

3

Forest

INTRODUCTION

3.1 National Forest Policy 1988 acknowledged the importance and primacy of local communities and provided for a sustainable management approach with maintenance of environmental stability as the prime objective. Commitment to conservation of nature is highlighted by the targets of maintaining one-third of land under the forest/tree cover. The social concerns are targeted through increasing productivity to meet local and national needs and creating a people's movement for afforestation. Industries have been advised to network with farmers for industrial raw material.

3.2 Forest cover is critical for a living environment as it influences the quality and quantity of air and water. The role of forests as carbon sinks endows them added recognition as an important environmental factor. Therefore, forest cover and afforestation have been dealt with in Volume I, Chapter 9, 'Environment and Climate Change'.

3.3 In India, per capita forest area is only 0.064 ha against the world average of 0.64 ha. (FAO). The productivity of our forests is only 1.34 m³/ha/year against the world average of 2.1 m³/ha/year. While 78% of the forest area is subjected to heavy grazing and other unregulated uses, adversely affecting productivity and regeneration, nearly 10 MH of forest area is subjected to shifting cultivation. Land use changes such as diversion of community areas for non-biomass

purposes have directed nearly all biomass needs towards forests.

3.4 Plan investment in forestry and wildlife sector so far, including State and Central plan, has been about 1% of the total plan outlay. The National Forestry Commission (2006) has recommended an investment of 2.5% of the plan outlay in the forestry and wildlife sector.

3.5 As the State forest administration is responsible for management of forests, the focus of Central interventions should be on reinforcing the capacity of States to undertake the national policy mandates towards conservation and sustainable use. The strategy for the Eleventh Plan will, therefore, be to create an environment for achieving sustainable forestry and wildlife management with specific focus on the socio-economic targets. Accordingly, the following scenario will be the core of the forestry sector development strategy:

- The objective of enhancing the green cover will be integrated with livelihood opportunities. Suitable policy and legal measures for this purpose will back-up the programmatic interventions. The Tenth Plan strived to universalize Joint Forest Management (JFM). The resolve of the Eleventh Plan is to strengthen the regime by incorporating the concepts of harvesting, value addition, and facilitated marketing of forest produce.

- The ultimate aim of the State forest management will be to achieve optimally productive forests capable of providing timber and non-timber products, apart from the ecological services without unnatural change in the composition of the forests.
- The forests in the vicinity of habitations will be managed for livelihood needs of the neighbouring populations. For this, adequate support and empowerment will be ensured.
- The harvest of forest products will be governed by the availability. However, strategy for widening the production base beyond forests will be pursued to ensure sustainable use of the land resources of the country.
- Protected areas will be integrated with the sensitivities of local populations and protected area management planning will be based on the optimization of local community resources and the use of non-invasive benefits from the PAs directed towards the neighbouring population, on village eco-development principles.
- Support systems for attaining these results will be evolved in terms of R&D, capacity building, and strong information system for long as well as short term objective monitoring.

LINKING FORESTS TO LIVELIHOOD AND STRENGTHENING PARTICIPATORY PROCESSES

NATIONAL AFFORESTATION PROGRAMME

3.6 The CSS National Afforestation Programme (NAP) of National Afforestation and Eco-development Board (NAEB) assists rehabilitation of degraded forests through JFM Committees. Forest Development Agencies (FDAs) have been created at the district level to function as a link between the Ministry of Environment and Forest (MoEF) and JFM Committees for the scrutiny of projects, release of funds, and implementation of the sanctioned programmes.

3.7 NAP, as a CSS, has been the epicenter of the JFM movement. Out of about 22 MH forest area looked after by 1.07 lakh JFM Committees, NAP covers about 9 lakh ha through 23750 committees, which represents only 24% of the total committees and 4.20% of the total area under JFM. NAP as a stand-alone scheme may not have any impact unless it is able to influence the States to orient their programmes towards strengthening JFM.

3.8 There have also been certain shortcomings in the way JFM has been functioning. The modalities of JFM do not recognize the existing informal traditional institutions engaged in conservation. At the national level, centralized control on activities for NAP components has resulted in a slow pace of awareness and development of interface between the forest managers and community institutions.

