

Biosphere Reserves of India: Issues of Conservation and Conflict

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Abstract

The biosphere reserves (BRs) of India are the repository of biodiversity as well as the abode of many traditional societies. Such traditional societies derive many of their livelihood requirements from the rich biodiversity around them. All the more, the BRs also contribute to food security of the people within their premises. Many of the forest-linked activities of the traditional societies are mediated through rich traditional ecological knowledge (TEK). Unfortunately, while the issues of biodiversity have been addressed at length, the cultural diversity has been relegated to the point of oblivion. The BR management, therefore, necessitates understanding not only of ecological issues, but also socio-economic and cultural issues linked with the former. The present article looks into the development of the concept of BR and issues related with it in general terms and with respect to India in particular. It also ponders over the measures to reduce pressure on BR resources.

Keywords

Biosphere reserve, diversity, *zumsha*, livelihood, development

Introduction

The relationship between humans and nature has changed dramatically over the last 10,000 years. Ever-increasing human population requires increasing manipulation of the natural world to make food production efficient enough to feed so many people. The increasing need to control nature to provide food, combined with the increasing disconnection between humans and the natural world in daily life, is reflected in views towards nature and religion as society

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becomes more complex. During the different stages of human societies from hunter-gatherer to late industrial societies, nature went from being synonymous with a divine power, to symbolic of a divine power, to the antithesis of a divine power, to a commodity for sale in a society that does not recognise nature as intrinsic to its survival that must be protected. Perhaps the most important trend to keep in mind in the history of the relationship between humans and nature is the ever-increasing alteration and exploitation of natural ecosystems for human use.

The experiences of the past few decades have shown that the pace of human interventions on the ecosystems has accelerated manifold leading to a loss of wildlife, biodiversity and wilderness through time. Steady loss of biodiversity has resulted in the extinction of many species. It has serious economic and social costs for any country (Hannah & Lohse, 1993; Mittermeire, 1988). It has now been recognised that conservation and sustainable use of biodiversity are fundamental to sustainable development. It has now been realised that an environment, which is rich in biological diversity, offers the broadest array of options for sustainable human welfare and for adaptation to change.

Origin of Concept of Biosphere Reserve

The concern for the protection and promotion of conservation led to the formulation and adoption of many measures. The initial approach to promote conservation has followed the ‘hands off’ philosophy by setting aside areas (now known as protected areas) at the cost of people who have depended on the rich biodiversity of the same for centuries.

The concept of protected areas (PAs) for the conservation of wild species of fauna and flora has changed drastically since the establishment of the Yellowstone National Park in the United States of America in 1872. It was the world’s first national park. Here and in other areas, wildlife was protected against people. Central to this concept was the approach of non-interference, and public access to enjoy nature. It has been subsequently realised that in most parts of the world (particularly in the developing countries), PAs are neither completely insular nor isolated pieces of habitat. They have human habitation inside them that continues to eke out a living from these areas. All the more it was realised that the ‘hands off’ concept is not uniformly applicable and in many parts of the world, it has not worked.

Subsequently, it was recognised that the ideal approach for conservation is to preserve the health of the overall ecosystem, including diversity of species. It can be best accomplished by integrating it into the fabric of social, environmental and economic canvas. Under this ecosystem approach, man and environment are integrated together for a better future for all the living being. These considerations led to the origin of the concept of biosphere reserve (BR). The initiation of BRs goes back to the ‘Biosphere Conference’ organised by the UNESCO in 1968. This was the first inter-governmental conference examining as how to reconcile the conservation and use of natural resources, thereby foreshadowing the present-day notion of sustainable development. This conference resulted in the launching of the

'Man and the Biosphere' (MAB) Programme of UNESCO in 1970. It aimed to facilitate resolution of increasing conflict between the people and protected areas.

BRs, today, are addressing perhaps the biggest challenge in conservation, and, that is, how best to conserve biodiversity, while still meeting the needs of local communities in a socially and culturally sensitive manner. The idea to develop this 'non conventional' PA first took shape in 1974, within the framework of UNESCO's international research programme on MAB.

