

NATIONAL FOREST POLICY REVIEW



INDIA

by

Indian Institute of Forest Management

Current situation of forest resources and the forestry sector

Introduction

The forest policy of India is based on the principle that sustainability is not an option but an imperative (Planning Commission 2001). While maintenance of the ecological balance remains an important objective of forest management, contributions that forests make to the livelihood needs of the rural poor, especially tribal communities, are a primary consideration (MOEF 1988). Forest management in India must address biodiversity and environmental conservation, assist in meeting the livelihood needs of around 350 million rural poor, expand forest cover and increase productivity in accordance with national and international commitments. Since the mid-1980s, the forest area has increased (FSI 2000). Conservation efforts are based mainly on collaboration among forest departments, local communities, people's representatives and NGOs (MOEF 2001a). Although the National Forest Policy (1988) is the primary policy statement regarding forest management, various policy statements on environment and wildlife management also guide the management of the forestry sector.

Land, population, economy and forests

India with its 328.73 million ha area is the seventh largest country in the world occupying 2.5 percent of the geographical area; but it only has 1.8 percent of the world's forest cover (Kumar *et al.* 2000). Forest management in India is constrained by the low per capita forest cover. Compared to 0.6 ha per capita world average, the country has just 0.07 ha per capita of forests. The country has about one-sixth of the world's population and about 18 percent of the world's cattle population (MOEF 2001a).

The recorded forest area¹ is 76.52 million ha, which constitutes 23.28 percent of the total area. The Forest Survey of India (FSI) assesses forest cover² every two years. Its recent assessment showed that from 1993 to 1998 forest cover increased from 63.34 million ha or 19.26 percent during the sixth assessment to 63.73 million ha, which is 19.39 percent of the total area (FSI 2000). This increase is a remarkable achievement considering the heavy withdrawals of forest products, shifting cultivation, forest fires, inadequate pasturelands, low investments and conversion of forestlands for non-forestry purposes. About 31.20 million ha of forest plantations were raised from 1951 to 1999 (FSI 2000).

There are 16 major forest types, and India ranks sixth among the 12 mega biodiversity countries of the world. About 15.6 million ha or 4.75 percent of the total area is set aside in 89 national parks and 497 sanctuaries dedicated to wildlife and biodiversity conservation (MOEF 2002a). Forest conservation and environmental values are considered to be of paramount importance. Ensuring adequate regeneration is a precondition for the approval of management plans, which include evaluation of the prevailing conditions of the forest resources and site-specific prescriptions according to local management objectives. Most forest divisions (468 out of 510) are covered by these forest management plans, also known as working plans, working schemes or management plans; 286 such plans are currently in operation. They accord the highest priority to soil and water conservation, the protection of forest cover and conservation of environmental quality and biological diversity.

Forests help to meet the needs of about 1 027 million people. The population is growing by 2.13 percent *per annum* and the population density is 324 persons/km² (GOI 2001). Demands for timber and fuelwood are around 64 million m³ and 71 million m³, respectively, and forests are also the main source of fodder and non-wood forest products (NWFPs). Forests support nearly 270 million out of about 450 million head of livestock (MOEF 1999). About 72.21 percent of the population live in rural areas (GOI 2001). Out of approximately 580 000 villages, 0.17 million are located in the vicinity of forests (MOEF 2002b). Forests make a significant contribution to the

1 All lands statutorily notified as forest although they may not necessarily bear tree cover.

2 All lands with a tree canopy density of more than 10 percent, although they may not be statutorily notified as forest.

rural economy particularly for poor households. The contribution of the forestry sector varies widely in different parts of the country. A recent calculation showed that the sector contributes about 2.37 percent of the GDP at market prices (Chopra *et al.* 2001). During 2001/02, the estimated growth rate of the real GDP in India was 5.4 percent, and the per capita income in real terms was estimated at Rs.10 653 or US\$218 (CSO 2002).

Production and trade of wood products

Most wood in India is used as fuel. The shortage of timber is likely to worsen. The timber industry is dispersed and hence collection of production- and trade-related data is difficult. India imports sizeable quantities of forest products worth more than Rs.80 billion *per annum* (Planning Commission 2002a). The data on production, import and export of wood products are given in Table 1.

Table 1. Production, import and export of wood and wood products 2000/2001

Item	Unit	Production	Import	Export
Industrial roundwood	'000 m ³	1 575	1 942	3
Other industrial roundwood i.e. poles, posts etc.	'000 m ³	14	0	0
Pulpwood	'000 m ³	397	0	0
Fuelwood including wood for charcoal	'000 m ³	5 912	0	0
Sawnwood	'000 m ³	NA	30	1
Wood-based panels	'000 m ³	294	93	65
Newsprint	'000 MT	400	264	1
Paper & paperboard (NES)	'000 MT	9 474	NA	NA

Note: MT = tonnes

Source: The Forest Statistics Cell, ICFRE (2002)

Current and emerging issues, trends and critical problems

Current pressing problems and emerging issues

Forests play an important role in the conservation of environmental quality by preserving soil and water resources and biological diversity. The shrinking natural resource base, rapidly increasing human and livestock populations and poverty are all responsible for the tremendous degradation and pressure on existing forest resources (Kumar *et al.* 2000). Consensus on approaches for forest, wildlife and biodiversity conservation is difficult to reach because of conflicting demands for forest products and services. Forest productivity continues to decline due to unsustainable exploitation. Supporting administrative, financial and legal mechanisms for the effective participation of local communities and the private sector have not been realized fully. Institutional reform in forestry needs to be pursued with greater vigour. Some states have shifted to enabling legislation with respect to land use, tree felling and transport of forest products. Other states need to follow this trend. Extension services are inadequate to attract private investment. Weak databases and information systems for resource utilization and management planning also cannot properly support decision-making (MOEF 1999).

There is a general consensus among government agencies, NGOs, communities and the private sector that the national goal should include improving forest conditions, afforestation on non-forest wasteland, biodiversity conservation and improved management of NWFPs. The Greening India Programme of the Central Government is dedicated to afforestation and improving forest conditions (Planning Commission 2001). Forest protection and the participation of local communities in forest management have attracted greater attention in recent years. Decentralizing the forest administration under the Joint Forest Management (JFM) Programme has gained momentum with the recently introduced forest development agencies (FDAs) in forest-rich districts (NAEB 2002). JFM has created formal planning and management space for local communities, and commensurate delegation of financial control is provided under the FDAs. Conservation of medicinal plants, control of desertification and improving bamboo productivity and utilization are other important issues (MOEF 2002c). Intellectual property rights and associated patenting have triggered a discussion on the threat of biological plundering of the forests (Shiva *et al.* 1999). The application of indigenous knowledge is also attracting attention (Pandey 1998). India has decided to adopt and operationalize criteria and indicators (C&I) for sustainable forest management (SFM). The Bhopal-India Process has initiated the drafting of a national strategy that includes a policy mandate, awareness raising and other modalities for implementing SFM (IIFM 2000; IIFM 2001). Some organizations, experts and interested citizen groups have pointed out the necessity for integrated conservation and development planning at the regional or landscape level (WII 2000; WWF 2001). Madhya Pradesh State has taken steps to integrate biodiversity concerns and the equitable sharing of benefits into district planning despite problems in coordination (GOMP 2002). The management of natural forests, forest grazing, forest fires and human resource development in the forest departments are national research priorities (ICFRE 2000). Formulation, analysis and implementation of the national forest policy as well as a national policy on biodiversity are among priority research themes (ICFRE 2000). Opinion is divided sharply on the issue of involving the private sector in the rehabilitation of degraded forestland for generating forest products for industries (Planning Commission 1998).

ADMINISTRATION AND MANAGEMENT

Administration and management of forests are the focus of forest agencies and civil society; forest planning approaches have been reviewed several times. Rationalization of forest development schemes, restructuring of the state forest departments (SFDs) and a number of forest-related public interest litigations are indicators of official activities (Upadhyay and Upadhyay 2002; Om Consultancy 2000). Judicial processes are being employed for forest protection with demands for greater accountability and financial allocation to the forest and wildlife sectors. The primacy of forest sustainability and forest and wildlife protection has been established in a series of court

orders (Upadhyay and Upadhyay 2002). According to a recent order executive performances may be examined for their effectiveness in protecting the forests (The Nagpur Bench of High Court, Interim Order in WP 1277 of 2000 on 12 June 2002).

Political and administrative processes are promoting participatory forest management, decentralization, and simplified and effective forestry schemes. For example, village committees provided with adequate funds establish plantations, and implement village development activities and other schemes of the FDAs under the umbrella scheme *Samanvit Gram Vanikaran Samirddhi Yojana*³ (NAEB 2002). Funds flow directly from the National Afforestation and Eco-Development Board (NAEB) to FDAs in the districts, which reduces the time lapse between planning and execution. Another example of the new budgetary process is the proposed National Afforestation Scheme that will merge four NAEB afforestation schemes (see below). The JFM experience has highlighted cross-sectoral linkages. Hence, the forest development activities are contextualized in the overall development process. The FDAs also implement rural development activities in forest fringe villages to ensure that local needs are addressed effectively with greater flexibility in project formulation and fund mobilization.

IMPORTANT SCHEMES

The government supported four main plantation-related schemes during the Ninth Five-year Plan:

- The Integrated Afforestation and Eco-development Projects Scheme targeted afforestation activities with people's participation.
- The Area-oriented Fuelwood and Fodder Projects Scheme (started in 1988/89) aimed at augmenting fuelwood and fodder supplies in the 242 districts identified as fuelwood-deficient. The scheme also promoted efficient use of fuelwood, and encouraged people's participation in project management.
- The Conservation and Development of Non-Timber Forest Products including Medicinal Plants Scheme was also initiated during 1988/89. Focusing on tribal populations, the scheme aimed at conserving and improving NWFPs, as well as increasing their production to provide additional income for tribals and the rural poor living in and around forests.
- The Tree and Pasture Seed Development Scheme provided financial assistance to state governments for developing facilities for the collection, storage, testing, certification and distribution of quality seeds including those of pasture grasses, legumes and superior stands of endemic grasses.

Forest departments consider JFM to be a primary program. JFM and field-level planning are to be linked with the implementation of forestry activities. JFM is changing the administrative approach of the forest departments. The village committees need to be involved in implementation. JFM has achieved impressive results in rehabilitating degraded forests and forest protection. The Forest Fire Control Scheme has received additional funds in recent years, and its coverage in terms of forest area and states has increased substantially. The proposed Integrated Forest Protection Scheme will include control of forest fires, timber poaching and forest loss.

International conventions and the national forest policy

CONVENTIONS AND INITIATIVES SIGNED BY INDIA

India has participated in the international dialogue on forests. India is signatory to the following international conventions that affect forest management:

- Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), 1973;
- Convention on Wetlands of International Importance especially as Waterfowl Habitat, (Ramsar, 1971);

³ Roughly translated, this means Integrated Village Afforestation and Prosperity Plan.

- United Nations Framework Convention on Climate Change (UNFCCC), 1992;
- Convention on Biological Diversity (CBD), 1992;
- United Nations Convention to Combat Desertification (UNCCD), 1994;
- Convention on the Conservation of Migratory Species of Wild Animals, Bonn, 1979;
- Convention for the Protection of the World Cultural and Natural Heritage, 1972;
- International Convention for the Regulation of Whaling, 1946; and
- The United Nations Convention on the Laws of the Sea (UNCLOS), 1982;

The provisions on trade and environment measures by the World Trade Organisation (WTO) Agreement significantly affect the forestry sector. India is committed to the implementation of Chapter XI of Agenda 21 and the non-binding Forestry Principles. India believes that all subsequent deliberations on the international arrangements or mechanisms should be guided by and be in consonance with the elements for action identified in Agenda 21 and the Forestry Principles (MOEF 2002d). The Ministry of Environment and Forests (MOEF) coordinates participation in the deliberations on international agreements related to the environment and forests. It develops appropriate national strategies, legislation and administrative instruments to address the obligations under the conventions.

IMPACT OF INTERNATIONAL CONVENTIONS ON PLANNING AND STATUTORY CHANGES

The international conventions have a significant impact on the planning process in the forestry sector. India prepared the National Forestry Action Programme (NFAP) in 1999 (MOEF 1999) and prepared a National Action Programme to Combat Desertification in 2001. The latter is consistent with the UNCCD, and will be implemented over the next 20 years (MOEF 2001c). In response to the CBD, a National Policy and Macro-level Action Strategy for conservation and sustainable use of biodiversity has been formulated, and a National Biodiversity Strategy and Action Plan for micro-level (state and local) action is under preparation (MOEF 2000c).

In response to the UNFCCC, several initiatives have been taken that include increasing the efficiency of conventional energy generation and use, the development of major renewable energy programs, promotion of clean coal and biomass energy technologies as well as forest conservation.

Recently, 20 new wetlands have been added to the Ramsar sites (Seventh Meeting of Ramsar Convention, 1999). This convention has helped in generating debate on wetland conservation. Recently, 183 wetlands of international importance have been studied, and guidelines for preparing management plans have been finalized. In addition, the directory of wetlands has recorded 2 107 natural and 65 253 human-induced wetlands occupying an area of 4.1 million ha (Planning Commission 2002a).

The CBD highlighted the need for a comprehensive statute dealing with the subject. In pursuance with the convention, the government drafted the Biodiversity Bill in 2000. The objectives of the convention are mirrored in the preamble of the bill, which states that the proposed legislation is to “provide for conservation of biodiversity, sustainable use of its components and equitable sharing of benefits arising therefrom”. The bill has been submitted to parliament.

