

National & International instruments for biodiversity conservation

Biodiversity and ecosystem services such as food, clean water and medicine are essential for the survival of humankind. Yet their condition is deteriorating dramatically, with the rate of species extinction hundreds of times higher today than the average over the past ten million years. Up to one million species are threatened with extinction, many within the next few decades. These are the conclusions reached in the global report on the state of nature adopted by the **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)** in May 2019.

Around the world, many efforts are being made to conserve biodiversity. This objective is firmly anchored at the level of the United Nations, for instance as one of the 17 Sustainable Development Goals. One of the objectives of Goal 15 “Life on land” is to halt the loss of biodiversity.

The Convention on Biological Diversity (CBD) was established in 1992. Internationally, it is the most comprehensive convention on biodiversity and aims to bring the environmental, economic and social aspects of biodiversity management into harmony.

Biodiversity conservation relies on a combination of international treaties and national laws to protect ecosystems, regulate wildlife trade, and ensure the sustainable use of natural resources. These **instruments** are categorized into International (global frameworks) and **National** (country-specific) mechanisms.

A. International Instruments

- i. **Convention on Biological Diversity (CBD):** Adopted at the 1992 Earth Summit, it focuses on three main goals: conservation of biodiversity, sustainable use of its components, and fair and equitable sharing of benefits arising from genetic resources. Explore the treaty through the [United Nations CBD Portal](#).
 - **Cartagena Protocol:** Focuses on biosafety and the safe handling, transport, and use of Living Modified Organisms (LMOs) resulting from modern biotechnology.
 - **Nagoya Protocol:** Regulates access to genetic resources and ensures the fair sharing of benefits (ABS) derived from their utilization.
- ii. **CITES (Convention on International Trade in Endangered Species) 1973:** Aims to ensure that international trade in wild animals and plants does not threaten their survival in the wild. Learn about regulated species at the [CITES Official Website](#).
- iii. **Ramsar Convention on Wetlands 1971:** An international treaty for the conservation and sustainable use of wetlands, aiming to maintain their ecological character. Locate globally important wetlands on the [Ramsar Sites Information Service](#).
- iv. **CMS (Convention on Migratory Species / Bonn Convention) 1979:** Aims to conserve terrestrial, marine, and avian migratory species throughout their ranges

- v. **World Heritage Convention:** United Nations Educational, Scientific and Cultural Organization Connects nature and culture by seeking to protect natural and cultural heritage sites around the world considered to be of Outstanding Universal Value. Man and the Biosphere (MAB) Programme Supports biosphere reserves worldwide. Integrates conservation with sustainable development.
- vi. **International Union for Conservation of Nature and Natural resources (IUCN)** Maintains the IUCN Red List of threatened species. Provides scientific guidance for conservation policies.
- vii. **United Nations Framework Convention on Climate Change:** Although focused on climate change, it supports biodiversity conservation through ecosystem protection and nature-based solutions.

B. National Instruments (India Focus)

- i. **Wildlife (Protection) Act, 1972:** The foundational domestic legislation in India for the protection of wild animals, birds, and plants. It provides the legal framework for establishing National Parks, Wildlife Sanctuaries, Conservation Reserves, and Community Reserves.
- ii. **Biological Diversity Act, 2002:** Enacted to implement the CBD at the national level. It establishes a three-tier system comprising the National Biodiversity Authority (NBA) in Chennai, State Biodiversity Boards (SBBs), and local Biodiversity Management Committees (BMCs).
- iii. **Environment (Protection) Act, 1986:** An umbrella legislation enacted to implement the decisions of the 1972 UN Conference on the Human Environment. It grants the central government the authority to protect and improve the environment, including preventing hazards to living beings and ecosystems.
- iv. **Forest (Conservation) Act, 1980:** Designed to check deforestation and regulate the diversion of forest land for non-forest purposes.
- v. **Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Rights) Act, 2006:** Recognizes the rights of forest-dwelling communities to forest resources, acknowledging their role as traditional stewards of biodiversity.
- vi. **Protected Area Network**

National Parks , Wildlife Sanctuaries, Biosphere Reserves, Conservation Reserves, Community Reserves.