Biosphere Reserve as a Concept

BRs are unique kind of PAs comprising of terrestrial and coastal ecosystems that differ from a national park, wilderness area, national forest or wildlife refuge. When compared with national parks and other kinds of protected natural areas, it is found that while the other kinds of PAs are primarily concerned with conservation, and only secondarily with research and sustainable development, the BR takes into account the entire landscape and its elements both living and non-living under the ambit of conservation.

By design, BRs are internationally recognised, nominated by national governments and remain under the sovereign jurisdiction of the states where they are located. It covers different ecosystem types from mountain to the sea, from rural to urban systems as well as social aspects.

The UNESCO's framework (1996) stipulates that BRs should be representative of a bio-geographic province and should have appropriate zoning system with legally constituted and minimally disturbed core zone. In addition, the site should contain unique and pristine biodiversity, ecosystems and landscape suitable to explore and demonstrate approaches to sustainable development. BRs should be of appropriate size to serve three functions, namely, conservation of genetic resources, species and ecosystems; scientific research and monitoring; and promoting sustainable development in communities of the surrounding region, development and extension of logistic support. MAB has proposed an interdisciplinary research and capacity building aiming to improve the relationship of the people with environment. It has also suggested to bring at least one representative site in the country within each bio-geographic province under the network of BRs.

There is no single model for running BRs, but there are two common underlying principles. First, the management system of a BR needs to be open, not closed, to community concerns and second, it needs to be adaptable to changes in local circumstances. BRs are meant to be places where communities can work in concert with the area's land-managing agencies, local governments, schools and other institutions to design responses to external political, economic and social pressures that affect the ecological and cultural values of the area.

BRs are designated to deal with important questions of reconciling the conservation of biodiversity, the quest for economic and social development and maintenance of associated cultural values. Some important aspects of BRs delineate conservation of landscapes, ecosystems, species and genetic variations;

economic development, which is culturally, socially and ecologically sustainable and extension of logistic support for research, monitoring, education and exchange of information related to local, national and global issues.

The focus of BRs became sharper after the World Conference on Biosphere Reserves, held in Seville, in March 1995. BRs have since been looked at as sites linking up conservation with the livelihood of local communities. Clear-cut criteria for the management of BRs have been laid out, keeping in mind the sustainable development of the region as a whole. Each BR is now expected to accomplish the following: (a) ensure the conservation of biodiversity at all levels, (b) support culturally, socially and ecologically sustainable economic development of local communities and (c) promote relevant research, monitoring, education and information exchange. To carry out these functions, BRs are planned to be divided into three zones: the core zone to ensure the long-term protection of biodiversity with least disturbance. There could be several core zones within a BR to make certain that all the ecosystems within the region are represented. A 'buffer zone' surrounds or is contiguous to each core area. This area would accommodate activities that help conservation with related research. The area could also have activities such as tourism and education. The outermost area or 'transition zone' could extend into the surrounding human settlements, agricultural fields. This area is specifically meant for a number of stakeholders to work together towards the sustainable development of the area.

BRs have attempted to see how best to reconcile the conservation of biodiversity with ensuring sustainable livelihoods of local communities. These areas are also best equipped to address the three objectives of the Convention on Biological Diversity (CBD, 1992), which are: (a) conservation of biological diversity, (b) sustainable use of the components of biodiversity and (c) fair and equitable sharing of benefits arising out of the utilisation of genetic resources. In order to achieve the stated objectives, BRs target biodiversity from the ecological, social and economic dimensions.

Biosphere Reserves: India

The Ministry of Environment and Forest, Government of India launched the Biosphere Reserve (BR) Programme in 1986. The specific objectives of this Programme are:

1. To conserve the diversity and integrity of plants and animals within the natural ecosystem;
2. To safeguard the genetic diversity of species on which their continuing evolution depends;
3. To provide areas for multi-faceted research and monitoring;
4. To provide facilities for research and training;
5. To ensure the sustainable use of natural resources through most appropriate technology for improvement of economy and living standard of local people.

