

Biodiversity

Shaping Sustainable India

Biodiversity plays a crucial role in functioning of the ecosystems on which humankind depends for food and fresh water, health, recreation and protection from natural disasters. Its loss also affects cultural and spiritual values that are integral to human well-being. *India's Fifth National Report to the convention of biological diversity 2014.*



CEE
Centre for Environment Education



Industries (Pharmaceuticals, cosmetics, Paper and pulp, infrastructure etc.)



Forestry

Major Economic activities

The pulp and paper industry is one of the key industrial sectors contributing to the Indian economy, and the socio economic development providing employment to nearly 1.5 million people. The sector produces over 3 million tonnes of pulp annually from 10 million tonnes of wood, agro-residue and waste paper.

Agriculture including dairy, horticulture, fishery



India's coastline of around 7,500 km, support about 30% of the total 1.2 billion human populations. Marine fish production contributes substantially to nutritional security, income and livelihood of a large population of the country.

The contribution of forestry to the Gross Domestic Product (GDP) is barely 1.5 %. Valuation of the multiple benefits from the sector are not reflected in this. Did you know that the value of Indian forests preventing soil erosion is estimated at over Rs 47,000 per hectare; carbon sequestration at nearly Rs 1,00,000 per hectare; groundwater augmentation at around Rs 1,250 million.



Direct and indirect opportunity

Around 70 % of India's population is dependent locally on natural ecosystems for subsistence-livelihood including fuel, housing, food, water, and health-care herbs.



Employment including small scale industries

There are several secondary occupations involving non-farm based practices related to biodiversity including tourism and pilgrimage related services, handicrafts, collection of non-timber forest produce and so on.



Livelihood

Poverty reduction



East Kolkata Wetlands form an important component of waste water treatment infrastructure of the city, treating nearly 600 million litres of sewage daily using waste based pisciculture, agriculture and horticulture. This practice of agriculture and aquaculture combined provide livelihood to large, economically underprivileged, peri-urban population of 20,000 households.

Climate Change mitigation and Disaster Risk Reduction

Disaster Risk Reduction



Popular saying in West India that the death will not knock the door of farmers during famine, if they have a Shami tree (*Prosopis cineraria*), a goat and a camel, signifies the value of biodiversity in the lives of local communities. The mentioned plant and animals not only survive but protect and sustain a family under any harsh conditions.

Soil fertility and water retention

Green manure crops contribute 30 to 60 kilograms nitrogen per hectare annually besides providing soil organic matter and microelements. Indian farmers are highly dependent on biodiversity for green manure as well as fodder for their livestock.



Health systems



Regulation of immune response

Over 7,500 species of plants have been used for medicinal purposes including veterinary use by various indigenous communities. Besides, many pharmaceutical companies use plant extracts for production of drugs for various ailments and diseases including cancer.



Even today, over 70 % of the health care needs of India are met by traditional medicines which are largely plant based. Over 4,00,000 practitioners of traditional medicinal systems including Ayurveda, Unani and Siddha, and millions of local people, particularly women depend on biodiversity for the health care.

Source of traditional and modern medicines

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Clean air, water, regulation of pests and vector borne diseases

The decline in Asia's vultures attributed to Didofenac sodium, a drug also used in treating livestock, has not only resulted in the loss of several critically important ecosystem services, but also an increase of feral dogs in India. Find out why? This has shot up the cost of treatment due to rabies and also the human deaths. For instance, a 2008 study estimated an increase of feral dogs by 5.5 million, 38.5 million additional dog bites, and more than 47,300 human deaths from rabies and treatment cost of over USD 34 billion (2 trillion Indian rupees).

