Report of

THE STEERING COMMITTEE ON

THE ENVIRONMENT AND FORESTS SECTOR

FOR
THE ELEVENTH FIVE YEAR PLAN
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Planning Commission

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ABBREVIATIONS

AICOPTAX	All India Coordinated Project on Taxonomy
AICTE	All India Council for Technical Education
AWBI	Animal Welfare Board of India
BHS	Biodiversity Heritage Sites
BMC	Biodiversity Management Committees
BOD	Biochemical Oxygen Demand
BSI	Botanical Survey of India
BTX	Benzene Pollutants (benzene, toluene, xylenes)
CAAP	Clean Air Action Plan
CAMPA	Compensatory Afforestation Management Authority
CBD	Convention on Biological Diversity
CBF	Central Board of Forestry
CBWTF	Common Bio-medical Waste Treatment Facilities
CCA	Community Conserved Areas
CDM	Clean Development Mechanism
CETP	Common Effluent Treatment Plants
CITES	Convention on International Trade on Endangered Species
CPCB	Central Pollution Control Board
CPCSEA	Committee for the Purpose of Supervision and Control of Experiments on Animals
CREP	Corporate Responsibility on Environmental Protection
CRZ	Coastal Regulation Zone
CSD	Commission on Sustainable Development
CSFER	Centre for Social Forestry and Eco-rehabilitation
CSIR	Council of Scientific & Industrial Research
CSO	Central Statistical Organisation
CSS	Centrally Sponsored Schemes
CZA	Central Zoo Authority
DBT	Department of Biotechnology
DFE	Directorate of Forest Education
DLR	Department of Land Resources
DNA	Designated National Authority
DO	Dissolved Oxygen
DRDA	District Rural Development Authority
DSS	Decision Support System
DST	Department of Science & Technology
DWD	Department of Wasteland Development
EAC	Expert Appraisal Committees
EAP	Externally Aided Project
EIA	Environmental Impact Assessment
ENVIS	Environmental Information System
FAO	Food and Agriculture
FCA	Forest Conservation Act
FDA	Forest Development Agencies

FLIS	Forest Land Information System
FREEP	Forestry Research Education and Extension Project
FRLHT	Foundation for Revitalisation of Local Health Traditions
FSI	Forest Survey of India
GAP	Ganga Action Plan
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Green House Gas
GIS	Geographic Information System
GLOBE	Global Learning and Observations to Benefit the Environment
GLORIA	Global Observation Research Initiative in Alpine Environments
GMEF	Global Ministerial Environment Forum
GMO	Genetically Modified Organisms
GPA	Global Plan of Action
GPS	Global Positioning System
IBIS	Indian Biodiversity Information System
ICAR	Indian Council of Agriculture Research
ICFRE	Indian Council of Forestry Research and Education
ICI	Indigenous Community Institutions
IFAD	International Fund for Agricultural Development
IFS	Indian Forest Service
IGNFA	Indira Gandhi National Forest Academy
IGNOU	Indira Gandhi National Open University
IIFM	Indian Institute of Forest Management
IMD	India Meteorological Department
IPCC	Inter-governmental Panel on Climate Change
IPIRTI	Indian Plywood Industries Research and Training Institute
ITTA	International Tropical Timber Agreement
ITTO	International Tropical Timber Organization
IUCN	International Union for the Conservation of Nature & Natural Resources
IVRI	Indian Veterinary Research Institute
JFM	Joint Forest Management
JFMC	Joint Forest Management Committees
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
JPAM	Joint Protected Area Management
LMO	Living Modified Organisms
Lpcd	Litres per person (capita) per day
LRTAP	Long-Range Trans-boundary Air Pollution
MFP	Minor Forest Produce
MLD	Million Litres per Day
MNES	Ministry of Non-Conventional Energy Sources
MNRE	Ministry of New and Renewable Energy
MOA	Ministry of Agriculture
MOEF	Ministry of Environment and Forests
MOU	Memorandum of Understanding
MTA	Mid Term Appraisal

NAEB	National Afforestation and Eco-development Board
NAEEB	National Afforestation, Ecorestoration and Eco-development Board
NAP	National Afforestation Programme
NAQP	National Air Quality Planning
NCEPC	National Committee on Environmental Planning and Coordination
NCFR	National Curriculum Framework Review
NCT	National Capital Territory
NEAC	National Environment Awareness Campaign
NECA	National Environment Clearance Authority
NEMP	National Environmental Monitoring Programme
NEPED	Nagaland Environmental Protection and Economic Development Project
NFAP	National Forestry Action Programme
NGO	Non Governmental Organisation
NIP	National Implementation Plan
NLCP	National Lake Conservation Plan
NOx	Oxides of Nitrogen
NPV	Net Present Value
NRAP	National River Action Plan
NRC	National Referral Centre
NRCP	National River Conservation Plan
NREGA	National Rural Employment Guarantee Act
NREGP	National Rural Employment Guarantee Programme
NREP	National Rural Employment Programme
NTCA	National Tiger Conservation Authority
NTFP	Non-Timber Forest Produce
NWDB	National Wasteland Development Board
NZP	National Zoological Park
O&M	Operation & Maintenance
ODS	Ozone Depleting Substances
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic (Oslo & Paris Convention)
PA	Protected Areas
PAH	Polycyclic Aromatic Hydrocarbons
PESA	Panchayat (Extension to Scheduled Areas) Act, 1996
PIC	Prior Informed Consent
PM	Particulate matter
PCPI	Pollution Control and Prevention in Industrial Areas
POP	Persistent Organic Pollutants
PPVFR	Protection of Plant Varieties & Farmers' Rights
PRI	Panchayat Raj Institutions
RD	Rural Development
RSPM.	Respirable Suspended Particulate Matter
RLEGP	Rural Landless Employment Guarantee Programme
RRA	Regional Resource Agencies
RTI	Right to Information
SACON	Salim Ali Centre for Ornithology and Natural History

SAICM	Strategic Approach to International Chemicals Management
SECA	State Environmental Clearance Authority
SFM	Sustainable Forest Management
SFR	State of Forests Report
SHGs	Self-Help Groups
SME	Small and Medium Scale Enterprises
SO_2	Sulphur dioxide
SPCB	State Pollution Control Board
STP	Sewage Treatment Plants
TBGRI	Tropical Botanical Gardens and Research Institute
TFRA	Scheduled Tribes and other Forest Dwellers (Recognition of Forest Rights) Act
TSDF	Transport, Storage and Disposal Facilities
UGC	University Grants Commission
UIDSSMT	Urban Infrastructure Development Scheme for Small & Medium Towns
UNCCD	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environment & Development
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
VF	Village Forest
VFC	Village Forest Committee
VOC	Volatile Organic Compounds
VSE	village and Small-scale Enterprises
VSI	Village and Small Industries
WHO	World Health Organisation
WII	Wildlife Institute of India
WLPA	Wildlife Protection Act
ZSI	Zoological Survey of India

EXECUTIVE SUMMARY

Across the political spectrum of the country, there has been recognition of the vital role natural resources play in providing livelihoods and securing life-support ecological services, particularly to the poorest of the poor. The National Environment Policy emphasizes the need to identify emerging concerns arising from better scientific understanding, economic and social development and development of multilateral environmental regimes. Accordingly, the Eleventh Plan needs to work on integrating development planning and environmental concerns, providing for the use of economic instruments based on principles such as the 'polluter pays', supplemented by command and control policies where these are more appropriate.

Environment is the key natural asset on which development will be based. The regulatory process led by Government will need knowledge-based critiques – by funding open research on the projects, by opening schools that teach people the science of environmental impact assessments. Concerns of people will be the guiding principle for environmental management.

The Eleventh Five Year Plan for the Environment, Forest, and Animal Welfare sector is designed to address these emergent concerns and is based on a serious re-examination and re-thinking of the functioning of the sector. Underlying this proposed strategy is a focus on inclusiveness and coherence and integration of natural and social perspectives, involvement of civil society and academics in planning and monitoring, learning from the past and enhancing devolution, accountability and transparency. The monitorable Socio-Economic Targets of the Eleventh Plan include increasing forest and tree cover by 5 percentage points.The target of increasing the forest cover/ eco-restoration basically aims at increasing the resource base of the income generating productive assets in State, community controlled and other accessible land and water resources for fulfilling the needs of the rural poor for ensuring their access to these for bolstering their ability to sustain themselves through self-employment. Ecotourism offers excellent possibilities of taking the benefits of nature conservation to local communities in many ways including homestead tourism.

In order to strengthen the framework of governance and integrate environmental concerns into all planning and decision-making processes across all sectors and developmental activities of the Central Government an independent, statutory Commission on Sustainable Development (CSD) and District Paryavaran Vahinis have been proposed. Setting up of a National Environment Clearance Authority (NECA) and State Environment Clearance Authority (SECA) will also help in improving the quality, independence, and transparency of the Environmental Impact Assessment (EIA) process.

In order to integrate the global environmental agreements at the international level with work at the national level there is need to assess the time and cost of participating in the international meetings and our strategies for the future. A new major inter-ministerial high level programme providing for long-term sustained activities in different aspects of global change including climate change assessment and mitigation has been proposed.

The thrust areas of the National Air Quality Programme during the Eleventh Plan shall include review of standards, expanded monitoring, use of multiple instruments for regulation and assessment of health impacts. A single comprehensive Clean Air Action Plan covering criteria pollutants, air toxics and hazardous air pollutants shall be prepared. Greater awareness and involvement of local communities and local Governments in the monitoring of water pollution in river and water bodies will help in implementing the river action programmes. A co-ordinated programme for waste management and minimisation to integrate with the JNNURM, CPCB and MOEF will be pursued for analysis of trends for monitoring and work on strategies and support for development of suitable technologies and implementation thereof in an effective manner.

Freshwater ecosystems such as lakes and rivers are under serious threat across India. The NRCP should graduate from being a 'sewage treatment plan' to a programme with a more broad based approach. The integration of NRCP and NLCP with the investment being made under the JNNURM will need to be pursued for effective impact on pollution abatement of water bodies.

Use of scientific, social and local information will be imperative for formulating environmental management plans for coastal areas. It is important to ensure participation of civil society in the State level coastal zone management committees and empower fishing/coastal communities to carry out conservation and ensure sustainable harvest.

The Environmental Awareness programmes will link environment education in the school and college student projects to the proposed NEMP which would function under the guidance of a committee of experts drawn from various disciplines including not only ecology and environmental chemistry but also public health and socio-environmental studies. The focus of this programme will be on tracking the status and change in the socially relevant biophysical parameters and their social impacts where possible and on making this information available as widely as possible.

The forestry sector is facing the most crucial paradigm change of all the social and economic sectors. Foresters today are required to play multifarious roles to deal with a variety of externalities besides coping with traditional forestry management practices. It is, therefore, very essential to develop expertise in the field of forestry and wildlife management as well as to create awareness among the personnel of other services and all other stakeholders who directly or indirectly influence the development and management of forests and wildlife eco- systems.

Today BSI and ZSI are facing major challenges in view of the new regime of sovereign rights of countries of origin over genetic resources, provisions of the Biological Diversity Act and the fast evolving knowledge and information environment. It should be ensured that these Institutions evolve a culture of openness, working with other Institutions and functioning as a part of a network. The setting of Biodiversity Management Committees at the local level has begun and requires modifications in the governance arrangements and must be supplemented by documentation of existing biodiversity and people's knowledge, linked to a national biodiversity information system.

GB Pant Institute of Himalayan Environment and Development will reorient its activities to evolve as a resource centre for the Himalayan States and Government of India for advice on sustainable development. The focus of research will include socio-economic development of the mountain habitations. Apart from training, research, advisory and advocacy role of Wild life Institute of India, the new approaches would include developing workable framework for mainstreaming conservation in development projects and policies, empirical studies on ecological impacts of developmental projects and human activities, strengthening common property resource management and developing expertise in managing wildlife in isolated, fragmented patches across landscapes.

Under ICFRE & IPIRTI, specific thrust will be given for developing technologies and processes for agro- forestry and social forestry. A forest biodiversity network will be established for integrating the available information at one platform and studies in the left out areas. Inter-sectoral impacts, trade and market aspects of forest economics, ecosystem research, policy research and concerns of climate change including carbon trade methodologies will be taken up.

The Eleventh Plan must, of course, continue to strengthen the traditional wildlife conservation efforts in the form of support for habitat and infrastructure development. For strengthening the Wild life management the scheme will cover monitoring the traffic of wildlife contrabands and regulating movement of wildlife articles across the country through regional offices of the Directorate of Wildlife Preservation and setting up of Wild Life Crime Bureau. It is also imperative that conservation efforts build stronger linkages with livelihood concerns. Thus existing programmes should extend from wetlands, mangroves, and coral reefs to mountains, grasslands and alpine ecosystems.

The NTCA would address the ecological, social as well as administrative concerns for conserving tigers by providing a statutory basis for protection of tiger reserves apart from providing strengthened Institutional mechanisms for the protection of ecologically sensitive areas and endangered species and positively engaging local community members in conservation efforts. The Project Elephant will focus on developing strategies for strengthening and developing elephant movement corridors as the efforts to acquire the corridor areas have generally met with difficulties.