Presently, there are 18 BRs in India. These are:

1. Nilgiri
2. Gulf of Mannar
3. Nanda Devi
4. Sundarban
5. Similipal
6. Pachmarhi
7. Nokrek
8. Great Nicobar
9. Manas
10. Dibru-Saikhowa
11. Dehang-Dibang
12. Khangchendzonga
13. Agasthyamalai
14. Achanakmar-Amarkantak
15. Kachchh
16. Cold Desert
17. Seshachalam
18. Panna

Issues of Indian Biosphere Reserves

In the context of India, human population living within the BRs has always been a matter of conflicting interests and debate. It is so because the BRs of India are also the abode of many traditional societies that have always been an integral part of the ecosystem functioning there, living close to the nature. Living in the areas rich in natural resource, traditional societies fulfil many of their livelihood requirements from rich biodiversity around them. The flexibility and creativity in the BR's concept need to be seen from the point of view of both biodiversity as well as the population diversity. The benefits of population diversity at societal level are comparable to those accruing from the biodiversity. It is important to allude that while the issues of biodiversity have been addressed at length and caught attention widely, the cultural diversity has not been touched upon and left to the point of oblivion.

In the majority of the Indian BRs, the focus is still on providing local people with alternative sources of livelihood so as to reduce pressure from these areas, and many of these areas have within them the eco-development projects that are facilitating this. However, very few are actually looking at how to 'sustainably use' the resources of the area and thereby, allow for the local people to have a stake in the management, research and monitoring, and protection of the area in question. Over the past few years, the Joint Forest Management (JFM) programme in India has progressed beyond simply meeting the subsistence needs of local communities, to contributing to income generation and improvement of livelihoods, but this is only a spin off, and not a focused approach. What is needed

is a biodiversity-based approach wherein people are assured of economic and other returns which, in turn, may provide local communities the right incentive for protection of biodiversity existing in BRs. Some of the biodiversity-based enterprise activities are discussed below.

Building Upon the Traditional Knowledge System

The forest-linked activities of the traditional societies are mediated through rich traditional ecological knowledge (TEK), having economical, ecological and socio-cultural dimensions. A participatory approach involving stakeholders will prove very effective in the management of natural resources and ecosystem conservation in BR. Such an approach must imply traditional knowledge and traditional conflict prevention strategies in the management of BR resources. For example, in certain parts of North Sikkim, close to the BR, local communities have a system known as *zumsha* concerned with the social, developmental and environmental issues of local significance (Kumar, 2013). The local governance system of Lachen valley is unique. This system is called the *zumsha* system. The literal meaning of this is 'gathering of people'. It is the traditional institution entrusted with the task of administering and organising activities within a given territory. The general council of the *zumsha* is composed of household heads. The head of the *zumsha* is known as *Pipon*. This system of self-governance was initially established during the first half of the nineteenth century in order to provide structure and cohesion to the societies and the activities of the people. It was operative in Lachen and Lachung blocks of the Sikkim. In 1970s, when the Indian government initiated the reorganisation of Sikkim's administration and introduced the *Panchyatiraj* system, the *zumsha* was officially recognised as the system of self-governance in place of *Panchyatiraj*. This system continues to function even today in Lachen and Lachung. The *zumsha* system prescribes and regulates activities such as grazing, tree felling and of medicinal plants and herbs, taking a full account of TEK and imposing penalties for violations. Grazing is permitted only when complete care is taken to retain the regeneration capacity of the rangeland. This includes allotment of a particular piece of land for grazing, determination of the number of cattle allowed to graze, guidelines about the correct season, and suggestions concerning the times when cattle should be left in and brought out of the forests. Granting by the *zumsha* the right to fell the trees and collect medicinal plants and herbs, with the recommendation of *Pipon*, is also based on TEK with little danger of overexploitation. Such factors as the socio-economic status of household and systematic allotment of area for collection, considering the capacity for ecological regeneration, are also taken into account in granting rights concerning quantity, species and so on. Other forms of local traditional knowledge can also be integrated with the BR management to make it more efficient. Another example is that the restriction of grazing in the Nanda Devi BR (Valley of Flowers) has led to the undesirable spread of 'polygonal sp'.

