

CONSERVATION AND MANAGEMENT OF BIODIVERSITY IN INDIAN FORESTS –NEW ECO-DEVELOPMENT APPROACH

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1. Introduction

India with a population of 1000 million people is home to 16 percent of the world's population, 18 percent of the world's livestock numbering 470 million and occupies only 2.5 percent of the world's geographical area covering 3.29 million square kilometres (MoEF – 2001). It is one of the twelve-mega diversity countries in the world and supports two bio-diversity hot spots as well as sixteen diverse major forest types from the sub-tropical and mangroves to tropical evergreen forests as well as temperate and alpine forests in high Himalayan ranges. Even though recorded forest area in the country is 7,65,210 sq. km.(23.42% of the land area), satellite data indicates forest cover of 6,75,538 sq. km. (20.55 % of the total land area). However, 12.68 % of the total forest area have crown cover of over 40 % and the rest is open forest. About 0.48 million ha are mangrove forests (FSI 2001). Practically all of the forest area is under severe stress due to heavy removal of fuel wood, fodder, timber, non-wood products and grazing.

2. Bio diversity in Indian forests

The Botanical survey of India have assessed that the country has 45000 identified plant species including 15000 flowering plants (nearly 7 % of world's flora) out of which 5154 are found only in India. The Zoological Survey of India records 81000 identified species of animals (6.5 % of worlds fauna) including 1228 birds. Out of this 164 of its 446 reptiles species and 121 of its 204 amphibians are unique to India (MoEF – 1999-I). This bio diversity wealth is spread over ten biogeographic zones covering diverse ecosystems. Further continuing explorations and studies may reveal many more plant and animal species. Recent rapid surveys using revised IUCN guideline (Sacon – 2000) indicate that in India 76 bird species, 98 amphibians, 198 reptiles and 178 mammal species are endangered or vulnerable. Similarly around 1500 endemic plant species are facing varying degrees of threat.

3. Biological and economic significance

India's rich and unique biological resources are economically important both globally and nationally. At least 166 species of crop plants and 320 species of wild relatives of cultivated crops originate on the Indian sub-continent (WB - 1996). About 90 % of all medicines used in India come from plant species. Medicinal plants and various non-wood forest products as well as fuel wood, fodder and grazing for domestic animals serve an important source for subsistence as well as of income and livelihood for nearly 147 million people living in 0.17 million villages (FSI-1999) The forest areas yield various non wood forest products for local consumption and economic gains.

As such keeping the 15.69 million ha. area, under 592 protected areas network, out of the bio mass collection system without alternative arrangements would only generate opposition and negative impact from the local people. The sustainable management and protection of the bio-diversity, rich protected areas have to be ensured only through innovative policies and programmes. There are major problems in effective and sustainable management of these protected areas as more than 50 % of these have (MoEF - 2000) human population in and around. Large human and livestock populations depend on fuel wood, fodder, grazing, non-wood forest products (fruits, roots, medicinal plant parts,

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gums, bamboo, cane, wild meat, honey, fish, etc.) from the areas declared as National Park or Sanctuary. Similarly, major development activities like construction of roads, dams, township, industries, canals, etc., have been prohibited specially in the core areas.

4. Forest and bio diversity conservation - Policy and legal measures

Conservation of natural habitats has been an integral part of Indian culture since time immemorial. The pillar edicts of Emperor Ashoka in 250 BC directed the citizens to protect all living forms. The earliest modern attempts to protect forest and wild life was the enactment of Indian Forest Acts of 1865, 1894 & 1927 and the Madras Elephants Preservation Act of 1873. These were followed by many legislation at State & Central level on Preservation of wild life & Forests. After India gained Independence in 1947 new policy and legislative steps were initiated to conserve forest and wild life. The Forest Policy of 1952 for the first time provided for having 33% of the land area of the country under forest cover (Section 19) and also for setting up of sanctuaries & national parks for preservation of wild life (Section 20). This was followed by enactment of “The Wild Life (Protection) Act, in 1972 & 1991 Amendment which apart from provisions for protection of wild life and punishment for poachers also has provision for creation of sanctuaries (Section 18), National parks (Section 35) and also Closed areas (Section 37). In 1972 the now famous Tiger project was launched in India.

- a) **Sanctuary:** Areas of Ecological significance for the purpose of protecting, propagating and developing wildlife and its environment. Here regulated & limited human activities are permitted.
- b) **National Park:** Area of considerable ecological importance is constituted as national parks where no extraction of forest products or human habitation are permitted. It provides for the highest value of legal protection.

