
STATUS OF BIODIVERSITY CONSERVATION IN INDIA

India has a long history of conservation supported by innumerable examples mentioned in our ancient texts. The sustainable use and equitable sharing of benefits of its biodiversity are deep rooted in the Indian traditions. Reverence for plants and animals is associated with our deities, rituals and religious practices throughout India in its diverse urban, rural and tribal communities. 'Tulsi' or the sacred basil is cultivated in almost every home throughout India. At the auspicious occasion of Grahapravesh (first entry to a newly built house, also referred to house warming ceremony) people enter alongwith Tulsi plant in the house. It has helped conserve hundred of plants considered **sacred species** by the masses for thousands of years. The common practice of exchanging farm-conserved seeds by rural women at important rituals in south India, seasonal dietary practices, traditional farming practices and taboo on hunting pregnant animals are other examples which helped our biological wealth for centuries. Bisnois sacrificing their lives, mostly women and children to save trees as far back as 1730 A.D. from forcible felling by the rulers is exemplary. Such an awareness and importance of conservation from

ancient times gave the impetus to the well known "Chipko Movement" of the Garhwal Himalayas in 1973 and the Appiko Movement of Karnataka in 1983. Women folk clung to the trees to stop tree felling by the contractors forcing the government to change the age-old forest policy.

Another such example are the **sacred groves**, the unique Indian tradition to preserve our rich heritage. Ecosystems are considered sacred and preserved since ancient times as sacred forests groves, lakes, ponds, caves, mountains etc. The "**Bamboo groves**" of Rajbanshi community of North Bengal, "**Orans**" of West Rajasthan, "**Sarnas**" of Chhattisgarh and Chhota Nagpur, "**Maw-Bukhars**" of Khasis of Meghalaya, "**Dev rais**" of Maharashtra, "**Kovil Kadu**" of Tamil Nadu and "**Kuvus**" of Kerala are some of the examples of sacred groves. More than 2000 'Sacred groves' are reported to exist in Kerala.

A knowledge of traditional and ethnic ways of resource utilisation provided an insight into a healthy co-existence of plants, animals and ethnic people in a sustainable manner since ancient times. This study of the conventional ethnobiological systems could help a great deal in understanding the problems concerned with conservation. An All India Coordinated Research Project on Ethnobiology was launched by the Department of Environment, Govt. of India in 1982 to identify and document valuable knowledge on the uses of our indigenous biological wealth. It could be revealed that the tribals have specific knowledge about the use of over 10,000 wild plants which include 8000 medicinal plants, many of which are endangered species.

The Tropical Botanical Garden and Research Institute (TBGRI) has established a separate Division for Conservation Biology for *in-situ* and *ex-situ* conservation of such plants. Besides Government, NGOs and private sectors are also taking steps for *in-situ* conservation traditions. One such example is Kani tribe of Kerala who shared traditional knowledge of the wonder herb **Arogyapacha** (*Trichopus zeylanicus* var *travancoricus*) about rejuvenating, antifatigue and immunosuppression.

Conservation Priorities

The conservation process starts with recognition and identification of the biogeographic zones, ecosystems and species. The Wildlife Institute of India, Dehradun (1988). This was followed by the study of status of Protected Areas in India by the Indian Institute of Public Administration (1990). WWF - India in 1997 sponsored a country wide project on conservation prioritisation of ecosystems and habitats, funded by Biodiversity Programme, U.S.A. Another important step in this direction is the setting up the Indian Institute of Biodiversity by Govt. of India in Itanagar, Arunachal Pradesh, 2001-2002. The Botanical Survey of India and Zoological Survey of India have brought out Red Data Books on endangered plant and animal species. Salim Ali Centre for Ornithology and Natural History (SACON) is preparing a Red Data Book exclusively on Indian birds.