Criteria for assessment of green cover of the country need a review and greening, as an indicator of productivity of natural resources, will be linked to management for livelihood. Greening programmes, thus, will have to be supportive of rural economy along with their ecological services. Participatory process will be strengthened by ensuring legal, social and economic empowerment of community organizations in order to facilitate considered decisions on planning, practicing and utilizing the forest in their vicinity. Institutional support for statutory provisions for empowerment of forest dwellers and other stakeholders will be ensured by capacity building in terms of skills and infrastructure. Building up data and information base and leveraging the technology will be an important component of forestry and wild life sector.

Forests of the country can be optimally managed but cannot be expanded. The needs from the forests will be diverted to non-forests by facilitating optimum production models

to stakeholder communities and farmers for commons and farmlands. These models will be based on the livelihood needs and economic opportunities available with the communities.

The focus of the Central Plan will be to augment the capacity of the State forest and wild life management towards efficient management planning, optimizing the production of goods and services and enable a strong people forest interface through meaningful partnership for sustainable livelihoods and forest management. The Central efforts will aim at supporting the States efforts in policy and programme initiatives towards conservation of forest resources as strong life support systems economically as well as ecologically.

In all, the existing programmes will be recast into fewer, focused activities and new programmes on important habitats beyond PAs, optimizing productivity of commons, facilitating farm forestry and encouraging fair trade will be taken up. Intensive monitoring of environmental trends and orienting development towards sustainability will be the focus through related green cover and abatement of river pollution. Accordingly, the proposed outlay for Rs. 19,720 Crore for Eleventh Plan is categorized into seven groups of activities.

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Chapter 1: Introduction[1]

At the Cross-roads

A major advantage in formulating the Eleventh Plan is that India's economic fundamentals have improved enormously and we now have the capacity to make a decisive impact on the quality of life of the mass of our people, especially on the poor and the marginalized. Yet, it is also true that economic growth has failed to be sufficiently inclusive. The percentage of our population below the poverty line is declining but only at a modest pace. Malnutrition levels also appear to be declining, but the magnitude of the problem continues to be very high. Far too many people still lack access to basic services such as health, education, clean drinking water and sanitation facilities without which they cannot claim their share in the benefits of growth. Employment is a significant area which shows up where our growth process is failing on inclusiveness. The number of workers is growing, particularly in non-agriculture, but weaknesses appear in unemployment, the quality of employment and in large and increasing differentials in productivity and wages. Agriculture lost its growth momentum from the mid-1990s and subsequently entered a near crisis situation. Consequently, agricultural employment has increased at less than 1% per annum, slower than population and much slower than non-agricultural employment. Furthermore, this has been associated with a sharp increase in unemployment (from 9.5% in 1993-94 to 15.3% in 2004-05) among agricultural labour households which represent the poorest groups.

Traditionally, the rate of growth of GDP has been at the centre of planning. However, growth is not an end in itself - it is a means to an end which must be defined in terms of multi-dimensional economic and social objectives. The Eleventh Plan provides an opportunity to focus on and diagnose the reasons for these failings and to reverse at least some of the adverse outcomes of the recent growth pattern. It should aim at making employment generation an integral part of the growth process and devise strategies to accelerate not only growth of employment but also of wages of the poorly paid. Central to this must be the recognition that a very large number of people in our society lack access to income generating productive assets and that this hinders their ability to sustain themselves through pure self-employment. In order to make growth more inclusive, it is vital that more people gain access to more productive assets with which they can themselves generate decent incomes and also that GDP growth generates sufficient demand for wage labour so that those who cannot be self-employed are employed at decent wages. Indeed, as pointed out by the National Commission on Farmers, we need a new deal that rebuilds hope about farming, and one may add, other rural livelihoods, including herding, fishing, forest produce gathering, basketry and other artisanal activities.

The Eleventh Plan for the Environment, Forest and Animal Welfare sector is of particular relevance in this context. Across the political spectrum of the country, there has been recognition of the vital role natural resources play in providing livelihoods and securing

[1] The material in the 1st Chapter (except for parts of the second section) is derived almost entirely from two guiding documents of the Government of India, namely the Approach to 11th Five Year Plan (2006) as adopted by the National Development Council and the National Environment Policy (2006) as approved by the Cabinet. All that has been added are a few phrases to link it to the context of Environment and Forests.

life-support ecological services, particularly to the poorest of the poor. This is reflected in our formulation of the principal objectives of the National Environment Policy:

i. **Conservation of Critical Environmental Resources:** To protect and conserve critical ecological systems and resources and invaluable natural and man-made heritage which are essential for life-support, livelihoods, economic growth and a broad conception of human well-being.

ii. **Intra-generational Equity: Livelihood Security for the Poor:** To ensure equitable access to environmental resources and quality for all sections of society and in particular, to ensure that poor communities, which are most dependent on environmental resources for their livelihoods, are assured secure access to these resources.

iii. **Inter-generational Equity:** To ensure judicious use of environmental resources to meet the needs and aspirations of the present and future generations.

iv. **Integration of Environmental Concerns in Economic and Social Development:** To integrate environmental concerns into policies, plans, programmes and projects for economic and social development.

v. **Efficiency in Environmental Resource Use:** To ensure efficient use of environmental resources in the sense of reduction in their use per unit of economic output, to minimize adverse environmental impacts.

vi. **Environmental Governance:** To apply the principles of good governance (transparency, rationality, accountability, reduction in time and costs, participation and regulatory independence) to the management and regulation of use of environmental resources.

vii. **Enhancement of Resources for Environmental Conservation:** To ensure higher resource flows, comprising finance, technology, management skills, traditional knowledge, and social capital, for environmental conservation through mutually beneficial multi-stakeholder partnerships between local communities, public agencies, the academic and research community, investors, and multilateral and bilateral development partners.

The causes of degradation of environmental resources lie ultimately in a broad range of policy, and Institutional, including regulatory shortcomings, leading to the direct causes. However, our approach so far has emphasized regulation as the major instrument with the State to check environmental degradation. As the Tenth Plan pointed out, India has adopted almost all environmental protection Acts and rules enforced in developed countries. But environmental degradation continues despite the existence of a long-standing policy, and legal-cum-Institutional framework for environmental protection. Therefore, the need for reducing the gap between principle and practice cannot be over-emphasized. In particular, we must now focus on making a decisive impact on the quality of life of the mass of our people, especially on the poor and the marginalized. This objective cannot be achieved if we simply follow a 'business as usual' approach.

We must also bear in mind that while expenditure is an important measure of the pace of implementation, it is not a measure of effectiveness. For that, it is necessary to go from

outlays and expenditures to final outcomes. Bearing this in mind, we must give up the tendency to continue funding old plan schemes even when they have lost their relevance or have failed to yield results. The time has surely come when both the Centre and the States must undertake a serious Zero Based Budgeting exercise to weed out such schemes in the Eleventh Plan. At the same time, subsidies must be curtailed by targeting these effectively to those who deserve them and reducing the non-merit subsidies.

Ground policies and programmes in scientific understanding[2]

The National Environment Policy emphasizes the need to identify emerging concerns due to better scientific understanding, economic and social development and development of multilateral environmental regimes. In this context, one may point to two major themes, namely, interconnected nature of complex systems underlying environmental issues and the difficulties of predicting the behaviour of such complex systems. The interconnected nature is, for instance, the rationale behind the "Ecosystem Approach" adopted by the Convention on Biological Diversity to which India is one of the first signatories. This implies that more than any other sector, the Plan for the Environment sector should be concerned with mainstreaming its concerns, such as sustainability, in every other sector. Population growth increases the environmental load irrespective of the rate of economic growth. Rapid economic growth can intensify environmental degradation. The solution does not lie in slowing growth since slow growth also leads to its own form of environmental deterioration. With rapid growth, we can have the resources to prevent and deal with environmental problems, but we must also ensure that rapid growth is environmentally benign. The Eleventh Plan must, therefore, integrate development planning and environmental concerns, providing the use of economic instruments based on principles such as the 'polluter pays', supplemented by command and control policies where these are more appropriate. Clearly, the Eleventh Plan should not end up simply as a Plan for spending the outlays available for the Ministry of Environment and Forests. Similarly, the Forestry sector should not operate in isolation, especially in view of the fact that some 28% of India's villages relate directly to forest ecosystems, and these villages harbour highest levels of people below the poverty line, whose livelihood security should be a major focus of the Eleventh Plan.

Secondly, ecology and other sciences of complex systems now emphasize the severe limits to our ability to arrive at general laws and to predict their behaviour, leading to often unexpected consequences of human interventions. The Bharatpur wetlands, famous for the large heronries in the rainy season and the enormous flocks of migratory birds visiting in winter, offer an illuminating case study. It was one of the first wildlife sanctuaries to be created at the instance of Dr Salim Ali in the 1950s. He had worked for years at Bharatpur, banding thousands of migratory birds. Bharatpur had been subject to grazing by buffaloes and other uses such as collection of 'khus' grass by local people for centuries and had remained a biodiversity rich habitat. However, Dr Salim Ali felt that the habitat would greatly benefit from a cessation of buffalo grazing and was supported by experts of the International Crane Foundation. These recommendations led to the declaration of the locality as a National Park in 1982. The rigid regulations applicable to a National Park called for total cessation of livelihood activities of local people, so buffalo grazing was banned without any alternatives

[2] The exposition of ecosystem approach and adaptive management is the only part of Chapter 1 to include extensive material not contained in the two documents cited in footnote 1.

being offered. There were protests; but the ban was enforced. This intervention was followed by a totally unexpected outcome. It turned out that buffalos were keeping under check a water loving grass *Paspalum*. When grazing stopped *Paspalum* grew unchecked, rendering the wetland a far worse habitat for waterfowl, the prime objective of the National Park management. The numbers of visiting Siberian cranes have also been declining. Residents of the village Aghapur adjoining the National Park have an intriguing suggestion in this regard. They believe that Siberian cranes earlier had better access to underground corms and tubers, their major food, because the soil used to be loosened while digging for 'khus' roots. Since this collection was stopped on declaration of the site as National Park, the soil has been compacted reducing their access to this food. This is a plausible hypothesis worth exploring further.

This case history illustrates well the rationale behind the new philosophy of managing complex systems like ecosystems, namely that of adaptive management. ***Since the consequence of an intervention in such complex systems is largely unpredictable, it is appropriate to treat any intervention as a working hypothesis.*** Thus the proposition that stoppage of buffalo grazing would improve the waterfowl habitat should have been treated as a working hypothesis. Grazing should have been banned in some portions of the National Park and allowed to continue in others. The consequences should have been monitored, compared and decision made to either further extend or retract the ban on grazing. Indeed, this is the broad philosophy underlying modern management practice, namely, that it should be attempted on a case by case basis in a flexible fashion, and not on the basis of some abstract rigid principles.

Infuse a spirit of partnership throughout the spectrum of environmental management in the country

The Ninth principle enunciated by the National Environment Policy pertains to the "Public Trust Doctrine", namely, that the State is not an absolute owner, but a trustee of all natural resources, which are by nature meant for public use and enjoyment, subject to reasonable conditions, necessary to protect the legitimate interest of a large number of people, or for matters of strategic national interest. This is particularly significant in the context of the Forestry and Wildlife sector, which, for historical reasons has tended to stand aloof from the mainstream of social developments. However, the strategy of inclusive growth proposed in the Approach to the Eleventh Plan can command broad based support only if growth is seen to demonstrably bridge divides and avoid exclusion or marginalization of large segments of our population. These divides manifest themselves in various forms: between the haves and the have-nots; between rural and urban areas; between the employed; and the under/unemployed, between different States, districts and communities; and finally between genders. The divides are typically most acute in districts with rainfed agriculture or extensive land degradation, generally poor infrastructure and connectivity and low human development indicators. Many of these districts also have large tribal populations, where problems of tribal rights in forest areas have remained unresolved and contribute to persistent dissatisfaction. Lack of economic development in these districts, often because large parts of their traditional land and forest resources have been declared State forests or protected areas within an exclusionary framework, has led to severe social problems and a perception of alienation and neglect. Such a perception soon deteriorates into an adverse security environment. This, in turn, discourages development and creates a vicious circle. Many such districts have seen a rise of Naxalism,

which now poses a severe internal threat. Such marked inequalities are a matter of concern and, in some cases, even shame. The Eleventh Plan must ensure that the growth process helps to bridge these divides. The recently enacted Scheduled Tribes and other traditional forest dwellers (Recognition of Forest Rights) Act offers considerable scope for rectifying past injustices and should be used during the Eleventh Plan for democratic decentralization of forest governance.

As the National Environment Policy asserts, the present day consensus reflects three foundational aspirations. First, that human beings should be able to enjoy a decent quality of life; second, that humanity should become capable of respecting the finiteness of the biosphere; and third, that neither the aspiration for the good life, nor the recognition of biophysical limits should preclude the search for greater justice in the world. The Eleventh Plan for the Ministry of Environment and Forests can help progress towards greater justice by focusing on the empowerment of Panchayats and the Urban Local Bodies, in fact going down to the level of gram sabhas and ward sabhas, particularly, in terms of functions, functionaries, funds, and corresponding capacities. Such empowerment could particularly help rural poor enhance access to income generating productive assets from State and community controlled land and water resources and thereby bolster their ability to sustain themselves through self-employment. As a part of the effort to promote partnerships, the Eleventh Plan should revive the programme of district level Paryavaran Vahinis to promote a broadly participatory process of environmental monitoring and management.

