contribution for sustainable development.

## **2. Convention on biological diversity**

The Sustainable Development Goal 15 of the 2030 Agenda for Sustainable Development is devoted to “protect, restore and promote sustainable use of terrestrial eco systems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss”. At the Rio+20 Conference, Member States reaffirmed, through paragraphs 197-204 of the outcome document, the future we want that “intrinsic value of biological diversity, as well as the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its critical role in maintaining ecosystems that provide essential services, which are critical foundations for sustainable development and human well-being”. Member states also recognized “the severity of global biodiversity loss and degradation of ecosystems” and stress the negative impact that this situation has on food security, nutrition, access to water, health of the rural poor and people worldwide. Furthermore, the importance of implementing the strategic plan for biodiversity and achieving the biodiversity targets adopted at the tenth conference of the parties to the convention.

## **3. National biodiversity authority and its role on protecting biodiversity**

The National Biodiversity Authority was established in 2003 by the Central Government to implement India’s Biological Diversity Act. The NBA is a statutory body and that performs facilitative, regulatory and advisory function for Government of India on issue of conservation, sustainable use of biological resource and fair equitable sharing of benefits of use. The Biological Diversity Act, 2002 mandates implementation of the provisions of the Act through decentralized system with the NBA focusing on advice the central government on matters relating to the conservation of biodiversity, sustainable use of its components and equitable sharing of benefits arising out of the utilization of biological resources; advice the state government in the selection of areas of biodiversity importance. The State Biodiversity Boards focus on advice the state governments, subject to any guidelines issued by the central government, on matters relating to the

conservation of biodiversity, sustainable use of its components and equitable sharing of the benefits arising out of the utilization of biological resources.. The Local Level Biodiversity Management Committees are responsible for promoting conservation, sustainable use and documentation of biological diversity including preservation of habitats, conservation of land races, folk varieties and cultivators, domesticated stocks and breeds of animals and microorganisms besides chronicling of knowledge relating to biological diversity.

#### 4. Importance of biodiversity hotspots

Tropical rainforests are the Earth's oldest living eco system. Today, they contain the most concentrated areas of biodiversity. More than two-thirds of the world's plant species live in tropical rainforests. An area of the rainforest the size of two football grounds may have more than 400 species of trees. The canopy structure of the forest provides a great quantity of places for plants to grow and animals to live. The canopy offers sources of food, shelter, hiding places and interaction between different species for the plants and animals to thrive. Moreover, tropical rainforests receive a lot of sunlight because of their geographical location. The process of photosynthesis helps plants convert the sunlight into energy that supports life in the rainforest. A number of unique plant and animal species will become extinct if the rainforests are destroyed. Less than 1 per cent of the world's tropical plants have been tested for pharmaceutical properties, yet at least 25 per cent of all modern drugs came originally from rainforests. The plants of the rainforest are used in medicines that fight illnesses like cancer, and heart disease. Since the plants in the rainforest grow very close together and have to deal with the constant threat of insect predators, they have adapted by producing chemicals that researchers have found useful as medicines. It is estimated that 70 per cent of the anti cancer plants identified so far are present only in rainforests. Many plants and trees, like orchids, have been removed from the rainforest in an effort to cultivate them. In wetlands, plants will take up contaminants in water and process and purify the water. Shellfish such as mollusks take in nutrients from the water, thereby preventing a condition called eutrophication, which can cause a huge increase in organisms in the water that leads to oxygen depletion and mass die-offs. If any species is removed from the food webs of an eco system, the eco system can crash, and in the case of water quality, contaminants can remain and cause immense additional problems. The biodiversity of microbes, fungi, and other smaller organisms is important in decomposing waste matter. Organic material in nature, such as leaves, logs and twigs, and dead animals and insects, is all degraded and decomposed by the biodiversity of organisms in the ecosystem. It is a delicate balance, in which certain insects or microbes perform a vital function in removing waste from the environment, making it cleaner and less ripe for the spread of disease. Honey bees are not the only organisms responsible for pollinating plants and crops. In actual fact, birds, bats, and butterflies play a vital role in spreading pollen and in dispersing seeds. Butterflies and hummingbirds, for instance, feed on nectar and can transfer pollen from flower to flower.