International conventions have influenced India’s wildlife laws significantly. CITES in particular has influenced the provisions of the Wildlife (Protection) Act, 1972 and the Export-Import Policy. The MOEF has drafted a proposal to include new provisions in the act for regulating possession and trade of the species listed in the convention. The impact of CITES on wildlife conservation is exemplified in the country’s stand on ivory trade.

India is concerned about the impact of international economic and trade policies on forest management particularly the non-tariff barriers under the WTO. The Technical Barriers to Trade (TBT), Sanitary and Phyto-sanitary (SPS) measures and other measures related to the environment have potential implications on forestry product exports from developing countries.

Although SPS measures are meant to protect domestic forest resources from introduced pests and diseases, its use by developed countries as a disguised restriction on forest product imports cannot be ruled out. It potentially threatens exports from developing countries. Similarly TBTs prevent deceptive or illegal practices, protect human health and safety and prevent environmental degradation. However, the rising concern about forest degradation may express itself in unreasonable demands for environmental safeguards with negative implications for forest products exports from developing countries. For example, the export potential of Indian handicraft products may not be realized if western buyers demand rigorous certification. The Ministry of Textiles and its promotional agencies have already initiated the certification process for wood-based handicraft products to meet buyers' demands. However, the global community should be aware of the time and resources required in developing proper certification arrangements. It is worthwhile mentioning the importance of handicraft exports for poverty alleviation in the country, which has a significant impact on checking forest degradation. India is a net importer of wood and wood products, and it imports forest products worth more than Rs.80 billion. India's export/import policy does not require certification for the wood imports.

Mobilizing financial resources for SFM is problematic in most developing countries. Funds required for implementing planned activities cannot be generated internally. India believes that international arrangements and mechanisms must ensure adequate funding based on proposals and priorities outlined by the country concerned. India supports the establishment of a Global Forest Facility, along the lines of the Global Environment Facility (GEF), with adequate representation of developing countries that suffer from high pressure on their forest resources (MOEF 2002d).

Another significant issue is to synergize fora dealing with forestry-related issues. India has taken the view that duplication of efforts should be avoided in new international institutional arrangements or mechanisms on forestry-related issues. Enhanced coordination of the existing arrangements is more useful, and all opportunities for its promotion should be explored (MOEF 2002d).

Current national forest policies

National statement or objective related to forests

The National Forest Policy (1988) is the primary policy statement related to forestry, which reflects the ethical standards on the natural environment enshrined in the constitution. Forestry and the environment interface with many other sectors, which affect the forest and wildlife resources. Some of the prominent forest-related policy pronouncements are:

FOREST-RELATED PROVISIONS IN THE CONSTITUTION OF INDIA

The Constitution of India makes explicit reference to forest protection. According to Article 48A the “State shall endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country.” Further, “to protect and improve the natural environment including forests, lakes, rivers and wildlife, and to have compassion for living creatures” is one of 10 fundamental duties of every citizen under Article 51A of the constitution. Under the constitution both the central and the state governments may legislate on issues related to forests and protection of wild animals and birds. The Seventy-Third Amendment of the constitution and its extension to the Scheduled Areas⁴ through an act in 1996 affirms commitment to decentralized decision-making and devolution of authority to village institutions.

THE NATIONAL FOREST POLICY, 1988

The principal aim of the National Forest Policy (1988) is to “ensure environmental stability and maintenance of ecological balance including atmospheric stability, which are vital for sustenance of all life forms, human, animal and plant.”⁵ It unambiguously states that the “derivation of direct economic benefit must be subordinated to this principal aim⁶,” and that conservation includes preservation, maintenance, sustainable utilization, restoration and enhancement of the natural environment⁷ (Appendix 1).

Creating a massive people’s movement including the involvement of women and indigenous people for forest conservation is an integral feature of the policy⁸. The policy underscores the full protection of customary rights and concessions of tribal communities and other rural poor living within and near forests. It recognizes their requirements for fuelwood, fodder, NWFPs and construction timber⁹. The 1988 policy envisages the following objectives:¹⁰

- Conserving the natural heritage;
- Increasing forest/tree cover substantially through afforestation and social forestry programs;
- Meeting the requirements for fuelwood, fodder, NWFPs and small timber of the rural and tribal populations;
- Increasing the productivity of forests;
- Encouraging efficient utilization of forest produce;
- Creating a massive people’s movement; and
- Maintaining environmental stability.

The basic objectives and strategies defined in the policy are still relevant, and guide forest conservation in India. In 1997, a task force constituted to revise the policy agreed that the present policy takes into account relevant ecological, economic and socio-cultural aspects of forest management, and encompasses SFM. In addition to the National Forest Policy, the policy directives

4 They are predominantly tribal areas.

5 See § 2.2

6 See § 2.2

7 See § 1.1

8 See § 2.1

9 See § 4.3.4

10 See § 2.1

are also implicit in the National Conservation Strategy and Policy Statement on Environment and Development (1992) and various provisions and amendments of the Indian Forest Act (1927), the Wildlife (Preservation) Act (1972) and the Forest (Conservation) Act (1980).

NATIONAL FORESTRY ACTION PROGRAMME, 1999

The NFAP is a comprehensive long-term strategic plan for the next 20 years. It identifies the issues and programs for achieving sustainable forestry development in India by harmonizing the activities of different stakeholders. The NFAP evolved through coordinated centre-state strategic planning with inputs from many national and international consultants. It identifies five programs: (1) protect existing forest resources, (2) improve forest productivity, (3) reduce total demand, (4) strengthen the policy and institutional framework and (5) expand the forest area. As resources are inadequate efforts are being made to mobilize resources both from external and internal sources for implementing the NFAP. The MOEF, with FAO and UNDP, organized a conference of international donors for this purpose. Some funds have been mobilized through discussions with interested donor agencies of developed countries.

The Protect Existing Forest Resources program encompasses forest protection, soil and water conservation, and conservation of protected areas and biodiversity. The proposed activities include forest boundary management, settlement of tenurial issues, JFM, ecodevelopment, ecotourism, watershed protection, control of desertification and strengthening working plans.

The Improve Forest Productivity program consists of four items, (i) rehabilitation of degraded forests, (ii) research and technology development, (iii) development of NWFPs and (iv) assisting private initiatives with community participation. Integrated management for wood and NWFPs and other forms of multiple-use management and forest development through technology improvement are considered important.

The Reduce Total Demand program focuses on reducing the demand for forest products through technological interventions and other measures that increase the efficiency of forest products use. Superior cook stoves, improved cooking practices and alternative fuels, rotational grazing, stall feeding, value-added downstream processing, market manipulation and pricing mechanisms are some of the approaches.

The Strengthen Policy and Institutional Framework program aims at strengthening the central and the state forestry administrations and institutions. It covers forest policy and legislation, research, safeguarding intellectual property rights, development of information systems, extension and public education, and dissemination of information.

Tree plantations on forest- and non-forestlands with people's participation are envisaged under the Expand Forest Area program.

COIMBATORE CHARTER ON ENVIRONMENT AND FORESTS, 2001

The National Conference of the Ministers of Environment and Forests held at Coimbatore in January 2001 resolved to protect and improve the environment and forests, and outlined the strategies for realizing the goals of the National Forest Policy (Appendix 2). The resolutions address the following issues:

Forest cover and afforestation: The target of bringing 109 million ha or one-third of the total area under forest and tree cover is to be achieved during the next 20 years. States will increase investments in afforestation substantially. The budgetary process will be simplified for schemes related to enhancing the forest cover of the country. As practised in the past, the Planning Commission will be persuaded to earmark one-fifth of the rural development funds for afforestation.

Approaches to forest rehabilitation: JFM will be the main approach for regenerating degraded areas with natural rootstock, and technology-based plantations with substantial investment will be established in degraded or treeless areas. Bamboo plantations, medicinal plantation projects and coastal shelterbelt plantations are identified as the thrust areas.

Forest fire control: States will adopt the project approach for controlling forest fires in accordance with the National Fire Prevention and Control guidelines of 1999. JFM committees will be engaged in forest fire prevention and control.

Strategy in drought-prone areas: Special measures for drought-prone areas will include tree plantations on non-forestlands, water-harvesting measures on forest- and non-forestlands, a fodder development program and organizing cattle camps.

Infrastructural strengthening: Priorities for strengthening infrastructure include filling vacant field positions and provisions for forest roads, buildings, communication equipment, vehicles and arms required for forest protection.

Long-term operational planning: Preparation and implementation of working plans for management including boundary demarcation, prevention of encroachment, control of pests and diseases, natural regeneration, felling and other silvicultural operations; this will be carried out with the approval of the central government.

Controlling wildlife offences: An effective mechanism for intelligence gathering and a database of habitual offenders as well as investigation and prosecution of offenders will be developed for reducing wildlife offences. An effective enforcement infrastructure will be created to prevent poaching within and outside protected areas.

THE NATIONAL WILDLIFE ACTION PLAN (2002-2016)

The National Wildlife Action Plan has six major programs: (1) strengthening and enhancing the protected area network, (2) effective management of protected areas, (3) conservation of wild and endangered species and their habitats, (4) restoration of degraded habitats outside protected areas, (5) control of poaching, taxidermy and illegal trade in wild animal and plant species, and (6) monitoring and research (MOEF 2002a).

MAIN DEVELOPMENT PROGRAMS

While the NFAP outlines forestry development programs, lack of financial resources is a major constraint for its implementation. A number of afforestation and other development programs are supported by the central government under the centrally-sponsored programs. The central and state governments share the budgetary support of similar schemes under the central assistance programs. However, the state governments implement the forestry development programs mainly from their own plan and non-plan sources. Thrust areas include afforestation, forest protection including boundary demarcation, JFM, assisted natural regeneration, application of information technology for forest management, reorganization of the forest departments and capacity building. The share of the budget allocations to the forestry sector has remained low, at about one percent. Hence, many states have sought and obtained loans from international organizations and developed countries. Twenty-five projects covering about 4.0 million ha of forestland in 17 states have been completed. Ten ongoing projects, including one in the central sector, with a total project cost of 29.61 billion rupees are operational.

DISSEMINATION OF POLICY INFORMATION

The provisions of the Rules of Business in the central and state governments and various guidelines require constant interaction of the related departments. Consultations reach from policy formulation to implementation. Administrative procedures such as standardized mailing lists, official publications and web sites, among others, facilitate sharing and dissemination of policy pronouncements and decisions. Further, regular cross-referencing of different policies encourages officials to look into forest-related policies. Frequent media coverage and the public debate on forest-related issues also draw the attention of officials and concerned citizens.

FOREST POLICIES RECOGNIZED BY OTHER INSTITUTIONS

Two categories of agencies explicitly or implicitly recognize forest policies in their own policies, programs and activities: (1) Agencies dealing with non-forestry development, such as irrigation, road construction, electricity transmission and mining, often require forestland, and consequently, they interface with forest agencies. (2) Agencies dealing with issues that directly or indirectly link to forest-based resources (e.g. tribal, livestock, watershed, rural and industrial development).

Specific forestry policies and thrust areas

Forest conservation: The diversion of forestland for non-forestry development is regulated in accordance with the principles of sustainable development by statutory provisions, which also include general guidelines for mitigative measures such as compensatory afforestation. Conversion of forestland to agriculture has been ruled out. The forest industries are encouraged to procure raw materials from non-forest areas.

Wildlife conservation: Protection of species and their habitats is a key policy goal. Creating an effective enforcement infrastructure, capacity building and development of adequate expertise on wildlife-related matters are priorities. Protected areas continue to increase (Table 2). The Ecodevelopment Programme for harnessing people's participation in wildlife protection and conservation has been recognized as an essential part of effective protected area management (MOEF 2001b).

People's involvement in forest management: Affirmation of the national policy for people's participation in forest management is expressed in JFM, which emphasizes the creation of an enabling environment, empowerment and capacity building of village communities and

local forestry officials. Future activities under JFM will focus on regeneration, productivity enhancement, relationships with other local institutions, intersectoral linkages, sustainability, equity and other livelihood issues. Encouraged by the success of the JFM, Madhya Pradesh State has encouraged voluntary adoption of scientific forest management by the owners of tree-covered private and community areas through the *Lok Vaniki*¹¹ program, which contrasts with the earlier thrust on direct control of or intervention in the management of private forests (GOMP 2001).

Forest management: Forests in India have the potential to yield 139 to 235 million m³ per annum compared to the current 88 million m³ (Pachauri and Sridharan 1998). The 10-year operational and working plans address objectives related to conservation, productivity improvement and responsible use of forest resources. In addition to technical and scientific details, the working plans also link site-specific micro-planning for meeting local needs with strategic plans at the state and national levels. Adequate investment in forest regeneration is an essential precondition for forest harvesting. If regeneration is inadequate, harvesting will be restricted. The working plans prescribe felling restrictions in ecologically fragile areas (e.g. steep slopes, riparian zones) and important wildlife habitats. There is a ban on tree felling in forests 1 000 m above sea level.

Forest management information system: The forest policy recognizes the need for data collection and the dissemination of reliable information for forest management. The policy stipulates that "periodical collection, collation and publication of reliable data on relevant aspects of forest management needs to be improved with recourse to modern technology and equipment."¹²

Year	National parks	Sanctuaries	Area (km ²)
1975	05	126	24 000
1980	19	205	76 000
1993	75	421	142 923
1995	80	441	148 000
2002	89	497	156 000

Source: MOEF 2002a; Khare *et al.* 2000.

¹¹ Lok Vaniki means people's forestry.

¹² See § 4.14

What is JFM?