Promote agricultural growth and support systems for farm economy

The Approach to the Eleventh Plan assigns high priority to regaining agricultural dynamism. A second green revolution is urgently needed to raise the growth rate of agricultural GDP to around 4%. This is not an easy task since actual growth of agricultural GDP, including forestry and fishing, is likely to be below 2% for the Tenth Plan period. The challenge posed, therefore, is to at least double the rate of agricultural growth and to do so recognizing demographic realities, particularly the increasing role of women.

Taking all the above into account, the Eleventh Plan strategy to raise agricultural output will be based on several elements of relevance to the Environment and Forest sector.

- Improve water management, rain water harvesting and watershed development;
- Reclaim degraded land and focus on soil quality;
- Diversify into high value outputs, fruits, vegetables, flowers, herbs and spices, medicinal plants, bamboo, bio-diesel etc., but with adequate measures to ensure food security;
- Promote animal husbandry and fishery; (and one may add also forestry);
- Improve the incentive structure and functioning of markets; (including for forest produce such as medicinal plants, bamboo, mahua and tendu)

Agriculture has particularly stagnated in districts with rainfed agriculture or extensive land degradation, generally poor infrastructure and connectivity and low human development indicators. Especially for such districts, but also more generally, it is necessary to revive and improve the whole range of systems support that a small farm economy requires, but which appears to have deteriorated. It is clear that a successful strategy will require a very significant

effort to improve land and water management and a much enhanced extension support, in addition to a major step-up in provision of quality planting material and better animal breeds along with adequate feed and fodder. The survival of pastoralism is crucial for sustainable land use. Besides conserving domestic biodiversity, it is a means of producing food in dry lands without depleting groundwater resources. However, there are many constraints on expansion in this area. Grazing permits are denied in traditional grazing sites that have been converted into protected areas/wildlife sanctuaries, national parks/Joint Forest Management (JFM) programme. Original pasture lands or stipulated animal drinking water ponds are encroached upon, or used for other purposes. Bio-diesel (Jatropha) planting is being promoted through State agencies without seeing all the consequences such as blocking the migration routes of animals and encroaching upon herd-passing pathways. It is vital to ensure that the commons are protected and women, who make up a substantial portion of the workforce in this sector, are given control over them. This will prevent their use for other purposes.

There is a substantial gap between potential and actual agricultural yields, and further region-wise, crop-wise analysis is necessary to identify the specific constraints and policy distortions that have resulted in these yield gaps. Development of such strategies for different agro-climatic zones require a strong data base with regard to soil characteristics, soil health, water availability, weather parameters, local agro-biodiversity, and resource management systems.

Promote rural small scale enterprises

We need to recognize explicitly that it is the village and small-scale enterprises (VSE) which will have to provide most of the new employment during the Eleventh Plan, at least half of which will have to be created in rural areas. Eleventh Plan should address the many problems faced by VSE units and home based workers, particularly women. The most important of these are the non-availability of timely and adequate credit, unreliable or even absent power supply, and many barriers to accessing forest produce. But there are others, e.g. requirement of permissions from a number of Government agencies, the burden of multiple inspections and, often, need to maintain numerous registers and submit many returns. Indeed, the Forestry sector is replete with many remnants of the control regime that need drastic overhaul.

Self-employment is promoted through many schemes by many different departments. Besides an array of programmes for village and small scale enterprises, there are special schemes for scheduled castes and tribes. As far as Rural Development is concerned, the present strategy for promotion of self-employment in rural areas relies mainly on formation of self-help groups to empower rural communities and enable them to take up economic activities. Many other departments in Government also have schemes that provide assistance to SHGs but guidelines vary in scope, content, and implementation mechanisms thus creating overlap and inefficiency. The Eleventh Plan should integrate the self-employment programmes implemented by different Ministries into an integrated programme that cuts across Ministries. The programme should also provide for training and capacity building of educated unemployed youth, particularly in rural areas, as such unemployment has assumed serious proportions especially in the southern parts of the country. Marketing support will have to be provided to SHGs to ensure their sustainability.

The possibilities in agro-processing, including processing of forest produce, are increasing, especially for youth who are unable to enter the industrial sector. There is however little or no training available in processing of agricultural or forest produces. There exist many Government schemes with known technologies that need to be taken to the youth through Short Term courses. Starting agricultural schools with strong agro-processing, irrigation, soil conservation, and forestry/gardening components will thus be one of the goals of the Eleventh Plan.

Ensure convergence with NREGP to augment ecological resource base

The divide between urban and rural India has become a truth of our times. The Central Government has already adopted a multi-pronged strategy to reduce this divide in its various dimensions. The National Rural Employment Guarantee Act 2005 (NREGA) attempts to ensure a social safety net as it provides guaranteed employment in rural areas. It can also become instrumental in building rural infrastructure especially if resources from other programmes are pooled in. In this context, the Eleventh Plan for the MoEF can play a very significant role in linking NREGA with augmenting the ecological resource base.

NREGA assures every rural household at least 100 days of manual work at minimum wages. Initially in effect in 200 districts, the Act will be extended to the entire country over a five-year period. Unlike employment programmes in the past that were supply-driven, bureaucracy-controlled and suffered from large leakage including misuse of funds arising from false muster rolls and poor project design, this is demand-driven, based on a legal right and requires PRIs to select projects relevant to the needs of the community. Initial assessments are mixed, e.g. muster rolls continue to be problematic in many places, but it is clear that the demand-driven nature of NREGP has not led to as high leakages or cost as some had originally feared. If anything, the main teething problems appear to be insufficient information and unduly high task norms, which have caused demand to be much less than earlier estimated. Where these have been addressed, it is a very popular scheme effective in providing fall-back income, reducing distress migration and in creating assets. To fulfill the rights created, the Eleventh Plan must ensure that NREGP is adequately funded and effectively implemented. State Governments should address existing problems, meet employment demand promptly and, by using NREGP in convergence with other schemes, such as those from Forest and Environment sector, develop land and water resources effectively, especially to benefit the scheduled castes and tribes.

Promote synergies with JNNURM and Bharat Nirman

Rapid economic growth will inevitably lead to an increase in urbanisation as cities provide large economies of agglomeration for individual activity. Unfortunately, the State of urban infrastructure in the country has deteriorated to an extent that we are not able to fully benefit from these economies. Poor urban infrastructure inflicts a severe hardship on people. Congested roads, poor public transport, inadequate availability of water, improper treatment of sewage, uncollected solid waste and above all grossly inadequate housing that forces more than 50% of our population in some metropolis to live in slums, all these severely decrease the quality of life and lower the well being of urban population. Unless, we deal with these problems now, this will deteriorate further as urban population may rise from present 28% to

40-50% by 2025. To cope with massive problems that have emerged as a result of rapid urban growth, the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) was launched by Govt. on 3rd December, 2005 for a seven-year period beginning 2005-06. In order to ensure outcomes, the State has to prepare city development plans, detailed project reports and sign MOU indicating milestones for implementation of reforms with the Ministries of Urban Development and Urban Employment and Poverty Alleviation to access the funds from the Central Government. Similarly, Bharat Nirman is a time-bound business plan for action in rural infrastructure over the four year period (2005-2009). Under Bharat Nirman, action is proposed in the areas of irrigation, rural roads, rural housing, rural water supply, rural electrification and rural telecommunication connectivity. To ensure accountability, the names of villages electrified, villages connected by all weather roads, villages provided drinking water and villages provided with telephones will be put on the Internet.

As emphasized above, more than any other sector, the plan for the Environment sector should be concerned with mainstreaming its concerns, such as sustainability, in every other activity. This is particularly significant in the context of JNNURM and Bharat Nirman.

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Chapter 2: Present scenario

Environment Sector

Indian society has a long tradition of caring for the environment, a tradition evident in the large numbers of peafowl and monkeys roaming fearlessly, and peepal and banyan trees dotting the countryside. In the administrative system environment has traditionally been a responsibility of the agencies responsible for civic amenities. With the environmental impacts being visible beyond the boundaries of civic bodies and taking trans boundary proportions on issues like pollution, overuse of natural resources and conservation of physical and biological environment, Cenral Government constituted a National Committee on Environmental Planning and Coordination (NCEPC) in 1972. Subsequently it was in 1980 when, based on recommendations of a High Power Committee under the Deputy Chairman, Planning Commission, Department of Environment was created at the Centre with specific responsibility of Pollution monitoring and regulation, conservation of critical eco-systems designated as Biosphere reserves and Conservation of Marine Eco-systems. The Department was to act as a nodal agency for environmental protection and eco-development in the country and carry out environmental appraisal of development projects through other Ministries/Agencies as well as directly.

Seventh Five Year Plan was the turning point in environment sector when serious thought started on coastal and river pollution concerns. Environment Protection Act came into being, Ganga Action Plan was initiated at a cost of Rs 240 crore and Central Ganga Authority was constituted under the Chairmanship of the Prime Minister. The Ministry of Environment & Forest came into existence in 1985. Subsequent period saw evolution of Ganga Action Plan into the NRCP and NLCP, creation of a number of Environmental Authorities for dealing with environmental discipline in the country and a comprehensive Environment Clearance Notification 1994, recently reengineered in 2006 providing for comprehensive EIA process and clearance process for 39 development activities in 8 categories. Coastal Regulation Zone Notification was issued in 1991 seeking States to regulate development of coastal area based on the principles of conservation. This process has been reviewed in 2006 and a revised strategy for coastal zone protection is in process of formulation.

Air pollution

The Air (Prevention and Control of Pollution) Act 1981 is the main legislation regulating the pollution issues through the Pollution Control Boards in the States. Monitoring of air quality of 92 cities and towns is taken up by coordinated efforts of Central and State PCBs, universities and research Institutes with respect to 3 main pollutants SO_2, NOx and RSPM. Out of these, as many as 65 are found to be non attainment cities. Main factors responsible are found to be vehicles and industries. Natural dust has been a factor in about 15 cities. These facts indicate the need of close coordination between auto industry/industry, environment and science & technology administration.

CPCB has identified 2301 medium and large scale polluting industrial units under 17 highly polluting categories. The requisite pollution control devices are reported to have been provided in 1927 units, while 235 have been closed and 139 are still defaulting.

Water

The Water (Prevention and Control of Pollution) Act, 1974 regulates the water pollution matters through the SPCBs. Water quality is monitored through a network of 784 stations on monthly or quarterly basis covering 168 rivers, 53 lakes apart from number of ponds, creeks, canals, drains and ground water wells. Main parameters include Biochemical Oxygen Demand (BOD) and coliform count. Presently, NRCP covers approved projects costing Rs 4492 crore covering pollution abatement works in 160 towns along polluted stretches of 34 rivers in 20 States. NLCP covers 28 lakes and National Wetland Conservation Programme covers 66 identified wetlands. The programmatic interventions seem to be addressing the awareness and improvement in the quality of water. However, increased use of water and low recognition of requirement of treatment of effluents and environmental management remain a matter of concern.

Hazardous and Biomedical waste

The SPCBs have legal back up for enforcing management of Hazardous waste and Biomedical waste (Management and handling) Rules. It is assessed that about 4.4 million tonnes of hazardous waste is generated annually by over 13,000 units. At the instance of Supreme Court, an inventory of dumpsites is being carried out. The MoEF provides assistance for installing TSDF for management of hazardous waste. So far, 4 such systems have been supported. Biomedical waste is generally disposed by incinerators or conventional methods.

Sustainable Development and International Commitments

India is committed to pursue a course of sustainable development and is a party to several pertinent global and regional commitments. However, it largely lacks Institutional mechanisms required to mainstream environment into the development process. As yet, no indicators and assessment parameters have been put into place to gauge the country's move towards sustainability. The MOEF is the nodal agency for many international programmes related to sustainable development. Important ones are as follows:

- Commission on Sustainable Development (CSD) under UN Conference on Environment & Development (UNCED)
- United Nations Environment Programme (UNEP) Global Ministerial Environment Forum (GMEF)
- Global Environment Facility (GEF)
- United Nations Framework Convention on Climate Change (UNFCCC) and related mechanisms like Kyoto Protocol, Inter-governmental Panel on Climate Change (IPCC). MoEF is the seat of Designated National Authority for Clean Development Mechanism (CDM).
- Montreal Protocol for Ozone Layer protection
- Basel Convention for trans boundary movement of hazardous waste, Rotterdam Convention for prior informed consent procedure for hazardous chemicals and pesticides in International Trade, Stockholm convention on persistent organic pollutants (POP)
- Convention on Biological Diversity and Cartagena Protocol on Biosafety.

- Convention on International Trade on Endangered species (CITES)
- International Tropical Timber Agreement, 2006.

During the Eleventh Plan, we need to put in place transparent and participatory mechanisms to assess the country's progress in implementing its commitments under these programmes and treaties.

Biodiversity and Conservation

Among the first ever organizations handed over to the Department of Environment were the BSI and ZSI. These historical organizations have been well equipped, organized and networked for undertaking biodiversity assessments in the Country. The present status of the activities of these organizations needs to match the demand of biodiversity information and knowledge. The world known Indian Botanical Gardens at Kolkata and various herbaria of BSI are in dire need of revamping with modernization with IT interface.

Under the Man and Biosphere programme of UNESCO, till 1989, 7 Biosphere Reserves were declared initially which has risen to 14. The concept recognizes human development, conservation of social and cultural resources as equally important as the biological resources for sustainability. The Ministry fosters the support for research, monitoring, education and information exchange for the designated biosphere reserves.