## 5. Economics of biodiversity

Biological diversity contributes to billions of dollars to national economy for all countries around the world. This is real, and not potential. According to the Secretariat of Convention on Biological Diversity, the projected economic potential of biodiversity in the pharmaceutical sector is about \$640 billion of which 25-50 per cent is derived directly from biological resources, globally. Herbal supplements, personal care products and food products collectively have a market size of \$65 billion representing the largest 'nature' based market. The economic potential of coral reefs, on an average, at any given site include the following an estimated \$189,000/hectare per year in reducing natural disasters, tourism up to \$ 1 million/hectare/year, genetic material and prospecting upto \$57,000/hectare/year, fisheries upto \$3,818/hectare/year. Collectively we are looking at an economic potential of \$1,250 million/hectare/year from coral reefs. Consider that one can apprehend a mere 10 per cent of this potential for the local people. People are talking about \$125,000 per year/hectare and it translates to Indian Rs.6125000/hectare/year. If India has on an average 2330 hectares of coral reefs, and talking value of Rs 14,27,12,50,000 of revenue per year from this simple but critical eco system as of now. The contributory numbers can go up many-fold if we invest in the proper maintenance of this ecosystem.

## 6. Decline of biodiversity

World Wildlife Fund has released its Living Planet Report 2014 on September 30 and it wasn't the usual doom-and-gloom environmental news story that is forgotten the next day. The report is the result of a science-based study using 10,380 populations from 3,038 species of amphibians, birds, fish, mammals and reptiles from around the earth is acquiring worldwide attention for its findings clearly states that between 1970 and 2010, the planet has lost 52 per cent of its biodiversity. In the same 40-year period, the human population has nearly doubled. Those figures take a while to sink in, especially since the previous WWF report that analyzed animal populations, published in 2012, showed a decline of only 28 per cent over a similar time frame. Specifically, the WWF biennial report found that we have lost 76 per cent of freshwater wildlife, 39 per cent of terrestrial wildlife and 39 per cent of marine wildlife since 1970. While some animal species numbers are increasing and some are stable, the declining populations are decreasing *so* rapidly that the overall trend is down. Latin American biodiversity took the biggest plunge, diminishing by 83 per cent. Elsewhere in the tropics, populations are down 56 per cent. Temperate zones fared better, with a loss of 36 per cent; while terrestrial animal populations in parks and wildlife refuges are down 18 per cent, indicating that protected areas can limit losses. Low-income countries are suffering a disproportionately greater loss of biodiversity, a 58 per cent decline. While high-income countries actually showed a 10 per cent increase in biodiversity, a loss of 18 per cent in middle-income countries and the astounding figure for low-income countries cancelled those gains out. Despite the fact that low-income countries are suffering the greatest eco system losses, high-income countries are using five times the ecological

resources that they do. Those living in high-income countries are consuming more resources per person than nature can replenish, which means that per capita ecological footprints in high-income countries are greater than the amount of bio-capacity and the ability of an eco system to produce useful biological materials for food, fuel, building and other needs and to absorb carbon dioxide emissions are available per person. People residing in middle and low income countries have had little increase in their per capita footprints over the same time period. Those statistics boil down to the fact that every year, we use 1.6 planet's worth of natural resources. If people lived the lifestyle of a typical United States resident, people would need 3.9 planets per year.

## 7. Conclusion

Biodiversity offers 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 resource of new biodegradable pesticides. Several important pharmaceuticals have originated as plant based substances, which are of incalculable value to human health. Further, 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. India has 23.39 per cent of its geographical area under forest and tree cover. Of the 34 internationally identified biodiversity hotspots, India harbours 3 hotspots, i.e., Himalaya, Indo Burma, Western Ghats and Sri Lanka. Western Ghats are newly included in World Heritage list. It is very rich in flora and fauna and serves as cradle of biodiversity. Many factors threaten the world's biological heritage. The challenge is for nations, government agencies, organizations and individuals to protect and enhance biological diversity, while continuing to meet people's needs for natural resources. The need of the hour is all possible efforts should be initiated to save biodiversity both by ex-situ and in-situ conservation activities to sustain biodiversity.

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