

PRESS NOTE

BIODIVERSITY, CONSERVATION AND SUSTAINABLE USE OF MEDICINAL PLANTS*

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Introduction:

India one of the 17 mega diversity countries is gifted with a wide spectrum of biodiversity. Agro biodiversity focusing the portion of biodiversity revolves around plants, animals and microorganism. Plant genetic variability, is very much useful to breed improved varieties and also to utilize in commercial purposes. Therefore they are given top most importance and being explored and conserved. It is estimated that the total biodiversity on the range of 3.25 million species to 1.4 billion species. According to the world conservation monitoring center the total number of species described at the global level so far is around 1.7 million. Like Food crops as well as commercial crops, medicinal plants are also having wide genetic variability and being exploited from time immemorial. By intuition, and instinct, Indian, Rishis identified, a particular plant, for a specific human disease. In addition **Siddhas, Dhanvanthiries, Moolavars, Nagarjunas** and the farmers and ancient experts identified and explored many medicinal plants and their uses in curing human diseases, and these details were also written in Palmyrah leaves and maintained in literature.

Human beings have been utilizing enormous direct economic benefits from biodiversity in the form of food, medicines and industrial products and has the potential for gaining many more. All our food comes from wild species brought into

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domestication. Besides, firewood, timber and other industrial products are obtained from wild. Throughout the world almost a quarter of all medical prescriptions are either for chemical compounds from plants or microorganisms or of synthetic versions. In India traditional doctors use more than 2500 plants for medicinal purpose while Chinese have been using over 5000 medicinal plants. Rubber, wood, paper, pesticides and many other natural products support our industries. Oil and coal and cement are all of biotic origin. Our half of food source and human nutrition is provided by rice, wheat, maize and potato.

There are a lot of evidences to show the use of medicinal plants to cure human diseases from very long period ago. The Rig veda (5000 BC) mentioned 67 medicinal plants, Yajurveda 81, and Athervaveda (4500 – 2500 year BC) 290 plants. Later Charak Samhita (700 BC) and Sashrut Samhita (200 BC) have described properties and uses of 1100 and 1270 plants respectively.

World Health Organization's role:

The World Health Organization (WHO) estimated that 80% of the population in developing countries relies on traditional medicines, mostly plant drugs for their primary health care needs.

Genetic resources of medicinal plants:

India is the treasure of plants, among them 70 percent of the plants are spread across tropical forests of Western Ghats, the Vindhya Nagpur Plateaus, Aravalli, Terai region, wide areas of Hemalayas and North East. Among these plants more than 15000 plants are medicinal plants and they grow well here because India is bestowed with favourable climatic and environmental conditions.

Biodiversity is also precious "genetic library" maintained by several ecosystems. The potential of the genetic diversity of medicinal plants has not been tapped and thus their preservation and conservation is essential for economic benefit. There is also an intimate relation ship between genetic diversity of medicinal plants and ecological

processes. Natural habitat also preserve a reservoir of continuously evolving genetic material that enable various medicinal plant species to adapt changing conditions.

According to the available information about 1800 species are used in classical Indian systems of medicines, Ayurvedic uses 1200, Siddha utilizes 900, Unani uses 700, Amchi uses 600 and 450 species are used by Tibetan.

In India, large quantities of Myrobalan (4,80,000 t) Mahua flowers (50,000 t), Salseeds (50,000 t), Neem berries (1,15000 t), the tree gums, Nuxvomica seeds, *Vetaria-indica* roots, Sandal wood, Lemongrass Palmrosa, Gingergrass, Vettiver, besides varieties of medicinal raw materials are some major products and marketed domestically. The domestic market of Indian systems of medicine and Homoeopathy is to the tune of 4000 crores per annum and Ayurveda drug market alone is to the tune of 3500 crores.

Export of products of medicinal plants:

India ranks second to China in exporting medicinal plants. In the last 10 years India's export of medicinal plants have trebled. India exports currently 35700 t of medicinal plants and plant-parts with medicinal properties annually to USA, Japan, Germany, Russia, France, Switzerland and Hongkong etc which earns 3000 crores annually. Besides about 500 medicinal industries available in India provide employment opportunities.

The estimated 95% of the medicinal plants collected in India are from the wild and process of collection is said to be destructive because of plant parts like roots rhizomes, barks, wood, leaf flower, seeds etc are used to prepare drugs. It is estimated that the parts used for processing Ayurvedic drugs are roots (29.6%), leaves (25.8%), bark (13.5%), wood (2.8%), wholeplant (16.3%), and rhizome (4%) and the rest seeds and flowers etc.