Mangroves, Wetlands and Coral Reefs are recognized as important habitats and special programmes are run for conservation efforts of these habitats. The existing programmes support the efforts of States and civil society organizations for undertaking conservation, research, and information gathering for such habitats. A major country-wide participatory exercise has been carried out in 2000-2003 to formulate a National Biodiversity Strategy and Action Plan with detailed strategies on conservation, sustainable use and equity.

A major lacuna in all these efforts is the absence of linkage between biodiversity assessment and conservation with its sustainable use, particularly to benefit rural poor and equitable sharing of benefits with these communities, especially holders of traditional knowledge.

Rivers and Lakes Conservation

The pollution of surface water sources is one of the consequences of unsustainable urban and industrial growth. The pollution due to effluents from domestic and industrial waste finding way to the rivers and lakes resulted in launch of specific programmes like Ganga Action Plan, Yamuna Action Plan, now NRCP and the NLCP. The urgent need of maintaining good level of water quality of surface and ground water resources led to the consideration of the rivers holistically and plans to restore their ecological health to begin with, improve the water quality to the bathing standard Class B. Cities and towns located near the banks of rivers were found to be the gross polluters and they were taken up for planning and implementing schemes to ensure that only treated waste water is discharged in to the rivers.

The cleaning of the Ganga River, started about 20 years ago, remains an unfinished task. Under the Ganga Action Plan Phase-I, pollution abatement works were taken up in 1985

in 25 Class-I towns in Uttar Pradesh, Bihar and West Bengal and sewage treatment capacity of 865 MLD was created at a total cost of Rs. 451.70 crore, tackling only about 35 per cent of the pollution load. Phase-II (1993) for pollution abatement in Ganga's tributaries (Yamuna, Damodar and Gomti), merged with NRCP in 1996, covers 95 towns located along the River Ganga and its tributaries in seven States. It is estimated that another 30 per cent of the pollution load of Ganga would be covered on completion of on-going works under NRCP. However, there will still be a gap of nearly 35 per cent of the pollution load to be addressed in future.

The 22 km stretch of Yamuna in Delhi, between Wazirabad and Okhla, is critically polluted. The Sewage treatment Plants (STPs) in Delhi cannot handle the entire discharge load of about 3,300 MLD and even the capacity created is not fully utilized. Adequate treatment capacity needs to be created and utilization of the full capacity must be ensured to cleanse the River. Apart from these, major river cleaning projects include Gomti River in Uttar Pradesh costing Rs. 263.04 crore; Musi River at Hyderabad costing Rs. 344.08 crore; and Pamba River in Kerala costing Rs. 18.44 crore.

Forests and Wildlife

At the time of independence, the area of Government owned forest land of the country was approximately 40 mha. By 1951, the extent of recorded, i.e. Government controlled forest lands grew to 71.80 mha, which reached 77 mha by 1991 and is 77.47 m ha at present. However, the land use classification of MoA, primarily based on land records, indicate forests as land use to the extent of 69.54 m ha, apart from the lands under pastures and culturable wastelands. Furthermore, the actual extent of forest cover as revealed by remote sensing imagery is much less than this figure. This indicates the inadequacy of the basic updating systems of Government records.

India is a mega biodiversity country. The unique biological diversity of India is spatially distributed among a vast range of habitats and ecosystems spread throughout the ten bio-geographical regions, ranging from the high Himalayas to the Andaman archipelago. The biodiversity of the country is reflected by 45, 000 identified plant and fungal species including 15, 000 flowering plants (nearly 7 % of world's flora) out of which 5,154 are found only in India. The records of 81, 000 identified species of animals (6.5 % of world's fauna) including 1228 birds, 446 reptiles with 164 endemic species and 204 amphibians with 121 unique to India reflect the richness of animal diversity. However, recent rapid surveys using revised IUCN guideline (SACON – 2000) indicate that in India 76 bird species, 98 amphibians, 198 reptiles and 178 mammal species are endangered or vulnerable. Similarly, around 1500 endemic plant species are facing varying degrees of threat. Many of these life forms inhabit the forest habitats as many other terrestrial habitats have lost their natural status. India is also rich in freshwater and marine biodiversity which is less known. Of all these the freshwater habitats are under the most severe stress.

FSI assesses the status of forest and tree cover in the country. Its State of Forests Report (SFR) of 2003 indicates the tree canopy cover, based on remote sensing of over 67.83 mha i.e. 20.64% of the land area. Out of this extent, which aggregates the blocks of more than 1 ha area under tree cover, 5.128 mha (1.56%) is reported in very dense, 33.39 m ha (10.32%) in moderately dense and 28.78 m ha (8.67%) in open canopy category. In addition to this,

nearly 10 mha area has been assessed (notionally based on ground sampling for the patches not captured by remote sensing) as under tree cover outside the Government-controlled forest lands, totaling up to 77.83 mha or 23.68% of the land area of the country. The report also indicates that though over the last few years the extent of forest cover has stabilised, the low extent of good forests is a matter of concern.

Reasons for Degradation

Indian forests have been under severe pressure for meeting growing demands for alternative land uses, fuel, fodder, grazing, timber, pulpwood and non-wood forest products from ever growing human and livestock population and industrial, development and infrastructure needs. Some important facts about our forests in this context are as follows:

- Per capita forest area is only 0.064 ha. against world average of 0.64 ha. (FAO) i.e. only 1 /10^{th} of the world average.
- The growing stock (wood biomass indicating growing capital) of Indian forests/trees is estimated at 6414 million cubic meters [4782 in forest and 1632 outside] i.e. 61.72 cum per ha. (SFR-2003) with only 0.7 cum/ha/year productivity against world average of 2.1 cum/ha/year. This is mainly due to non-recycling of biomass in forest soil, forest fire, grazing, and over-exploitation etc.
- Due to rapid industrial development along with an increase in human population from 390 million (1950) to 1 billion in 2001 and domestic animals from 350 million to 520 million, the demand – supply gap for fuel wood, construction and industrial timber, fodder and non-wood forest products is rapidly increasing leading to over–harvesting and degradation of ecosystem.
- Vast stretches of forest are still diverted for a variety of developmental and infrastructure projects; such diversion has significantly increased in the last decade as pressures to maintain a high economic growth rate mount without adequate integration of ecological sensitivity.
- In spite of recognition of the significance of fulfilling needs of local communities in the Forest Policy, there are inadequate Institutional arrangements to involve them positively in forest conservation and management. As a result, forest resources suffer the consequences of being viewed as open access resources. As such, 78% of the forest area is subjected to heavy grazing and other unregulated uses adversely effecting productivity and regeneration. Similarly, nearly 10 mha of forest area is subjected to shifting cultivation, once a sustainable rotational agro-forestry system that has run into difficulties with population increase and penetration of market forces.
- Land use changes including diversion of community areas for fuel, fodder etc for non primary production purposes have redirected nearly all non farm needs towards forests.
- In spite of the fact that nearly 23 % of the land area of the country is dedicated for forests, low allocation (less than 1%) under Plan to the forestry sector, combined with lack of cooperation between the local communities and the State machinery, has restricted the intensity of management.

Management and policy perspective

State organized, more intensive forest management started in India in 1864 and first Indian Forest Act was enacted in 1865. Present Central Act of 1927 provides for formation of the Reserved and Protected Forest as well as Village Forest accompanied by forest settlement to record the rights of the local people. The first Forest Policy resolution was promulgated 19th October 1894. It aimed at ensuring maintenance of adequate forest cover for general well being of the country; maximum revenue collection and providing land for cultivation, and meeting needs of local people. Management of forests was transferred to States in 1935.

In independent India, Forest Policy of 1952 was among the notable initiatives and provided for a minimum forest cover to be 33% of the total land area of the country. In 1976, The National Commission on Agriculture appreciated the role to be played by forestry in development of the country and recommended large scale plantations on degraded forest areas and social forestry in community and private lands to meet the growing gap in timber and firewood requirements. It also suggested formation of Forest Corporations to raise plantations in degraded forest lands. It led to initiation of large scale social forestry projects in 1980 onwards with international assistance and as part of rural development program since the Seventh Plan.

Forest was brought under concurrent list in 1976 by 42nd Constitutional Amendment. Enactment of the Forest (Conservation) Act in 1980 (amended in 1988) empowered the Central Government (MOEF) to guide the States in the matters related to diversion of forestland for non-forestry purpose, conversion of natural forests into plantations and even priorities of forest management in line with the National Forest Policy.

With MOEF, 'National Wasteland Development Board (NWDB)' was also set up in 1985 with a mandate of regenerating degraded forest as well as non-forest wastelands in the country with the active involvement of the people and the stakeholders. Its bifurcation in 1992 into the National Afforestation and Eco-development Board (NAEB) and the NWDB resulted in focus of NWDB (now DWD in DLR) in dealing with land capabilities rather than biomass production.

In 1988, the new National Forest Policy acknowledged the primacy of the requirements of local communities and adopted the sustainable management approach with maintenance of environmental stability and restoration of ecological balance, soil and water conservation as the prime objective of forest management. Conservation of natural heritage and genetic resources is highlighted with indicator targets of maintaining the forest/tree cover (33% of landmass and 66% in hills). The social concerns are targeted through increasing productivity of forest to meet first the local and then national needs and creating massive people's movement for afforestation to reduce pressure on existing forests and meeting people's needs sustainably. Industries have been specifically advised to network with farmers for production of industrial raw material instead of depending on subsidized supply from Government forests. Economic benefits of forests have been subordinated to these principal aims.

Participatory Management or Joint Forest Management

Based on certain field level initiatives during 1980s, a major policy decision was taken by the CBF in December, 1987 to work for effective people's participation in forest protection and management. Accordingly, on 1.6.1990, a Circular was issued by the MOEF, advising on the modalities for people's involvement in forest conservation and management through establishment of appropriate village level organization and under a proper scheme. Regular evolution of the models on the basis of local socioeconomic conditions has resulted into the present strength of 99,868 such committees (13.8 million families) in 28 States covering 21.44 million ha. of degraded forest lands in the country. This participatory regime is now seen as a potential strength of forest management for bringing about sustainability in the forest fringes. The challenge now is to empower truly the local communities with decision-making powers and appropriate rights and responsibilities and ensure that substantial benefits from forest conservation accrue to them.

Similar approach has been attempted in wild life management also. In Project Tiger, India Eco-development Project was implemented during 1995-2005 under a GEF sponsorship. The main focus of the programme was village eco-development through sustainable development of village resources and involvement of local people in conservation of protected areas. The results have been encouraging at some sites and participation and benefit-sharing are now a recognized aspect of PA management. However, the adoption of this approach as an integral part of PA management is yet to be realized; in particular, joint management through a share in decision-making powers and the full integration of conservation and livelihoods across the landscape from within to outside PAs are as yet absent or weakly developed. Also very weak is the recognition of a large range and diversity of community traditions or new initiatives towards conservation.

Forest and Bio-diversity Conservation – Policy and Legal measures

The important milestones in independent India on Wildlife Conservation include provision in National Forest Policy, 1952 for setting up of sanctuaries and national parks for Preservation of Wild life (Section 20). Enactment of the Wild Life (Protection) Act, 1972, launch of Project Tiger in 1973, Project Elephant in 1992 and the Biological Diversity Act, 2002. The National Forest Policy 1988 has conservation as its basic objectives: "Conserving the natural heritage of the country by preserving the remaining natural forest with vast variety of flora and fauna which represents the remarkable biological diversity and genetic resources of the country".

The National Board for Wildlife, chaired by the Prime Minister of India, is the apex body to consider the wildlife and biodiversity conservation issues at the National level. Establishment of the Directorate of Wild Life Preservation, ban on Indian Ivory and India's membership of CITES indicate Central initiatives towards protection of wildlife. On Research and Development front, Wild Life Institute of India, Central Zoo Authority and now Tiger Conservation Authority and National Wild Life Crime Control Bureau show the increasing Central resolve to support the responsibility of States for conservation.

Biological Diversity Act (No. 18), 2002 provides for regulating the use of India's rich biodiversity and associated knowledge with equitable sharing of benefits arising out of such

use and to check bio-piracy. Under this act, a National Biodiversity Authority has been set up in 2004 in response to India's commitment in CBD, several States have also established Biodiversity Boards and Biodiversity Management Committees at the level of local bodies. The forest areas dedicated for protection of wildlife habitats include 96 National Parks and 509 Wildlife Sanctuaries. This total area covered under the special protection is 15.7 mha, which is about 4.78 % of the geographical area of the country covering about 20% of the total forests. The Institutional system designed for conservation, monitoring and sustainable utilization of biodiversity under Biological Diversity Act includes Biodiversity Management Committees (BMC) at the level of local bodies such as panchayats and municipalities and State Biodiversity Boards at State and National Biodiversity Authority at the Central level. The BMC is required to establish and maintain People's Biodiversity Registers. Establishment and continuous nurture of the BMCs constitute the brick and mortar of biodiversity conservation and national database on biodiversity and associated knowledge. In reality this will not be achieved without extensive capacity building at community level and support under BMC fund. According to this Act, the Central Government (primarily MOEF) is responsible for training and public education to increase awareness with respect to biodiversity. Five years since the enactment of this, nothing tangible on public awareness is done. There is an urgency to take up this capacity building to grass root Institutions and the communities. Here, apart from the Government agencies, NGOs can play important role. High priority to this Institutional and public capacity building during the Eleventh Plan must be given.