3.9 In a national-level study conducted by the Indian Institute of Bio-Social Research and Development in 2004–05, JFM was evaluated in about 500 JFM Committee areas in 13 States across the country. The criteria were clarity and purpose of roles, institutional mechanisms, capacity of JFM Committees, and resource management. Impact on forest profile, socio-economic aspects such as household income, village development, women empowerment, and social unity were studied. The average score for institutionalization is 51% with high scores for West Bengal (68%), Rajasthan (62%), and Maharashtra (56%). However, no State has reached the state of incorporating and routinization of JFM. The effectiveness of the institutions has been rated as 50.28% with strong correlation with resource management. To achieve success the need for more motivation than mechanisms has been felt. Highest effectiveness was observed in Uttaranchal, West Bengal, Orissa, and the least in Karnataka, Andhra Pradesh, and Chhattisgarh.

3.10 Close analysis has revealed that conflicts and failures have been more where the benefits from managed resources are scarce or not clearly visible. This situation demands investment for improving productivity of the resources and rationalizing the modalities of sharing. Products from the forests could form a share of communities while ecological benefits including perpetual green cover could be the national share. Products can then be accounted as the value paid by the State to the communities for the environmental services rendered by them for conserving forests.

3.11 National Afforestation/Eco-restoration Programme, as the flagship programme of the Central Government, will be designed for augmenting ecological resources and resultant benefits will accrue to the participating community. The main objective will be

to empower all participatory institutions to ensure forest conservation.

- For improving the outreach of the Programme, States will also need to implement their forest improvement programmes through the Forest Development Agency (FDA) mechanism.
- It will be ensured that the micro plans evolve from the JFM Committees and the decisions on species for afforestation are based on a naturally compatible combination of species with local ownership.
- The JFM framework will duly recognize the existing Van Panchayat and other community forestry institutions and honour their democratic decisions related to management of forests. The gram sabhas under the PESA in Schedule V areas and the traditional institutions in the North East can act as community forestry institutions. The green cover of the community forests and the environmental services will be treated as the share of the State and the harvested products as the share of the community.
- The programme may also include a component for encouraging forest-based small enterprises with appropriate mechanisms for accessing forest produce. Self-employment programmes will be supported with training and capacity building of educated unemployed youth.
- The social component in the Programme can also include specific projects on decentralized energy solutions such as biomass gasification-based electricity, solar systems, etc., for improvement of community services, linking these to planting projects.
- The programme for afforestation/eco-restoration should leverage part of allocation under NREGP for augmenting the ecological resource base.

National Afforestation, Eco-restoration, and Eco-development Board

3.12 The NAEB may be renamed as the National Afforestation, Eco-restoration, and Eco-development Board (NAEEB) to broaden its vision to include non-tree ecosystems. The NAEEB programme will have the following components:

- Grants-in-Aid for Greening India Scheme will include assistance for setting up well-equipped

nurseries for quality planting material, supported by well-networked genetic improvement plans and well-monitored seed/clone testing and certification programme, apart from afforestation efforts by NGOs.

- Monitoring and evaluation of the state of desertification and afforestation/eco-restoration programmes and co-ordination of programmes for combating desertification based on the defined criteria and indicators, as mandated within United Nations Convention to Combat Desertification (UNCCD).
- Support to regional centres of the NAEB to assist in dissemination of technologies and NAEEB programmes through mass awareness and studies.
- Eco task forces for afforestation/eco-restoration of the areas where afforestation/eco-restoration is not possible with participation of people due to harsh conditions.

Augmenting Common Biomass Resources

3.13 More than four lakh villages in the country do not have a forest in the vicinity. For augmenting the biomass resource base, community controlled and other accessible lands need to be made optimally productive.

3.14 Panchayat Raj Institutions should identify such available lands and empower the community groups for their regeneration and management on locally relevant terms. States will provide technology and wages through the social forestry wing, with the support of the Central Government through a new CSS. Thus the funds and technical support under this programme will be available where Panchayats are willing to put the underproductive lands under productive regimes.

3.15 The NREGP can be linked for building these common resources. However, this would presuppose proactive action by fund users and sustained supply of manpower till the establishment of the plantations.

PROMOTION OF AGRO-FORESTRY

3.16 Agro-forestry offers ancillary opportunities of sustained income per unit investment in agricultural lands as subsidiary to the main crops. While in

commercial agriculture, bund planting has been popular, net returns are better than conventional practices in many situations in rainfed areas. Subsistence or commercial agro-forestry has thus scope to grow from the existing indicative contribution of about 3% to about 10% of the forest/tree cover.