PRESENT SCENARIO OF BIODIVERSITY AND WILDLIFE CONSERVATION IN INDIA

It includes combination of *ex-situ* and *in-situ* conservation as both are complimentary to each other. Due to continuous increase in number of endangered species of flora and fauna steps have been taken to protect and manage the wildlife of the country. Non-governmental voluntary organisations as well as governmental organisations at state and central levels have been set up to protect the wildlife.

Forestry and **wildlife** from an organisational viewpoint have been primarily under the control of state governments. However, quite recently the subject was given top priority and a separate Ministry of Environment and Forests entrusted with the task of environmental protection. The Department of Environment, Forests and Wildlife under this Ministry was set up with the view to have coordination between states and the centre

and speedy and faithful implementation of the steps to be taken in programme of wildlife management in the country.

The wildlife management aims at: (i) protection of natural habitats through controlled, limited exploitation of species, (ii) maintenance of the viable number of species in protected areas (national park, sanctuary, biosphere reserve etc.) (iii) establishment of Biosphere Reserves for plants and animal species, and (iv) protection through legislation.

Wildlife can also be preserved by: (i) improving the existing protected areas as sanctuaries, national parks etc. (ii) imposing restrictions on export of rare plant and animal species and their products. (iii) educating public for environmental protection at all levels of education.

ex-situ conservation

- Chain of large number of Botanical and Zoological Gardens
- Gene Banks. These include Indian National Gene Bank (INGB), National Bureau of Plant Genetic Resources (NBPGR), National Bureau of Animal Genetic Resources (NBAGR)
- Seed Banks
- Germplasm facilities

in-situ conservation

(a network of protected areas)

- Wildlife sanctuaries
- National parks
- Biosphere reserves
- Tiger reserves
- Ramsar sites

The Ramsar sites represent different aquatic habitats and are named so after the Ramsar convention held in 1971 for protection of wetlands of international importance. In India a total of 16 Ramsar sites have been identified, covering about 1.1 million hectare, including the Andaman and Nicobar Islands.

Ex-situ as well as in-situ conservation is being followed by non-governmental as well as governmental organisations.

Non-Government Organisations

There are a number of non-govt., voluntary, national and international organisations actively dedicated to wildlife conservation. Principal organisations are:

Bombay natural history society

It was founded in 1883; engaged in collection of information and specimens of fauna and flora of India, Burma (Myanmar) and Ceylon.

Wildlife Preservation

Society of India, Dehradun

It was founded in 1958 with several objectives of wildlife management.

World Wide Fund for Nature, India

The World Wildlife Fund, Indian National Appeal was launched in India in 1969 at the time of the XIIth General Assembly of the International Union of Conservation of Nature and Natural Resources, held at Delhi. WWF-International was formed in 1961, with its Headquarters at Glands, Switzerland, and controlled by a board of International Trustees. It has set up National Appeals in several countries. WWF in India was founded with a Board of eight Trustees and has its Headquarters in Mumbai. It has supported the well-known "Project Tiger" and other similar projects.

Government Organisations

A number of Wildlife Acts have been made from time to time by State as well as Union Government for wildlife conservation. Some of these are:

- Madras Wild Elephant Preservation Act, 1873.
- All India Elephant Preservation Act, 1879.
- The Wild Birds and Animals Protection Act, 1912.
- Bengal Rhinoceros Preservation Act, 1932.
- Assam Rhinoceros Preservation Act, 1954.
- Indian Board for Wildlife (IBWL) 1952.
- Wildlife (Protection) Act, 1972, amended in 1983, 1986, 1991.
- Establishment of National Parks, Sanctuaries and Zoological Gardens.

- India became a party to CITES (Convention of International Trade in Endangered Species) (of Wild Flora and Fauna) in 1976.
- Indian National Man and the Biosphere Committee, 1972 for Biosphere Reserve.
- Projects to conserve individual endangered species like crocodiles (1954), lion (1972) and tiger (1973).
- National Wildlife Action Plan, 1982 endorsed by IBWL.
- Forest (Conservation) Act, 1980, amended in 1988.
- The Environment (Protection) Act, 1986.
- The Biodiversity Act, 2002, implemented in 2004.
- The National Environmental Policy, 2006.