Forest Products and services

Forest Management being a component of Natural Resource Management, the demands of forest produce on forest resource compared to the supply situation needs attention. Among the most important needs in terms of value and volume are timber, pulpwood, fuel and fodder, and a variety of non-timber forest produce. While timber and pulpwood have large commercial and environmental importance, fuel, fodder and NTFP constitute basic needs of rural areas particularly of the underprivileged section of the society.

Timber

National Forestry Action Programme of the MOEF projected a demand-supply gap of almost 64 million cubic meters in 2006. The shortage especially in industrial sector is being met through import since 1985 for raw material or finished products like logs, pulp, paper, newsprint, plywood, etc. amounting to nearly Rs. 9000 crore (2003-2004). Timber being the most environment-friendly structural material needs to be encouraged also compared to the present material like plastic, composites and metals. The augmented productivity of the forests itself can play a significant role in fulfilling this requirement.

Fuel Wood

Fuel wood constitutes an important basic need of about 40 per cent of the population of India. It has been estimated that annual per capita fuel wood consumption in the country varies from about 0.20 to 0.90 tonnes from warm to cold regions and average for the country works out to about 0.35 tonnes. The annual fuel wood requirement of the country of the population, which is dependent on the fuel wood has been estimated to about 200 million

tonnes, whereas availability of the fuel wood from the forests on a sustainable basis is about 17 million tonnes. In rural area, fuel wood is the most preferred fuel, being collected from forests and common property resources and from agricultural wastes being a non-monetized commodity. Further, with developing technologies for use of even smaller sizes of wood for composite wood, particle boards, composites etc, small wood otherwise used for firewood is being used for such commercial activities. The fact remains that India may have sufficient food to eat but not sufficient fuel wood to cook it.

Fodder

Forests meet about one-third of fodder requirement in India. The dependence on forest for fodder supply increases during drought years. Grasslands, apart from being among the most productive ecosystems of the world, are the most important components of country's animal husbandry. Yet, compared to the livestock population, fodder management is not a visible part of livestock management. Projections of FSI indicate that 33% of fodder supplies come from forest area through lopping and grazing. This role of forests needs to be understood and supported for ensuring sustainable growth of agriculture sector, especially in terms of life support systems for the rural poor, the target group of development.

Non Wood Forest Produce

The National Forest Policy, 1988 in a way redirected the focus of forest management from timber production towards local needs. The non-timber forest products have been important means of benefits to the forest and fringe dwellers. Total production of NTFP has been assessed as worth about Rs 4188 crore annually (IEG, 2002). Traditionally NTFP have been common properties except large volume items like Tendu leaves, sal seeds, myrobalans, Mahua etc., which had commercial clientele outside forests. Various mechanisms have been in vogue for harvesting and management of these including contracts, corporations, co-operatives and now participatory systems. By far the co-operative systems with Federations dealing with value addition and commercialized trade for optimum benefits have been found working in Madhya Pradesh and Chattisgarh. The devolution of ownership of NTFP to PRIs and Gram Sabhas in PESA areas has resulted in concerns about integrating commercial value of these products with the empowered Institutions .

Social and Agro-forestry

The importance of greening was recognized in the objectives of the First Five Year Plan itself, in 1951, which indicated immediate scope for extending the area under forests for extension of tree lands as a measure to prevent soil erosion and for establishment of village plantations. Subsequently, at the instance of National Commission on Agriculture, promotion of greening of available lands including growing of trees for augmenting agriculture began. A series of externally aided Social forestry projects during 1980s extended the scope of the sector beyond Government forests.

In the Seventh Plan, Forestry got more attention as the Central directive of use of 25% of the DRDA funds under NREP, RLEGP etc. on social afforestation. This provision was not pursued since Eighth Plan. Regeneration of forests and raising tree crops is a long term activity and given the inadequacy of Institutional mechanisms to ensure that local communities benefited from them, compared to other development works, this activity did not receive due focus from the rural development programmes. In the on-going programmes

of Watershed Management being implemented by various Central Ministries like Agriculture, Rural Development, afforestation is a latent component of the package of watershed management which aims more at equitable sharing and caring of watershed benefits. The cost norms of these programmes are not able to support substantial afforestation activities requiring strong wage contribution. A problem with these programmes has been an exclusive focus on augmenting tree cover rather than overall ecosystem services.

Investment in Forestry sector development

Forestry sector is dealt in several contexts in the country. The management of forest estate with the Government is basically handled by the State Governments. While capacity building and research have been the specific mandate of Central Government since beginning, the responsibility of leading the States towards national priorities of environmental integrity came to Central Government with inclusion of this sector into concurrent list. Decision to not convert the natural forests into plantations, primary concern for needs of communities and establishment of a PA Network brought down the tangible benefits and necessitated higher investment in the sector. However, considering the definite contribution of the sector for tourism and environmental amelioration by carbon sequestration, the contribution to GDP has been estimated at about Rs. 23, 003 crore, about 2.37% compared to CSO assessment at 1.2%, which takes into account only recorded production of goods.

The pattern of plan outlays in the successive Plans from beginning for forestry has been following the pattern of less than 1% of the Plan size. However, considering that the sector transformed drastically after adoption of Forest Policy, 1988 from a commercially strong revenue earning enterprise into an imperative for sustainability of natural resources and development in general along with sustainable supply of goods and services for rural livelihood and national needs as well as a repository of biodiversity raw material for future scientific and economic developments in all the possible aspects of human well being, investments have been too meager.

In the Tenth Plan, share of Forestry in Central Plan is only 0.30% and in the State Plans 1.94%. The Centrally Sponsored Schemes (CSS) augment the State Plan investment by only about 15% of the total. Since forest is on concurrent list and National/global concerns override the local ones, Central Government is equally, if not more, responsible for the development of forests, the central contribution needs to be at least 50% of the total State Plan for forestry sector.

In 1999, the MOEF worked on a National Forestry Action Programme (NFAP) for a period of 20 years, with support from UNDP-FAO. It recommended an annual target of 3 mha including regeneration of 0.775 million ha of natural forests, 0.775 mha, plantations and 1.450 mha Agro and Social forestry programmes.

The National Forestry Commission constituted by Government of India submitted its report in March, 2006 to the Prime Minister. Earlier deliberations at this level were held in 1976 by the National Commission on Agriculture. The Commission has recommended no specific change in the National Forest Policy but reiterated the need of visible commitment for investment of 2.5% of the Plan outlay in the sector and Institutionalized contribution of Rural Development programmes in forestry.

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Chapter 3: Review of Performance in Tenth Plan

Environment

The Tenth Plan recognized that sustainability is not an option but an imperative. Clean air, pure water, conservation of forests and wild life and generation of greenery are essential for a healthy environment. Moreover, a very significant proportion of Indian population depends on environmental resources for their subsistence and livelihoods. Environmental issues need to be viewed in a holistic perspective, and it is essential to develop mechanisms for mainstreaming environmental concerns into development activities. Major challenges for planners and policy makers are: prevention of degradation of land, controlling floods and droughts, preventing desertification, conservation of fragile ecosystems, prevention of deforestation, conserving biodiversity, and mitigating water and air pollution. Furthermore, all of these have significant links to the three major concerns of the Eleventh Plan, namely, bridging the growing divides in the society, doubling the rate of growth of agriculture and substantially increasing employment in the rural sector.

The National Environment Policy

Tenth Plan was a period of reengineering of the environmental processes and law. During the Tenth Plan, the first National Environment Policy has been put in place in May 2006. Apart from this, following developments were notable in various related fields.

- Review of environmental clearance system and Environment Clearance Notification.
- Charter on Corporate Responsibility for Environmental Protection
- Review of Coastal Regulation Zone Notification
- Amendment of Breeding of and Experiments on Animals (Control and Supervision) Rules
- National Working Plan Code for forests
- Enactment of Biological Diversity Act and Rules and setting up National Biodiversity Authority
- Setting up of Tiger Task Force for review of Project tiger
- Amendment in Wild Life Protection Act providing for creation of NTCA and National Wildlife Crime Control Bureau
- Creation of CAMPA
- Amendment of Hazardous Wastes (Management and Handling) Rules
- Completion and submission of the report of National Forestry Commission

Major initiatives and actions taken so far in the four thematic areas, international cooperation and regulatory regime are enumerated under the respective heads. These have enabled identification of gaps and programs necessary.

Air Pollution

The CPCB monitors ambient air quality at 315 stations covering 115 cities/towns in 28 States and 4 Union Territories in the country to: i) determine the status and trend in ambient air quality, including significant parameters like benzene and polyaromatic hydrocarbons; ii) assess health hazard and damage to materials; iii) develop preventive and corrective measures; v) understand the natural cleansing process. A programme for real time air quality monitoring for the cities above the population of 1 million has been started during the Tenth Plan. The automatic air quality monitoring systems are operational in Jodhpur, Patna, Pune and Solapur while those in Kanpur, Varanasi, Jharia and Kolkata will be functional soon.

Presently, the criteria pollutants monitored by SPCBs and associate agencies include SO_2, NOx and RSPM. Other parameters for toxic trace matters and polycyclic aromatic hadrocarbons are also monitored for selected cities. Air and water quality monitoring programmes are confined to a limited number of towns and cities mainly on account of limited resources. Action Plans for improvement of air quality have been drawn for 16 identified cities at the advice of the Apex Court. Based on the basic format prepared by CPCB for this purpose, the SPCBs have been requested to evolve such plans for their respective areas.

MOEF has initiated a few projects and constituted a Committee on Environmental Health to review the current status of environmental health.

Water Pollution

The CPCB has been monitoring for the last 25 years the quality of water in rivers and lakes and in the coastal belts in 870 locations with respect to physical parameters, nutrients, major ions, organic and pathogenic pollution in water bodies. A total of 86 polluted stretches have been identified and action plans for improving the water quality are being prepared.

The NRCP has covered 160 towns along the polluted stretches of 34 rivers in 20 States, and 1777 million liters per day (MLD) of sewage treatment capacity has been created till now which is approximately 30 per cent of the required 5365 MLD. The water quality in most of the rivers has reasonably improved. The impact reported by MoEF reveals that Biological Oxygen Demand (BOD) is within the prescribed standard at most major cities along the Ganges. The rivers Narmada, Mahanadi, Brahmini, Baitarni, Subarnrekha, Beas and Chambal maintained a Dissolved Oxygen (DO) level of 4.0 mg/l or above throughout the year. In Ganga, Yamuna, Krishna, Sabarmati, Tapi, Sutlaj however, DO gas as low as 0.3 mg/l.

Under NLCP, initiated in 2001, conservation of 42 lakes in 12 States has been taken up through 28 projects. So far, 10 projects have been completed and 10 more are likely to be completed by the end of Tenth Plan.

As small-scale industries do not have adequate resources, space or skilled manpower to treat their wastewater, a scheme of CETPs was initiated. The CETPs are partially funded by

Govt. of India. Charters on CREP in respect of 17 categories of highly polluting industries in collaboration with the concerned industries have been formulated.

Solid Waste Management

As per the National Environment Policy, 2006 management of industrial and municipal waste is the major cause of soil pollution and is a serious challenge in terms of magnitude and required resources. A set of rules under the Environment (Protection) Act, 1986 for proper management of hazardous waste, municipal solid waste, plastics and biomedical waste have been notified. Partial financial assistance is being provided for setting up of CTSDF including incinerators for hazardous waste, municipal solid waste and biomedical waste.

In order to comply with the provisions of the Rules, some of the healthcare facilities have installed their own biomedical waste treatment facilities and others are availing services of CBWTF. There are 126 CBWTF, including 13 under installation, in the country as on March, 2005.

Apart from studies on waste minimization and related matters, MOEF also provides assistance to the SMEs for adoption of cleaner production practices and reduction in waste generation is in place. Waste Minimization Circles have been established in 41 sectors and in about 600 SMEs.

Ministry of Urban Development has established the JNNURM and formulated a set of schemes relating to urban development, water supply and sanitation and urban environment sector, namely (a) Accelerated Urban Water Supply Programme, (b) Low cost sanitation scheme (c) Scheme for providing solid waste management in the selected towns having air fields of Indian Air Force, (d) Integrated Development of small and medium towns, (e) Mega city scheme. MOA has formulated a scheme on Balanced Use of Fertilizer. The main components of the scheme are to strengthen the soil-testing programme in the country and to encourage production and promotion of urban biodegradable waste into compost through mechanized composting. MNRE (previously MNES) has formulated a National Programme on Energy Recovery from Urban and Industrial Wastes.

International Agreements and Conventions

India has been involved in several key multilateral agreements on environment issues in recognition of the trans-boundary nature of several environmental problems, impact of chemical industry and trade. The Hazardous Waste (management and Handling) Rules, 1989 have been amended in 2000 and 2003 to incorporate the obligations under the Basel Convention. With the coming into force of Kyoto Protocol in February, 2005 the GOI has set up the National CDM Authority. Under the Country Programme for phasing out of Ozone Depleting Substances (ODS), multilateral funds aggregating to US$ 137 million for over 349 ODS projects have been received. Since 1995, fiscal incentives are being provided for capital goods acquired to implement ODS phase out projects funded by the Multilateral Fund.