3.17 India today imports large quantities of timber as well as pulp. For ensuring impetus in greening in farm sector, organizing markets and facilitating fair trade will be the priority. Concessions for cheap and duty-free import of pulp need to be reviewed. Market options and incentives including overseas markets should be available to the farmers. R&D for enhancing productivity and testing indigenous alternatives to conventional agro-forestry species such as Eucalyptus and Acacias, suitable for the farm sector, should be taken up.

MITIGATION OF DEGRADATION OF FORESTS

3.18 The management of government forests is handled by the State Governments whereas capacity building and research have been with the Central Government.

3.19 Apart from a network of regional centres of MoEF for monitoring the compliance of central regulations, a CSS Integrated Forest Protection was launched in the Tenth Plan. The programme could be made fully operational only in 2005–06 and is yet to show an impact. Assistance provided under this programme needs to be thoughtfully used for building modern sustainable forest management capacity of the states. This will include management information, inventory and assessment, and adoption of modern methods for planning and monitoring. Accordingly the following two programmes of MoEF, viz., Integrated Forest Protection, and Strengthening Forestry Divisions, are proposed to be reoriented in the Eleventh Plan.

INTENSIFICATION OF FOREST MANAGEMENT SCHEME

3.20 The Integrated Forest Protection Scheme will be redesigned to provide assistance to the states for building capacity and basic infrastructure for modern forest management. Improving Management Planning

and Survey (land records) set-up will be the first priority for Central assistance. The following components will be provided for modernization of the State forest management:

- Modernization of the management planning (Working Plan) units with equipment, infrastructure, and manpower. This may include forest inventories, training and satellite imagery processing, and GIS facilities. This will also include professional services such as ecologists and sociologists for relevant inputs.
- Forest Land Information System for land records, with modern and empowered survey, and land record maintaining mechanisms for documenting the legally recognized individual rights, concessions, ownerships including those under the Scheduled Tribes and other Forest Dwellers (Recognition of Forest Rights) Act.
- Forest boundary demarcation by providing assistance for the state-of-the-art infrastructure, training/outsourcing survey work, fixing permanent boundary pillars, updating the forest block indices and compartment histories.
- Installation of forest fire surveillance and warning systems, along with fire management planning in participatory mode. This fire management system will also be integrated with a national network for forest fire surveillance and monitoring.
- Assistance for general infrastructure for accommodation in remote areas, communication, improvement of road network, etc., will also be a part of this programme.

STRENGTHENING FOREST MANAGEMENT

3.21 The programme will cover consultations and studies on relevant matters for efficient management of the sector including monitoring of compliance through the network of regional offices of the Ministry. Following specifically earmarked components should be part of this programme:

- A National Forestry Information system may be set up, along with networking with the States, for tracking the changes in forest development, harvesting, trade, and utilization scenarios. This will include information on non-timber forest produce

(NTFP) resources including medicinal and aromatic plants.

- The National Working Plan Code may be revisited for incorporating aspects dealing with ecological and biodiversity concerns of the forest areas. This will also include NTFP, medicinal, and aromatic plant resources.
- A mechanism for internationally recognized independent sustainable forest management certification regime for forest resources and products may be set-up.

MANAGEMENT OF GREGARIOUS FLOWERING IN THE NORTH EAST

3.22 Muli bamboo, *Melocanna baccifera*, grows over an area of approximately 18000 square kilometre (sq km) in the States of Mizoram, Tripura, Manipur, and parts of Assam, Nagaland, and Meghalaya. The largest population of the species exists in Mizoram covering about 6700 sq km. Gregarious flowering has commenced after a flowering cycle of about 48 years and the whole flowered bamboo population will dry off after seed setting. This may result in ecological, economic, and social problems in the area due to destruction of large tracts, rendering them vulnerable to forests fires, depletion of important bamboo resources for the artisans and industry, and increase in rodent population causing further destruction and health hazards. For working out a strategy for management of gregarious flowering in the North East, consultations began in April 2002 which resulted in the launching of a CSS for which a sum of Rs 85 crore was approved by the Central Government as part of an action plan of Rs 366 crore. The programme actually took off in 2005–06 and will continue till 2008–09. The action plan has the following priorities:

- Resource survey and mapping be taken up for assessment of the growing stock affected.
- Harvesting of the standing crop of bamboo to the extent possible before flowering, including arrangements to facilitate transport by road, railway, waterways, etc. Effective ways of disposal of the harvested bamboo by linkages with paper mills like Hindustan Paper Corporation Ltd, promoting bamboo-based cottage industries and establishing mini mechanical chipping and pulping units in small-scale industrial sector.