Indian Board of Wildlife (IBWL)

This is the main advisory body of Govt. of India. It was first constituted in 1952 as an advisory body under the name **Central Board of Wildlife**. Later it was re-named as IBWL. At its first meeting, the Board made a recommendation for unified legislation for wildlife conservation in India. The Wildlife (Protection) Act was enacted in 1972, which has been adopted by all states.

The Wildlife (Protection) Act, 1972 and the provisions of the Convention on International Trade in Endangered Species (CITES) and Export and Import Policy of India are continued to be enforced through the offices of the Regional Deputy Directors of Wildlife Preservation located at Delhi, Mumbai, Kolkata and Chennai with the help of State Wildlife Wings and the Customs Departments. The Wildlife (Protection) Amendment Bill, 1991 was passed by the Parliament and promulgated as Act no. 44 of 1991, after it had received the ascent of the President of India on 2.10.1991. The new provisions of the Act regarding setting up of the Zoo Authority, protection of rare and endangered species would be enforced under this Act.

Indian Board of Wildlife was reconstituted during January 1991, under the Chairmanship of the Prime Minister. The functions of IBWL are as follows.

- To advise Central and State Governments for promotion of conservation and effective control of poaching of wildlife.
- To advise on the setting up of national parks, sanctuaries and zoological gardens.
- To advise the Govt. on policy regarding export of living animals, trophies, skins, fur, feathers and other wildlife products.
- To review the progress in the field of wildlife conservation in the country and suggest measures for improvement.
- To promote public interest in wildlife and on need of its preservation in harmony with natural and human environment.
- To assist and encourage the formation of Wildlife Societies and to act as Central Coordinating Agency for such bodies.
- To advise Central Govt. on any matter that it may refer to the Board.

PROTECTED AREAS NETWORK

In conservation biology, in-situ conservation of wildlife is a comprehensive system of protected areas. There are different categories of protected areas which are managed with different objectives for bringing benefits to the society. These include: (i) national parks, (ii) sanctuaries, (iii) biosphere reserves, (iv) conservation reserves, (v) community reserves, (vi) natural monuments, cultural landscapes sacred groves etc. These areas may vary considerably in size, design, purpose and effectiveness of management (Table 19.13) but together form a solid basis of **conservation of biological diversity**.

A **sanctuary** has been defined on the web variously as follows :

- Refuge : a shelter from danger or hardship.
- Sanctuary has multiple meanings. A sanctuary is the consecrated (or sacred) area of a church or temple around its tabernacles or altar. In medieval law, a sanctuary was a place of religious right of asylum for felons on the run from the law. An animal sanctuary

National park

1. Hitched to the habitat for particular wild plant / animal species. An area having sites of major natural regions and / or plant and animal species of national or international significance such as tiger, lion, rhino etc. Area of special scientific, educational and recreational interest.

2. In India, the size range is 0.04 to 3162 sq. km. Most common (in about 40%) is 100 to 500 sq. km. In 15% is 500 to 1000 sq. km.

3. Boundaries circumscribed by legislation.

4. Except the buffer zone, no biotic interference.

5. Tourism permissible.

Sanctuary

Oriented generally to a particular species of animal. A natural area reserved / set aside for the protection of natural fauna or particular animal species.

Size range is 0.61 to 7818 sq. km. Most common (in about 40%) is 100 to 500 sq. km. In 25% is 500 to 1000 sq. km.

Boundries not sacrosant but protected by Govt. or private agency. Limited biotic interference.

Tourism permissible.

Biosphere reserve

Not hitched to anyone, two or more species, but to the whole ecosystem i.e. totality of all forms of life i.e. ecosystem-oriented. Protected ecosystems as unique biological area throughout the world.