JFM is a forest management strategy by which the government (represented by the Forest Department) and a village community enter into an agreement to *jointly* protect and manage forestland adjoining villages and to share responsibilities and benefits. The village community is represented through an institution specifically formed for JFM. This institution is known by various names in different states but is most commonly referred to as the Forest Protection Committee (FPC). In some states, *panchayats* can also enter into a JFM agreement with the Forest Department. Under the JFM, an FPC takes the responsibility for protecting a forest area from fire, grazing and illegal harvesting. In return, it receives greater access to forest produce and a share in income earned from that forest area (MOEF 2002b).

Trees outside forests (TOF): TOF play an important role in supporting rural economy and livelihoods as well as in environmental amelioration. Developing and understanding their role, their assessment and introducing appropriate technological and institutional mechanisms to augment and harness their potential for social development are receiving considerable attention (Rathore and Prasad 2001; Prasad *et al.* 2001).

Policy instruments

The National Forest Policy advocates the use of miscellaneous policy instruments including legislation and regulation, voluntary agreements, fiscal incentives, research and educational and extension campaigns for the conservation and sustainable development of forests. The administrative framework of the forestry sector has changed significantly from regulatory to participatory.

The legal framework of the forestry sector can be classified into three categories. The first set of acts regulates access and use of forest products such as the Indian Forest Act (1927). The second set focuses on conservation such as the Wildlife Act (1972) and the Forest Conservation Act (1980). The third set comprises enabling laws that encourage private investment. Restrictive laws with regard to land ceilings, tree felling, transit passes and marketing have discouraged the private sector from engaging in farm forestry and agroforestry. Recently, various state governments have passed enabling laws (e.g. relaxing tree felling and transit rules). For example, the Madhya Pradesh Lok Vaniki Adhinyam (2001) provides comprehensive support to private tree growers.

The financial incentives for private and community tree planting vary among states. Incentives include subsidies for farm forestry and for planting of trees on public land. Some state governments (e.g. Madhya Pradesh) provide wasteland outside forest areas on a long-term lease basis for planting trees. The land ceiling has also been relaxed for plantations in some states. The central and state governments provide assistance to the panchayats to plant trees on community land. NGOs are providing grants for afforestation and tree plantation on public and private wasteland adjoining forest areas. The government also rewards innovative initiatives in afforestation.

Perverse incentives in the form of pricing concessions and long-term agreements to supply wood to forest-based industries have been abolished in many states. The subsidy on fuelwood and timber required for subsistence use has also been rationalized by some states. States have tried to create markets for forest produce. However, it is unrealistic to rely entirely on market forces or voluntary efforts. Governments have the responsibility for safeguarding NWFP collectors against exploitation by middlemen. Hence in many states, important NWFPs have been nationalized, which means that only the government or its agent can purchase these products.

The National Forest Policy emphasizes support for forestry research, education and extension. The Indian Council for Forestry Research and Education (ICFRE) supported by the central government conducts research according to the priorities laid out in the National Forestry Research Plan in coordination with state-supported research organizations and universities. It also

imparts forestry education and supports the development of curricula at various levels to accelerate the pace of research and provide expertise in various fields. Other institutions supported by the central government provide technical support to the SFDs and private tree growers. The government also supports awareness-raising activities and provides information and technical guidance to tree growers.

Non-forestry policies affecting the management of forests and trees

Forestry competes with most economic sectors that deal with natural resources. Contradictions and inconsistencies between forest policy and other sectoral policies are not unusual, and affect the forestry sector in numerous ways. The government adopted the National Conservation Strategy in 1992 to ensure that environmental issues are considered in developmental policies. The strategy identifies two broad categories of environmental problems:

- those caused by negative effects of development; and
- those caused by poverty and lack of development.

The strategy identifies priorities and actions for population control and conservation of natural resources based on the concept of sustainable development. It highlights the importance of integrating environmental considerations in the policies and development programs of various sectors, and identifies steps to be taken in key sectors such as agriculture, irrigation, animal husbandry, forestry, energy, industry, mining, tourism, transport and human settlement (Appendix 3). In general, recent non-forestry policies have responded positively to the provisions of the National Conservation Strategy.

The National Population Policy (2000) aims to reduce population growth through decentralized decision-making. The target is a stable population by 2045. The policy envisages involving the MOEF, field-level functionaries of the SFDs and village self-help groups created under JFM in planning and implementation. It also recognizes the potential of social forestry in reducing the time spent on fuel and fodder collection by women and children. The time saved can be used for children's education, which will eventually help in population control. The National Policy on Education (1986) aims to promote values supporting environmental protection and recognizes the importance of creating environmental consciousness.

The central government plays an advisory and coordinating role for land reform. The constitution provides legislative and administrative jurisdiction on land issues to the states. A Land Resource Management Policy and Approach is under consideration by the government. The policy outlines of 1988 focused on conservation, sustainable development and equitable access to benefits. It envisages coordinating the formulation and implementation of water resource management policies, forest management policies and urban planning within the overall national land-use policy.

The National Water Policy (2002) envisages the preservation of environmental quality and ecological balance in the planning, implementation and operation of irrigation projects. It encourages less-water demanding land uses in drought-prone areas.

The National Agriculture Policy (2000) seeks to promote technically sound, economically viable, environmentally non-degrading and socially acceptable uses of natural resources – land, water and genetic endowment – to promote sustainable agricultural development. It foresees the integrated and holistic development of rainfed areas by conserving rainwater via vegetative measures and augmenting biomass production through agroforestry and farm forestry. It also pays greater attention to the management of grazing land to supply animal feed and fodder normally obtained from forests. Agricultural intensification relieves pressure on marginal lands where most remaining forests are located (Kumar *et al.* 2000).

The National Livestock Policy is being finalized. The National Livestock Policy Perspective (1996), however, envisages the sustainable growth of the livestock sector. It aims to promote programs such as JFM, community fodder farms and grazing land protection committees for the sustainable use of local natural resources (MOA 2001).

A Comprehensive Renewable Energy Policy is in preparation (Lok Sabha 2002). Several policy measures support the spread of renewable energy technologies. Major policy initiatives including the provision of fiscal and financial incentives have been undertaken to encourage private and foreign investment in renewable energy sources, particularly technology upgrading, introduction of new technologies, market development and export promotion (MNES 2002).

The National Mineral Policy (1993) recognizes the close links between extraction of minerals and other natural resources such as land, water, air and forests. The policy provides comprehensive guidelines for the sustainable development of mineral resources without undermining forests, environment and ecology.

Basic principles for ecotourism as defined in the “Ecotourism in India – Policy and Guidelines, 1998” include compatibility with, and lower impact, on the environment. Biosphere reserves and forests are identified as ecotourism resources. The guidelines highlight scientific planning based on the thorough understanding of local resources and carrying capacity as well as continuous monitoring and detailed codes of conduct for developers, operators, visitors, host communities, NGOs and research institutions. The new policy on tourism is also being finalized.

The Industrial Policy (1991) highlights the need to preserve the environment, and ensures efficient use of available resources by industries. The policy includes the removal of compulsory licensing requirements and relaxes import restrictions for many raw materials. Plywood, veneer and wood-based particleboards, medium density fibreboard, block board, paper and newsprint (except bagasse-based units) processing have been removed from compulsory licensing requirements. The investment ceiling has been raised to Rs.300 million. Other policy measures to enhance industrial investment include reduction of income taxes and corporate taxes, excise duties and customs duties on raw materials (Chemprojects 1999).

The Export Import Policy (2002-2007) regulates the export and import of plant and animal products consistent with provisions of the Wildlife Act (1972) and CITES. The liberalization of wood and wood product imports has helped to reduce pressure on natural forests. However, the lower prices of imported products are affecting the growth of paper and paper product industries adversely (Chemprojects 1999).

Policy formulation

Processes of forest policy formulation

In the past, policy formulation was dominated by the policy community¹³ consisting of a small number of “experts” and consultants. There is a widely held view that the role of bureaucracy in policy formulation has been pervasive (Jain 2001). In recent years, the participation of civil society in policy-making fora has increased and policy-making has become consultative with emphasis on facilitating stakeholder discussions instead of only harnessing expert knowledge. The government is making genuine efforts to reach out to many actors at the local level. This is evident from the process adopted to formulate the National Biodiversity Strategy and Action Plan (NBSAP), in which workshops and public hearings at the district and *talukas* (sub-district) levels are being organized to seek inputs from farmers, pastoralists, the fishing community, and other users who are dependent on biodiversity (MOEF 2002e). According to Jain (2001) public policy-making in India is perhaps more polyarchal than in any other country, because of the existence of a federal polity, the pluralistic nature of society, a free press, and conflicting demands made by different groups through an active and expanding network of communications.

Formalization and legitimization of the policy formulation process

The government has played a central role in the management of forests in India since the establishment of the Forest Department and national forest policies have been providing guiding principles to the states for managing forests. Several states have also formulated state forest policies, under the framework of the National Forest Policy, to consider the special characteristics of the state (GOC 2001). Managing forests was the sole responsibility of the state until 1976, as “forest” was classified as a “state subject” under the constitutional division of responsibility. The Forty-Second Constitutional Amendment placed forests in the concurrent list, which implies that both central and state governments share responsibility and control over forestry matters. However, forest protection, management and utilization remain with the states, which mostly decide on the staffing and resources required for implementing policies.

The Constitutional Amendment Act has mandatory provisions for the creation of a three-tier local government (*panchayat raj* institutions) structure at the district, block and village levels in rural India. These institutions have been vested with powers to decide on wide-ranging subjects listed in the Eleventh Schedule of the constitution, which includes social and farm forestry, minor forest produce¹⁴ and fuel and fodder. The Seventy-Third amendment excluded tribal people (except for reserved areas) and Scheduled Areas from the act. The Bhuria Committee was set up in 1994 to formulate a law for extending these provisions to the Scheduled Areas and to suggest modifications in other acts relevant to the Fifth Schedule to strengthen institutions of local self-government in the Fifth Schedule areas. On its recommendation, the Provisions of the Panchayats (Extension to the Scheduled Areas) Act, 1996 (PESA) came into effect in December 1996. PESA authorizes the tribal *gram sabha* (village assembly) to control all non-timber forest resources. Thus, the legislative powers on forestry matters are fairly decentralized to the village level.

Revisions of the national-level policy involve an extended and complex political process. Usually, it starts with the creation of a review committee by the ministry, which includes major stakeholders who are recognized as experts. After extensive consultations during which the existing policy and its implementation are reviewed, the committee prepares a draft report. After obtaining concurrence from the minister-in-charge, the draft note is sent to all concerned ministries or departments to obtain their views on the proposal. Cases of new policy initiatives or policy changes, which require the coordination of various ministries are discussed in the Committee of Secretaries, which is the highest advisory body of bureaucracy. This process helps

¹³ The policy community includes a section of forestry bureaucracy and all other stakeholders actively engaged in policy processes.

¹⁴ Certain identified NWFPs.

in reducing inter-sectoral inconsistencies in the policies. In the case of legislation, the draft documents are circulated to all the states and union territories for review. The draft has to be referred to the Ministry of Law and Justice for advice on legal feasibility and constitutional congruity. These processes have been laid down clearly in the Rules of Business (GOI 1961a,b). The policies are approved finally by parliament.

The Planning Commission is responsible for assessing all national resources, augmenting deficient resources, formulating plans for the effective and balanced utilization of resources and determining priorities; it plays an important role in policy-making (Planning Commission 2002b). Although the five-year forestry sector plans are based on the National Forest Policy, priorities within the policy objectives are determined by the allocations made by the Planning Commission. Similar bodies have also been created at the state level.

Various lawsuits against the Union of India exemplify major judicial interventions in the national forestry administration (Upadhyay and Upadhyay 2002). A milestone suit was brought before the Supreme Court of India seeking judicial intervention in the implementation of the provisions of the National Forest Policy (1988). A series of orders was passed in this case, which have long-term implications for forest management. Implications include: (1) The definition of forests has been widened to cover any area understood as such according to the dictionary meaning. Accordingly, the Forest (Conservation) Act (1980) will be applicable not only to government forests, but also to any area recorded as forests in the government records, irrespective of ownership. (2) The forest will be managed strictly in accordance with the prescriptions of the approved working plans. (3) Environmental audits of compensatory afforestation and their publication have become mandatory.

Stakeholder participation in policy formulation

Vira (1995) has identified 13 groups, namely, central and state governments, forest bureaucracy, subsistence users, medium and large farms, powerful local politicians, forest-based industry, forest contractors, NGOs, social activists, conservationists and the international community as stakeholders. Their interests depend on forest policy and agencies and have a bearing on policy evolution. The government has begun to realize the importance of a meaningful dialogue with NGOs and other members of civil society in crafting new policies. It is making special efforts to engage civil society by giving responsibility to NGOs to facilitate the identification of stakeholders and dialogue between government officials and civil society. This arrangement is believed to help democratic deliberations. The task of obtaining the views of voluntary organizations on the proposed amendment to the Indian Forest Act (1927) was given to an NGO, the Indian Social Institute in New Delhi. Similarly, Kalpvriksha (also an NGO) is coordinating the formulation of National Biodiversity Strategy and Action Plan.

Capacity to formulate, implement, monitor and evaluate policies

The MOEF plays a pivotal role in formulating basic policy guidelines and legislation for forest management. It facilitates policy dialogue to achieve national consensus on complex forestry issues using fora like parliamentary committees, the Indian Board of Wildlife, periodic conferences of forest ministers of states and consultations on forest management with the state forest secretaries and principal chief conservators of forests. A separate forest policy division has been established in the MOEF with primary responsibility to review and articulate forest policy. Policy analysis units have also been set up in some states in the offices of the principal chief conservators of forests.