- Regeneration of flowered areas including introduction of economically important bamboo species for subsequent use.

CAPACITY BUILDING AND RESEARCH

CAPACITY BUILDING

3.23 The ongoing paradigm change in the forestry sector necessitates fundamental orientation and attitudinal changes of the personnel in line with multifarious roles of forests, corresponding variety of externalities, and for coping with traditional forestry management practices. This includes social sensitivities along with the scientific basis of the processes of nature.

3.24 An integrated capacity building programme will be designed for forestry personnel including training of trainers for State frontline staff training institutions and will also enable stakeholders to understand the perspective of conservation in human well being by providing them state-of-the-art information and knowledge base.

INDIAN INSTITUTE OF FOREST MANAGEMENT (IIFM)

3.25 IIFM has emerged as a premier forestry institution and has contributed to the development of criteria and indicators for sustainable forest management and participatory forest management processes. Based on an evaluation, IIFM intends to enlarge its educational and management development programmes as well as policy-relevant research focused on forestry and its linkages with rural institutions and natural resource-based rural livelihoods. The Institute will take up policy and development research including the valuation of ecosystem services, evaluation of the economy of participation in natural resource, especially forest management, and modelling of impact of climate change on livelihood and forest resources.

WILDLIFE INSTITUTE OF INDIA (WII)

3.26 Apart from the training, research, and advisory role of WII, the new approaches would include developing workable framework for mainstreaming conservation in development projects and policies, empirical studies on processes for ecological impacts

of developmental projects and human activities, strengthening common property resource management, and developing expertise in managing wildlife in isolated and fragmented landscapes. The use of modern tools and technology and development of analytical capabilities will be undertaken.

INDIAN COUNCIL OF FORESTRY RESEARCH AND EDUCATION (ICFRE)

3.27 The Council was created in 1986 to evolve a scientific environment in forestry, in view of the new scope of genetic, ecological, climatic, and economic roles, compared to pre-1988 mandates, of largely silviculture-based management systems, and ancillary aspects on regeneration, harvest, and utilization. Accordingly, the management of research and education needs to be supported by enabling decision-making through consultation and in a professional capacity.

- The Council should have specific separate mandates regarding the administration of its institutes and co-ordination of research. For this purpose, a task group may be set up, involving top-level research managers, forest managers, and policy makers, to propose a working mechanism including resource mobilization for its research and education components. This group may also deliberate on integrating wildlife, biodiversity, and habitat/landscape/ecological research concerns within the Council.
- For the plan period, 50% of the total grants-in-aid to ICFRE will be earmarked exclusively for research and education. The Council will encourage its institutes to collaborate with other institutions of repute in relevant fields including State Forest Research Institutes.
- Research programmes will be oriented towards meeting the priority areas of productivity, genetic improvements, ecosystem research, and updating growth and yield parameters required for analysis in management planning. Management of natural forests for improvement of their profile will be the main focus. The research and education programme in the field of utilization of wood and wood products should also include Indian Plywood Industries Research and Training Institute (IPIRTI).

- Nation-wide long-term genetic improvement programmes for indigenous species, screening of Indian species for fast growing, short rotation alternatives for traditional species for industry and protocols for survey, inventory, and management planning for NTFP, medicinal, and aromatic plants in forests will be launched.
- Specific thrust will be given for developing technologies and processes for agro-forestry and social forestry. Quality seed and planting material programmes in public or private sector will be supported by credible testing and certification regimes.
- A forest biodiversity network will be established for integrating the available information on one platform and for studies in the left out areas. It will be compatible with the management planning systems of forest administration and the other existing/evolving information resources.
- Inter-sectoral impacts, trade, and market aspects of forest economics, ecosystem research, policy research, and concerns of climate change including carbon trade methodologies, will be taken up.