In 1976 through a Constitutional amendment (42nd) The Government of India brought the subject of “Forest” under concurrent list and incorporated Article 48 A (part IV Directive Principles) for protection & improvement of Forest and Wild Life by the states. Similarly under Article 51 A (g) (part IV A Fundamental Duties) it directed the citizens “To protect and Improve the natural environment including forest, lakes, rivers and wildlife and have compassion for living creatures”. In 1980 the Forest Conservation Act was enacted (Amended 1988) which provides that no recorded forest area can be transferred for non-forestry use without prior approval of the Government of the India. A new ministry of Environment & Forest (MoEF) was created in 1985.

The new Forest Policy of 1988 specifically provided as part of its basic objectives:- “Conserving the natural heritage of the country by preserving the remaining natural forest with vast variety of flora & fauna, which represents the remarkable biological diversity and genetic resources of the country”. The Directorates of Wild Life Preservation were set up in the central ministry and in the states. Schemes were initiated for providing special protection to some of the keystone species like tiger, elephant, rhino, Asiatic lion, Himalayan musk deer, turtles and crocodile; regulating import and export of wild life and their parts and derivatives according to International convention like CITIS. In 1982 the Wild Life Institute of India was set up for research and training and the Central Zoo authority was set up in 1992 to guide and monitor zoos as well as all ex-sites conservation activities (MoEF-2000).

Realizing that many species of animals & plants have become endangered the aforementioned Wildlife Conservation & Development steps were initiated to progressively strengthen and implement the well-developed strategy detailed under the National Wild Life Action Plan of 1983. Keeping in view various complex issues it established following goals:

- i) Establishment of a representative network of protected areas.

- ii) Developing appropriate management system, with due regards to needs of local people and ensuring their involvement and support
- iii) Protecting bio diversity within multiple use areas, and
- iv) Extending conservation efforts beyond protected areas

The Wildlife institute of India prepared a report recommending creation of a well-planned protected area network covering 10 biographical zones. It led to rapid expansion of protected area network though these still do not cover all ecosystems adequately. Twelve Biosphere reserves have also been established which encompass some of the protected areas and surrounding ecosystems and landscape. In 1970, there were only 10 National parks and 127 Sanctuaries. Currently India has 90 (3.688 million ha). National Parks and 502 Wildlife Sanctuaries (12 million ha) covering a total of more than 15.68 million ha., (MoEF - 2004)) of forest area. As a result, in some of the best forests in the country, commercial extraction of timber has been banned. However, most of these have human settlements in the core as well as encroachments and hunting pressures. The areas are also subject to pressure from outside agencies for other development needs.

It was also observed that critical eco systems could not be protected without full cooperation of the local people and without addressing their subsistence as well as socio economic and cultural needs. These were closely linked with goods and services derived from near by forest areas notified as Sanctuaries or National parks. Keeping this in view and the clear directive of the Forest Policy of 1988 (Section 4.10) for involving local people & forest dwellers in protection and management of forest areas the Government of India issued specific new policy directives to the state Government and forest administrators.

A Biological Diversity Act (No. 18) was passed in Feb. 2003. The main intent is to protect India's rich biodiversity and associated knowledge against their use by foreign individuals and foreign organizations without sharing the benefits arising out of such use and to check bio-piracy. Under this act a National Biodiversity Authority has been set up in October 2003.

5. A new approach of community participation in forest and protected area management

- i) Joint Forest Management (JFM):- Community participation in sustainable forest management is an age-old practice in India. However, it got considerable official support at local levels in many areas since 1970's when social forestry programme was adopted under country's development plans. On 1st June 1990 the Government of India issued the policy directive of "share and care " for involving of village communities and voluntary agencies for regeneration & management of degraded Government forests. In Feb'1999 it's scope was enlarged to cover also the good forest areas. This directive provides for steps to be taken for involvement of local community in all aspects of forest Management from preparation of micro management plans, protection and development activities as well grant of usufructory benefits of forest products and share in the sale of timber. This flagship Programme has generated considerable interest all over the country and at present there are 63,000 village forests protection / development committees covering 17 million hectares of mostly degraded forest areas in the country under JFM. In this process of ecological improvement and protection of forests the wild life also prospers. A new approach of grouping these JFM committees in each forest division under a Forest Development Agency [FDA] for direct funding by the MOEF for implementation of micro plans developed in collaboration with the JFM committees was launched in 2001. This has given the desired administrative and financial help, which has been widely welcomed by the JFM committees and other stakeholders.
- ii) Eco development around national parks and sanctuaries:- It was soon realised that JFM approach will not be effective in protected areas as even sustainable consumptive exploitation of biomass

