

Phytodiversity and Its Importance

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Introduction

The term biological diversity was first coined by Norse and McMangus in 1980 to present a combination of two related concepts, genetic diversity (the amount of genetic variability within species) and ecological diversity (the number of species in a community of organisms). The term biological diversity denotes as "biodiversity". India, a land of physical, cultural, social and linguistic diversity endowed by nature with enormous biological diversity includes about 40,000 species of flora and 89,000 species of fauna and equally rich marine life along the shelf zone of over 45 million hectares. As a result India ranks amongst one of the 12 mega biodiversity countries of the world.

Biodiversity status in India

India which is the 7th largest country in area and 2nd largest populated, country can be divided physiographical into 3 distinct regions- The Himalayas, Indo-Gangetic plains and Peninsular India. India has created a network of protected areas in the form of 96 national parks, 510 wildlife sanctuaries and 28 tiger reserves 25 elephant reserve and 16 biosphere reserves. The area covered under protected area network (PAN) accounts for around 5% of the total geographical area of the country. The rich biodiversity in India has given shape to variety of cultural and ethnic diversity which includes over 550 tribal communities of 227 ethnic groups spread over 5,000 forest villages. India consists of: two realms the Himalayan region represented by Palaearctic realm and the rest of the sub-continent represented by Malayan realm. Five biomes - (i) Tropical humid forests, (ii) Tropical dry or deciduous forests

(including monsoon forests), (iii) Warm deserts and semi-deserts, (iv) Coniferous forests and (v) Alpine meadows. Ten bio-geographic zones - 1. Trans Himalayan 2. Himalayan 3. Indian desert 4. Semi Arid 5. Western Ghats 6. Deccan Peninsula 7. Gangetic Plain 8. North-East India 9. Islands 10. Coastal area

Out of the 34 hotspots, nine leading hotspots have been recognized while eight hottest hotspots based on an analysis of five key factors: number of endemic species (both plants and animal), endemic species area ratios and the habitat loss. The hottest hot spot are Madagascar, Philippines, Sundaland, Brazil Atlantic Forest, the Caribbean, Indo-Burma, Western Ghats/Srilanka and Costal Forest of Tanzania/ Keniya. While the utilization of biological resources is a prerequisite for human sustenance on this planet, at the same time it is equally essential to conserve these resources for future generations through their sustainable utilization. Over the centuries we have had close linkages with nature and possibly the world's first recorded conservation measures were enacted in India as back as in 3rd Century B.C. by Emperor Ashoka. Today we seem to be losing two to five species per hour from tropical forests alone. This amounts to a loss of 1800 populations per hour. Biodiversity is not uniformly distributed on the earth. There are broad global patterns' regional and focal concentrations of biodiversity. About 44% of vascular plants and 35% of vertebrates are concentrated as endemic species in 34 hotspots, which account for only 1.4% of the global land area.

Importance of Biodiversity: Biodiversity provides to the humankind enormous economic benefits in the form of timber, food, fibre, medicines, industrial enzymes, food flavours, fragrances, cosmetics, emulsifiers, dyes, plant growth regulators, and National Conference on Biodiversity, Development and Poverty Alleviation 22nd May , 2010

pesticides The indirect ecological benefits from biodiversity include regulation of the gaseous composition of the atmosphere, soil formation, processing and acquisition of nutrients, tropic dynamic regulation of population. Biodiversity supplies the buffering capacity and stability of life on the planet by maintaining the interactive dynamics of ecosystem. For example, human beings derive all of its food, medicines and industrial products from the components of biological diversity. Some valuable drugs derived from plants are given below in Table.

The United Nations Environment Programme (UNEP) outlines eight major categories of biodiversity data for country studies (UNEP, 1993). The categories are as follows: 1. Biological, 2. Physical, 3. Socioeconomic, 4. Cost and Benefits, 5. Pressure and Threats, 6. Sustainable management, 7. Sources and contacts, 8. Interrelationships. These datasets will serve three main objectives of CBD namely: (a) the conservation of biodiversity, (b) the sustainable use of biological resources and (c) the equitable sharing of the benefits from using those resources.

Conservation– To conserve biodiversity we should follow the following points:-

- Repair damage to ecosystem so that they can once again provide critical services to humans and other constituent species.
- Preserve more critical areas that harbour unique biodiversity.

Chemical substance	Medicinal use	Plant Name /Common Name
Codeine	Analgesic, Antitussive	Papaver somniferum
Digitalin	Codiotoxin, Antimalaral	Digitalis purpurea
Quinine	Ant- malarial	Chinchona (Kunen)
Taxol	Ovarian cancer	Texus buccata
Vinbiastine	Lymphocytic leukaemia	Catharanthus roseus (Sadabahar)
Vasicine/Vascinol	Antiarrythmatic & Tonic	<i>Sida acuta</i> (Bariyari)
Catechin	Hepato-protactive	Acacia actechu (Kathha)
Barbadoin/Aloe emodin	Anti-ageing	Aloevera (Gritkumari)
Setosterol/ Palasonin	Aphrodisiac & Diuretic	Butea monosperma (Palash)
Ocimene/Lenonine	Anti-skin ulcer	<i>Ocimum basilicum</i> (Babu- tulsi)
Curcumine	Anti-bacterial	<i>Curcuma domestica</i> (Haldi)
Santalol	Antibacterial & Antifungal	Santalum album (Chandan)
Bacoside	Anticancer & Nervine tonic	<i>Bacopa monnieri</i> (Brahmi)
Asarone	Respiratory & Mental disease	Acorus calamus (Vach)
Vasicine	Antiviral & Antispasmodic	Justicia adhatoda (Vasaka)