INDIAN PLYWOOD INDUSTRIES RESEARCH AND TECHNOLOGY INSTITUTE (IPIRTI)

3.28 Besides the specific mandate of developing technologies for efficient utilization of wood in structural material, development and promotion of technologies for alternative and efficient use of residual waste like bamboo, husk, wood waste, small wood, etc., will be the thrust areas. Better utilization of the agro-forestry species including treatments for longevity of the products will be the focus of research for utilization. Apart from its own grants in aid, IPIRTI will be integrated with ICFRE for wood utilization research and technology. Technology transfer being the mandate of IPIRTI, professional courses on wood technology should be planned.

FOREST SURVEY OF INDIA (FSI)

3.29 Present scope of the FSI is limited to the assessment of tree canopy cover. The information is not sufficient for objective assessment and planning for the sector.

3.30 Scope of interpretation of satellite data for tree cover will include separate canopy status in forest lands,

patterns of degradation, and state of commercial plantations. With redefined green cover, appropriate indicators compatible with the technologies used by FSI need to be developed. Monitoring of ecological status of landscapes/habitats in terms of the dynamics of vegetation and early warning systems, productivity, consumption, and supply from forest and non-forest resources will be taken up. On the basis of these priorities, rationalization of the present network of regional units and manpower will be taken up. The scope, definition, and components of FSI inventories will be decided at an expert group level, in order to render them compatible with various national and international formats, definitions, and organizations for collaboration.

SOCIO-ECONOMIC AND POLICY IMPERATIVES

TRIBALS, NTFP, AND PESA

3.31 State governments will need to provide support for implementation of the Scheduled Tribes and other Forest Dwellers (Recognition of Forest Rights) Act for preparing the forest land records for the recognized rights, mapping of common forests for community management, and developing management plans.

3.32 To maximize economic benefits to the communities with sustainable forest use, the available mechanisms for dealing with NTFP will be reviewed. As the large volume NTFPs require dealing and trading at higher scale, professional services can be organized through the marketing federations of NTFP gatherers/processors. Nationalized system of collection through corporations and contracts will be dealt with in the light of the settled policy and legal position. Improving livelihood through gainful employment opportunities will be encouraged by organizing value addition of NTFP at community level under the NAP. For capacity building and technology assistance, linkages with voluntary organizations and programmes such as National Bamboo Mission, National Mission on Bamboo Applications, Village and Small Scale Industries, and institutes of rural development and technologies will be established.

GENDER PERSPECTIVE

3.33 Women are the principal stakeholders in natural resource use and management. It is crucial to ensure equal representation of women in the decision making and implementation processes in participatory planning and development programmes. JFM principles indicate 50% participation of women in JFM institutions. However, the models vary among States. The participation of women should be ensured in all community activities and the decisions should be based on their considered opinions. This should hold good for not only JFM but also processes such as afforestation through Panchayats, protected area management, planning, and use of common property resources including NTFP under the Tribal Rights Act or PESA. Thus gender perspective should be a visible component of any community-based programme.

MOBILIZATION OF RESOURCES FOR AFFORESTATION

3.34 Apart from enrichment activity for forests, afforestation/eco-restoration helps in sustaining the livelihood of the rural poor. Developing multipurpose resources in underproductive forest or non-forest areas must be a component of any employment generation programme. A shelf of afforestation/eco-restoration programmes will be generated for village communities for implementation under the NREGP. Necessary institutional initiatives will include notification of afforestation as one of the activities, and dovetailing afforestation programmes with the NREG programme.

COMPENSATORY AFFORESTATION FUND MANAGEMENT AND PLANNING AUTHORITY (CAMPA)

3.35 While considering the proposals for diversion of forest lands for non-forestry purposes under Forest (Conservation) Act, 1980, MoEF generally levies cost of compensatory afforestation in equivalent non-forest lands offered by the user agencies or in degraded forest land. Net present value of the land allowed to be diverted is also realized from the user agency. The funds thus accrued were to be made available by the respective States for identified compensatory afforestation and other forest development activities. The Apex Court had, however, observed that the funds were not

appropriated to the implementing authorities. It, therefore, directed the Central Government in 2002 to constitute an authority for management of the funds received from the user agencies and their exclusive and prompt utilization for the intended purpose. MoEF notified the constitution of CAMPA on 23 April 2004 for management and use of this fund for forest development. However, the mechanism is yet to take effect. It is understood that presently an amount of about Rs 5000 crore is available with CAMPA for utilization in forest conservation activities. The amount should be made available in the current plan period on the basis of specific project proposals from the States.