The reform of the forestry sector has been debated and discussed at great length in recent years especially in states where externally-aided forestry projects have been in operation. Several studies on the functioning of the sector were commissioned by the MOEF and the SFDs. These studies have made a number of recommendations on the reform needs of the sector. Some recommendations have been taken up while others are yet to be implemented by different states (Om Consultants 2000). Many SFDs have been reorganized to implement the objectives of the

National Forest Policy (1988) effectively. Also, several policy changes have been made by state governments to create a market-oriented environment and an appropriate legal and administrative framework conducive to people's participation in forestry. Of particular importance are reduction or removal of subsidies, modification in timber felling and transit rules, and benefit-sharing arrangements in JFM.

The upper level of the forest bureaucracy plays a crucial role in initiating policy analysis mainly because of its technical knowledge. Officials undergo a rigorous three-year training course at Indira Gandhi National Forest Academy (IGFNA) that focuses on building policy analysis capabilities. The Research and Training division of the MOEF is organizing short-term training courses for forest officials to update their policy analysis capabilities. Periodically, the MOEF and the SFDs commission studies on specific policy issues to benefit from expert opinions. Some studies have highlighted the need for further strengthening of the policy analysis capacity of the forest bureaucracy. Khare *et al.* (2000) recommended upgrading policy analysis capacity at the state level, collaborating with national and international institutions working on policy, strengthening the policy cell and redefining the role of the central government. The World Bank has pointed out that MOEF leadership is required to take initiatives in legal and policy reforms (Kumar *et al.* 2000).

Forest policy implementation and its impacts

Implementing the forest policy

The SFDs are the main agencies for implementing the forest policy. The central government provides financial, regulatory, research, education and extension assistance and reviews the implementation of the National Forest Policy.

FINANCIAL ASSISTANCE

The MOEF provides funds for SFDs to implement forest development programs. It also assists the national Planning Commission in deciding outlays for the forestry sector in state plans. Assistance for forestry is monitored by the National Afforestation and Eco-development Board (NAEB) housed in the MOEF. The NAEB has set up seven regional offices in the country to coordinate with the states. The JFM network created at the national level also assists policy-makers in obtaining feedback for proper policy formulation (MOEF 2002b).

As internal resources are inadequate, the MOEF is making efforts to mobilize resources from external sources. The Externally-aided Project Division of the ministry assists states in obtaining funds from donors. The current average investment in the forestry sector is around Rs.16 billion from all sources. This compares to the average annual requirement of Rs.52.85 billion according to the NFAP. The sustainability of participatory institutional development is a complex issue in a highly differentiated society like India, where the poor have little voice and the SFDs are starved of resources (Kumar *et al.* 2000). Inadequate resources seriously constrain the implementation of the National Forest Policy.

RESEARCH AND EDUCATION ASSISTANCE

The ICFRE provides research and education support to the forestry sector. It is an autonomous body with eight institutes located in different parts of the country entrusted with the responsibility of carrying out research on national and regional priority issues. It also provides research support to universities, industries, NGOs and others. A National Forestry Research Plan (NFRP) prepared by the ICFRE translates the requirements of the National Forest Policy of 1988 into detailed research programs and has been implemented since April 2000. It is linked closely with the NFAP and the five-year plans. The ICFRE along with other institutions such as the Wildlife Institute of India and the Indian Institute of Forest Management are also providing forestry education. The Forest Survey of India monitors forest cover and publishes a State of the Forest Report biennially.

RECRUITMENT AND TRAINING

Recruitment and training for the Indian Forest Service (IFS) is controlled by the MOEF. It also provides training to professionals recruited by the states and approves the syllabus of range officer's induction training. This centralized system helps in identifying training needs and building the capacity of forestry professionals.

REGULATORY ASSISTANCE

The MOEF has set up six regional offices to coordinate with state governments. These offices mainly monitor the implementation of the Forest Conservation Act (1980) and all ongoing forestry development projects including centrally sponsored schemes with specific emphasis on forest conservation. It assists the states in preparing forest management plans that have to be approved by the MOEF. This process ensures the congruity of the plans with the National Forestry Plan. The Wildlife Division of the MOEF, which is supported by four regional offices, monitors wildlife-related law enforcement and implementation of centrally assisted programs and schemes. Steering committee members of Project Tiger and Project Elephant as well as officials of the ministry review the management of national parks and sanctuaries, and tiger and elephant reserves. The export and import of forest products are also regulated by the central government.

CHANGES IN RULES AND OTHER STATUTORY PROVISIONS

Since 1 June 1990, the MOEF has directed the state governments to involve local communities in the management of degraded forests and requested NGOs to facilitate the process. Numerous states issued enabling resolutions to adopt JFM. Currently, 27 states have adopted JFM (MOEF 2002b). The central government issued new guidelines on 21 February 2000 to further strengthen JFM.

The central government updated the Indian Forest Act (1927) in 1989 primarily to conform with the National Forest Policy and to consolidate progressive amendments made in different states. The draft bill was circulated to all states and union territories for comments. Consultations with different stakeholders were also held. The bill has been revised several times, and the process is likely to be completed in the near future. The translation of the policy into statutory provisions is time-consuming due to the elaborate processes involved. Although India has a well-articulated forest policy, its translation into a feasible strategy has been slow (Kumar *et al.* 2000).

MONITORING

Several institutions monitor policy implementation at the central and the state levels. State governments have two types of monitoring mechanisms. Mid-level and senior-level officials of the department monitor the progress in implementing forestry schemes. Policy analysis units have been set up in some states and some states have independent monitoring and evaluation units. Further, the state finance and planning departments also monitor policy implementation as do independent agencies like the Office of the Accountant General and legislative committees.

The central government monitors policy implementation in various ways using parliamentary committees, the Indian Board of Wildlife, conferences of forest ministers and consultations with state forest secretaries and the principal chief conservators of forests. A separate Forest Policy Division of the MOEF has the primary responsibility to monitor policy implementation. The regional offices of the MOEF and the NAEB also have monitoring functions.

Impact and effectiveness of forest policy

All the directives concerning environmental protection and forest management were retained and reinforced in the National Forest Policy. However, emphasis has shifted toward people's participation in forestry

COMMUNITY FOREST MANAGEMENT

JFM covers more than 14 million ha of forestland under 63 618 JFM committees (Table 3). More than 2.8 million families are involved, and about one-fourth of them belong to indigenous or disadvantaged communities (MOEF 2002b). JFM has had several positive impacts, including the improvement of forest conditions, reduction of encroachment, raised income of local people and improved relationships among local communities, NGOs and the SFDs (MOEF 2002b; Kumar *et al.* 2000).

Table 3. Spread of JFM in India

Year	Number of committees	Area under JFM (ha)
1999	34 932	7 019 957
2000	44 493	11 629 538
2002	63 618	14 095 360

Source: MOEF (2002b); Planning Commission (2001); Khare *et al.* (2000).

About 170 000 villages are located within 5 km from forest areas, and 20 000 additional JFM committees are to be organized each year over the next five years (MOEF 2002c). The February 2000 Guidelines on JFM address a number of issues including legal backup to village committees, effective participation of women, conflict resolution and recognition of self-initiated groups. For policy formulation, coordination and guidance, a JFM network with the Director-General of Forests as its chairperson has been established in the MOEF. The network consists of government officials, representatives of leading NGOs, donor agencies and premier forestry institutions. This

network should carry forward the commitment to multi-stakeholder dialogue at various levels and promote experimentation to ensure more effective forest conservation (MOEF 2001a).

AFFORESTATION

The public and the private sectors are engaged in afforestation and promote private nurseries and state-of-the-art nurseries, which are an important component of the afforestation programs. Kumar *et al.* (2000) have noted a higher survival rate of seedlings in recent years.

LAND-USE STRATEGY

According to forest policy directives, forest industries are to cooperate with farmers to produce raw materials. Forestland will not be leased to forest-based industries. Rejection of earlier practices of allowing cultivation on encroached forestland is another bold decision. Further, enabling legislation related to the management of private forest and tree resources should have a positive impact on the future shape of forestry.

SFM

The Working Plan Code for forest management in forest divisions is at the final stage of revision. The country is also developing and testing C&I for sustainable management of the tropical dry forests under the Bhopal-India process. Substantial funding has been made available for forest fire prevention and control, and forest protection schemes have received the highest priority. The fire budget rose from Rs.13.04 million in 1992/93 to Rs.145.00 million in 2001/02. State funds are being utilized in much larger proportions than funds provided by the central government (MECON 2001).

NWFP MANAGEMENT

NWFP collection, marketing and processing are important elements of the forest policy. State legislation favours local communities in benefit-sharing arrangements. The central government and different states have set up Medicinal Plant Boards for the promotion of medicinal plants. There is also a thrust on bamboo development for supporting the livelihoods of the rural poor.

WILDLIFE-RELATED POLICIES

The country is setting up a representative network of scientifically managed protected areas to ensure ecological security and the conservation of biodiversity and the environment. The eco-development of areas adjoining national parks and sanctuaries has reduced park-people conflicts and supports the livelihoods of millions of rural poor and tribal populations. Ecotourism has been declared a thrust area to support local livelihoods. This has helped to reduce poaching.

FOREST INFORMATION MANAGEMENT

Although mandated in the forest policy, the development of a comprehensive forest information system at the national level is only at a rudimentary stage (Prasad and Rathore 2000).

Conclusions and recommendations

The policy formulation process in the forest and wildlife sectors has moved away from the domain of bureaucracy and experts to consultations with many stakeholders from the public and private sectors and civil society. Gradually, policy changes have expanded the role of local committees in terms of functional areas. Communities are increasingly involved in forest protection and the implementation of forestry schemes at the local level. The need to strengthen capacities of local committees and village leaders remains.

The requirements of the forestry sector seldom appear on the priority list of the state exchequer, and budget allocations to the sector have remained low. External assistance has become important for implementing long-term structural changes. The mobilization of adequate resources for forestry programs and the inordinate delay in translating policies into statutory provisions require immediate attention.

Until recently, policy assessment was the exclusive domain of top-level bureaucrats and national experts, and assessments tended to be subjective. The participation of more stakeholders in monitoring and assessments has increased objectivity, although coordination remains a challenge. The new approach for preparing, implementing and monitoring site-specific plans provides an opportunity for local communities to participate in decision-making. The new approach also requires institutions to strive for the right balance of effectiveness, efficiency, equity and sustainability. The changes in the policy process require problem-oriented forest policy research.

Recommendations

Resource mobilization: The forestry sector needs a substantial increase in funds. Resources required for achieving SFM are not available within the country. More efforts are necessary to mobilize external funds to ensure forest sustainability and livelihood security for communities living in and around forest areas.

Coordination issues: The multiplicity in the present management of the forestry sector requires effective coordination, including managing obligations arising out of international conventions and among different management levels, and perspectives and commitments arising out of policy pronouncements at the national level.

Capacity building: The deepening of democracy has increased opportunities for participation. This requires capacity building for local communities and field officers, which should not only focus on managerial skills, but also on competence to participate in the policy process.

Policy research: New demands by various stakeholders require a greater understanding of the policy process. Institutions for forest policy research should be strengthened and researchers and practitioners working in the forest policy process need to interact frequently, and exchange ideas and experiences. A regional forum should be established in one of India's premier forestry institutions to facilitate the sharing of experiences by countries that implement participatory forest management.

Strengthening of community forest management: JFM has shown positive results, but requires further administrative and legal support that favours local communities. Conflicting demands on forest resources by different parts of society are increasing. Disputes within and among JFM committees as well as between the Forest Department and NGOs and committees are not uncommon and should be addressed. The present formal methods in the forestry sector cannot solve all problems in an efficient, equitable and administratively practical manner. Therefore, the government should take steps to develop a comprehensive strategy for managing conflicts.

Operationalizing SFM: The country is committed to SFM. However, the development of an institutional monitoring mechanism based on C&I is challenging. Technological, administrative and social mechanisms should be developed.

Creating a forest management information system: Many policy decisions in the forest sector are based on incomplete information, which affects the quality of decisions adversely. A suitable forest management information system should be developed at all decision-making levels. National institutions like the Indian Institute of Forest Management, the ICFRE and the Forest Survey of India can play important support roles in this activity.