Table : Some valuable drugs derived from plants:



- To increase species numbers and preserve genetic diversity corridors should be construct.
- Global biodiversity information network can be accessed by scientist and policy maker worldwide. It will help to develop local conservation action plans.
- Any biodiversity conservation programme cannot succeed without the involvement of local people, so policies that concentrate to meet out the needs of local communities from the biodiversity should be implemented.

Everybody needs to know that why Biodiversity is important for mankind. Several species of plants are economically important and tribes reside in the forest area are dependent for many purposes and used them as food and fodder and for cure of various disease. Due to variation in size, shape, colour and sheen of the leaves structure are of great aesthetic appeal. Most of the species are used as pot plants and remains green throughout the year. Since time human being has made use of plants in different ways and also use of plants as a source of medicine from the time of human civilization. India has a valuable heritage of herbal remedies. Its rural people living in remote villages and forest areas still depend to a great extent on the indigenous systems of medicine. Some of the tribal medicines have been incorporated in the organized systems of medicine. However, much larger number of folk medicines has remained confined to certain pockets of India. One fifth of the estimated 17000 angiosperms found in India constitute useful plants. Wealth of India series listed approximately 1500 medicinal plants.

Useful plants

A list of more important useful species has been provided below. On the basis of most common use timber wood, edible plants, medicinal plants and plants species of miscellaneous use have been categorized.

1. **Timber Wood**: (for construction work, railway sleepers, pots, agricultural implements, furniture, carts and instruments etc.): *Acacia nilotica, Adina*

cordifolia, Anogeissus latifolia, A. pendula, Azadirachta indica, Dalbergia latifolia, D. sissoo, Gmelina arborea, Hardwickia binata, Mangifera indica. Michelia champaca, Ougeinia oojeinensis, Prosopis juliflora, Shorea robusta, Tectona grandis, Terminalia alata and Xylia xylocarpa are the source of valued and durable timber with strength, and are popularily used other species are Alangium salvifolium, Albizia spp, Alstonia scholaris, Anthocephalus, Toona ciliate, Diospyrous spp., Eucalyptue spp., Garuga pinnata, Sterculia spp. Stereospermum spp., Ziziphus spp.

2. Edible plants:

- i. Leaves and tender shoots: Amorphophallus sylvaticus, Bauhinia spp. Cassia tora, Corchous spp., Dendrocalamus stricuts, Martynia annua, Phoenix acaulis, Tribulus terrestris.
- Rhizomes/tubers: Curcuma spp. Dioscoria bulbifera, D. pentaphylla, Dleocharis, Nelumbo nucifeara.
- iii. Flowers: Bauhinia purpurea, B. racemosa, Celastrus paniculatus, Madhuca longifolia var. latifolia, Moringa oleifera, Nelumbo nucifeara, Woodfordia fruticosa.
- iv. Fruits: Aegle marmelos, Annona reticulate, Artocarpus spp., Buchanania lanzan (seeds) Diospyros malabarica, D.melanoxylon, Emblica officinalis, Feronia limonia, Ficus hispida F.racemosa, Flacourtia indica, Mangifeera indica, Moringa oleeifera, Phoenx acaulis, Solanum torvum, Tamarindus indica, Ziziphus mauritiana.
- v. **Seeds** : Bauhinia vahlii, Cassia occidentalis, Semecarpus anacardium, Sterculia urens.

3. Economically Important plants:

The list of species contains with medicinal properties and generally used as by Indian Pharmaceutical Industries. Scattered notes gathered during field exploration on medicinal use by local people have been given under following points. National Conference on Biodiversity, Development and Poverty Alleviation 22nd May , 2010



- i. Insect repellent oil from leaves of *Azadirachta indica* and *Cymbopogon martini*.
- ii. Jaggery from stem sap of *Phoenix sylvestris*
- iii. Kattha (Catechu) from wood of *Acacia* catechu.
- iv. Oil (for paints, vanishes, lubrication, tanning, soap, massaging and illumination etc. from Argemone mexicana Buchanania lanzan, Celastrus paniculate, Madhuca longifolia, Pongamia Pinnata, Schleichera aoleosa, Shorea robusta.
- v. Paper pulp from *Dendrocalamus strictus, Eucalypatus,* spp.
- vi. Weighing (Ratti- the jeweller's weight) with seeds of *Abrus precatorius*.

- vi. Perfume from essential oil from Cymopogon spp., Jasminum spp., Michelia champaca and Vetiveria zizainoides.
- vii. Wood (for toys, combs, decorations, matchsticks, packing cases, splinters, pencil and scale etc.) Ailanthus excelsa, Boswellia serrata, Erythrina suberosa, Holarrhena antidysenterica, Holoptelia integrifolia, Kydia calycina, Mallouts philippensis, Toona ciliata and Wrightia tinctoria.

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