FOREST PLANTATIONS

3.36 For sustaining forest cover, existing commercial plantations should be intensively managed for optimum productivity and provided with scientifically designed inputs including quality planting material, cultural/silvicultural treatments, etc. Harvesting and replanting should be the interlinked operations. In the context of the required thrust on agro-forestry, it should be ensured that plantation projects in forest lands avoid agro-forestry species.

3.37 On the other hand, afforestation works should be taken up with a specific context and habitat profile in mind and only in participatory mode with local communities. The species selection should be a part of the micro plans. The Central Government is responsible for the approval and monitoring of Working Plans. Therefore, MoEF should ensure that no new commercial plantations are created in the name of afforestation/eco-restoration.

PRIVATE FORESTRY INITIATIVES

3.38 The Central Government has been deliberating on modalities of PPP. The concept of multi-stakeholder partnership in forestry is primarily based on granting tenure on degraded lands (including forest lands) to investors with benefit-sharing arrangements. Considering the multiple stakes of local communities over the forest lands, and the accepted position of first charge of communities on natural resources, such partnership with industry for forest lands is not desirable. However, with the explicit consent of the

communities in public-hearing mode, possibilities of such ventures in non-forest wastelands can be explored.

3.39 Encouraging industry as a dedicated destination for agro-forestry products will be desirable and focus should be on establishing appropriate linkages with the farmers for cultivation of tree crops as suggested in the National Forest Policy 1988. The examples of ITC-Bhadrachalam and other similar initiatives within the private sector are worth emulating in this context.

AREAS UNDER SHIFTING CULTIVATION

3.40 The North Eastern hill areas need to be viewed as cultivated and uncultivated domains—both with extensive tree cover owned by people, individually or collectively. The length of the *jhum* cycle is the main determinant of degradation of *jhum* lands. The reduced amount of land available for *jhum* shortens the fallow period and results in increased economic pressure on low-income families. Most of the shifting cultivation is practiced on lands with customary community rights. In such areas, any afforestation activity beyond fallow management is expected to face resistance. Replacement of these practices by settled agriculture or horticulture has resulted in alienation of the lands from common categories, putting further pressure on the remaining commons.

3.41 For the areas with *jhum* cycles above 10 years, the tree farming model of Nagaland Environmental Protection and Economic Development Project may be studied. It provides for planting of fast-growing indigenous trees along with main crop to ensure that the trees attain harvestable girths by the subsequent slash and burn stage, and find demand in the timber market. While tree planting can be supported under NAP, appropriate market linkages for ensuring economic benefits to the farmers from the tree products will be quite useful. For this, opening up markets beyond NER with appropriate safeguards is important.

ECO-TOURISM

3.42 Eco-tourism, including homestead tourism, offers excellent possibilities of taking the benefits of nature conservation to local communities in many

ways. The protected areas and the adjoining terrestrial and wetland ecosystems have the potential to contribute to the rural economy and community development. A long-term policy is needed on eco-tourism, complementary with the conservation objectives and participation of the local stakeholders from the serving communities.

3.43 The eco-tourism plans should include modalities of managing the ecological and socio-economic integrity of the area, designs to strengthen the capacities of locally formed institutions, such as land management committee, waste management committee, alternative fuel technology institutions, tour operators committee, etc. The programmes should be taken up with the tourism sector and build on community ownership to promote equitable distribution of the net benefits.

PRESERVATION OF WILDLIFE AND FOREST BIODIVERSITY

3.44 The 1952 National Forest Policy provided for setting up of sanctuaries and national parks for preservation of wildlife. Enactment of the Wildlife (Protection) Act, 1972, launch of Project Tiger in 1973, Project Elephant in 1992, and the Biological Diversity Act 2002 are other milestones. Indian Ivory is banned and India is a member of the Convention on International Trade in Endangered Species of Wild Fauna and Flora. On the R&D front, WII, Central Zoo Authority (CZA), the new Tiger Conservation Authority, and

National Wildlife Crime Control Bureau show the increasing Central resolve to support the responsibility of States for conservation.

3.45 The public forests dedicated to the protection of wildlife habitats include 96 national parks and 509 wildlife sanctuaries. The total area of 15.7 MH, which is about 4.78% of the geographical area of the country covering about 20% of the total forests, is maintained under this protected area network. Scientific assessments of biodiversity of fauna, flora, and micro-organisms and well-organized retrievable databases for these are yet to be achieved.