Size range over 5670 sq. km.

Boundaries circumscribed by legislation.

Except the buffer zone, no biotic interference.

Tourism normally not permissible

is a place where animals live and are protected. en.wikipedia.org/wiki/sanctuary.

- An area constituted by competent authority in which killing and capturing of any form of wild life is prohibited, except with permission and the boundaries and character of which are sacrosanct.

www.mp.nic.in/forest/definitions.html

A **national park** has been defined variously on the web as follows :

- A relatively large area containing representative examples of major natural regions, features, or scenery of national or international significance. National park ecosystems are not heavily altered by humans and they are protected by national governments.

www.pc.gc.ca/apprendre-learn/prof/sub/ecol/itm7/index_e.asp

- An area owned by the State and dedicated site for the conservation of scenery and the natural and historic objects of national significance and to the conservation of wild animals and plants by such means as leave them unimpaired for the enjoyment of present and future generation.

www.mp.nic.in/forest/definitions.html

- A national park is a reserve of land, usually owned by a national government, that

is protected from most human development and pollution.

en.wikipedia.org/wiki/National_park

A **Biosphere reserve** has been variously defined on the web as follows :

- A part an international network of preserved areas designated by the United Nations Educational, Scientific and Cultural Organization (UNESCO). Biosphere Reserves are vital centres of biodiversity where research and monitoring activities are conducted with the participation of local communities, to protect and preserve healthy natural systems threatened by development. The global system currently includes 324 reserves in 83 countries.

www.mrdc/prg/reference/glossary/b.asp

- A management model of the United Nations Man and the Biosphere program where a core reserve is surrounded by buffer zones with human use increasing away from the core.

www.msu.edu/~jaroszjo/greenway/glossary/glossary.htm

At the 15th meeting of the IBWL held on 1st October 1982, the then Prime Minister, Late Indira Gandhi gave a 12-point strategy for an Action Plan for the conservation of wildlife in

BIODIVERSITY OR BIOPIRACY ?

India's newly passed biodiversity framework legislation comes under criticism and guarded support from leading environmentalists as reported by Ranjit Devaj of Inter Press Services.

India's newly passed biodiversity act has come under criticism from leading environmental activists who say the legislation alienates indigenous farmers from their resources and facilitates "biopiracy." When it was passed on Dec. 11, 2002 Union Environment and Forests Minister T.R. Baalu claimed that the legislation would regulate access to genetic resources and associated knowledge by foreign individuals and institutions and ensure equitable sharing of benefits arising out of the use of resources and knowledge with the country and its people.

He also said the act provided safeguards to protect the interests of local people, growers and cultivators of biological diversity, as well as Indian researchers through a new National Biodiversity Authority (NBA), supported by state level boards and management committees that would regulate access to plant and animal genetic resources. "The NBA's approval will be required before obtaining any form of intellectual property rights on an invention based on a biological resource from India or on a traditional knowledge and it will deal with all cases of access by foreigners," Baalu said.

Indian citizens, companies are allowed free access to biological resources within the country for research purposes but are barred from transferring findings to foreign entities without the NBA's approval. But all these provisions only succeed in burying biodiversity under a mountain of bureaucracy that can only serve to alienate ordinary farmers from their resources while making international biopiracy easier, say leading activists

Suman Sahai of the Gene Campaign and Vandana Shiva of the Research Foundation for Science Technology and the Environment (RFSTE).

"By excluding agriculture from the act's purview, global corporations can still gain access to valuable biological resources," said Shiva. But an impoverished local farmer who allows his cow to graze freely on the commons could find himself penalized for inadvertently destroying a herb considered to be a valuable biological resource, she said.

Sahai said the act was weak on the issue of intellectual property rights (IPR). "All that is stipulated is that IPR applications will have to go through the NBA and in its confused way ends up running to the national and international campaigns against patents on life forms." She said because there is no structure on patents in the bill, the NBA could now actually give permission for someone to take a patent out on a rare species of, say, a turtle or a bee.

