

Biodiversity at Global , National and Regional level

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The present geological era is perhaps the richest in biological diversity. About 2.1 million species have been identified till date, while many more species are believed to exist. According to UNEP (1993-94) i.e. UN convention on environment protection) estimate, the total number of species that might exist on Earth range between 9.0 – 5.2 million.

Invertebrate animals and plants make-up most of the species. About 70% of all known species are invertebrates (animals without backbones such as insects, sponges, worms, etc.;;) while, about 15% are plants. Mammals, the animal group to which man belong, comprise a comparatively small number of species. Of all the world's species only 10 to 15% live in North America and Europe. By contrast, the centers of greatest biodiversity tend to be in the tropics.

Out of estimated 30 million species on earth, only one-sixth has been identified and authenticated in the past 200 years. There are at present 1.8 million species known and documented by scientists in the world. Thus, the majority of species are yet to be discovered.

| Form of Life | Known Species | Estimated Total Species |
|-------------------------------------|----------------------|--|
| Insects and other arthropods | 874,161 | 30 Million species, extrapolated from surveys in forest canopy in Panama, most believed to be unique to tropical forests. |
| Higher plants | 248,400 | Estimates range from 275,000 to 400,000 at least 10.15% species believed undiscovered. |
| Invertebrates (excludes arthropods) | 116,873 | True invertebrates may number millions of species. Nematodes, eelworms, and roundworms may each comprise more than one million species |
| Lower plants (fungi and algae) | 73,900 | Not available |
| Micro organisms | 36,600 | Not available |
| Fish | 10,056 | 21,000 assuming that 10% fish remain undiscovered, the Amazon and Orinoco rivers alone may account for 2,000 additional species. |
| Birds | 9,040 | Known species probably account for over 98% of all birds. |
| Reptiles and Amphibians | 8,962 | Known species probably account for over 95% of all reptiles and amphibians. |
| Mammals | 4,000 | Known species probably account for over 95% of all mammals. |
| Total | 1,390,992 | 10 million species considered a conservative estimate. If insect estimates are accurate, total exceeds 30 million. |

- Biodiversity of 89 countries with diversities higher than India are located in South America such as Brazil, and South East Asian countries such as Malaysia and Indonesia.
- The species found in these countries, however, are different from our own. This makes it imperative to preserve our own biodiversity as a major economic resource. While few of the other 'mega-diversity nations' have developed the technology to exploit their species for biotechnology and genetic engineering. India is capable of doing so.

Throughout the world, the value of biologically rich natural areas is now being increasingly appreciated as being of unimaginable value. International agreements such as the World Heritage Convention attempt to protect and support such areas. India is a signatory to the convention and has included several protected areas as World Heritage Sites.

These include Manas on the border between Bhutan and India, Kaziranga in Assam, Bharatpur in U.P., Nandadevi in the Himalayas, and the Sunderbans in the Ganges delta in West Bengal. India has also signed the Convention in the Trade of Endangered Species (CITES) which is intended to reduce the utilization of endangered plants and animals by controlling trade in their products and in the pet trade.

Biologically, tropical rain forests are the centres of the world. Much of the earth's contemporary flora and fauna originated in the humid tropics. For millions of years, tropical rain forests have been factories of evolutionary diversity from which plants and animals, capable of adapting to more difficult environments, have gone forth to populate the subtropical and temperate regions. It is essential to maintain areas of tropical rain forest large enough for this evolution to continue. The tropical forests are regarded as the richest in biodiversity. Species diversity in tropics is high.

The reasons are as follows:

1. Warm temperate and high humidity provide favourable conditions for many species.
2. Tropical communities are more productive because these areas receive more solar energy.
3. Over geographical times the tropics have had a more stable climate. In tropics, therefore, local species continued to live there itself.
4. Among plants, rate of out crossing appear to be higher in tropics.

Biodiversity exists on earth in eight broad realms with 193 bio-geographical provinces. Each bio-geographical province is composed of ecosystems, which are constituted by communities of living species existing in an ecological region.

The developing countries, located in subtropical/tropical belt are far richer in biodiversity than the industrial countries in the temperate region. The Valvilovian Centres of diversity of crops and domesticated animals are also located in the developing countries.

