

BIOSPHERE RESERVE PROGRAMME IN INDIA

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Biosphere reserves should preserve and generate natural and cultural values, through management that is scientifically correct, culturally creative and operationally sustainable. The world network of biosphere reserves, as implemented through the Seville Strategy, is thus an integrating tool which can help to create greater solidarity among peoples and nations of the world: UNESCO, 1995.

Biosphere Reserve Concept

The biosphere concept has been refined over the years and more and more countries have discovered the usefulness of putting this multifunctional approach to nature conservation into practice in the field. Biosphere reserves are protected areas of terrestrial and coastal/marine ecosystems displaying one or more characteristics viz., (a) representative examples of natural biomass; (b) unique communities or areas with unusual features of exceptional interest; (c) examples of harmonious landscape resulting from traditional patterns of land use; (d) examples of modified or degraded ecosystems that are capable of being restored to more or less natural conditions and are internationally recognised within the framework of UNESCO's programme on Man and the Biosphere (MAB). Reserves are nominated by national set of conditions before being included to the network. Each biosphere reserve is intended to fulfill three basic objectives:

- *In-situ* conservation of biodiversity (genetic resources, species, ecosystems) of natural and semi-natural ecosystems and landscapes;
- Contribution to foster sustainable economic development of the human population living within and around the biosphere reserve;
- Provide facilities for long term ecological studies, environmental education and training, and research and monitoring related to local, national and global issues of conservation and sustainable development.

These functions/objectives are associated together through a zonation system consisting of a core area, buffer area and transition area (see Box 1).

Box 1. Elements of Biosphere Reserves (UNESCO, 1995).

- One or more core zones: securely protected sites for conserving biological diversity, monitoring, minimally disturbed ecosystems, and undertaking non-destructive research and other low-impact uses (such as eco-tourism and education).
- A well-defined buffer zone(s): which usually surrounds or adjoins the core zones, and is used for cooperative activities compatible with sound ecological practices, including environmental education, recreation and applied and basic research.
- A flexible transition area or area of cooperation: which may contain a variety of agricultural activities, settlements and other uses and in which local communities, management agencies, scientists, non-governmental organizations, cultural groups, economic interests and other stakeholders work together to manage and sustainably develop the area's resources.

Biosphere Reserve Functioning/Operation

Biosphere reserve designation, planning and management are strictly national prerogatives, though international leadership to establish reserves throughout the World and to promote and coordinate international cooperation in research, monitoring and information exchange has its role. Methods for designing and managing biosphere reserves are kept in general, so that the great variation in how the biosphere concept has been applied around the World would be easier. New methodologies for involving stakeholders in decision making processes and resolving conflicts have been developed and emphasis has been given to the need to use the regional approaches for effective conservation and management. New kinds of biosphere reserves, have evolved considerably, from a primary focus on conservation to a greater integration of conservation and development, through increasing cooperation among stakeholders (UNESCO, 1995).

A biosphere reserve should be large enough to be an effective conservation unit and to accommodate different uses without conflict.

- It should provide opportunities for ecological research, education and training, and it should have special value as a base line for measuring long-term changes in the biosphere reserve as a whole.
- It should have adequate long-term legal protection. In some cases, it may incorporate existing or proposed protected areas, such as national parks, sanctuaries, or nature reserves.
- It should seek the cooperation and participation of the local people in the management, for without their agreement and support conservation cannot be achieved in the long run.

In brief the different objectives or functional attributes of the biosphere reserve is explained here one by one.

Conservation

Biosphere reserves contain a set of unique ecosystems identified on the basis of its natural resources-biodiversity, naturalness and effectiveness as a conservation unit. The natural or unique areas mostly form the core area of the biosphere reserve where as a rule no disturbance is allowed or are minimally disturbed. Recently the core area of many biosphere reserves of the World have been designated as a World heritage site due to unique natural and cultural values. Biosphere reserves may be the store house of highly valuable genetic resources such as medicinal plants, traditional landraces of crops and their wild relatives and ancient races of domestic animals. Therefore biosphere reserves may be very useful to conserve *in-situ* the precious/valuable genetic resources.

Box 2. Ensuring local support for conservation-action plan for biosphere reserves (UNESCO, 1994).

- Recognize that local support is fundamental to the long-term conservation and sustainable use of biodiversity.
- Ensure that local populations participate as true partners in designing and managing conservation programmes.
- Allow local populations to identify their own socio-economic needs.
- Ensure that people who bear the costs of conservation projects (e.g., restrictions on fishing) also receive a high proportion of the benefits (e.g., tourist revenues).
- Initiate research activities that identify options for sustainable use of biodiversity.
- Use indigenous knowledge to manage protected areas to the extent possible.
- Ensure that local population have maximum stewardship over local resources (rather than government agencies at the regional and national levels).
- Offer income-earning activities and/or services (e.g., improved access to markets, low interest credit, controlled access to resources) to local populations and others with a stake in conservation-development projects.
- Provide local population with the skills and resources needed to make lifestyle changes necessitated by conservation measures.
- Educate local populations about the rationale for conservation and the relationship between conservation actions and benefits.

Research, Education and Monitoring

Man and the Biosphere (MAB) programme of the UNESCO is devoted to international scientific cooperation and training and it is its one of the major concern. International biosphere reserve network is being increasingly recognised as a basic

framework for activities involving a number of countries to undertake cooperative research/studies to enhance knowledge on ecosystems, biodiversity, testing and assessing different land use systems and their management techniques, undertake in-depth scientific studies on species suitable for degraded land rehabilitation to attain sustainable development and monitoring changes in a particular or samples of ecosystems exist in the biosphere reserve.