for local use could not be allowed in such areas and there was also no scope for any commercial exploitation for sharing the economic benefits. However, It was also essential to ameliorate the hardship faced by villagers living in & around the protected areas due to restriction on extraction of biomass as well as grazing and fuel wood collection. As such the Government of India launched a new scheme of eco development around the protected areas including the tiger reserves. The Policy guidelines issued in Dec' 1991 aimed at development of innovative package of practices of socio economic development along with biomass generation in the targeted villages around the protected areas, which were dependent to a considerable extent on the protected areas for subsistence and livelihood. The Policy paper laid down some criteria for selection of such areas and villagers on priority basis for implementation of the schemes in phases. It also laid down details of activities to be undertaken in forest and community areas situated on the fringe of the protected areas. This programme adopted a landscape development approach including all the government, community and private holding as per local needs as against regenerating of only government forest areas under JFM programme.

- iii) Objective: - The basic objective of this eco-development project is to remove man-animal conflict through better management of the degraded forests & community wasteland in the buffer zones and fringe areas to meet the local needs under a participatory management system. It is for achieving high biomass production in degraded areas along with agro-forestry, improved agriculture horticulture as well as promotion of non- farm income generating activities including eco-tourism to improve house hold income and to provide alternative, to the existing practice of large scale removal of fuel, fodder, non-wood forest products for self use & sale as well as heavy grazing in the protect areas.
- iv) The Eco-development strategy has two thrust areas:-
 - a) Improvement of protected area management to effectively conserve bio-diversity and involvement of local people in protected area planning and protection as well as developing incentive for conservation by supporting sustainable alternatives to harmful use of natural resources.
 - b) To strengthen and support the collaboration between the protected area authorities, local people, state development and planning agencies and other stakeholders that will strengthen the participatory management of protected areas in a sustainable way.

6. Proposed activities and programmes under eco development approach

The eco development Programme is to be carried out in two phases.

- i) **Phase I:** It will comprise of :-
 - a) Survey and preparation of management Plans
 - b) Silvipastoral development
 - c) Raising of close-spaced fuel wood & fodder plantation of fast growing indigenous species.
 - d) Setting of livestock veterinary centres.
 - e) Setting of fixed/ mobile dispensaries including vaccination / family planning clinics.
 - f) Providing safe drinking water.
 - g) Fixing of electrical/ solar streetlights.
 - h) Supply of improved chullahs, solar cookers and “gober gas” plant.
 - i) Erection of physical barriers including electric fencing to protect crops, etc from animals depredation.
 - j) Soil conservation measures like gully plugging, terracing of cultivated fields' etc.

- k) Setting up of small irrigation dams/ anicuts.
 - l) Training of staffs, volunteers and village level workers in Eco development and related activities/ techniques.
 - m) Purchase of vehicles and equipments directly concerning the above activities and construction of buildings.
- ii) **Phase II** activities will comprise of:-
- a) Insurance of life, crops and property against animals depredation.
 - b) Improved dry land farming techniques.
 - c) Improvement of soil productivity through manuring, soil conservation, crop rotation, etc.
 - d) Horticulture suited to local conditions including cultivation of medicinal plants.
 - e) Farming of domestic animals like pigs and poultry.
 - f) Agriculture, sericulture and pisciculture.
 - g) Setting up of cottage industries based on appropriate technology.
 - h) Providing facilities for marketing of various produces.
 - i) Education and recreation facilities aimed at explaining the role of the protected areas and wildlife management in general in maintaining land productivity, soil regime, etc.
 - j) Study of the culture and tradition of the local communities to establish the link between their life styles and maintenance of Ecological Equilibrium.

Additional innovations and activities, as an outcome of socio-economic surveys, can also be taken up with prior approval of the Director of Wild life Preservation, Government of India. The scheme is to be implemented with central government sponsored funds by the wildlife wing of the state forest departments, with active involvement of the local people and also NGOs wherever available & willing. The outline for preparation of management plan for each was also elaborated in the circular.

7. Impact Analysis:

As this program is comparatively new and is in a development stage there is hardly any published literature giving the impact analysis of the various activities being undertaken on local socio-economic concerns as well as on the protected area management. However, general discussions with local people and park managers during frequent visits to such areas by the author following issues emerged.