Role of Traditional Knowledge in Conservation

Introduction

Tribal groups or indigenous communities are inseparable from nature and they earn their livelihood from there. According to anthropological data on linguistic basis, there are over 104 million tribal people in India belonging to 705 indigenous groups. They are biodiversity protectors and not exploiters. The traditional knowledge possessed by these indigenous communities is an invaluable asset for our nation and also it is responsible for our economic growth

Traditional Knowledge (TK) refers to the knowledge, practices, skills, and beliefs developed by indigenous and local communities through long-term interaction with their environment. It is passed from generation to generation and plays a significant role in conserving natural resources and biodiversity.

Importance of Traditional Knowledge in Conservation

1. Biodiversity Conservation

- Traditional practices help protect endangered species and maintain ecological balance.
- Diversity of plants conserved by tribals as wild fruits, seeds, bulb, roots and tubers for edible purpose.
- These tribal groups are known to practice shifting cultivation and during this practice they do not perform complete felling of trees but they retain several horticultural important species such as *Syzygium cumini* (Jamun), *Grewia asiatica* (Falsa), *Mangifera indica* (Mango), *Citrus* sps. (Orange), *Musa* sps. (Banana) etc.
- Sacred groves and community-protected forests often serve as biodiversity hotspots.

2. Sustainable Resource Management

- Traditional harvesting methods prevent overexploitation of resources.
- Practices such as rotational grazing, shifting cultivation with fallow periods, and seasonal fishing help maintain ecosystem health.
- Encourages the sustainable use of forests, water, and wildlife.

3. Conservation of Genetic Diversity

- Indigenous farmers preserve traditional crop varieties and livestock breeds.
- These varieties often have resistance to pests, diseases, and climatic stress.
- Helps maintain agricultural biodiversity and food security.

4. Climate Change Adaptation

- Traditional knowledge provides strategies for coping with droughts, floods, and changing weather patterns.
- Indigenous forecasting methods based on environmental indicators support local adaptation efforts.

5. Ecosystem Restoration

- Traditional communities use native species and ecological understanding to restore degraded lands.
- Their knowledge contributes to reforestation, soil conservation, and watershed management.

6. Cultural and Spiritual Conservation

- Many natural areas are protected due to cultural and religious beliefs.
- Sacred forests, rivers, and mountains are conserved as part of community traditions.
- Strengthens the connection between people and nature.

7. Support for Modern Conservation Strategies

- Combining traditional knowledge with scientific research can improve conservation planning, habitat restoration, and wildlife management.
- Many conservation programs now recognize the value of community participation and Indigenous knowledge systems.

8. Protection of endemic plant

- Sacred groves is conserved and protected by indigenous communities by relating the diversity rich patch of forest by adhering to taboos related to sustenance of the ecosystem.
- Local communities possess detailed knowledge of plants, animals, and ecosystems. Traditional medicine is often being referred to as an alternate system of medicine. Vast knowledge about traditional medicine has been compiled in our Upanishads and Vedas etc.
- Several herbal medicines have been developed for chronic and acute diseases by utilizing the knowledge of traditional healers. Plants such as Rauwolfia serpentina (Sarpagandha), Allium sativum (Garlic) have been used in relieving hypertension, Leaf extracts of Catharanthus roseus (Periwinkle), Withania somnifera have been used in preparation of anticancer medicines since decades.

Examples from India

- **Sacred Groves** in states like Meghalaya, Karnataka, and Maharashtra protect diverse plant and animal species.
- The **Bishnoi community** of Rajasthan is known for protecting wildlife and trees.