In fact, the new law would undo protection against the patenting of life forms contained in earlier path-breaking legislation such as the Plant Variety Protection and Farmers Rights Act (PPVFR) passed in 2001, though it does recognize breeder's rights which again benefit large seed transnational corporations. Benefits conferred by the PPVFR were afterwards whittled away by cabinet approval, without consulting Parliament of the provisions of the International Union for Protection of New Varieties of Plants (UPOV) of 1978, which legitimizes the interest of global seed giants.

"The area on which the biodiversity act is silent is the very area at the centre of a raging global controversy, in which Indian civil society has been very vocal in protecting local communities from the damage inflicted by patents on biological resources and indigenous knowledge," Sahai said. A reputed scientist herself, Sahai said the act will acutally discourage research with its "strong tangles of bureaucratic red tape."

Not only will research proposals now need

to be vetted by the NBA but publications will also have to conform to government guidelines causing infinite delays at a time when scholars are already protesting the loss of valuable time because of cumbersome procedures. Local communities, in whose name the legislation was carried out, as Baalu claimed, will actually have no say in the granting of patents on biological material or in deciding what will be 'equitable' when it comes to the sharing of benefits. This will now be decided by bureaucrats in the NBA.

Activists now hope to make use of procedural steps such as presidential assent and notification before any act actually becomes law to undo as much of the damage as possible and these can extend to another six months.

Other experts have been kinder to the act. According to Ashish Kothari of the Pune-based voluntary group of Kalpvriksh, will the act could have been stronger it can be a step in the right direction provided clear and stringent rules are now framed under it. Kalpvriksh collaborates with the government on the National Biodiversity Strategy and Action Plan (NBSAP), a two-year project that ends next year and is funded by the Global Environment Facility through the United Nations Development Program.

Kothari conceded that there needs to be "full involvement of the public" if the act is to succeed in its stated aim, but added that the legislation only provided the framework and that it was now up to the government and citizens to use it pro-actively. India has documented over 45,000 species of flora and 75,000 known species of fauna and contains within its borders two of the world's 10 biogeographic zones. The country is one of the world's 12 megacentres of biodiversity.

Contained within the subcontinent are tropical wet evergreen forests, deserts and alpine vegetation and vast coastal systems. Coupled with an unaccountable bureaucracy and impoverished local populations, the region is nevertheless the repository of vast traditional knowledge and thus makes for biopirates's delight.

Convention on Biological Diversity (CBD)

(North and South Fall Apart)

- The key factor behind a global treaty on biodiversity was loss of biodiversity around the globe at alarming rates during 1980s.
- However, negotiations on such a treaty which later came to be known as the Convention on Biological Diversity (CBD) began with sharp differences between countries in the North (developed, industrialised ones) and South (developing ones) on the principles behind the conservation and use of the world's biodiversity.
- Developing countries realised the fact that pharmaceutical and biotechnological companies from the North were making huge profits using their plant genetic resources and therefore, asserted their ownerships. (Table 19.22). Developing countries came to the negotiating table determined to ensure national sovereignty over their biodiversity.
- The North wanted the Southern countries to embark on conservation programmes on their genetic resources which fed its pharmaceutical and agro-business, while the South no longer wanted to provide such services free of cost. The Northern countries thus wanted to establish “global lists” of the biodiversity for the purpose of their protection and conservation.
- Developing countries challenged such an assertion of the North that the world's

Table 19.23. Plant biodiversity in selected countries and regions.

Countries	No of Species
Brazil	55,000
Colombia	45,000
India	45,000
China	45,000
Venezuela	30,000
South Africa	25,000
Indonesia	23,000
Mexico	20,000
Peru	20,000
Australia	20,000
North America	25,000
Europe	23,000
Japan	13,000
	4,000

biodiversity (80% of which existed in the forests of South) (Table 19.23) was the common heritage of human kind. They were able to establish firmly that biodiversity and the knowledge of its use is a sovereign right of nations, and a common concern of mankind, but not a common heritage.