A project proposal for preparation of the National Implementation Plan (NIP) for management of POPs has been communicated to GEF for funding. Strategic Approach to International Chemicals Management **(**SAICM) is a policy framework for international action

on chemical hazards under UNEP. India has contributed US$ 100,000 to the SAICM Trust Fund for implementation of the strategic approach committed by the member countries in its Dubai Declaration.

The Ministry took several initiatives in various international meetings related to conventions on implementing the Rio Agreement and Agenda-21, Montreal Protocol, Basel Convention, Commission on Sustainable Development, Global Environment Facility, UNFCC, Stockholm Convention on Persistent Organic Pollutants etc. India is also a party to the Convention on Biological Diversity (CBD) which came into effect on December 29, 1993. A status report on biodiversity and a National Biodiversity Strategy and Action Plan have been prepared. Legislation namely 'Biological Diversity Act' has been passed in the Parliament. In the context of the Conventions and to establish sound financial resource base, a significant achievement has been the establishment and replenishment of the GEF, which enabled India to secure substantial commitment of funds from the GEF comprising grants and low interest loans to implement programme for the protection of environment, particularly for addressing climate change, conservation and sustainable use of biodiversity, reduction of ozone layer depletion, protection of international waters and other global environmental challenges. India is a producer member country of the ITTO and participated in the negotiations for a successor agreement to the ITTA, 1994, culminating in the finalization of the ITTA, 2006.

Information, R & D and Technology

Access to environmental information is a principal means by which environmentally conscious stakeholders can evaluate the status of environmental resources, legal requirements, and compliance of national environmental standards and international environmental regimes. This whole area was revolutionized during the years of the Tenth Plan by developments in Information and Communication Technologies and the passage of the RTI Act and important new initiatives are now called for.

Environmental Information System (ENVIS) is a Plan scheme to set up a distributed information network with subject specific centers. ENVIS network consists of a chain of 78 subjects-specific and State-related centers located in specialized organization / Institutions throughout the country. The scheme needs to be further evolved, networked and supported to serve better as subject specific repository of information.

Environmental Education, Training and Information

Under the Environment Education in School System project initiated in 1999 to strengthen environment education in the formal school curriculum, a comprehensive assessment of the status of environment content in the school curricula and infusion of appropriate environmental education is intended. The States participating in this project are Andhra Pradesh, Assam, Goa, Jammu & Kashmir, Maharashtra, Orissa, Punjab and Uttaranchal. A framework for environmental appreciation courses is being prepared in consultation with IGNOU. Introduction of environmental concepts in the Business/Management Education is another focus. A Committee comprising representatives from Management Institutions, AICTE, UGC, Industry and MOEF is deliberating on this aspect.

National Environment Awareness Campaign (NEAC) is a multi-media campaign providing financial assistance to registered NGOs, schools, colleges, universities, research Institutions , women and youth organisations, army units, State Government Departments etc. for organising/ conducting awareness activities. These activities include seminars, workshops, training programmes, camps, padayatras, rallies, public meetings, exhibitions, essay/debate/painting/poster competitions, folk dances and songs, street theatre, puppet shows, preparation and distribution of environmental education resource materials etc., followed by actions like plantation of trees, management of household waste, cleaning of water bodies etc. The programme is being implemented through 28 designated RRAs in different States/regions of the country.

Eco-clubs (National Green Corps) are promoted in schools to educate children in an interactive manner about their immediate environment and impart knowledge about the importance inter-dependence with ecosystems. The Central Government provides financial assistance for establishment of Eco clubs @ Rs.2500 per Eco-club, Training of Master Trainers, teacher training and distribution of resource materials.

GLOBE is an International Science and Education Programme which stresses hands-on participatory approach aimed at school children. About 100 schools spread over different parts of the country are a part of this programme. An International training workshop for trainers was organized at New Delhi in January, 2002. Under the Mass Awareness Programme, a sequel of environmental film festivals "Vatavaran" has been organized twice during tenth plan.

A NCFR, including a review of school level activities on environment, was conducted during the Tenth Plan period. It has stressed the need to focus on a hands-on activity-oriented participatory approach for environmental education throughout the country. It has also suggested that the data so generated could be used to organize a publicly accessible, transparent database on India's environment.

Centres of Excellence

This scheme was started in 1983 to strengthen awareness, research, and training in priority areas of environmental science and management. The following ten Centres of Excellence are supported by the Ministry. FRLHT, Bangalore was recognized in Tenth Plan period.

- Centre for Environment Education, Ahmedabad
- C.P.R Environmental Education Centre, Chennai
- Centre for Ecological Sciences, Indian Institute of Science, Bangalore
- Centre for Mining Environment, Indian School of Mines, Dhanbad
- Salim Ali Centre for Ornithology and natural History (SACON), Coimbatore
- Centre for Enviornmental Management of Degraded Ecosystems, University of Delhi, New Delhi
- Tropical Botanic Garden and Research Institute, Thiruvananthapuram

- Madras School of Economics, Chennai
- Foundation for Revitalization of Local Health Traditions, Bangalore

Energy conservation and climate change

The role of the E & F sector in energy conservation is basically seen through the attempts on follow up of climate change predictions and suggested mitigations. Under the aegis of UNFCCC, preparation of India's second National Communication to the convention is slated to contain frameworks for estimation of GHGs from various sectors as well as vulnerability assessment and adaptation for water resources. A joint collaborative research programme with Government of UK has been undertaken for assessment of sectoral impact of climate change. Accordingly, India has also taken significant initiatives in pursuing the Kyoto Protocol agenda. The Designated National Authority in MoEF, set up in 2003, has approved 473 CDM projects for consideration of Executive Board. Out of these 144 projects stand registered with CDM as on January 2007, constituting 30% of the total projects – the largest package. However, information on contribution of Annex 1 countries in investment and technology transfer is not yet available.

Apart from the endeavors on bringing energy efficiency and reducing emissions, working on the potential impacts, forecasting systems and adaptations in response to climate change are going to be the key concerns of development. The dynamics of Alpine Flora is now known to be a good indicator of impact of climate change since impacts of human land use, which could mask climate related signals, are negligible in Alpine regions. Further, Alpine ecosystems are considered particularly sensitive to climate warming, since they demand low temperature conditions. Indian mountain zones harbor compressed ecotonal transformations from tropical to Alpine environments. Therefore, Alpine zones become ideal for comparative ecological observations in context of climate change. On these principles, GLORIA was launched in 1997. Since then it has established 47 target regions in Europe, Canada, U.S., and New Zealand. The principal objective of this initiative is to establish a network of permanent plots in all Alpine ecosystems and collect periodical data on vegetation patterns along with environmental parameters and work out the patterns to changes to develop the forecast systems as a sound basis of decision-making. The Alpine areas of our country could play a key role in this context, in providing clues for adaptations against climate change in addition to serving as the climate change forecasting systems.

NATIONAL RIVER CONSERVATION PLAN

Ganga River

In 1985, the Government launched Ganga Action Plan (GAP). This Rs 462-crore project's objective was to improve the water quality of the rivers to acceptable standards (defined as bathing water quality standards) by preventing pollution from reaching it. In other words, intercepting the sewage and treating it before discharge into the river. Under the programme, 25 towns located along the river in Uttar Pradesh, Bihar and West Bengal were selected. In 1993, the first phase of GAP ended and GAP-II began with the same objectives. But this phase included work on four tributaries of the Ganga – Yamuna, Gomti, Damodar and Mahanadi. In this phase, the estimated cost had increased to Rs. 2,386 crore.

This was also the time when the CPCB identified 71 polluted stretches in the 14 major river basins in the country. In 1995, the NRCP was launched to clean these stretches. The 10-year NRCP has an outlay of Rs 2, 318 crore. A separate directorate for this programme was created under the MOEF, which, by 2006, has funded 20 States to clean up 42 polluted stretches of 34 rivers passing through 160 towns.

The programme's apex body — the National River Conservation Authority — is headed by the Prime Minister but has met only four times since 1994. Under the programme, State Governments are required to set up citizen's monitoring committees. Many States have not constituted these committees, in others they remain ineffective.

There is also very little documentation of the programme – its successes and failures. The data for Ganga River is available for 19 years (1986-2005) at 16 sites as averaged values of DO and BOD. For sake of convenience, the stretch has been divided in three zones upper (Rishikesh – Garhmukteshwar) middle (Kannauj – Varanasi) lower (Patna – Uleberia). The upper zone meets the requirements of bathing waters (DO > 5.0, BOD < 3.0 mg/l) at all time with respect to DO and BOD values. The values of 1986, 1996 and 2005 indicate that despite increase in pollution load the quality was maintained at values prior to GAP schemes. Improvement in Allahabad – Varanasi stretch led to deletion of this area from earlier critical zone category. Data of summer averages of 1996-2005 for Yamuna indicate that the quality of water was maintained all through in Haryana with DO values above 5.0 mg/l and BOD values less than 3.0 mg/l. The Yamuna water at Delhi was always poor with DO values <5.0 mg/l and BOD values > 3.0 mg/l. The poor quality trend continued downstream also with values of DO fluctuating. The critical stretch of Yamuna in 2005 has only extended further indicating no improvement in water quality and the effect of NRCD schemes was not positive.

Over the past 20 years of the programme, the evaluations have been few, the analysis even weaker and, as a result, corrections have never been made. The NRCP is a critical programme for the country with pollution reaching devastating proportions in many rivers. It needs to be carefully evaluated for future actions. The problem also is that many river stretches—Cooum in Chennai, Yamuna in Delhi and Ganga in Kanpur — have no freshwater flow and hence no assimilative capacity. Even if the effluent are treated to a BOD of 30 mg/l – which is technically possible using secondary treatment – the river will remain polluted as there is no dilution.

But what is even more worrying is that our rivers are beginning to lose the assimilative capacity, to regenerate and to revive, between the cities they transect.

An assessment of the spending in the 20 years between its inception and 2005 shows that roughly 70 per cent of the funds had been sanctioned for just four States, through which polluted rivers flow:

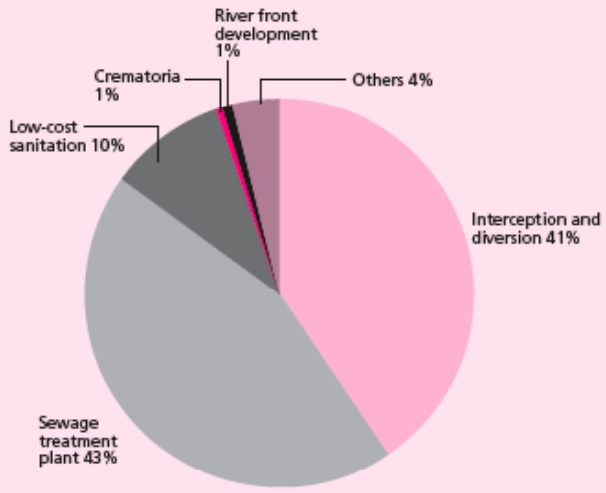
- Uttar Pradesh and West Bengal for Ganga,
- Tamil Nadu for Cooum and Adyar
- Andhra Pradesh for its polluted Musi, River.

Ganga and Yamuna received almost 40 per cent of the sanctioned costs, followed by Cooum — 10 per cent. An analysis of this data reveals that 10 out of 34 rivers received almost 88 per cent of the NRCP money. The rest got just 12 per cent of the sanctioned amount.

Over this 20-year project period, it had been estimated that sewage treatment capacity of 6,247 mld would be built. But only 2,318 mld capacity has been created during this period. This is excluding the sewage capacity of 2,330 mld installed by the Delhi Government. This sewage treatment capacity was not included in the Yamuna Action Programme and so is not a part of its balance sheet. In other words, over this period, roughly 44 per cent of the outlay has been spent, and about 37 per cent of the sewage treatment capacity has actually been built. This would not even account for the sewage treatment capacity that is being actually utilized or that is being utilized effectively.

The bulk of this investment has gone into creating sewage treatment infrastructure. An analysis of the expenditure in the national river action programme – GAP-II and the NRCP — shows that as much as 84 per cent has been spent on interception and diversion and building facilities for treatment of domestic sewage. (*see Graph 1.1*: *Break up of expenditure (1995-2005)).*

GRAPH 1.1: Break up of expenditure (1995-2005)



Note: Does not include expenditure under GAP-I for which data is not available
Source: Anon 2005, MIS report of programmes under National River Conservation Plan-Vol II, MoEF, New Delhi, November, *mimeo*

Who will pay?

But the real issue plaguing the programme has been not just what will be spent, but who will pay for it and more importantly, who will pay for the running costs of the capital assets.

When it began, the programme was funded totally by the Central Government. But in early 1990, it was decided to ask the States to invest half the funds. Seven years later there was a

reversal in Government policy and this decision was revoked in 1997. It was then agreed once again, that the Central Government would spend 100 per cent of the funds. This arrangement did not last for long. In 2001, this was amended once again and a new cost-sharing formula was evolved when it was agreed that for new projects the Centre would invest 70 per cent and the States 30 per cent. Even local bodies were to be involved in footing the bill for the river clean up efforts. The local body is now expected to contribute to one-third of the 30 per cent share of the State. The O&M of the assets created under the programme are also the full responsibility of the State Government and the local body.