It is important to preserve the numerous varieties of plants and animals that belong to one species. Each variety within a species contains unique genes and the diversity of genes within a species increases its capacity to adapt to pollution disease and other changes in the environment.

National and Local Level:

- Based on a survey of about two-third of the geographical area of the country, the Ministry of Forests and Environment (MOEF) reports that India has at present 89,317 species of fauna and 45,364 species of flora representing about 7.31% of the world fauna and 10.88% the world flora described so far.
- Based on another survey, India has over 108,276 species of bacteria, fungi, plants and animals already identified and described. Out of these, 84 percent species constitute fungi (21.2 percent), flowering plants (13.9 percent), and insect (49.3 percent). In terms of the number of species, the insects alone constitute nearly half of the biodiversity in India (Fig 4.1).
- These species occur on land, fresh and marine waters, or occur as symbionts , mutualistic or parasitic state with other organisms. In the world as a whole, 16, 04,000 species of Monera, Protista, Fungi, Plantae and Animalia have been described so far. However, it is estimated that at least 179, 80,000 species exist in the world, but as a working figure 122, 50,000 species are considered to be near reality.

Table 4.2 : Number of Species of Bacteria, Fungi, Plants and Animals

| Taxon | Number of Species | Percentage |
|--------------|--------------------------|-------------------|
| Bacteria | 850 | 0.8 |
| Fungi | 23,000 | 21.2 |
| Algae | 2,500 | 2.3 |
| Bryophyte | 2,564 | 2.4 |
| Pteridophyta | 1,022 | 0.9 |
| Gymnosperms | 64 | 0.1 |
| Angiosperms | 15,000 | 13.9 |
| Insecta | 53,430 | 49.3 |
| Mollusca | 5,050 | 4.7 |
| Pisces | 2,546 | 2.4 |
| Amphibian | 204 | 0.2 |
| Reptilia | 446 | 0.4 |
| Aves | 1,228 | 1.1 |
| Mammalian | 372 | 0.3 |
| Total | 108,276 | 100.00 |

India is 10th among the plant rich countries of the world, fourth among the Asian countries, eleventh according to the number of endemic species of higher vertebrates (amphibian, birds and mammals), and tenth in the world as far as richness in mammals is concerned.

Some Salient Features of India's Biodiversity

- India has two major realms called the Palaearctic and the Indo Malayan; and three biomes, namely the tropical humid forests, the tropical dry deciduous forests and the warm desert/ semi-deserts.
- India has ten bio-geographic regions, namely the Trans-Himalayan, the Himalayan, the Indian desert, the Semi-arid zone, the Western Ghats, the Deccan Peninsula, the Genetic plain, North-East India, the Islands, and the coasts.
- India is one of the 12 mega-diversity nations of the world.
- India is one of the 12 centres of origin of cultivated plants.

Some Salient Features of India's Biodiversity

- There are two hotspots that extend into India. There are the Western Ghats/ Sri Lanka and the Indo-Burma region (covering the Eastern Himalayas). Further these hotspots are included amongst the top eight most important or hottest hotspots.
- India has 26 recognised endemic centres that are home to nearly a third of all the flowering plants (angiosperms) identified and described to date.

Some Salient Features of India's Biodiversity

- India has six Ramsar Wetlands.
- They are Chilika Lake, Harike Lake, Loktak Lake, Keoladeo National Park, Wular Lake and Sambhar Lake.
- India has 5 world heritage sites namely, Kaziranga National Park, Keolades Ghana National Park, Manas Wildlife Sanctuary, Nanda Devi National Park and Sundarban National Park.

Some Salient Features of India's Biodiversity

- India has twelve biosphere reserves, namely Nilgiri, Nanda Devi, Nokrerak, Manas, Sunderbans, Gulf or Mannar, Great Nicobar, Similpal, Dibru-Saikhowa, Dehang Debang, Pachmarchi and Kanchanjanga.
- Further, amongst the protected areas, there are 88 national parks and 490 sanctuaries in India covering an area of 1.53 lakh sq.km.

Thanks

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