- **North profits from destruction of hotspots in South.**
- The biodiversity hotspots were originally identified by British scientist Norman Myers in two articles in *The Environmentalist* in 1998 and 1990.
- Biodiversity hotspots are regions of significant diversity threatened with destruction through commercial exploitation. There are **34 hotspots** in the world, accounting for just **1.4 per cent** of the world's land. These regions support **60 per cent of species** on earth. A hotspot contains at least **1,500** species of endemic vascular plants.
- **70 per cent** of the world's species is found in just **12** countries: Australia, Brazil, China, Colombia, Costa Rica, Ecuador, India, Indonesia, Madagascar, Mexico, Peru and the Democratic Republic of Congo.
- The global market value of pharmaceuticals derived from genetic resources is between **US \$75 billion** and **US \$ 150 billion** annually. Annual world wood exports are worth **US \$97 billion** with 3.4 million cubic meters of

wood being extracted annually. But few of the resources-rich countries get this money.

- Worldwide 2,264 million tonnes of cereals are produced each year, 1,324 million tonnes of sugarcane, 619 million tonnes of milk and 259 million tonnes of meat. About 75 per cent of global food comes from just 12 crops.
- Global **fish imports** are worth **US \$ 35 billion** annually.
- Just **14** mammal and bird species account for **90 per cent** of the meat humans eat. 75 per cent of medicines come from herbal, animal or microbotic origin.
- Most of the world's food resources are **consumed in the North**, which has fewer hotspots. In developing countries, average daily consumption is 2,681 kilocalories per capita against 3,380 kilocalories per capita in industrialized countries.
- The countries blessed with biodiverse regions are not benefiting from them. For instance, the US has about **110,000 sq km** of biodiverse area yet only a combined GDP of **US \$1,806.2 billion**. Madagascar and Indian Ocean islands are known for biodiversity—with **600,451 sq km**. But Madagascar has a GDP of just **US \$ % 5,033 million**. The lesson: the North is exploiting resources of the South.
- The **final text** of CBD laid down **three objectives** — conservation of biodiversity, its sustainable use, and the fair and equitable sharing of benefits arising out of its use. The text did not include an article on global lists, but rather emphasised a country's sovereignty over its resources. The final text of CBD was adopted on May 22, 1992 at the seventh session of INC in Nairobi.
- But the implementation of the treaty was not easy. At the Rio Summit, when the convention was opened for signature on June 5, 1992 the U.S. refused to sign as it gave too much leeway to the South. But 150 countries signed the treaty.
- The convention came into force from December 29, 1993, and till January 1, 1999, it was ratified by 175 countries. T

2006 a mere 14 out of 188 member countries of CBD have a national legislation. The Secretariat of CBD is at World Trade Centre, 413 St. Jacques Street, Office 630, Montreal, Quebec H2Y 1N9, Canada.

- Biotechnology and Genetically Modified Organisms (GMOs) become a controversial issue.
- The U.S. has still not ratified CBD.
- Performance of the developing countries during the post-Rio period has been disappointing, and only few of them could so far implement law to stop biopiracy by multinationals as required in CBD.

The problem in establishing such a law is partly related to the Northern definition of Intellectual Property Rights (IPRs). The North IPR system is based on patents, and rejects any informal and often unrecorded knowledge systems (as in most societies of developing countries) of traditional communities. The patent system was further consolidated in 1995 under the Trade-Related Intellectual Property Rights (TRIPS) provisions of the W.T.O. So far TRIP's definition of IPRs has been in conflicts with the provision of CBD, which accepts the rights of local communities over knowledge related to use plants and their products. Developing countries have also failed to ensure their profits from use of their biodiversity percolate down to the indigenous communities.