References

- Chemprojects. 1999. Study on role of industry in forestry <http://www.envfor.nic.in/nfap/welcome.html>
- Chopra, K.; Bhattacharya, B.B. & Kumar, P. 2001. *Contribution of forestry sector to gross domestic product (GDP) in India*. New Delhi, Institute of Economic Growth.
- CSO (Central Statistical Organisation). 2002. Revised estimates of annual national income, 2001-2002 and quarterly estimates of gross domestic product, 2001-2002. http://www.nic.in/stat/stat_act_t1.html
- FSI (Forest Survey of India). 2000. *State of forest report 1999*. Dehra Dun, FSI.
- GOC. 2001. *Chhattisgarh State Forest Policy, 2001*. Raipur, Government of Chhattisgarh.
- GOI. 1961. *Government of India (Transaction of Business) Rules, 1961*.
- GOI. 1961. *Government of India (Allocation of Business) Rules, 1961*.
- GOI. 2001. Census of India 2001: provisional population totals – India. <http://www.censusindia.net/results/resultsmain.html>
- GOMP. 2001. The Madhya Pradesh Lok Vaniki Adhiniyam, 2001. Madhya Pradesh Forest Department, Government of Madhya Pradesh, Bhopal.
- GOMP. 2002. *Madhya Pradesh biodiversity strategy and action plan*. Bhopal: Department of Biodiversity and Biotechnology & Environmental Protection and Coordination Organisation.
- ICFRE (Indian Council of Forestry Research & Education). 2000. *National forestry research plan, Volume 2: research priorities and plans*. Dehra Dun, ICFRE.
- IIFM (Indian Institute of Forest Management). 2000. *Bhopal–India process for sustainable management of Indian forests*. Bhopal, Indian Institute of Forest Management.
- IIFM. 2001. *Bhopal–India process*. Bhopal, Indian Institute of Forest Management.
- Jain, R.B. 2001. *Public administration in India: 21st century challenges for good governance*. New Delhi, Deep & Deep Publications.
- Khare, A.; Madhu, S.; Saxena, N.C.; Palit, S.; Bathla, S.; Vania, F.; & Satyanarayana, M. 2000. *Joint forest management: policy, practice and prospects. Policy that works for forests and people*. Series No. 3. New Delhi, World Wide Fund for Nature – India and London, International Institute for Environment and Development.
- Kumar, N.; Saxena, N.; Alagh, Y.; & Mitra, K. 2000. *India: alleviating poverty through forest development*. Evaluation Country Case Study Series. Washington, D.C., World Bank.
- MECON. 2001. *Evaluation of centrally sponsored scheme: modern forest fire control methods*. Ranchi, MECON Ltd.
- MNES. 2002. Incentives for non-conventional energy sector (direct & indirect taxes) 2002-2003. Ministry of Non-Conventional Energy Sources, Government of India, New Delhi <http://www.mnes.nic.in/frame.htm?majorprog.html>
- MOA. 2001. The National Livestock Policy, Ministry of Agriculture, Department of Animal Husbandry and Dairying: *In India – National Action Programme to combat desertification in the context of UNCCD, Volume I: Status of desertification*. New Delhi, Government of India.
- MOEF (Ministry of Environment and Forests). 1988. *The National Forest Policy, 1988*. New Delhi, Government of India.
- MOEF. 1999. National Forestry Action Programme – India. New Delhi, Government of India.
- MOEF. 2001a. *Joint forest management cell: a report*. New Delhi, Government of India.
- MOEF. 2001b. The Coimbatore Charter on Environment and Forests. *Enviro News 5* (March-April 2001).
- MOEF. 2001c. *India – National Action Programme to combat desertification in the context of UNCCD, Volume –I: Status of desertification*. New Delhi, Government of India.
- MOEF. 2002a. National Wildlife Action Plan (2002–2016). New Delhi, Government of India.
- MOEF. 2002b. *JFM: A decade of partnership*. Government of India, New Delhi.

- MOEF. 2002c. *Report of the working group on forestry sector: 10th Five Year Plan 2002–2007*. New Delhi, Government of India.
- MOEF. 2002d. *Interim country report – India for United Nations Forum on Forest (UNFF – II)*. New Delhi, Government of India.
- MOEF. 2002e. National Biodiversity Strategy and Action Plan, 2002: Process. <http://sdnp.delhi.nic.in/nbsap/index1.html>
- MOF (Ministry of Finance). 2002a. Economic survey 2001–02: review of developments. Government of India, New Delhi <http://indiabudget.nic.in/es2001-02/general.html>
- MOF. 2002b. Key indicators. Government of India, New Delhi <http://indiabudget.nic.in/es2001-02/chapt2002/tab1.1.html>
- MOF. 2002c. Trends of major macroeconomic indicators: 1990–91—2001–02. Government of India, New Delhi <http://indiabudget.nic.in/es2001-02/chapt2002/tab1.2.html>
- NAEB (National Afforestation and Ecodevelopment Board). 2002. *National Afforestation Programme: A participatory approach to sustainable development of forests (centrally sponsored scheme) – operational guidelines for the Tenth Five-Year Plan*. New Delhi: Government of India.
- Om Consultants. 2000. Forest sector institutional framework study for the World Bank: Paper for the Workshop on Policy & Institutional study, Om Consultants (I) Pvt. Ltd.
- Pachauri, R.K. & Sridharan, P.V. (eds.) 1998. *Looking back to think ahead. Green India 2047 project – growth with resource enhancement of environment and nature*. New Delhi, Tata Energy Research Institute.
- Pandey, D.N. 1998. *Ethnoforestry: local knowledge for sustainable forestry and livelihood security*. Himanshu, Udaipur.
- Planning Commission. 1998. *Leasing of degraded forest lands. Working group's report on the prospects of making degraded forests available to private entrepreneurs*. New Delhi: Government of India.
- Planning Commission. 2001. *Report of the task force on greening India for livelihood security and sustainable development*. New Delhi, Government of India.
- Planning Commission. 2002a. *Report of the steering committee on environment, forest and wildlife for the Tenth Five-Year Plan (2002–2007)*. New Delhi, Government of India.
- Planning Commission. 2002b. <http://planningcommission.nic.in/about.html>
- Prasad, R. & Rathore, C.S. 2000. Country paper: status of national forestry information system in India. *In Proceedings of the programme inception workshop – forestry information processes and planning, 10-12 July 2000*. EC-FAO Partnership Programme. Bangkok, FAO Regional Office for Asia and Pacific.
- Prasad, R.; Kotwal, P.C.; Rathore, C.S. & Jhadhav, Y.D. 2001. Information and analysis of trees outside forests in India, information and analysis for sustainable forest management: linking national and international efforts in South and South East Asia. Working Paper No. 1, August 2001. Bangkok, FAO Regional Office for Asia and Pacific.
- Rathore, C.S. & Prasad, R. 2001. TOF resource study and management: assessment methodologies and institutional approaches in India. Paper presented at the FAO Expert Consultation on Trees Outside Forests, 26–28 November 2001, Rome.
- Shiva, V.; Jafri, A.H. & Bhutani, S. 1999. *Campaign against biopiracy*. New Delhi, Research Foundation for Science, Technology and Ecology.
- Upadhyay, S. & Upadhyay, V. 2002. *Handbook on environmental law, volume I: forest laws, wildlife laws and the environment*. New Delhi, LexisNexis, Butterworths.
- Vira, B. 1995. *Institutional change in India's forest sector, 1976–1994: reflections on state policy*. Oxford Centre for the Environment, Ethics & Society Research Paper No. 5.
- WII (Wildlife Institute of India). 2000. *Conserving biodiversity in 21st century through integrated conservation and development planning on a regional scale*. Proceedings of the workshop

organized at Lal Bahadur Shastri National Academy of Administration, Mussoorie in collaboration with Wildlife Institute of India, Dehra Dun, 28 – 30 June 1999.

WWF. 2001. *Stakeholder workshop on landscape conservation in Satpura-Mailkal hill ranges*. Proceedings of the workshop held at Bhopal during September 2001.

Appendix 1: National Forest Policy, 1988

No. 3A/86-FP
Ministry of Environment and Forests
(Department of Environment, Forests & Wildlife)

Paryavaran Bhavan, CGO Complex
Lodi Road, New Delhi - 110 003
Dated the 7th December, 1988

RESOLUTION

National Forest Policy, 1988

1. PREAMBLE

- 1.1. Resolution No. 13/52-F, dated the 12th May 1952, the Government of India in the erstwhile Ministry of Food and Agriculture enunciated a Forest Policy to be followed in the management of State Forests in the country. However, over the years, forests in the country have suffered serious depletion. This is attributable to relentless pressures arising from ever-increasing demand for fuelwood, fodder and timber; inadequacy of protection measures; diversion of forest lands to non-forest uses without ensuring compensatory afforestation and essential environmental safeguards; and the tendency to look upon forests as revenue earning resource. The need to review the situation and to evolve, for the future, a new strategy of forest conservation has become imperative. Conservation includes preservation, maintenance, sustainable utilisation, restoration, and enhancement of the natural environment. It has thus become necessary to review and revise the National Forest Policy.

2. BASIC OBJECTIVES

- 2.1. The basic objectives that should govern the National Forest Policy are the following
- Maintenance of environmental stability through preservation and, where necessary, restoration of the ecological balance that has been adversely disturbed by serious depletion of the forests of the country.
 - Conserving the natural heritage of the country by preserving the remaining natural forests with the vast variety of flora and fauna, which represent the remarkable biological diversity and genetic resources of the country.
 - Checking soil erosion and denudation in the catchment areas of rivers, lakes, reservoirs in the interest of soil and water conservation, for mitigating floods and droughts and for the retardation of siltation of reservoirs.
 - Checking the extension of sand dunes in the desert areas of Rajasthan and along the coastal tracts.
 - Increasing substantially the forest/tree cover in the country through massive afforestation and social forestry programmes, especially on all denuded, degraded and unproductive lands.
 - Meeting the requirements of fuelwood, fodder, minor forest produce and small timber of the rural and tribal populations.
 - Increasing the productivity of forests to meet essential national needs.
 - Encouraging efficient utilisation of forest produce and maximising substitution of wood.
 - Creating a massive people's movement with the involvement of women, for achieving these objectives and to minimise pressure on existing forests.

- 2.1. The principal aim of Forest Policy must be to ensure environmental stability and maintenance of ecological balance including atmospheric equilibrium which are vital for sustenance of all lifeforms, human, animal and plant. The derivation of direct economic benefit must be subordinated to this principal aim.

3. ESSENTIALS OF FOREST MANAGEMENT

- 3.1. Existing forests and forest lands should be fully protected and their productivity improved. Forest and vegetal cover should be increased rapidly on hill slopes, in catchment areas of rivers, lakes and reservoirs and ocean shores and on semi-arid, and desert tracts.
- 3.2. Diversion of good and productive agricultural lands to forestry should be discouraged in view of the need for increased food production.
- 3.3. For the conservation of total biological diversity, the network of national parks, sanctuaries, biosphere reserves and other protected areas should be strengthened and extended adequately.
- 3.4. Provision of sufficient fodder, fuel and pasture, specially in areas adjoining forest, is necessary in order to prevent depletion of forests beyond the sustainable limit. Since fuelwood continues to be the predominant source of energy in rural areas, the programme of afforestation should be intensified with special emphasis on augmenting fuelwood production to meet the requirement of the rural people.
- 3.5. Minor forest produce provides sustenance to tribal population and to other communities residing in and around the forests. Such produce should be protected, improved and their production enhanced with due regard to generation of employment and income.

4. STRATEGY

4.1. Area under forests

The national goal should be to have a minimum of one-third of the total land area of the country under forest or tree cover. In the hills and in mountainous regions, the aim should be to maintain two-third of the area under such cover in order to prevent erosion and land degradation and to ensure the stability of the fragile eco-system.

4.2. Afforestation, Social Forestry & Farm Forestry

- 4.2.1. A massive need-based and time bound programme of afforestation and tree planting, with particular emphasis on fuelwood and fodder development, on all degraded and denuded lands in the country, whether forest or non-forest land, is a national imperative.
- 4.2.2. It is necessary to encourage the planting of trees alongside of roads, railway lines, rivers and streams and canals, and on other unutilised lands under State/corporate, institutional or private ownership. Green belts should be raised in urban/industrial areas as well as in and tracts. Such a programme will help to check erosion and desertification as well as improve the micro-climate.
- 4.2.3. Village and community lands, including those on foreshores and environs of tanks, not required for other productive uses, should be taken up for the development of tree crops and fodder resources. Technical assistance and other inputs necessary for initiating such programmes should be provided by the Government. The revenues generated through such programmes should belong to the Panchayats where the lands are vested in them; in all other cases, such revenues should be shared with the local communities in order to provide an incentive to them. The vesting, in individuals, particularly from the weaker sections (such as landless labour, small and marginal farmers, scheduled castes, tribals, women) of certain ownership rights over trees, could be considered, subject to appropriate regulations; beneficiaries would be entitled to usufruct and would in turn be responsible for their security and maintenance.

4.2.4. Land laws should be so modified wherever necessary so as to facilitate and motivate individuals and institutions to undertake tree-fanning and grow fodder plants, grasses and legumes on their own land. Wherever possible, degraded lands should be made available for this purpose either on lease or on the basis of a tree-patta scheme. Such leasing of the land should be subject to the land grant rules and land ceiling laws. Steps necessary to encourage them to do so must be taken. Appropriate regulations should govern the felling of trees on private holding.

4.3. MANAGEMENT OF STATE FORESTS

4.3.1. Schemes and projects, which interfere with forests that clothe steep slopes, catchments of rivers, lakes, and reservoirs, geologically unstable terrain and such other ecologically sensitive areas should be severely restricted. Tropical rain/moist forests, particularly in areas like Arunachal Pradesh, Kerala, Andaman & Nicobar Islands, should be totally safeguarded.

4.3.2. No forest should be permitted to be worked without the Government having approved the management plan, which should be in a prescribed format and in keeping with the National Forest Policy. The Central Government should issue necessary guidelines to the State Government in this regard and monitor compliance.

4.3.3. In order to meet the growing needs for essential goods and services, which the forests provide, it is necessary to enhance forest cover and productivity of the forests through the application of scientific and technical inputs. Production forestry programmes, while aiming at enhancing the forest cover in the country, and meeting national needs, should also be oriented to narrowing, by the turn of the century, the increasing gap between demand and supply of fuelwood. No such programme, however, should entail clear-felling of adequately stocked natural forests. Nor should exotic species be introduced, through public or private sources, unless long-term scientific trials undertaken by specialists in ecology, forestry and agriculture have established that they are suitable and have no adverse impact on native vegetation and environment.

4.3.4. Rights and Concessions

4.3.4.1. The rights and concessions, including grazing, should always remain related to the carrying capacity of forests. The capacity itself should be optimised by increased investment, silvicultural research and development of the area. Stall-feeding of cattle should be encouraged. The requirements of the community, which cannot be met by the rights and concessions so determined, should be met by development of social forestry outside the reserved forests.