- **Debal Deb** from Rayagada district, **Odisha** is known as the **Seed warrior**, having spent the past two decades collecting and preserving India's increasingly rare indigenous rice species. The ecologist's efforts have led to the creation of a massive seed bank named 'Vrihi', housing more than 1,410 endangered varieties. 'Vrihi' live seed bank is currently **South Asia's largest folk rice seed bank** maintained by him.
- **Rahibai** belonging to Kombhalne in Ahmednagar's Akola tehsil, **Maharashtra** - is known as the **"Seed woman"**, who has pioneered a movement to preserve indigenous seeds. She has 114 varieties of 53 crops.
- **Beej Swaraj** (Indigenous seed sovereignty for and by tribal women) - This village with majority tribal families located in the Banswara district of **Rajasthan** recognize the deep link between crop diversity and tolerance.
- Traditional water-harvesting systems such as johads and tanks help conserve water resources.
- Indigenous communities in the Northeast India practice community-based forest management.

Challenges

- Loss of traditional knowledge due to modernization and urbanization.
- Reduced transmission of knowledge to younger generations.
- Lack of recognition and documentation.
- Commercial exploitation without benefit-sharing.

Conclusion

Traditional knowledge is a valuable tool for environmental conservation. Combining traditional practices with modern scientific approaches can improve biodiversity protection, sustainable resource management, and climate resilience. Recognizing and supporting local communities is essential for effective long-term conservation.

Community – based conservation, concept of Zoo management.

Community-based conservation (CBC) is an approach to conservation that involves local communities in the management and protection of natural resources and also in zoo management. CBC empowers local populations to act as wildlife stewards by integrating their socioeconomic needs with biodiversity protection. CBC shifts zoos from isolated, top-down exhibits into community hubs that fund local habitat restoration, employ residents in conservation, and incorporate indigenous ecological knowledge into animal care.

Purpose

The main purposes and aims of CBC are:

- **Conservation of natural resources:** empowering communities to take ownership of their natural resources and encouraging them to implement conservation practices that are tailored to their specific needs.
- **Sustainable use of resources:** This involves ensuring that resources are used in a way that does not degrade the environment or compromise the ability of future generations to use these resources.
- **Poverty reduction:** CBC can contribute to ecotourism, sustainable agriculture or forestry, and non-timber forest products. By providing economic benefits to local communities, CBC can help reduce their dependence on natural resources.
- **Empowerment of local communities:** Empower local communities and involving communities in decision-making and management processes.
- **Promotion of social justice:** To promote social justice by ensuring that the benefits and costs of conservation are distributed fairly among all members of the community.

Community-Based Conservation Trends and Issues

Here are some trends and issues in CBC:

Trends

- Recognition of the importance of community participation and ownership in conservation.
- Emphasis on collaborative decision-making and co-management of natural resources.
- Recognition of the role of traditional knowledge and practices in conservation.
- Integration of conservation with community development goals.
- Increased use of technology and social media for communication and engagement.
- Emergence of community-led ecotourism and sustainable livelihoods as conservation strategies.
- Increased attention to issues of social equity and justice in conservation.

Issues

- Conflicts over resource use and access.
- Power imbalances and unequal representation in decision-making processes.
- Limited capacity and resources of communities to participate effectively in conservation.
- Lack of recognition and support for traditional knowledge and practices.
- Challenges in balancing conservation objectives with the needs and aspirations of local communities.
- Threats to community-based conservation initiatives from external factors, such as extractive industries and large-scale development projects.
- Limited funding and financial sustainability of community-based conservation initiatives.

Benefits and Costs of Community-Based Conservation

Here are some benefits and costs of community-based conservation:

Benefits of Community-Based Conservation

- Local communities become active participants in conservation efforts
- Local knowledge and expertise are more effective and sustainable conservation practices.
- Conservation efforts are often more cost-effective, as communities are more likely to invest their own resources (e.g., time, labor, funds) in the management of natural resources they depend on.
- CBC can improve the relationship between conservationists and local communities, leading to greater trust and cooperation in conservation efforts.

Costs of Community-Based Conservation

- CBC can be time-consuming and resource-intensive.
- The involvement of local communities can lead to conflicting and resolved through negotiation and compromise.
- CBC may require a significant amount of capacity-building and training for local communities.
- The success of CBC may be also dependents on global economic trends or political instability over local communities.
- Unequal distribution among community members, leading to potential conflicts.

Figure Caption

The Gama Valley of the Qomolangma Mt. Everest National Nature Preserve, among the first protected areas in the world without wardens.