3.46 During the Eleventh Plan, initiatives will be taken for mitigation of wildlife–human conflicts, involving and compensating local communities, management of habitats outside PAs, rehabilitation of displaced communities, and strengthening and protection of indigenous knowledge while improving research and monitoring systems.

INTEGRATED DEVELOPMENT OF WILDLIFE HABITATS

3.47 The CSS ‘Development of National Parks and Wildlife Sanctuaries’ provides assistance to the States for conservation activities in the wildlife areas. During the Tenth Plan, out of the outlay of Rs 350 crore, Rs 240 crore was allocated and 342 PAs have been covered. MoEF has prioritized the PAs on conservation value basis. However, all PAs do not have scientifically drafted management plans. At present, about 204 PAs

Box 3.1

Avoided Deforestation Incentive Mechanism for States

- There is no incentive to the States to protect forests. In the era of climate change, India has to depend on avoided deforestation as a mitigation step. In this context, there should be a mechanism that supports and encourages avoided deforestation. This money must be shared between the States and the forest dwelling communities.
- Satellite imagery can be used for determining the extent of avoided deforestation. The aim would be to pay for existing dense forest cover, at rates which reflect the opportunity costs of the forests. This will create local stakes and economic interest in dense forest protection.
- It is important to develop a compensation structure for the State Government and the local community. The Central Government should create a system for cess on all tax payers—a forest services tax (replace the road cess) to fund this mechanism.
- If such a strategy is developed internally in India, it can provide the framework to source carbon funds for avoided deforestation that can enhance economic benefits of protection and livelihood security.

are reported to have approved management plans. The principal objective of Central assistance being developing efficient management, the assistance needs to have linkages with the management plans.

3.48 The scheme may be renamed as 'Integrated Development of Wildlife Habitats' with wider scope for conservation. The support for management, protection, and development of PAs can be augmented by the following initiatives by MoEF:

- Evaluation of the non-recurring investment in the PAs should form the basis of further non-recurring assistance. The Central assistance can also be linked to the deployment of sanctioned frontline staff strength in the first place. The concept of project-based assistance with a provision of mid-course third-party appraisal may be considered.
- States should constitute specialized units for undertaking surveys, inventories, and the socio-economic analysis required for management planning and baseline landmarks for the PAs including the community and conservation reserves.
- Assistance for development of PAs should be based on the management plan and assessment of outcomes of the past interventions. Participatory management with village eco-development will be an earmarked component of the programme. Ministry will issue an eco-development resolution to the States with guiding principles, as was done in case of JFM in 1990.
- Assistance should also be provided for management of the identified special vulnerable habitats of high conservation value outside PAs on similar terms. This may include assisted regeneration for the vegetation components of such habitats.
- Species recovery and conservation programmes should also be supported for endangered species/ecosystems such as the Snow Leopard, the Great Indian Bustard, the Dolphin, and their habitats. Wide consultation will be undertaken for threat assessment and project formulation, considering the larger landscapes and socio-economic issues involved.
- Management of human-wildlife conflict may include compensation for damage from wildlife, measures to mitigate and avoid ingress of wildlife

movement into habitations, tracking, capture, and translocation of wildlife from high conflict areas in excess of carrying capacity, to other suitable habitats on case to case basis.

STRENGTHENING WILDLIFE MANAGEMENT

3.49 The Directorate of Wildlife Preservation with a network in major ports of import/export has been reinforced with National Wildlife Crime Control Bureau. The following components may be added to the programme.

- Studies and consultations needed for important areas of concern such as conservation values, biodiversity impact assessments, cost-benefit analysis of relocation proposals of habitations from wildlife areas, etc.
- Pilot projects for species focused initiatives and relocation of viable populations of wildlife species to new habitats, monitoring of the impact of rescue/conservation/outreach efforts, etc.
- A programme for rehabilitation of traditional hunting communities with the participation of NGOs, activists, forest department, and the revenue department.

CENTRAL ZOO AUTHORITY (CZA)

3.50 The CZA provides financial assistance to recognized public sector zoos having adequate land, potential, and willingness to develop as modern zoos. A laboratory for conservation of endangered species at the Centre for Cellular and Molecular Biology Hyderabad and five veterinary centres for zoo animal health care have been supported. The assistance to zoos includes modern housing and upkeep of animals including relocation of the existing zoos. During the Eleventh Plan, this may also include the following components.