Since BRs are home to many traditional societies which are at various stages in their development, building upon TEK is crucial for addressing the issues

pertaining to the management of BRs with concern for their sustainable livelihood needs.

Provisions of Alternative Livelihood

Human population living close to BR is highly dependent on forests in the buffer zones, be it for timber and non-timber forest products. Imposition of biosphere principles in terms of conservation entails certain restriction on the use of BR's resources and it translates into some costs, which people have to bear. The studies have shown that the people are willing to accept as well as pay for the sake of conservation if their economic concerns are properly addressed. The studies carried out in various BRs of India (Chandra, Mandal, & Singh, 2013; Mandal, 2007; Singh & Patil, 2007) illuminate the fact that conflicts are likely to crop up only when the real pressure of conservation restrictions begins to affect socio-economic conditions of people living in fringe area settlements, in the absence of viable alternatives to their traditional dependence on BR resources.

An effective conservation policy requires a strategy based on the provision of alternative livelihood options and additional resources, to defray the pressure and dependence on the BR resources. It is also important for the efficient management and conflict prevention. This can be achieved by the building up capacity of the local communities to enhance the productivity, thereby reducing their dependence on the resources that are likely to be subject to restrictions.

Another revenue generating by-product from biodiversity-rich areas is tourism. Ideally, what needs to be promoted is called 'ecotourism'. This kind of tourism relies on an area of natural beauty, and the revenue generated as a result of this activity is channelled back to the local communities. The Khangchendzonga Biosphere Reserve is a case in point.

The government of Sikkim worked on four kinds of activity related to tourism: (a) examining threats linked to tourism (eco-degradation, littering, etc.) and promoting activities that will reduce these, for example, reduce fuel wood use, (b) developing marketing strategies to promote ecotourism in the region, (c) developing economically profitable enterprise activities for local communities, such as lodge and restaurant operations, guiding, portering, pack animal operation and vegetable production and (d) addressing policy issues related to tourism, such as the regulation and control of entry and government's monopoly on transportation. In this endeavour, it was helped by the Mountain Institute, G. B. Pant Institute of Himalayan Environment and Development, Travel Agents Association of Sikkim and the Green Circle (a local NGO). Perhaps one of the most significant achievements of this project has been the emergence of a local NGO at Yuksam called the Khangchendzonga Conservation Committee (KCC). It has developed a code of conduct for tourists who trek on this route. They have also taken up the job of voluntarily patrolling the trail, thus helping the forest department to regulate tourism.

This effort on part of the government has been a great success. It has benefited all stakeholders. The capacity building of various stakeholders in this project has also helped to replicate this elsewhere in the state. Such activities have already been initiated in some of the other BRs also.

For the success of BR programmes, it is a sine qua non that local communities must derive direct and indirect benefits in the implementation of the overall BR concepts. In summary, the most important initiative to be implemented concurrently for effective conflict prevention necessitates that protection for ecosystem has to be based on participatory approach wherein the community is given responsibility for effective monitoring and exercise of traditional rights and principles of resource use.

Sacred Landscape and Conservation

Many traditional forest dwelling societies treat their habitat as sacred. People venerate and propitiate their deities of local pantheon and regional level. The sacredness begins from species level and extends up to the landscape. It is true in case of the Lepcha and the Bhutias communities of Khangchendzonga, the Shompen of Great Nicobar BRs.

It can be explained through an example. Sikkim is known as *Demazong* which means 'hidden valley full of treasure, fruits and flowers'. It is a land of hydraulic culture where almost every water body, be it small or big, is treated as sacred. In fact the sacredness begins at species level and reaches up to the landscape level with the Mountain Khangchendzonga acting as a guardian deity (Chandra et al., 2013)