- a) It was apparent that the new multidisciplinary approach for area development including biomass generation around the fringe villages had a positive impact on the local people
- b) The park staff which was seen only as a regulatory authority is now gradually being considered as a coordinator of village development works
- c) A vision for re greening of the fringe areas of the parks through participatory management with socially-equitable village institution is emerging
- d) Efforts by park staff to meet urgent local development needs and consequent generation of employment connected with management of park, as guides for eco-tourism for visitors, rehabilitation of local ecosystem, better availability of water, fodder, fuel, compensation for loss of domestic animals, etc. is slowly generating goodwill and interest of local villagers towards need for preservation of the park area and related activities.
- e) An existing beginning has been made for process oriented transition from unilateral state control to a partnership approach with local people. However, ensuring equitable participation, strengthening of village community level institution, bringing about attitudinal change all around including park staff, resolving conflicts, integration with works of others development departments, increasing productivity through technical inputs, enhancing local job opportunities etc. are complex and dynamic challenges.

These will have to be addressed through well-balanced package of practices provided under the eco development programme.

- f) Total involvement & co-operation of local stake holders in the management & protection will be the prime factor in ensuring sustainable development of the protected areas and ecological corridors.
- g) There was need for full policy and budgetary support [At least 0.5% of the national plan as the protected areas cover nearly 5% of the land area of the country] of the state and central government for all such development activities.

8. The way ahead

An exiting beginning has been made to develop a process oriented new strategy for protection & conservation of India's rich bio-diversity especially in the National Parks & Sanctuaries by adoption of a people friendly and ecologically sound eco development approach. In addition to the observations made in Para 7, following few additional steps are suggested for improving the functioning of this process driven approach to make it more effective as well as providing it with necessary impetus for rapid spread to cover all the protected areas in the country.

- a) The Ministry of Environment & Forest (MoEF) should provide adequate funds and give full powers of the government to the eco development project steering committee for clearing all financial and administrative issues to avoid procedural delays. Decentralization of powers down to field and eco development committee level.
- b) The project implementation board should be chaired by the Director General of Forest to clear all technical issues e.g. microplans, shifting of budget allocation from one activity to another based on field situation, awarding of necessary research projects and consultancies for studies & periodical independent monitoring by a three member expert group.
- c) The funds from central assistance or external assistance should flow directly from the project director in MoEF to the chief wildlife warden of each state [on the lines of FDA] and onwards to the park director and the local ecodevelopment committees for implementation of activities under approved microplans.
- d) Micro plans should be prepared with active & effective co-operation of the local Eco development committees which should clearly list the approved activities and proposed expenditure. Moreover, it should be clearly focussed on conservation goals (60% or more budget) with only supporting activities of other areas of rural development & infrastructure (less than 40%) as detailed in MoEF guidelines for eco development issued in December 1992 (para 6).
- e) The latest satellite imagery acquired from National Remote Sensing Agency (NRSA) should be digitally interpreted and then integrated with the GIS based maps for micro planning and periodical monitoring of all eco development activities in and around (10 Kms.) the protected areas.
- f) To ensure transparency in working & expenditure the project authorities should hold open forum workshops in each protected area, at least once a year, and ensure presence of local stake holders, eco development committee members, NGOs etc to discuss previous year's performance as well as next years' annual plan of operations.
- g) All the biomass removed from the protected areas & as well as fringe areas on account of fire protection, removal of weeds, shrubs from grass land, thinning to open up congested areas etc. should be equitably distributed for local use through the eco development committees.
- h) The Wildlife Institute of India should impart training to officers (future Trainers), field staff, NGOs & Eco development committee members on preparation of microplans with the help of GIS application & database. The states should be helped to set up such training centres for local people.

- i) Eco- tourism is becoming very popular in India and many parks have also important religious sites drawing large number of pilgrims. As such visitor management should form as important component of the park management plan. The local people should be involved as trained guides & to provide homestay to visitors, who's number for entry or any day can be fixed based on carrying capacity of the Park. The hotels, which have been set up with the park as the chief attraction, should pay a 5% surcharge on all room rent to the park authorities for implementing eco development programme.
- j) All revenue generated through entry fees to the park should be ploughed back as an additionality to normal park budget. Moreover, the director of the protected area should be made the nodal officer for co-ordinating all rural developmental & employment generation programmes in all villages situated within 10 km belt outside the park boundaries on the lines of the recently approved Forest Development Authority scheme.

9. Conclusion

The protection of bio diversity is important for the well being of the people of the developing countries. Time has come for policy makers to give due attention to urgent needs of wildlife managers and local people who are entrusted with this responsibility as the situation has reached the critical level of "Protect or Perish". The need of the hour is of a grand vision supported by political will at the highest level followed by required investment in the dedicated and innovative eco development programme as well as technical legal and administrative support and committed work by all involved in this noble endeavour. The Indian experience is a clear pointer that the eco development approach with people's close participation has the best chance to ensure sustainable management of the protected areas for biodiversity conservation.

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