

Biodiversity and Its Conservation

Dr. Jayanta Bhuyan¹ and Dr. Nikhilesh Baruah²

¹Professor, Deptt. of Plant Breeding and Genetics, Biswanath College of Agriculture,
Biswanath Chariali

Assam Agricultural University-784176

²Junior Scientist, AICRP on Dryland Agriculture, Biswanath College of Agriculture,
Biswanath Chariali

Assam Agricultural University-784176

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The most fascinating feature of Earth is the existence of life, and the most fascinating feature of life is its diversity. Edward Wilson, a sociobiologist, coined the term 'biodiversity' in the year 1985 to highlight the diversity and abundance that is found in the rich flora and fauna on Earth. Biodiversity in short can be defined as "the totality of genes, species and ecosystem in a region". Diversity within species is the genetic diversity, between species is the species or taxonomic diversity and of ecosystem is the ecological diversity.

International Union for Conservation of Nature (IUCN) in 2004 has recorded the total number of known plant and animal species to be slightly more than 1.5 million. India stands 7th in the world as far as number of species contributed to agriculture and animal husbandry is concerned. Although India occupies only 2.4 percent of the world's land area yet it contributes to the world's biodiversity approximately 8 percent of the total number of species. These species are flowering plants, mammals, fish, birds, reptiles, amphibians and constitute 17.3 percent of the total whereas nearly 60 percent of India bio-wealth is contributed by fungi and insects. India is endowed with 366 domesticated species of economic importance and 326 species of their wild forms native to the subcontinent.

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Megadiversity countries

Megadiversity country is defined as one that contains 20,000 higher plant species or, in the case of a country with fewer than 20,000 but more than 10,000 such species, at least 5000 endemics, or contains at least 2000 species of higher vertebrates. There are 17 mega diversity countries. India is recognized as an important Megadiversity country.

Hotspot



Those areas that feature exceptional concentration of endemic species and face imminent threat of habitat destruction are known as hotspots. Altogether 18 hotspots have been identified including eastern Himalayas and Western Ghats of India. To qualify as hotspot, a region must contain at least 0.5 % or 1500 of world's 270,000 vascular plant species as endemics. Secondly, a hotspot should have lost 70% or more of its primary vegetation, described as the form of habitat that usually contains the most species, especially endemics.

Significance of Biodiversity

- Proper maintenance of biodiversity is essential for survival on earth. An area rich in diversity of species is considered to be more stable than an area in deprivation. Moreover, we rely entirely on the environment to fulfill our needs to survive.
- It provides ecological stability by providing various services required for the survival of human life. Every species serves a specific function in an ecosystem. Some produce and decompose organic matter while others capture and store energy. An abundant and diverse ecosystem is more productive and resilient to environmental stress like droughts, floods, landslides, etc.
- Rich biodiversity provides economic value as it is a reservoir of various resources like cattle, fishes, forests, medicinal herbs, wood, crops, etc., that are essential for the propagation of life on Earth.
- Abundant and balanced biodiversity also provides ethical and aesthetic value by conserving the rich cultural heritage.

Conservation of biodiversity

Rapid urbanization, industrialization, mega development projects and replacement of large number of old crop varieties with very few commercial varieties are contributing to genetic erosion. This erosion and extinction would lead to non availability of vast gene resources to deprive future crop improvement programmes.

The IUCN Red List is a critical indicator of the health of the world's biodiversity which was first introduced in 1994. The Red List classifies plants into different categories such as Extinct (EX), Vulnerable (VU), Conservation Dependent (CD), Lower Risk (LR), Data Deficient (DD) and Not Evaluated (NE). It estimates that 20,000 to 25,000 plant species are threatened due to biotic and abiotic pressure on land mass and over exploitation by man for its welfare. IUCN Red List stating different status of plant species heading towards extinction

indicates the necessity of flora conservation. The IUCN Red List is updated from time to time.

Biosphere Reserves

Biosphere reserves conserve biotic communities within natural ecosystem and help to preserve the core areas of indigenous flora and fauna and safeguard genetic diversity of species and provide natural evolution process of diversity. In India nine sites have been identified and notified as Biosphere reserves including Manas and Dibru-Saikhowa of Assam and Nokrek of Meghalaya.

Ex Situ Conservation

Botanical gardens, herbal gardens and gene banks, etc. constitute ex-situ conservation methods. In India, the National Bureau of Plant Genetic Resources (NBPGR) represents the largest gene bank in the country. Cryopreservation is a potential and popular *ex-situ* plant conservation method to conserve plant parts for indefinite period. It involves the storage of viable tissues at ultra low temperature. Liquid nitrogen is mostly used as cryogen. This is a potential long term plant preservation/conservation technology. Therefore creation of public awareness regarding importance of biodiversity and prevention of widespread deforestation should be given topmost priority for conservation of diversity of flora and fauna.