This sharing has problems, as local bodies – municipalities and city water utilities – say that they have no funds to pay for the running of the infrastructure that has been created. This issue continues to haunt the programme, without any real breakthrough.

Examining the sewage question

We need to understand the quantum of sewage and its political economy to assess how rivers can be cleaned. Till now, we have only built the hardware, but we have not assessed how it can meet the objective that has been set for it, to clean our rivers.

Despite all the investments made we have not been able to bridge the gap between treatment capacity and waste generation. For instance, when GAP was initiated in the early 1980's, a total of 1,345 mld sewage flowed into Ganga but even then the programme had only planned for a treatment capacity for 882 mld sewage. Meanwhile, by 2005, sewage generation increased to about 8,250 mld along the basin and all the built treatment capacity merely adds up to about 4,000 mld. This includes STP capacity created under GAP-I (808 mld), GAP-II (865 mld) and 2,330 mld, which is in Delhi. The gap between demand for treatment capacity and its availability has only increased. This gap will remain even when all the planned treatment capacity is completed. Under GAP-II, a capacity augmentation of 1,403 mld is yet to be created. This will increase treatment capacity for this basin to 5,403 mld, as against the existing sewage generation of over 8,000 mld, which still leaves a gap of about 2,600 mld.

There are currently four issues that need to be considered in this approach to river cleaning:

- What is the estimate of the waste generated and our infrastructure to treat it?
- Is the infrastructure being built?
- Once infrastructure is built, is it effective in controlling pollution? Can it reduce water stress by promoting reuse?
- What are the economics of building and operating these plants?

In 2006, CPCB estimated, based on the 2001 census, that a total of 29,129 mld sewage is generated from Class I and Class II towns (cities with population of 50,000 to one million and above). CPCB also estimates that assuming a 30 per cent growth per decade in urban population, the current waste generation is 33,212 mld. As against this, the country has the capacity to treat 6,190 mld of sewage in the existing treatment plants. Furthermore, if all the treatment plants currently under construction or proposed were built, the country would have

additional capacity of 1,743 mld. Therefore, the country presently has the capacity to treat roughly 18.6 per cent of the sewage generated and is adding capacity to treat another 5.2 per cent of the waste discharged. The gap, even with these flawed water-waste estimates, is massive: 27,022 mld currently – or put another way, we do not have the capacity to treat over 80 per cent of the waste that is generated.

Even if we have the money to invest in the hardware and the money to run it, STPs are not the solution. A large part of urban India lives in unauthorised, or simply unconnected settlements and cities are growing into the unconnected suburbs. All this, then, means a huge investment is needed to build conveyance systems. Also STPs work best if we have a fully connected and properly maintained sewage system. But most cities have poorly maintained systems, limited in their coverage. Thus open drains become sewage carriers.

The location of STPs is determined by availability of land. Hence pumping sewage is an expensive pastime municipalities indulge in. And even if we manage to treat waste, proper disposal or reuse is rarely planned.

The NRCP has put forward its proposal for an additional Rs 1,672 crore to complete the approved schemes. In addition it requires an additional Rs 3,000 crore for Ganga and Yamuna, and another Rs 2,600 crore for other important programmes. All in all it needs roughly Rs 7,000 crore, which it says will assist in cleaning the rivers in the next Plan period.

But the fact remains that the current investment is not adequate for total river cleaning. It is either too little to late – *a few drops of treated water in a sea of sewage*. Or it is planned poorly to even make an impact. It is also important to note that river cleaning will require creation of infrastructure of a scale that can match the problem. Furthermore, this infrastructure will need to be affordable by city Governments – in terms of capital and more importantly, in terms of running costs.

Cutting costs will require, first and foremost cutting waste in water usage. It will then require cutting costs in transporting first sewage and then its treated effluent. This in turn will require planning so that sewage treatment facilities are located as close to the sites of sewage creation as possible and that the treated effluent is reused in the area. It will also require us to experiment with new technologies to treat effluents which are cost effective and can recycle waste.

National Lake Conservation Plan (NLCP)

The NLCP was approved as a 100% centrally funded scheme during the Ninth Plan. Due to shortage of resources at that time, conservation of only 3 small lakes viz. Ooty and Kodaikanal in Tamil Nadu and Powai in Mumbai were taken up at a cost of Rs. 14.9 crore. The scheme now provides assistance to States at 70:30 sharing basis and till date 28 projects have been approved for conservation of 42 lakes at an estimated cost of about Rs. 508 crore. The activities, apart from intercepting, diverting and treating the pollution loads entering the lake, include desilting, deweeding, bioremediation, and constructed wetland approach etc. depending upon the site conditions. Catchment area treatment and lake front Eco-development includes bunding, fencing, and shoreline development, creation of facilities for public

recreation and entertainment (children's park, boating etc.) and public area with public participation.

The pollution status of lake waters has not been as much as in rivers but yet significant in the lakes of Andhra Pradesh, Tamil Nadu, Gujarat, Madhya Pradesh, Himachal Pradesh. The nitrates were high in lakes of Andhra Pradesh, Karnataka, Kerala indicating eutrophic conditions.

The programmes of river and lake conservation have been taken as stand-alone attempts by MoEF for assisting the States for sewage treatment instead of a comprehensive river conservation programme. Consequently, O&M has been a matter of concern. Often, components other than sewage treatment have been ignored. The importance of sewage treatment as an integral part of municipal management can not be over emphasized as a responsibility of the local bodies.

With special emphasis on comprehensive urban development in Mission mode, this aspect gets recognition as most important component of urban infrastructure. Thus the opportunity for River Conservation for tackling other issues can be planned.

Forestry and Wildlife

Apart from their ecological services like biodiversity and a key role in the hydrological cycle and in carbon storage, forests are vital for livelihoods of billions of people. While non farm products like wood and non wood products are derived from these, their ecological, economic and social contributions have been crucial for people living in remote areas. Considering these facts, their contribution to the well being of the society has been consistently and seriously undervalued, in good measure because of lack of Institutional framework to ensure the involvement of local communities. It has therefore been recognized that sustainable dependence of communities on these resources and conservation can only be ensured if they are empowered for planning and managing these resources. Tenth Plan objectives were set based on the vision from the National Forest Policy 1988 and our commitment to the Rio Earth Summit on forestry and people. Accordingly, the priorities of the Tenth Plan have been as follows,

- Efficient management of good forests would include scientific management of bamboo bearing areas, NTFP resources including *in situ* conservation of medicinal plant resources.
- Cover all the 1.70 lakh forest fringe villages under Joint Forest Management by empowering communities for micro planning and afforestation.
- Provide conservation measures to the fragile ecosystems such as coastal areas (mangroves and coral reefs), hills and mountains, wetlands, shifting cultivation areas, biodiversity hotspots etc.
- Rationalizing fiscal measures affecting the forest based industries and trade in order to boost the indigenous production of forest products in agro-forestry and other social forestry systems while reducing the demands on natural forests.

- Agro-forestry be promoted by creating enabling environment by rationalizing forest produce related regulations, providing research and development back-up particularly quality planting materials and streamlining marketing and trade. A greening India programme was proposed for providing impetus on the efforts to increase the forest cover to 25% in the Tenth Plan.
- Strengthening the PA network by up-to-date management planning, people's participation in protection including man animal conflict resolution.

It was emphasized that gainful employment generation from the forest resources would be possible from value addition to the products and therefore research and technology focus be on value addition, marketing and increasing productivity.

The Coimbatore Charter (2001) of Forest Ministers of Centre and States resolved that the States would allocate at least 2% of their total Plan allocation for the sector. The Tenth Plan outlay of States, Rs 11, 444.34 crore amounted to 1.94% of the total State Plan outlay.

EAPs in the sector have been basically oriented towards capacity building of the State Forest Departments for taking up scientific management planning, application of modern technology in management of Government forests and Joint Forest Management. Contribution of EAPs for afforestation has therefore been meager. At the same time, EAPs have been part of the State Plans and corresponding GBS allocation has been cut down in many cases leaving shortage of funds for activities not covered under the EAPs including afforestation.

Total outlay in Forestry and Wildlife in the Tenth Five Year Plan amounts to only 0.94 %. Since Ninth Plan, the outlay has come down from above 1% in the previous Plan. Further, the allocations in the Annual Plans have not been proportional to the Five Year Plan outlays. There has also been inadequate effort at drawing on activities in other sectors for promoting environmentally positive actions.

Forest cover

One of the ten monitorable targets of the Tenth Plan aimed at achieving 25% forest/ tree cover and achieving one third by the end of Eleventh Plan i.e. 2012. The existing information on forest/tree cover based on the satellite data of 2002 indicates a green cover of 23.68%. There has been a net improvement of 0.65% between 2000 and 2002. Presuming that the same growth rate continues till 2007, Tenth Plan target of 25% will be fulfilled by 2007, which will be visible in the data of 2008, to be used for State of Forest Report 2009.

Considering the targets of Plan and National Forest Policy, a deficit of an extent of 31.46 m ha exists at present. According to the recent estimate of MoEF, recorded forest area without forest cover amounts to 20.90 m ha out of which only 5 m ha could be brought under the tree cover. This implies that 26.46 m ha area is required to be brought under tree cover outside Government forests to reach one third mark. This means that the proportion of effort for greening the area under control of Forest departments is limited to 16% while 84% of the effort is required in non-forest department areas. At present no specific strategy exists for taking up greening of 26.46 m ha area outside Govt. forests which is to be covered in public lands, private lands, community lands and farm lands.

One dimension of the issue is that the target of 33% forest and tree cover puts a responsibility on the forest sector to augment tree cover, at times at the expense of altering natural formations like grasslands and non tree common property resources like gochars and other village common lands. The amendment of target of 1952 policy of one third area for forests to that of forest/tree cover resulted in change of perception from ecological habitats to tree cover. Further, understanding of natural processes leading to the recognition of biodiversity characteristics and ecological services rendered by the habitats like grasslands, natural desert ecosystems, Alpine and riparian habitats suggests that the natural habitats, even if devoid of tree component, be recognized as 'green cover' and accounted so. This may require the following steps to be taken:

- An ecosystems-based mapping of the habitats qualifying as above for accounting in the "tree cover" assessed by FSI. Such areas, based on their ecological status, would not be subjected to conventional tree planting and will be managed for their ecological values.
- The policy objective of 33% tree/forest cover should accordingly be reframed in terms of an overarching objective of conserving and restoring natural ecosystems within which the tree cover constitutes a sub-set and the total includes the other ecosystems. The notion of trees being the most critical indicator of health of forest land use has to be seen in context of an ecological approach.

Joint Forest Management

Universalisation of Joint Forest Management (JFM) is another thrust area of the Tenth Plan in forestry sector. It envisages involving communities in forest management in all the 1.70 lakh villages situated in the vicinity of forests.

The CSS National Afforestation Programme (NAP) of NAEB has been launched for rehabilitation of degraded forests through JFM Committees. Under the NAP, Forest Development Agencies (FDAs) have been created at district level to function as the link between MoEF and JFM Committees for scrutiny of projects, release of funds and implementation of the sanctioned afforestation programme.

JFM has been adopted by 28 States so far. Till 2006; 99,868 such committees (138 lakh families) have been set up for managing 214 lakh ha of degraded forest lands. Progressive participatory mechanisms related to sharing of benefits are being developed by the States to ensure the commitment of communities in forest protection.

JFM as an Institution of participatory processes in forestry started with June 1990-resolution of MoEF. The basic model was based on *quid pro quo* approach of sharing of benefits with villagers for protection of Government forests, recognizing the presence of communities in the vicinity of forests as opportunity for protection. Subsequently the expectations from the concept, as influenced by developments at global level, have been more on community rights to manage the natural resources. In this context, an enabling environment for nurturing strong and vibrant grass root Institutions to share responsibilities of protecting the forests still remains a concern. Some of the important concerns in this context are:

- Ministry started the movement by issuing notification and subsequent guidelines on the official configuration and functioning of the JFM Institutions . However, the modalities have not left sufficient space for recognition of the existing informal Institutions engaged in conservation.
- At National level, centralization in defining activities, processes of Institution buildings, appropriate empowerment of community Institutions for decision making and inputs for improving productivity for benefits has resulted in slow pace of awareness and development of interface between the forest managers and community Institutions . Parallel indicative guidelines for JFM in NAP in spite of State level existing modalities created confusion for State level action.
- Treatment of JFM areas at par with commercially managed areas for regulations like working plans, stock maps, treatment maps, permits for removal, restrictions on harvesting based on prescriptions from the books on silviculture and tree oriented definition of forestry practices restricted the utility of the process in context of the local needs and experience.
- The local traditional social Institutions have not been built upon as the bedrock for effective management and governance of natural resources. This could have made the interventions socially and culturally relevant with significant economic implications in terms of reducing transaction costs and leveraging positive action of the primary stakeholders.
- NAP, as a CSS was to be the epicenter of the JFM movement as a forest management system. The system of direct funding to JFMCs for NAP projects, alienating the role of State administration resulted in failure of linkage between the Central efforts and State efforts. With a notion that NAP is exclusive programme of Central govt for JFM, State level afforestation programmes at times are independent of JFM, leaving the schemes for JFM with small provisions for training to JFMC members and token rural development inputs.
- The contribution of NAP for afforestation and JFM movement itself covers only about 9 lakh ha through 23, 750 committees, which is less than 25% of the total committees and 4.20% of the total area under JFM. These facts indicate that NAP as a stand alone scheme may not have any impact unless it is able to influence the States to orient their programmes towards strengthening JFM. Innovative ways are needed to pursue this imperative.
- Tenure issues have been claimed to be a limiting factor in evolution of JFM. The provisions of Section 28 of the Forest Act, 1927 empower the Government to assign any forests to villagers for management as village forests. The status remains that of Reserved forests. The present JFM regimes are based on a Government resolution backed by MoUs supported by Government orders defining modalities, acceptable to community Institutions . In both the cases, conflict resolution is the key factor, for which socially relevant arrangements like interface with Panchayat may be more effective than legal ones, which leave the judgment either on local authority or the judiciary. Such decisions are not resolutions but enforced orders, not socially enforceable for as sensitive issues like participatory management. It is necessary in this context to focus on the democratization of FDAs.