The local deities are related with nature and its components. There are some festivals and rituals to be observed during the year. In the month of August, 'Panglhabso' festival is celebrated and Buddhist lamas perform rituals and offer prayers in the name of the Mount Khangchendzonga. The monk and devotees go up to Dzongri 'Dhaplha gang' to offer prayers and rituals to Mount Khangchendzonga for deities for good harvest and to make the whole region free from diseases and any kind of natural disaster. There are altogether 109 known existing large and small lakes in Sikkim regarded as sacred by the people. Besides, all rivers and springs are also regarded as sacred. People dare not pollute these water bodies. In fact the people of Sikkim even apprise the outsiders about the sanctity of these water bodies and the kind of the nature's wrath they might face if they pollute the water bodies. Of these 109 lakes, seven lakes are considered holy and believed to be having power to fulfil the wish of the people. Therefore, they are also called the wishing lakes. These seven holy lakes are Khecheopalri, Kathok Tso, Bar Cho Marpu, Phu Cho Karpu, Ka Bur La Tso and Dafuk Yum Tso. These lakes are considered as seven offering bowls to the Mount Khangchendzonga. Besides, there are four holy caves in the four directions of Sikkim, namely, Lhari Nying Phu in the North, Dechen Phu in the west, Khandu Sang Phu in the south and Bas Phu in the east directions. These caves are religiously protected and people do not disturb the flora and fauna of these areas.

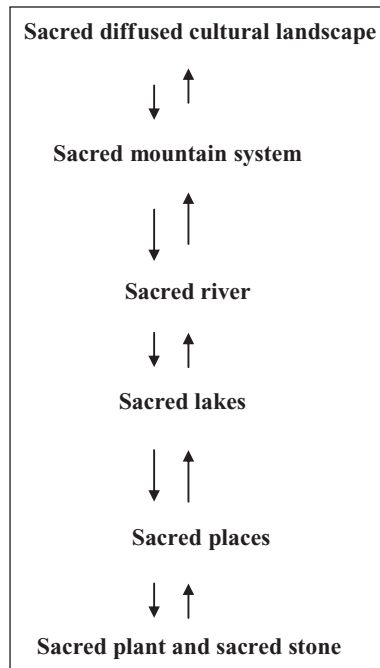


Figure 1. Organic Relation Between Man and Nature

Source: The author.

Even at meso and micro level, every landscape (be it high or low land), every stream and big trees and caves are believed to be the abode of a guardian deity that (*Yulha, Zibda*) is worshipped with great devotion by the local monastery in the morning rituals.

Every human habitation and place which has the footprints of human beings are decorated with the wheel of life, eight lucky signs, prayer flags, chorten and so on. The prayer flags can be seen almost everywhere in Sikkim—on hills, along the water bodies, beneath a big tree and on building tops. It seems that the sanctity to sacredness flow from the religious rituals. Religion is not an external element to the people but has brought together both the man and nature to interact on a day-to-day basis. Consequently, it has led to emergence and operationalisation of organic relationship between man and nature (Figure 1). This relation is world apart from the Newtonian reductionist approach that puts emphasis on the importance of parts. It is, on the contrary, a holistic relation where man interacts with nature with respect and treats it as a living entity.

Conclusions

Presently, the management efforts have largely been centred around the protection of natural resources within BRs from the outside impacts, but at the same time

restricting the use of these resources by the local communities residing in the BR. The concept of sustainable use of resources yet has not taken off due to lack of location-specific understanding on how the resources should be managed. Of late, emphasis is laid on the aspect that eco-development should also combat problems of community participation in forest ecosystem management/rehabilitation directly. What more is required for the management of natural resources is linkage with reinforcement of traditional system of land-based activities based on the traditional value system of local communities.

The BR management, therefore, necessitates understanding of not only the ecological issues but also the socio-economic and cultural issues linked with the former. Understanding societal perceptions of natural resources as a cultural resource—often seen through the conceptual framework of sacred species, sacred groves, sacred water bodies, sacred landscape or even sacred mountain system—and integrating it in the management strategy is necessary for the success of the Biosphere Reserve programme. In order to achieve this, conservation-linked development strategy has to be based on a value system that people can understand, appreciate and accept it, in turn, requires appropriate institutional arrangements for peoples' participation, through a 'bottom-up approach', ensuring that each household takes part in the decision-making process at the lowest level in the hierarchy keeping into consideration the gender sensitivities.

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