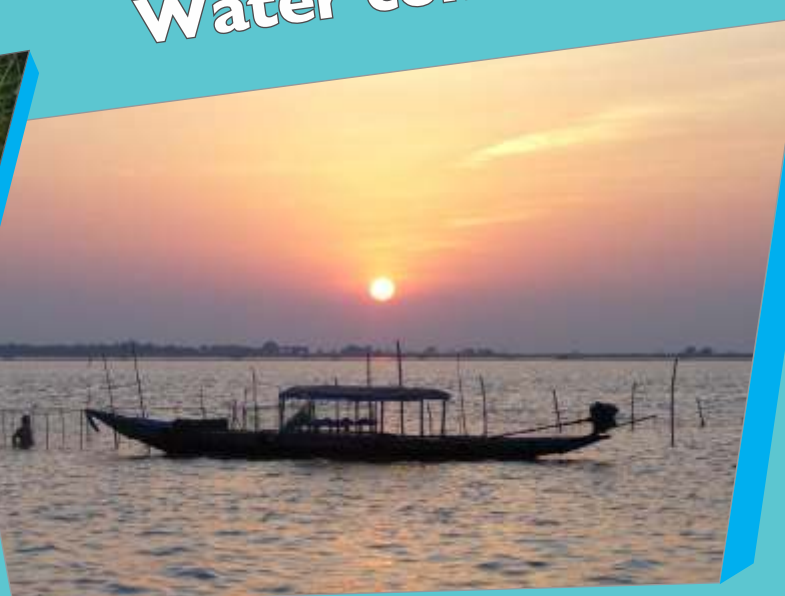


Water conservation

Water balance regulation

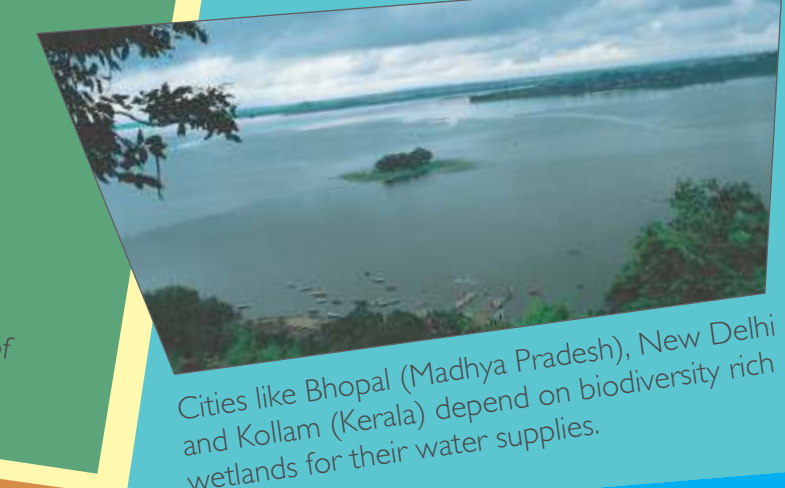


Over 15,000 households living in and around Karwar Jheel in Bihar harvest fish, fodder, mollusks and a range of vegetables for domestic purposes.



Water resources protection
Chilika brackish water lagoon in Odisha lends livelihood security to more than 2,00,000 fishers and 4,00,000 farmers living in and around the wetland and its adjoining catchments.

Sustained supply of water



Cities like Bhopal (Madhya Pradesh), New Delhi and Kollam (Kerala) depend on biodiversity rich wetlands for their water supplies.

Carbon sequestration

Forests neutralize approximately 21% of India's Green House Gas Emissions.



The pesticidal properties of plants like neem, once used extensively by the farmers for controlling pests, are regaining their value due to the major boost given to organic farming.

Nearly 20 % of India's population is directly dependent on forests for subsistence and livelihoods. Forests are the focal point of survival to nearly half of India's 89 million tribal population dwelling in forests or on the forest fringes. They draw half of their food from the innumerable forest products such as seeds, grains, roots, leaves and fruits.

Food supply: grains, fruits and vegetable, milk etc.

Food security



Pollination and pest control

Women and cultural diversity



Cultural evolution is very closely linked with natural evolution. Biodiversity is the foundation for the rich, diverse and vibrant cultural heritage across India. For instance, the life of forest dwellers in central India revolves around the Mahua tree (*Madhuca longifolia*) from subsistence to spiritual needs.



Spiritual values

Sacred groves continue to play a major role in the socio-religious life of traditional societies in India. They are places of social gathering, bonding and spiritual seat. Ritualistic ceremonies and dances are performed in the name of the reigning deity for grove protection, like Theyyam (ritual dance) in Kerala.

Traditions and Culture

Belief systems and traditional practices

In eastern Himalayas, tribal women use nearly 55 plant species in their food preparations. These highly skilled women with ethno biological knowledge, influence sustainable practices such as multistorey vegetations, regenerative techniques, selective harvesting. This has not only contributed to nutritional, food and livelihood security of tribal communities, but has led to conservation of plant species.