4.3.4.2. The holders of customary rights and concessions in forest areas should be motivated to identify themselves with the protection and development of forests from which they derive benefits. The rights and concessions from forests should primarily be for the bona fide use of the communities living within and around forest areas, specially the tribals.

4.3.4.3. The life of tribals and other poor living within and near forests revolves around forests. The rights and concessions enjoyed by them should be fully protected. Their domestic requirements of fuelwood, fodder, minor forest produce and construction timber should be the first charge on forest produce. These and substitute materials should be made available through conveniently located depots at reasonable prices.

4.3.4.4. Similar consideration should be given to scheduled castes and other poor living near forests. However, the area, which such consideration should cover, would be determined by the carrying capacity of the forests.

4.3.4.5. Wood is in short supply. The long-term solution for meeting the existing gap lies in increasing the productivity of forests, but to relieve the existing pressure on forests for the demands of railway sleepers, construction industry (particularly in the public, sector), furniture and panelling, mine-pit props, paper and paperboard etc. substitution of wood needs to be

taken recourse to. Similarly, on the front of domestic energy, fuelwood needs to be substituted as far as practicable with alternate sources like bio-gas, LPG and solar energy. Fuel-efficient "Chulhas" as a measure of conservation of fuelwood need to be popularised in rural areas.

4.4. Diversion of forest lands for non-forest purposes

4.4.1. Forest land or land with tree cover should not be treated merely as a resource readily available to be utilised for various projects and programmes, but as a national asset which requires to be properly safeguarded for providing sustained benefits to the entire community. Diversion of forestland for any non-forest purpose should be subject to the most careful examinations by specialists from the standpoint of social and environmental costs and benefits. Construction of dams and reservoirs, mining and industrial development and expansion of agriculture should be consistent with the needs for conservation of trees and forests. Projects, which involve such diversion, should at least provide in their investment budget, funds for regeneration/ compensatory afforestation.

4.4.2. Beneficiaries who are allowed mining and quarrying in forest land and in land covered by trees should be required to repair and re-vegetate the area in accordance with established forestry practices. No mining lease should be granted to any party, private or public, without a proper mine management plan appraised from the environmental angle and enforced by adequate machinery

4.5. Wildlife Conservation

Forest Management should take special care of the needs of wildlife conservation, and forest management plans should include prescriptions for this purpose. It is specially essential to provide for "corridors" linking the protected areas in order to maintain genetic continuity between artificially separated sub-sections of migrant wildlife.

4.6. Tribal People and Forests

Having regard to the symbiotic relationship between the tribal people and forests, a primary task of all agencies responsible for forest management, including the forest development corporations should be to associate the tribal people closely in the protection, regeneration and development of forests as well as to provide gainful employment to people living in and around the forest. While special attention to the following:

- One of the major causes for degradation of forest is illegal cutting and removal by contractors and their labour. In order to put an end to this practice, contractors should be replaced by institutions such as tribal cooperatives, labour cooperatives, government corporations, etc. as early as possible.
- Protection, regeneration and optimum collection of minor forest produce along with institutional arrangements for the marketing of such produce;
- Development of forest villages on par with revenue villages;
- Family oriented schemes for improving the status of the tribal beneficiaries; and
- Undertaking integrated area development programmes to meet the needs of the tribal economy in and around the forest areas, including the provision of alternative sources of domestic energy on a subsidised basis, to reduce pressure on the existing forest areas.

4.7. Shifting Cultivation

Shifting cultivation is affecting the environment and productivity of land adversely. Alternative avenues of income, suitably harmonised with the right landuse practices, should be devised to discourage shifting cultivation. Efforts should be made to contain such cultivation within the area already affected, by propagating improved agricultural practices. Area already damaged by such cultivation should be rehabilitated through social forestry and energy plantations.

4.8. Damage to Forests from Encroachments, Fires and Grazing

- 4.8.1. Encroachment on forestlands has been on the increase. This trend has to be arrested and effective action taken to prevent its continuance. There should be no regularisation of existing encroachments.
- 4.8.2. The incidence of forest fires in the country is high. Standing trees and fodder are destroyed on a large scale and natural regeneration annihilated by such fires. Special precautions should be taken during the fire season. Improved and modern management practices should be adopted to deal with forest fires.
- 4.8.3. Grazing in forest areas should be regulated with the involvement of the community. Special conservation areas, young plantations and regeneration areas should be fully protected. Grazing and browsing in forest areas need to be controlled. Adequate grazing fees should be levied to discourage people in forest areas from maintaining large herds of non-essential livestock

4.9. Forest based Industries

The main considerations governing the establishment of forest-based industries and supply of raw material to them should be as follows:

- As far as possible, a forest-based industry should raise the raw material needed for meeting its own requirements, preferably by establishment of a direct relationship between the factory and the individuals who can grow the raw material by supporting the individuals with inputs including credit, constant technical advice and finally harvesting and transport services.
- No forest-based enterprise, except that at the village or cottage level, should be permitted in the future unless it has been first cleared after a careful scrutiny with regard to assured availability of raw material. In any case, the fuel, fodder and timber requirements of the local population should not be sacrificed for this purpose.
- Forest based industries must not only provide employment to local people on priority but also involve them fully in raising trees and raw material.
- Natural forests serve as a gene pool resource and help to maintain ecological balance. Such forests will not, therefore, be made available to industries for undertaking plantation and for any other activities.
- Farmers, particularly small and marginal farmers would be encouraged to grow, on marginal/degraded lands available with them, wood species required for industries. These may also be grown along with fuel and fodder species on community lands not required for pasture purposes, and by Forest department/corporations on degraded forests, not earmarked for natural regeneration.
- The practice of supply of forest produce to industry at concessional prices should cease. Industry should be encouraged to use alternative raw materials. Import of wood and wood products should be liberalised.
- The above considerations will however, be subject to the current policy relating to land ceiling and land-laws.

4.10. Forest Extension

Forest conservation programme cannot succeed without the willing support and cooperation of the people. It is essential, therefore, to inculcate in the people, a direct interest in forests, their development and conservation, and to make them conscious of the value of trees, wildlife and nature in general. This can be achieved through the involvement of educational institutions, right from the primary stage. Farmers and interested people should be provided opportunities through institutions like Krishi Vigyan Kendras, Trainers' Training Centres to learn agrisilvicultural and silvicultural techniques to ensure optimum use of their land and water resources. Short-term extension courses and lectures should be organised in order to educate farmers. For this purpose, it is essential that suitable programmes are propagated through mass media, audio-visual aids and the extension machinery.

4.11. Forestry Education

Forestry should be recognised both as a scientific discipline as well as a profession. Agriculture universities and institutions dedicated to the development of forestry education should formulate curricula and courses for imparting academic education and promoting post-graduate research and professional excellence, keeping in view the manpower needs of the country. Academic and professional qualifications in forestry should be kept in view for recruitment to the Indian Forest Service and the State Forest Service. Specialised and orientation courses for developing better management skills by in service training need to be encouraged, taking into account the latest development in forestry and related disciplines.

4.12. Forestry Research

With the increasing recognition of the importance of forests for environmental health, energy and employment, emphasis must be laid on scientific forestry research, necessitating adequate strengthening of the research base as well as new priorities for action. Some broad priority areas of research and development needing special attention are:

- i. Increasing the productivity of wood and other forest produce per unit of area per unit time by the application of modern scientific and technological methods.
- ii. Revegetation of barren/marginal/waste/mined lands and watershed areas.
- iii. Effective conservation and management of existing forest resources (mainly natural forest eco-systems).
- iv. Research related to social forestry for rural/tribal development.
- v. Development of substitutes to replace wood and wood products.
- vi. Research related to wildlife and management of national parks and sanctuaries.

4.13. Personnel Management

Government policies in personnel management for professional foresters and forest scientists should aim at enhancing their professional competence and status and attracting and retaining qualified and motivated personnel, keeping in view particularly the arduous nature of duties they have to perform, often in remote and inhospitable places.

4.14. Forest Survey and Data Base

Inadequacy of data regarding forest resources is a matter of concern because this creates a false sense of complacency. Priority needs to be accorded to completing the survey of forest resources in the country on scientific lines and to updating information. For this purpose, periodical collection, collation and publication of reliable data on relevant aspects of forest management need to be improved with recourse to modern technology and equipment.

4.15. Legal Support and Infrastructure Development

Appropriate legislation should be undertaken, supported by adequate infrastructure, at the Centre and State levels in order to implement the Policy effectively.

4.16. Financial Support for Forestry

The objectives of this revised Policy cannot be achieved without the investment of financial and other resources on a substantial scale. Such investment is indeed fully justified considering the contribution of forests in maintaining essential ecological processes and life-support systems and in preserving genetic diversity. Forests should not be looked upon as a source of revenue. Forests are a renewable natural resource. They are a national asset to be protected and enhanced for the well being of the people and the Nation.

(K.P. Geethakrishnan)
Secretary to the Government of India

Appendix 2 : THE COIMBATORE CHARTER ON ENVIRONMENT AND FORESTS

National Conference of the Ministers of Environment and Forests
held at Coimbatore during 29–30 January 2001

A national conference on environment and forests was held on 29–30 January 2001 at Coimbatore. The conference was attended by the State Environment and Forest Ministers, Secretaries to the State Governments, Principal Chief Conservators of Forests, Chairpersons of the Central and State Pollution Control Boards/Committees and senior officials of the Ministry of Environment and Forests, Government of India. Members of the Parliamentary Consultative Committee of the Ministry of Environment and Forests also attended the conference. The conference was presided over by the Union Minister for Environment and Forests Shri T.R. Baalu and inaugurated by Shri Rangunath Misra, Member of Parliament (formerly Chief Justice of India).

The conference resolved to protect and improve the environment and forests of the country in accordance with the following:

Forest Protection and Afforestation

(a) Afforestation

1. The State and Union Territory Governments shall endeavour to expand forest /tree cover from the existing 23% to the desired 33% as mandated in the National Forest Policy, 1988 during the next 20 years thereby increasing the forest area from 76.5 million hectares to 109 million hectares of the country's geographical area of 328 million hectares.
2. The investment in afforestation has been, on an average, less than one per cent of the total Plan outlay in various Plan periods. The investment in afforestation shall be raised to a minimum of two per cent of the total outlay.
3. During the VII Plan, 20% of the funds under the rural development schemes were earmarked for the purpose of afforestation resulting in achievement of highest targets (8 million hectares). This earmarking was discontinued from the VIII Plan resulting in achievement of only 7 million hectares. To achieve the target of 33% forest/tree cover set by the National Forestry Action Programme (NFAP), 20% of the funds of the various rural development schemes such as Jawahar Rozgar Yojana, Drought Prone Area Programme, Desert Development Programme etc. be earmarked for afforestation. This may be done in consultation with the Planning Commission.
4. Under the Integrated Afforestation and Eco-Development Projects Scheme, multiple rows of strip plantations shall also be allowed due to non-availability of land for block plantations in some of the States.
5. While there is need to step up allocations to forestry sector for enhancing forest cover, it is equally important that the States ensure timely release of funds provided under the centrally sponsored schemes of the Ministry to the implementing agencies for their optimal utilisation. The Central Government shall approve plantation schemes for five years and release funds directly to the Forest Development Agencies.
6. Recognising that land degradation is a major environmental concern adversely affecting productivity and socio-economic conditions, suitable measures shall be taken for addressing the problem.
7. 15.5 million hectares of degraded area having natural root stock shall be regenerated using Joint Forest Management approach.

8. About 9.5 million hectares of partially degraded area with depleted natural root stock and another 6 million hectares of totally degraded and treeless area shall be regenerated through technology based plantations with substantial investments.
9. Bamboo plantations, medicinal plantation projects and coastal shelterbelt plantations have been identified as thrust areas. In order to have uninterrupted coastal shelterbelt plantations against cyclonic winds, afforestation on private lands would be encouraged by making suitable provisions in the guidelines keeping the Orissa model in view.

(b) Joint Forest Management (JFM)

1. All State and Union Territory Governments shall implement the guidelines (February 2000) related to JFM issued by the Ministry of Environment and Forests.
2. Forest Development Agencies shall be registered under the Societies' Registration Act, 1860. However, with regard to Village Committees, these may be registered under the Societies' Registration Act, 1860 or under any local act or rule, or with the Conservator of Forests.

(c) Forest Fire Control Measures

1. State and Union Territory Governments shall map fire prone areas and ensure that funds are spent on identified areas on project basis.
2. State and Union Territory Governments shall implement the provisions of the National Fire Prevention and Control guidelines of 1999 issued by the Ministry of Environment and Forests and take suitable measures for prevention, detection and control of forest fires.
3. The JFM Committees shall be assigned specific roles for fire prevention and control and the Committees be given incentives for fire prevention.
4. The State and Union Territory Governments shall organise Forest Fire Prevention Week annually to highlight the damage to bio-diversity from forest fires and for soliciting public support in prevention of forest fires.

(d) Issues Related to Drought Prone Areas

1. States and Union Territory Governments affected by drought shall endeavour to improve forest cover by extending tree plantation to non-forest lands for mitigation of drought.
2. Effective water harvesting measures shall be undertaken both on forest and non-forest lands by the States and Union Territory Governments.
3. Cattle camps may be organised in the forest areas where fodder is available in drought prone areas.
4. Suitable fodder development programme shall be drawn up by the State and Union Territory Governments for meeting the fodder requirements of the cattle.

(e) Strengthening of Infrastructure

1. The vacant posts of Forest Guards, Foresters, Range Forest Officers and Assistant Conservator of Forests shall be filled up by the State Governments on priority for conservation and protection of forests. The ban on recruitment of forestry personnel imposed by some State Governments shall be lifted and appointment of forestry personnel be treated on the lines similar to Police Departments in the States/Union Territories, considering that forest services are essential for the ecological security of the country.
2. The rules related to recruitment, training and cadre management of forest personnel shall be implemented with due diligence.
3. Infrastructure such as forest roads, buildings, wireless equipment, vehicles, arms, etc., required for forest protection shall be strengthened on priority.