- Support for rehabilitation and upkeep of animals of seven rescue centres created by CZA for rehabilitation of captive animals from the circuses.
- Development of a National Referral Centre at the Indian Veterinary Research Institute, Izatnagar (Bareilly) for specialized services and diagnostic facilities for health care of wild animals in Indian zoos.

PROJECT TIGER

3.51 The Tenth Plan period saw the depletion of tiger population from the Sariska Tiger reserve, resulting in the introspection through the Tiger Task Force. The methods of monitoring the status of wildlife have been found primitive. The recommendations of the Tiger Task Force are relevant for not only protected area management but also general forest management. The follow-up of the recommendations has resulted in the constitution of the Tiger Conservation Authority and Wildlife Crime Control Bureau at the Centre. Critical activities such as identification of areas feasible for relocation and inclusive protection strategies remain to be worked on. Out of about 1500 villages in tiger reserves, only 80 have been relocated so far including nine during the Tenth Plan period.

3.52 India eco-development project was taken up in seven tiger reserves during the Ninth Plan and the Tenth Plan at a cost of Rs 142 crore. The investments made for evolving a protected area management strategy with village eco-development as an important component are yet to be evaluated for sustainability. The evaluation of the project remains to be analysed for utility and cost efficiency in the context of extension to other protected areas.

3.53 The National Tiger Conservation Authority provides an institutional mechanism for Project Tiger. The prerequisites for efficient management, namely, filling up vacancies of frontline staff, capacity building for working in conservation areas, management planning on the acceptable principles of participatory processes, and scientifically sound systems for documentation and monitoring of the key constituents of the habitats should be ensured:

- Relocation of villages from the existing tiger reserves is a priority. The resources for this purpose will be earmarked in the annual plans on the basis of the project reports and feasibility.
- Specific arrangement for documentation of landmarks and progress on the basis of the socio-economic, population, habitat, and ecological indicators should be laid down for effective monitoring of the impact of management inputs in the tiger reserves.
- Village eco-development should be the core activity in the project. The assistance for the tiger reserves can be linked to the eco-development activities based on micro plans developed with full participation of local communities.
- Notification of any new tiger reserves should be considered based on the scientific data analysis as well as assessment of impact on local communities.

PROJECT ELEPHANT

3.54 The aim of Project Elephant is long-term conservation of viable elephant populations in the larger landscapes through strengthening or creation of corridors. Not enough attention has been paid to reduce human-wildlife conflicts. Much of the activities have been short-term responses to conflict situations. With increasing population, wild elephants are observed to be increasing their range by dispersing into new areas.

3.55 The project should focus on strategies for strengthening and developing elephant movement corridors. Possibility of relocation from the areas with the potential of restoration of habitats should be explored. For the captive elephant population, a complete database for monitoring the status of health and productivity should be aimed at. For State Governments maintaining domestic elephants, component for improving the *kraals* and training of *mahouts* may also be provided.

ANIMAL WELFARE

3.56 The Animal Welfare Board of India (AWBI) has been working on ensuring a humane dealing of animals in experimentation, during stress, of stray animals, and general protection from cruelty. The Animal Welfare movement has been largely based on NGO participation. The following components of animal welfare are dealt with by the Ministry under the plan:

- Provision of shelter houses.
- Provision of ambulance services for animals in distress.
- Animal birth control and immunization of stray dogs.
- Scheme for relief to animals during natural calamities and unforeseen circumstances.
- Assistance to AWBI.

- Assistance to Committee for the Purpose of Control and Supervision of Experiments on Animals.
- National Institute of Animal Welfare.

3.57 Proposed programmes for rabies control, *gaushalas*, and capacity building should be structured within the existing components. An information base along with fact sheets on the voluntary groups working in the field of animal welfare should be prepared. For National Institute of Animal Welfare, curricula

need to be designed based on the larger scope of career opportunities and subject related courses. A good programme of monitoring the status of stray dog population in the country can be taken up through collaborative, free, public domain knowledge resources based on student projects.

3.58 The total projected GBS for the Eleventh plan for the MoEF is Rs 8842 crore (at 2006–07 price) and Rs 10000 crore (at current price).