Estimates suggest that over half a million tones of dry raw materials are indiscriminately and most destructively collected from the wild every year. Due to over

harvesting several medicinal plants occurring in the forest areas of tropical subtropical temperate and alpine zones have either become extinct or endangered. High percentage of medicinal plants used by Indian industries today are collected from the wild and less than 20 species are only under commercial cultivation and about 600 species are used for the production of medicines. In a span of 10 years the used medicinal plants population of different species in a region or throughout its range of natural distribution has reduced by 80%. It is critically endangered.

Since processing involves destructive harvesting to use different parts of the plant species poses serious threat to the genetic resources and the diversity of medicinal plants, when the wild population loss is estimated as 50%. A threat assessment exercise as per latest IUCN guidelines, Southern and Northern India have already listed 427 species of medicinal plants that are endangered and threatened, of which 28 are considered extinct, 124 endangered, 81 valuable, 100 rare and 34 are sufficiently available. These species need detailed studies on their population structure, breeding behaviour and protection of their habitats for *in situ* conservation.

Conservation of medicinal plants:

This kind of situation warrants to develop methods for conserving the Indian medicinal biodiversity because it is the vital factor improving biological productivity. Several national and international agencies have formulated appropriate policies and strategies for the conservation of medicinal plants. Conservation and utilization of medicinal plants must involve a long term integrated and scientifically oriented action programme. This should involve pertinent aspects of protection, preservation, maintenance, exploitation, conservation and sustainable utilization. To ensure the availability of raw material of medicinal plants in future its genetic resources must be conserved to protect these endangered species by developing appropriate policies. A holistic and systematic approach envisaging interaction between social, scientific, economic and ecological groups would be a more desirable one.

Government of India has enacted a Biological diversity Act – 2002 and Biological diversity Rules, 2004 legislation, which

1. Ensures that the protection of Traditional knowledge at local, state and national levels.
2. Any person applying for IPR in India or abroad relating to biological resources occurring in and accessed from India must obtain prior approval and abide by the benefit sharing condition imposed by the National Biodiversity Authority.
3. The National Biodiversity Authority if necessary shall oppose world wide, IPR granted in relation to biological resources or knowledge derived from India.
4. No foreign agency can access biological resources occurring in India and related knowledge without prior consent of National Biodiversity Authority.
5. Share of the benefits shall be deposited in the National Biodiversity Fund (NBF). NBF would be used to reward people for their conservation efforts and knowledge.

The concept of biosphere reserves is the method where in specific ecosystems are conserved and managed. The germplasm collections of herbal gardens, drugs forms of valuable medicinal plants are the major sources in conserving genetic resources and biological diversity. There are two approaches to conserve the genetic materials of medicinal plants. *viz.*, *In situ* and *ex situ* conservations.

Bioprospecting:

The rapid loss of biodiversity remains greatest threat and to prevent this the “**Gap analysis method**” has been implemented to assesses the current status of the biodiversity in a given area. Another method is Bioprospecting ie, characterization of different agro ecological regions through remote sensing method on biosources, mapping, characterization and conservation of endangered medicinal and aromatic plants and bioprospecting molecules and genes for product development.

India as a part of emerging global market for herbal medicines, to have its rapid growth, herbal industry and traditional medicines sector of our country should emerge as strong forum under one umbrella. To initiate this effort the Federation of Indian Herbal industry (FIHI) was launched now in India. The Govt. of India, NGOs and Medical service Industry together should create a holistic Healthcare system.

Future thrust areas :

- Collection of seeds of endemic species in countrywide should be deposited and utilize them in breeding programme.
- Development of a nationwide network of Medicinal plant nursery involving farmers, Indian System of Medicines, Community, Plant Breedcas, industry and conservation organization.
- The medicinal plants should be domesticated and brought under cultivation to maintain constant supply of quality materials and thus reduce the pressure on the wild populations.
- Policy division to promote cultivation of medicinal plants, marketing development of research to regulate indiscriminate destructive collection of wild medicinal plants.
- Involvement of the tribal communities in exploration of collection and conservation and trade of ethno medicines along with nontimber forest produce.
- In order to conserve, cultivate and improve medicinal plants research should be strengthened to solve existing problems. Research should also to be strengthened on pharmacological, clinical and chemicals.
- Imparting in service training for staff of various government and non - government agencies like officials of forests, wild life, botanic gardens, and

teachers and students of schools and colleges in taxonomy and conservation techniques and value addition.

- Documentation of information on Geographical distribution and resource base, package of cultivation, value additions, market status, domestic policies, convention rules and regulations for harvesting, marketing industries and trade policy, pricing pattern, social and economic dimension, coordination of research and identification of national and international groups working on medicinal plants to share the scientific knowledge.