4. Working plans for boundary demarcation, prevention of encroachments, control of pests and diseases, natural regeneration, felling and other silvicultural operations shall be prepared and implemented after they are approved by the Central Government.

Wildlife Conservation

1. Wild animals do considerable damage to agricultural crops in areas adjoining national parks and sanctuaries, causing considerable concern, thereby requiring formulation of an appropriate insurance scheme for compensating damage to agricultural crops falling within five kilometers of national parks and sanctuaries.
2. Existing provisions for payment of compensation in the cases of deaths due to wild animals were emphasized, with the objective of ensuring compliance by the State/Union Territories Governments.
3. The ban on recruitment of forestry personnel shall be lifted and the vacancies filled up immediately on the lines of Police Department. The field formations shall be re-organised into viable units and be provided with adequate mobility, firearms and effective communication network.
4. An effective mechanism for intelligence gathering and database of habitual offenders should be developed for preventing wildlife crimes.
5. Adequate expertise shall be developed for prosecuting offenders and training be organised for undertaking investigation.
6. Steps shall be taken immediately for designating special courts for wildlife offences.
7. Create effective enforcement infrastructure both within protected areas and outside protected area to prevent poaching.

Functioning of Pollution Control Boards

and

Effective Implementation of Environmental Laws

1. For effective implementation of environmental laws, the Pollution Control Boards/Committees shall build up capacity for requisite expertise and infrastructure. To this end, the following measures shall be taken :
 - Induction of academicians, legal professionals, health experts and technologists as members of the Boards / Committees. This shall be done by 30 June 2001.
 - Appointment of multi-disciplinary staff by 30 June 2001.
 - Ban on recruitment shall be relaxed for the posts of scientists and engineers in the Pollution Control Boards/Committees.
 - Training of personnel, for which programme shall be drawn up by the Central Pollution Control Board.
 - Streamlining of Consent / Authorisation procedures.
 - Inventory of polluting sources and pollution load.
 - Formulation of Annual Action Plans.
 - Publication of Annual State Environment Report.
 - Strengthening and upgrading of water and air quality monitoring and laboratory facilities.
 - State Pollution Control Boards (SPCBs)/Committees shall be equipped with full-fledged laboratory equipment and manpower by 30 June 2001. List of minimum

requirement of equipment shall be circulated by the CPCB to all the SPCBs/Committees by 15 February 2001.

- The North-Eastern states and the State of Jammu & Kashmir shall prepare detailed proposals for strengthening of laboratories and manpower after consultations with the Chairman, Central Pollution Control Board and Secretary, Ministry of Environment and Forests, Government of India on 14 February, 2001. Proposals shall also be sent for setting up of Pollution Control Boards by the states of Chhatisgarh, Jharkhand and Uttaranchal.

Solid Waste Management

1. A Committee shall examine various environmental issues related to indiscriminate littering, with particular reference to the disposal of plastic wastes. The Committee shall be constituted under the Chairmanship of Shri Ranganath Misra, with the Chairpersons of the State Pollution Control Boards of Tamilnadu, Andhra Pradesh, Haryana, Maharashtra, and Uttar Pradesh as Members, and the Chairperson, Central Pollution Control Board as Member Secretary. The Committee shall submit its recommendations to the Central Government by 31 May 2001.
2. The State and Union Territory Governments shall create common treatment and disposal facilities for bio-medical wastes, to be situated as far as possible from populated areas. Spare capacities of facilities at larger hospitals shall be used to treat wastes from smaller units.
3. The State and Union Territory Governments shall complete inventory of hospitals/nursing homes and take legal action against violation of Rules.
4. Composting of municipal solid wastes shall be promoted by the State and Union Territory Governments.
5. The State and Union Territory Governments shall complete inventorisation of plastics recycling units by 31 March 2001.

Environmental Education and Awareness

1. A programme of volunteers to be called the National Green Army shall be launched this involving the establishment of Eco-clubs in about 100 schools in each district thereby covering around 50 000 schools in the country.
2. The above programme shall address various subjects for protecting and improving the environment, e.g., solid waste management, pollution control, afforestation, maintenance of parks and open spaces, dissemination of information and creation of awareness.
3. The State and Union Territory Governments shall be responsible for identifying schools, teachers and agencies responsible for implementing, supervising and monitoring the programme. The State and Union Territory Governments shall launch incentive programmes for adoption of Eco-club membership.
4. The Central Government shall make available financial assistance for establishing Eco-clubs, organising orientation of teachers and for resource materials.
5. The State and Union Territory Governments shall endeavour to enforce as a condition license of all cinema halls, touring cinemas and video parlours to exhibit free of cost at least two slides/messages on environment in each show undertaken by them. Short films on environment shall be shown in one show every day in cinema halls.
6. Short programmes (5-7 minutes duration) shall be broadcast by All India Radio and Doordarshan everyday and there could be, once a week, a longer programme.
7. The Government of India and the State and Union Territory Governments shall endeavour to ensure that environment and its problems related to pollution should be taught as a compulsory subject.

River Cleaning Programme

1. The focus shall shift from cleaning rivers to cleaning riverside towns and cities in a holistic manner, i.e., subjects such as solid waste, municipal garbage must become part of the cleaning process.
2. The State and Union Territory Governments, municipal bodies and the public shall also participate by making funds available.
3. The participation of local bodies by way of contributing funds and/or in kind shall become part of future proposals. In the absence of local bodies, the State Governments shall take that burden.
4. Public participation by way of funds and/or in kind shall become an essential part of future proposals.
5. A detailed plan for recovering operational maintenance costs shall become part of the project proposals in future.
6. Upstream activities including treatment of catchment areas of the concerned rivers (including their minor and major tributaries) shall be planned.
7. Efforts shall be made to eradicate open defecation particularly in the urban and semi-urban areas.
8. All institutions of Local Self Government, NGOs, educational institutions shall be involved in a process leading to a succinct code of practices for citizens including conduct at places of worship on the banks of rivers.

International Issues

The Central Government shall keep the State and Union Territory Governments informed about developments on international issues related to protection of the environment and forests. These shall cover all the subjects addressed under the various U.N. Conventions and agreements, including climate change, bio-diversity, ozone protection, desertification, wetlands, forestry and hazardous substances.

Appendix 3: National Conservation Strategies and Policy Statement on Environment and Development, 1992

5.0. PRIORITIES AND STRATEGIES FOR ACTION

5.1. Population Control

- 5.1.1 Unabated population growth, as at present, not only adds to the economic burden or all developmental activities, but also reduces the impact of economic growth on our society. Therefore, for the success of our planning, population control becomes the most urgent necessity. A comprehensive programme, with strong political backing and appropriate socio-economic measures, fully utilising the available scientific know-how, simultaneously making efforts for developing new methodologies, and supported by modern communication technology and managerial and organisational skills, is essential for success in this most difficult area. Population control should be a national mission for the next decade. Despite efforts of several years, population control projects have not met with success. More stern measures such as legislative and better incentives are needed.
- 5.1.2 Along with the development programmes to improve the living conditions, action must be directed towards stabilisation of population including the following measures:
- Launching a time bound national campaign for population stabilisation with the small family as a socially responsible objective;
 - Increased support for female education, female employment, and of social security programmes;
 - Easier access to the means of family planning and health care facilities;
 - Added incentives in terms of taxation and other benefits for family planning;
 - Environmental sanitation, prevention and control of communicable disease through integrated vector control and health education; and
 - Adoption of decentralised renewable energy devices that enhance quality of life in remote pockets while taking special care of the health needs of women.

5.2 Conservation of Natural Resources

5.2.1 Land and Water

- 5.2.1.1 An integrated land and water management approach is extremely important to sustain the food production, animal husbandry and other activities.
- 5.2.1.2 Amelioration of water logged and salt affected lands, command area development, protection of good agricultural land against diversion to urban and other uses, prevention of land fragmentation, maintenance of sustained productivity of soil and conservation of lands with forests and vegetal cover are the integral components of sustainable management.
- 5.2.1.3 The importance of water as a finite though a renewable resource, must be clearly recognised. Land and water uses are to be considered together, particularly in the context of recurring droughts and floods. Water conservation measures; discipline on use of water; economising the consumption of water in households, agriculture and industry; and appropriate recycling would be essential.
- 5.2.1.4 The steps to be taken for sustainable use of land and water should, include the following:
- Classification, zoning and apportionment of land for designated uses such as, agriculture, forestry, grassland, green areas, industrial activities, catchment areas

and watersheds and human settlements based on assessment of their capabilities and environmental considerations;

- Enactment of laws for appropriate land uses to protect the soil from erosion, pollution and degradation;
- Protection of land near water bodies and prevention of construction there upon;
- Measures to ensure equitable access to and responsibility for sustainable use of land and water resources;
- Micro-level planning to develop appropriate methodology and implementation of action plan by involving the people at the village level in social forestry programmes, landuse planning, afforestation etc.;
- Country wide campaign to minimise soil and runoff losses by carrying out extensive works like contour trenching, contour bunding, terracing, construction of small storages, catchment treatment and protection of the vegetal cover in the catchments and watersheds. This is to be a specific charge of protect authorities in all irrigation, power, road and agricultural projects;
- Restoration and reclamation of degraded areas including weed infested areas; mined areas, grazing lands and salt affected soils;
- Measures for preventing wind erosion by undertaking special programmes of conservation and afforestation in desert areas;
- Development of suitable agro-silvipastoral techniques with special emphasis on hilly areas and in arid and semi-arid zones;
- Building up a network for assessment and monitoring of soil and water (surface and ground water) quality throughout the country which should be on a permanent basis as in the case of meteorological stations;
- Measures for water conservation, recycling and optimal conjunctive use of surface and ground water for specific uses;
- Legislative measures to check over-exploitation of surface and ground water for various uses;
- Conservation of wetlands, for ensuring sustainable ecological and economic benefits;
- Encouragement to and improvement in traditional methods of rainwater harvesting and storage.
- Stringent measures for prevention and control of pollution due to indiscriminate disposal of solid wastes, effluents and hazardous substances in land and water courses;
- Control and abatement of pollution of water bodies from municipal and industrial wastes generated from urban habitats by intercepting and diverting such wastes away from water bodies;
- Classification, zoning and regulations for maintaining the quality of the water bodies to protect and enhance their capabilities to support the various designated uses; and
- Adoption of low cost sanitation technology for prevention and control of pollution in watercourses.

5.2.2 Atmosphere

5.2.2.1 For prevention and control of atmospheric pollution including noise pollution, the thrust will be on the following:

- Use of clean fuels and clean technologies, energy efficient devices and air and noise pollution control systems;
- Setting up of source specific and area wise air quality standards and time bound plans to prevent and control pollution;
- Proper location of projects to minimise the adverse impact on people and environment;
- Incentives for environmentally benign substitutes, technologies and energy conservation;
- Raising of green belts with pollution tolerant species;
- Developing coping mechanisms for future climatic changes as a result of increased emission of carbon dioxide and greenhouse gases; and
- Appropriate action to control adverse Impact on Indian continent due to ozone depletion and other gaseous effects in the atmosphere at global level.

5.2.3 Biodiversity

5.2.3.1 About 90% of the world food comes from 20 plant breeders find that they have to turn more and more to the wild species to introduce into the cultivated forms desired qualities of resistance to pests and diseases and the ability to withstand adverse soil and India's biological diversity is very rich but unfortunately its wealth is being eroded due to various reasons. This diversity needs to be preserved and the immediate task will be to devise and enforce time bound plans for saving the endangered plant and animal species as well as habitats of biological resources. Action for conservation must be directed to:

- Intensification of surveys and inventorisation of biological resources in different parts of the country including the island ecosystems. The survey should include information on distribution pattern of particular species/population/communities and the status of ethnobiologically important groups;
- Conservation of biodiversity through a network of protected areas including Biosphere Reserves, Marine Reserves, National Parks, Sanctuaries, Gene Conservation Centres, Wetlands, Coral Reefs and such other natural habitats of biodiversity. This should include
- Taxonomic and ecological studies on the flora and fauna with, adequate emphasis placed on the lower vertebrate, invertebrate and micro-flora which are important in contributing to the healthy maintenance of ecosystems;
- Full and correct rehabilitation of rural poor/tribals displaced due to creation of national parks/biosphere reserves/tiger reserves;
- Conservation of micro-fauna and micro-flora which help in reclamation of wastelands and revival of biological potential of the land;
- Protection and sustainable use of plant and animal genetic resources through appropriate laws and practices;
- Protection of domesticated species/varieties of plants and animals in order to conserve indigenous genetic diversity;
- Maintenance of corridors between national parks, sanctuaries, forests and other protected areas;
- Emulation and support for protecting traditional skills and knowledge for conservation; Development of methodologies to multiply, breed and conserve the threatened and endangered species through modern techniques of tissue culture and biotechnology;

- Discouragement of mono-culture and plantation of dominating and exotic species, in areas unsuited for them and without sufficient experimentation; and
- Restriction on introduction of exotic species of animals without adequate investigations

5.2.4 Biomass

5.2.4.1 For the vast majority of our rural people, the foremost need is for fuelwood, timber, fodder, fibre, etc. The issue of sustainable resource utilisation, therefore, has to be specially addressed first from the point of view of the biomass requirements of the rural poor. Action must be directed to:

- Devising ways and means by which local people can conserve and use thereafter the resources of the common lands and degraded forests, so that they have a stake in the continuing productivity of the resources;
- Encouraging private individuals and institutions to regenerate and develop their wastelands;
- Raising of fuelwood species and provision of alternatives to reduce dependence on fuelwood;
- Taking measures to increase the production of fodder and grasses to bridge the wide gap between supply and demand;
- Raising of bamboo and species providing small timber for local house construction and agricultural implements;
- Increasing biomass to meet essential requirement of biomass based industry;
- Promoting direct relationship between forest based industry and farmers to raise needed raw materials, provided this does not result in diversion of prime agricultural lands and displacement of small and marginal farmers;
- Extensive research and development in forestry for better regeneration and improved productivity;
- Development of technologies for enhancing the productivity and efficiency of use of all biomass resources (both terrestrial and marine);
- Institutional and technological systems to enable rural artisans to sustain biomass based crafts; and
- Curtailment of the supply of subsidised biomass based resources to industrial consumers.