Development

Basically from the very beginning the idea of biosphere reserves is to link it with the development of land, water, forest, and many other resources in their research, training, demonstration and educational activities to promote social and economic development and provide direct benefits particularly to the community living in and around so that they support and encourage the very existence of the biosphere reserve in the longer term (Box 2). These benefits are either related to the food supplies, education, health or can be related to the tourism and employment generation.

The link between conservation of biodiversity and the development needs local communities - a central component of the biosphere reserve approach - is now recognized as a key feature of the successful management of most national parks, nature reserves and other protected areas.

Management and Protection

The core and buffer areas of biosphere reserves must be delineated and have protected status under the legislation of the country concerned in order to ensure their longer-term protection. The transition area is usually undelineated and depends on the degree of cooperation and involvement of the different managers and landowners concerned (Vernes, 1992). The creation of protected areas has often been top-down, based on elitist concepts of land use and surrounded by restrictive legislation. Many protected areas in India, as in other countries, have existed only on paper. The guidelines for their control are not viable and they lack management plans. Intervention in development and conservation activities in and around reserves/protected areas particularly in developing countries is on the increase. Arguments for involving rural communities in the management of reserves use the concept of buffer areas and are based on the following assumptions that:

- The management of legally designated protected areas is made more effective and efficient if inhabitants of buffer areas are involved;
- Resource users with secure rights protect their resources; and
- Conflicts between all the different stakeholders can be resolved.

In more and more cases, biosphere reserves are being established by creating a new protected area and not adding on to an existing one. New mechanisms are being explored to coordinate the administrations of the different legal entities which make up the biosphere reserve. Currently, studies are underway to explore how countries can strengthen the legal status of individual sites for better management and protection.

International Biosphere Reserve Network

In 1983, UNESCO and the United Nations Environment Programme (UNEP) jointly convened the first International Biosphere Reserve Congress in Minsk (Belarus) in cooperation with the Food and Agriculture Organization (FAO) and the World Conservation Union (IUCN). During this congress it was estimated that there were 226 biosphere reserves located in 62 countries around the World, both in developing and developed nations. At the second World Congress on Biosphere Reserves held in Seville in March, 1995 about 324 biosphere reserves in 82 countries were reported.

Current Status of Indian Biosphere Reserve Network

In India MAB committee in 1979 has identified a network of 14 representative ecosystems to be designated as biosphere reserves. Subsequently the State governments/experts and expert groups suggested a number of potential sites to be designated as biosphere reserves. The name of the existing biosphere reserves, date of their notification, location are given in Table 1. The other proposed and identified sites are listed in Tables 2 and 3.

Table 1. Present status of biosphere reserves in India

Sl. No.	Name of the biosphere reserve	State(s)/U.T.	Date of notification	Area under reserve (km ²)
1.	Nilgiri	Karnataka, Kerala and Tamilnadu	01/08/86	5520
2.	Nanda Devi	Uttar Pradesh	18/01/88	2236.74
3.	Nokrek (Tura range)	Meghalaya	01/09/88	820
4.	Great Nicobar	Andaman & Nicobar	06/01/89	885
5.	Gulf of Mannar	Tamil Nadu	18/02/89	10500
6.	Manas	Assam	14/03/89	2837
7.	Sundarbans	West Bengal	29/03/89	9630
8.	Similipal	Orissa	21/06/94	4374
9.	Dibru-Saikhowa	Assam	28/07/97	765
10.	Dehang-Debang	Arunachal Pradesh	02/09/98	5111.5

How Biosphere Reserves are designated and managed in India

At the initiative of the central/state governments, detailed study is carried out and a project report is prepared following the criteria adopted by the central government. The land and forest being state concerns, the respective state governments have to agree to designate the identified area as biosphere reserve and provides financial assistance for management and research activities. Management of Biosphere Reserves is the responsibility of the concerned state with necessary technical input and training facilities provided by the central government. The programme is guided by a national level committee constituted by the central government which oversees the implementation of

management action plans and policy issues. Another expert group is constituted by the central government to recommend research projects in priority areas.

At the state level a high level steering committee is constituted, usually under the chairmanship of chief secretary, to develop and recommend items of management and monitor its implementation in the Biosphere Reserve. A local committee is also constituted by the state government to ensure proper coordination among various departments responsible for different development schemes in biosphere reserves.

Table 2. Sites identified by Indian MAB Committee of the Ministry of Environment and Forests, Government of India but yet to be notified

1.	Namdapha	Arunachal Pradesh
2.	Valley of flowers	Uttar Pradesh
3.	Thar desert	Rajasthan
4.	Little Rann of Kutch	Gujarat
5.	Kaziranga	Assam
6.	Kanha	Madhya Pradesh
7.	North islands of Andaman	Andaman & Nicobar

Table 3. Sites suggested by State governments/expert groups/experts but yet to be notified

1.	Kanchagdongza	Sikkim
2.	Abujmarh	Madhya Pradesh
3.	Pachmarhi	Madhya Pradesh
4.	Amarkantak	Madhya Pradesh
5.	Cold desert	Jammu & Kashmir, Himachal Pradesh
6.	Seshachalam	Andhra Pradesh
7.	Chintapalli	Andhra Pradesh
8.	Lakshadweep islands	Lakshadweep

The guiding principle of devolvement and implementation of management plans is participation of local in planning, implementation and evaluation of conservation schemes. Their perception of ground conditions, traditional wisdom and skills as well as their committed concerns are essential for successful execution of any development project.

Presently responsibility of management of biosphere reserve is with the forest departments. Gradually other government departments and most importantly the local persons have to be brought in to the routine management of biosphere reserve, something which has not been in practice but all government agencies and, in particular, the forest departments now consider a necessary element.

level to

To notify

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