6.0 DEVELOPMENT POLICIES FROM ENVIRONMENTAL PERSPECTIVES

Implementation of the aims and objectives of conservation and sustainable development will require integration and internationalisation of environmental considerations in the policies and programmes of development in various sectors.

Curtailment of consumerism and shift towards use of environment friendly products and processes, and low waste generating technologies through conscious efforts and appropriate economic policies including pricing of natural resources as well as fiscal incentives and disincentives will be the guiding factors for ensuring conservation and sustainable development.

For environmental conservation and sustainable development the steps which need to be taken in some of the key sectors of development activities are outlined in the following sections.

6.1 Agriculture and Irrigation

For sustainable management of agriculture and irrigation, the action points should include the following:

6.1.1 Agriculture

- Development of pesticides and insecticides policy for the country;
- Development of integrated pest management and nutrient supply system;
- Development and promotion of methods of sustainable farming, especially organic and natural farming;
- Efficient use of inputs including agro-chemicals with minimal degradation of environment;
- Phasing out and stoppage of persistent and toxic pesticides and their substitution by environmentally safe and appropriate pesticides;
- Promotion of environmentally compatible cropping practices, biofertilisers and bio-pesticides;
- Restriction on diversion of prime agricultural land for other purposes;
- Ensuring land for different uses based upon land capability and land productivity;
- Evolving cost effective and efficient methods of water conservation and use;
- Incentives for cultivation of crops with high nutritive value and those with lesser demands on water and energy inputs;
- Encouraging crop rotation patterns;
- Strengthening of local bodies like Zilla Parishads, Panchayats and Samitis to ensure effective decentralisation and optimal resource management; and
- Anticipatory programmes and contingency plans for disasters such as drought, flood and climate change.

6.1.2 Irrigation

- Priority to small projects to meet the requirements of irrigation without causing significant alteration in the environmental conditions;
- Revival of traditional water management systems and development of alternate irrigation systems such as harvesting and conservation of run-off rain water;
- Measures for increasing the efficiency of water-use, water conservation and recycling;
- Measures for provision of drainage as an integral component of irrigation projects and to prevent water logging and leaching;
- Watershed management through catchment treatment of the drainage areas, protection of vegetal cover and measures to prevent siltation in an integrated manner with the irrigation authorities being fully accountable; catchment treatment would be so designed as to have a direct impact on the life of the reservoir, hydrological regime and life support systems. It would depend on the location specific conditions in each case;
- Adoption of command area development approach for all irrigation projects to ensure optimal utilisation;
- Critical assessment of irrigation projects and delivery systems to ensure optimal utilisation of water resources along with measures to mitigate environmental, and social damage;
- Focus on decentralised network of small irrigation and water projects with minimum environmental disruption which will be of great value to local communities and yet capable of generating surplus for other areas at low cost;
- Design and implementation of irrigation projects which are environmentally sustainable, based on lessons learnt from a critical analysis of all past projects; and
- Continuous and ongoing evaluation and monitoring of all projects.

6.2 Animal Husbandry

The activities relating to animal husbandry should concentrate on the following:

- Development of an animal husbandry policy for the country;
- Intensification of sterilisation programme for containing unsustainable growth in livestock population;
- Improvement in genetic variability of indigenous population;
- Distribution of animals like goats under the Integrated Rural Development Programme strictly consistent with the availability of pasture lands to reduce pressure on the lands;
- Propagation of wildlife and wildlife resources management on sustainable basis;
- Selective breeding of animals used for draught power to conserve fuel;
- Promotion of stall feeding and rotational grazing;
- Restoration and protection of grazing lands;
- Involvement of local people in the policy planning on pasture lands and stall feeding to avoid fodder scarcity; and
- Incentive for growing fodder crops and establishment of fodder banks.

6.3 Forestry

Concerted efforts should be made for raising the forest cover and for conservation of existing forests which constitute an essential life support system and an important source of food, fibre, fodder, fuel and medicines etc. For attaining the goal of having at least one third of our land area under forest cover, intensified measures on a mission mode are required to be taken along with commensurate mobilisation of resources for this purpose. As outlined in the National Forest Policy (1988), the action points should include the following:

- Maintenance of environmental stability through preservation and, where necessary, restoration of the ecological balance that has been adversely disturbed by serious depletion of the forests of the country;
- Conserving the natural heritage of the country by preserving, the remaining natural forests with the vast majority of flora and fauna, which represent the biological diversity and genetic resources of the country;
- Increasing substantially, the forest/tree cover in the country through massive afforestation and social forestry programmes, especially on all denuded, degraded and unproductive lands involving the local people in this endeavour by giving them tangible economic motives and employment opportunities;
- Meeting the rights and concessions for requirements of fuelwood, fodder, minor forest produce and small timber of the rural and tribal population with due cognisance of the carrying capacity of forests;
- Increasing the productivity of forests to meet the essential national needs;
- Encouraging efficient utilisation of forest produce;
- Restriction on diversion of forest lands for non-forest uses and compensatory afforestation in case where diversion is unavoidable;
- Afforestation on common lands by the local communities through usufruct-sharing schemes;
- Motivation of farmers/land owners to resort to tree farming in similar manner of crop based farming;

- Substitution of wood by other materials, alternative sources of energy and fuel efficient stoves;
- Permission to forest-based enterprises after a thorough scrutiny regarding the availability of raw materials;
- Supply of forest produce to the industrial consumers only at its true market value and not at concessional prices;
- Involvement of local people and dedicated grass roots non-governmental organisations in the afforestation programme and for protection of existing forests; and,
- Creation of land banks for compensatory afforestation.

6.4 Energy Generation and Use

For prevention and control of pollution and environmental hazards in energy generation and use as also for encouraging popularisation of environmentally benign energy systems, the following measures should be taken:

- Environmental impact assessment prior to investment decisions and site selection; choice of practicable clean technologies for energy production and processes including waste utilisation, treatment and disposal of solid wastes, effluents and emissions;
- Location of energy generation projects based on environmental considerations including pollution, displacement of people and loss of biodiversity;
- Decentralised small projects for meeting the rural energy needs and incentives for use of non-conventional energy sources;
- Incentives and punitive measures (including proper pricing) to prevent abuse and to promote the use of energy efficient devices in the production and distribution systems and, for energy conservation in all sectors including households, agriculture, industry, power and transportation;
- Concerted efforts for development and propagation, of non-conventional renewable energy generation systems; and,
- Setting up of biogas plants based on cow-dung human excreta and vegetable wastes.

6.5 Industrial Development

Environmental considerations should be integrated while encouraging industrial growth. The action points in this regard should include a mix of promotional and regulatory steps, which are as follows:

- Incentives for environmentally clean technologies, recycling and reuse of wastes and conservation of natural resources;
- Operationalisation of 'polluter pays principle' by introducing effluent tax, resource cess for industry and implementation of standards based on resource consumption and production capacity;
- Fiscal incentives to small scale industries for pollution control and for reduction of wastes;
- While deciding upon sites, priority to compatible industries so that, to the extent possible, wastes from one could be used as raw material for the other and thus the net pollution load is minimised;
- Location of industries as per environmental guidelines for siting of industry;
- Enforcement of pollution control norms in various types of industrial units depending on their production processes/technologies and pollution potential; particular attention to be paid to highly polluting industries;

- Encouragement for use of environmentally benign automobiles/motor vehicles and reduction of auto-emissions;
- Collective efforts for installation and operation of common effluent treatment facilities in industrial estates and in areas with cluster of industries;
- Introduction of 'Environmental Audit' and reports thereof to focus on environment related policies; operations and activities in industrial concerns with specific reference to pollution control and waste management;
- Dissemination of information for public awareness on environmental safety aspects and stringent measures to ensure safety of workers and general population against hazardous substances and processes;
- Preparation of on-site emergency plans for hazardous industries and offsite emergency plans for districts in which hazardous units are located;
- Public liability insurance against loss or injury to life property;
- Setting up of environment cells in industries for implementing environmental management plans and for compliance of the requisites of environmental laws,
- Internalising the environmental safeguards as integral component of the total project cost;
- Environmental impact assessment from the planning stage and selection of sites for location of industries; and
- Clearance by Ministry of Environment & Forests of all projects above a certain size and in certain fragile areas.

6.6 Mining and Quarrying

To prevent and to mitigate environmental repercussions in mining and quarrying operations, action must be directed to:

- Mined area rehabilitation and implementation of the environmental management plans concurrently with the ongoing mining operations to ensure adequate ecological restoration of the affected areas;
- Rehabilitation of the abandoned mined areas in a phased manner so that scarce land resources can be brought back under productive use;
- Laying down of requisite stipulations for mining leases regarding tenure, size, shape and disposition with reference to geological boundaries and other mining conditions to ensure systematic extraction of minerals along with environmental conservation;
- Emphasis on production of value added finished products from mining so as to reduce indiscriminate extraction;
- Upgradation and beneficiation of minerals at the source, to the extent possible in order to ensure utilisation of low grade mineral resources and to reduce the cost of transportation, processing and utilisation;
- Environmentally safe disposal of the by-products of mining;
- Restriction on mining and quarrying activities in sensitive areas such as hill slopes, areas of natural springs and areas rich in biological diversity;
- Discouraging selective mining of high grade ores and recovery of associated lower grade ores during mining; and
- Environmental impact assessment prior to selection of sites for mining and quarrying activities.

6.7 Tourism

To ensure sustainable growth of tourism without causing irreversible damage to the natural environment, activities relating to tourism should take care of the following:

- Promotion of tourism based on careful assessment of the carrying capacity and support facilities such as transport, fuel, water and sanitation;
- Development of tourism in harmony with the environmental conditions and without affecting the lifestyles of local people; and
- Restriction on indiscriminate growth of tourism and strict regulation of the tourist activities in sensitive areas such as hill slopes, islands, coastal stretches, National Parks and Sanctuaries.

6.8 Transportation

For prevention of pollution and for development of environmentally compatible transportation systems, the following steps should be taken:

- Improvement in mass transport system to reduce increasing consumption of fuel, traffic congestion and pollution;
- Improved transport system based on bio-energy and other non-polluting energy sources;
- Rail transport and pipeline transport instead of road transport, where-ever possible, by appropriate freight pricing so as to reduce congestion, fuel consumption and environmental hazards;
- Transportation of hazardous substances through pipelines;
- Improvement in traffic now through proper maintenance of roads, updated traffic regulation and strict enforcement of prescribed standards;
- Enforcement of smoke emission standards for containing vehicular exhausts, at the manufacturer and user level;
- Phasing out the use of lead in motor spirit; and
- Regulations for environmental safety in transportation of hazardous substances

6.9 Human Settlements

To check unplanned growth of human settlements and to ensure a better quality of life for the rural and urban population, The action points should include the following:

- Creation of gainful employment opportunities and provision for meeting the basic needs, through better communications, entertainment, medical and educational facilities in rural areas to check rural urban migration;
- Decentralisation of urbanisation through establishment of secondary cities and towns with requisite infrastructural services and employment opportunities by developing human settlement perspective plan at national and state level;
- Disincentives for industrial and job location in existing urban centres which have exceeded their carrying capacity;
- Improvement of infrastructural facilities such as water supply, sewage, solid waste disposal, energy recovery systems and transportation in an integrated manner;
- Promoting the use of indigenous building materials and appropriate construction technologies by revising building and planning codes supporting small scale production, skill upgradation of artisans and people oriented delivery systems;

- Conservation of heritage sites and buildings, through regulation to ensure that these are not demolished, encroached upon and affected by indiscriminate construction and pollution;
- Stock-taking of buildings, areas, monuments of heritage value in the country;
- Recycling of existing building stock to save green open compounds and save building material;
- Planting of shade giving and fruit bearing and ornamental trees along the road side, in the compounds of schools, hospitals, Government as well as private office buildings, places of worship, places meant for public fairs, assemblies and markets, and the periphery of play grounds and water bodies;
- Botanical gardens representating the local flora;
- Raising of gardens, parks and open spaces in the towns and cities for public use and for promotion of environmental consciousness;
- Laying down a system for the propagation and protection of urban forestry by assigning responsibility amongst the various authorities;
- Deterrent measures to discourage indiscriminate growth of human settlement and polluting industries in vulnerable areas such as hilly regions and coastal stretches;
- Environmental appraisal of projects related to urban development and regional planning, preparation of environmental/ eco-development plans for sensitive regions and sub-regions for evolving desirable norms and space standards;
- Prevention of environmental health problems and associated communicable and non-communicable diseases by educating people on personal hygiene, sanitation and use of potable water;
- Creation/strengthening of health care facilities for all sections of society both in rural and urban areas; and
- Establishment of monitoring systems and epidemiological data to ensure adequate early warning system for prevention and control of diseases.