- Close analysis of the cases will reveal that conflicts arise where the benefits from resources managed are scarce or remotely visible. These situations are to be avoided by investment for improving the productivity of the resources and rationalizing the sharing modalities. Products from the forests could form share of communities while ecological benefits including perpetual green cover could be the national share. Products can then be accounted as the value paid by the State to the communities for the environmental services rendered by them for conserving the forests.

In the light of these facts, it is time that not only JFM modalities but the role to be played by the NAP is reviewed and remodeled to complement the efforts of the States in strengthening JFM. The outcome of the scheme should be that all afforestation activities are taken up in a truly participatory JFM mode, JFM Institutions are adequately empowered for decision making on all management aspects and socially relevant conflict management systems are developed.

Greening India

Tenth Plan suggested a greening India programme for taking up afforestation and agro forestry through an integrated programme. Considering the imperatives 86% of efforts of greening outside the area under control of forest departments and the fact that irrespective of recorded land use and ownership status, about 553 lakh ha wastelands exist including culturable ones, scope of optimizing productivity in culturable areas becomes the first consideration.

The suggested programme was not pursued in the Tenth Plan and the existing miniscule programme for grant-in-aid to Voluntary Agencies for afforestation was augmented with provision of production of quality planting material for afforestation. Considering that the scheme is very small and is yet to be made fully functional, it has hardly got recognition as an attempt in this direction.

Agro forestry and Farm forestry have been promoted earlier in the social forestry programmes. With National Forest Policy prescribing growing of industrial raw material with mutual collaboration of industry and farm sector, and technology advancement enabling use of diversity of farm products in production of structural material including panels and composites, scope of agro and farm forestry has tremendously increased. The efforts for creating an enabling environment for agro forestry as an enterprising supplement to agriculture for optimizing productivity were limited to a draft rule for rationalizing timber transit rules in the States. It is a known fact that in most of the States, common agro forestry species are exempted from transit regulations. However, a critical factor has been the lack of initiatives on market incentives, promoting fair trade and networking enterprises, which has resulted in no progress in this direction.

On the other hand, growing of the same crops in forest lands by forest management in many States has resulted in the reduced size of market for the farmers. In the areas with large scope of farm forestry crops, similar plantations in Government forests lands only discourages farm sector from agro forestry.

Within the agro forestry domain in rainfed areas, the National Missions on Bamboo and Biodiesel have been considered to be contributing to the green cover. The incentives provided by Government for planting these species, along with the efforts, if adequate, on promoting markets for the value added products, like industrial wood substitutes from bamboo and biodiesel blends for petro diesel, may provide important options for economic returns to farmers. For this, impact of the ongoing National Mission on Bamboo Application (DST) and National Biofuel Policy (MNRE) will be the determining factors. There remains a serious concern, however, about extending biofuel plantations on common lands, as they could have a negative impact on local biodiversity and on the livelihoods of people (mostly the poorest) who depend on common lands; the Eleventh Plan must ensure that such plantations are *not* promoted on common lands.

Social forestry was initiated in 1980s to assist rural communities and landless people to meet their livelihood needs for fodder, fuel wood, small timber, fruits, and minor forest produce through community-planned and managed tree plantations and nurseries. This programme was undertaken largely departmentally and could not establish the required linkage with the communities and instead, served mainly to urban and commercial uses through the widespread promotion of fast growing tree species.

In order to bring a fresh impetus on extension of tree lands outside forests, there is a need to revive the social forestry movement for development of common property resources at village level. Social forestry has been included as a Panchayat subject in the law. However, active role has seldom been played by the panchayats in afforestation/ ecorestoration of common lands. It is necessary that the establishments under social forestry collaborate with the panchayats and these Institutions be strengthened with adequate allocation of resources for afforestation/ ecorestoration and management of existing tree lands as common property resources. A programme was suggested as priority area of action in the MTA of the Tenth Plan. The programme is yet to be launched.

NWFP (NTFP), Tribals and Forest Villages

The National Forest Policy, 1988 underlines the symbiotic relation between the tribal people and forests and envisages a number of specific forest management measures to enhance the forestry sector contributions to tribal development. A related significant development is the 73rd amendment to the Indian Constitution in 1992, under which NTFP has been allocated to the PRIs. Latest development in this field has been the passage of Tribes (Recognition of Forest Rights) Act 2006, which recognizes the right of forest dwellers for ownership of forest lands used by them and also the right to use the forests as common property resources.

So far, allocation of right for NTFP collection from forests has been made through the tribal co-operative societies and such other Institutions , generally on payment of royalty. In some States, royalties have been abolished. However, the co-operative societies have failed to make the benefits of these resources available to the tribes who are in most of the cases, paid only collection charges. With promulgation of PESA Act, there is a need of a fresh look at the NTFP management mechanism including commitment of the communities for conservation. It is essential that the primary collectors of NTFP are provided with opportunities to add value to the raw NTFP and market them. The community Institutions would have to be

strengthened in terms of capacity building and involvement in decision making roles if the existing co-operative systems are to be replaced by them. Alternatively, the concept of endowment of these resources for community welfare can be considered that is, the existing Institutions market the produce and the proceeds are ploughed back to the community Institutions for development. Attempts to enhance the efficiency of the existing Institutions dealing with NTFP will be an important task in case this option is adopted.

Forest villages were set up in earlier times in remote forest areas to provide uninterrupted labour for forestry operations. In most of the cases tribes were settled in forests. Considering that it would not be appropriate to deny the forest villagers the legitimate right over land allotted to them several decades ago, the MoEF had formulated some guidelines for converting the forest villages into revenue villages after de-reserving the forest lands.

National Forest Policy of 1988 deals with the issue of forest villages by Stating that these should be developed on par with revenue villages. As per the compiled information in MoEF, 2690 forest villages cover 3,68,282.25 ha of forest area. Due to their legal status as forests, these villages have been deprived of the benefit of the development. Tribal Welfare Ministry has taken necessary steps for development of forest villages. With the new Tribal and Forest Dwellers (Recognition of Forest Rights) Act, development of these areas can be mainstreamed with rural and tribal development programmes of Government. However, the new law also necessitates preparation of land records for recognized ownerships, for which no preparatory action seems to have been thought of so far.

Integrated Forest Protection and Management

The CSS "Integrated Forest Protection" was launched during Tenth Plan period after amalgamating the parent schemes on modern forest fire control methods and forest infrastructure development for northeast. The scheme was proposed for Rs. 445 crore out of which Rs. 336 crore were available and Rs. 198 crore has been disbursed. The scheme was given a final shape only by 2005-06. Changes in cost norms from predecessor schemes (100% Central funds to 75%; 90% to special category States) resulted in procedural delays and difficulties with the States in providing matching grants resulting in low off take.

The programme, as central initiative should have been instrumental in orienting the focus of forest protection towards adopting modern trends in management planning, forest protection like consolidating boundaries, fire surveillance and monitoring and infrastructure for high performance, living conditions and mobility. Additional components on disease and pest surveillance, drying of trees, addressing the problem of grazing etc for maintaining the quality of forests are also important. The scheme has been barely able to provide some funds for traditional activities of clearing fire lines, construction of boundary cairns and upgradation of roads apart from construction of some buildings and purchase of vehicles.

The objective of the Central intervention in the forest protection was basically augmenting the capacity of the State Forest management for dealing with the protection matters. Thus identification of primary requirements and providing a strong foundation for activities needed to be a priority in the scheme. This would mean strengthening the capacity of inventory, assessments, database management and planning for protection and efficient management. Traditional activities seem to have been preferred for capacity building.

Forest Management, Policy and Law

The MOEF performs the task of leading the sector through its most important legal instrument, Forest (Conservation) Act 1980. The scope of the Act and responsibility of the GOI has been enlarged indefinitely through the WP 202/95, the Forest Case. Accordingly, the Ministry has a network of regional offices for monitoring compliance of its policies and orders. Important activities in this context are as follows:

In pursuance of target of forest/tree cover, the need of rationalizing the timber transit rules was responded by issuing an advisory to the States suggesting criteria of eco-sensitiveness of habitats and economic importance of tree species for determining the extent of regulation for cutting and transport. If analysed from protection point of view, barring a few cases involving highly valuable species, where theft of one log may be attractive enough, the regulations are not known to be specifically helpful in containing thefts. However, these laws are well known to contribute to the lack of enthusiasm for tree growing as economic activities. Linkage of reforms to central support for protection could be helpful in achieving this objective.

The Ministry released a National Working Plan Code in 2005 as guidelines for preparation of working plans. With the objectives of forest management accepted in the National Forest Policy, 1988 like maintaining the quality of forests for 'ecological considerations' and primary concerns being biological diversity and needs of the communities, the code needs to incorporate the principles and preferably, protocols for inventory and accounting of the corresponding resources and impacts for working on the prescription through scientifically selected "indicators". This could include appropriate provision for micro planning in JFM or other community forest management areas. Further, in follow up of our commitment of sustainable forest management, C & I for SFM to be adopted and public hearing in management planning of forest or wildlife areas would be desirable. It would also be desirable to incorporate modern developments in ecological sciences such as the concept of adaptive management in the Working Plan code. A beginning also has to be made to restructure the process of planning, such that micro-planning at local levels is done first and the working plan for the entire area is built on these, or at least that the two happen simultaneously so that the micro and macro priorities are meshed together.

The Ministry maintains close contact with the States in the matters dealt by it. However, a National database on the forestry-related aspects, including monitoring of State level developments, is the need of the hour. Keeping in view the concurrent nature of the subject, a system of monitoring State level forestry developments should include State Plan and Non-Plan activities, production, use and trade-related data and demand/supply situations which would be helpful in predictions and projections of the sector, necessary for National and regional planning and policy formulations.

In pursuance of promotion of agro forestry, much is required to be done specifically in terms of fiscal and market mechanisms for display of appropriate support for farmers for assuring open and fair markets for agro-forestry produce. This would include relaxing export, tariff mechanisms to encourage internal production, support for transparent networking and aggregating enterprise for large volume trade for Institutions like MFP Federations and

possible entry of Forest Corporations for providing support prices etc. An apt mechanism for ensuring fair trade including a certification regime acceptable to stakeholder market players would be part of this strategy.

Wildlife and Biodiversity Conservation

Project Tiger, Project Elephant and India Eco-development Project have been the highlights of the biodiversity conservation efforts of the country. It is proposed to include several new Protected Areas to Project Tiger. Under the CSS Development of Sanctuaries and National Parks, Central Assistance is provided to about 271 protected areas out of total about 605. Following facts about the schemes related to wildlife conservation need mention in this context:

Development of National Parks and Sanctuaries

The CSS started soon after the enactment of the Wildlife (Protection) Act, 1972. The PA network in the country constitutes 605 Protected Areas (96 National Parks and 509 Wildlife Sanctuaries) spread over most biomes and encompassing a wide array of habitats. Central Assistance is provided for development of habitats and interventions for efficient management like communication, census, research and interpretation for awareness. The assistance also aims for village eco-development programmes around the PAs.

During the Tenth Plan, out of the outlay of Rs. 350 crore, Rs. 181 crore was allocated and 217 PAs have been covered till 2005-06. The meager allocation has not been able to make any notable impact on the PA network. The assistance is based on the action plans furnished by the States, which are appraised by the officials of the Ministry before release of funds. In spite of declaration of PAs, preparation of management plans and their implementation still remains a concern in many cases. At present, about 204 PAs are reported to have approved management plans. The principle objective of Central Assistance being for developing efficient management, the assistance needs to be linked with the management plans.

The MTA of Tenth Plan suggested evaluation of the impact of the assistance provided for non-recurring items to individual Sanctuaries/ National Parks since beginning. With fulfillment of objectives in the recipient PAs, non-recurring assistance can be provided to the other PAs which could not be developed for want of Central Assistance. It is understood that the evaluation is in progress.

Relocation of habitations from these areas has not met with success. Issues like religious events, traditional rights and practices, man-animal conflicts continue to be the concerns of management. In the Tenth Plan, village eco-development was added as an in-built component of the scheme. Ensuring involvement of local community members in the decision making process, dovetailing of allocations of other line departments for the village eco-development micro plans, and reorientation of developmental activities around protected areas so that an ecosystem/landscape approach can be adopted, are the outstanding challenges.

The National Parks and Sanctuaries of the country contribute significantly to the GDP of the country through various kinds of ecological services and benefits and through the

tourism sector. Assessment of these values, a system of ploughing back the tourism revenues of protected areas for their maintenance and creating livelihood opportunities for neighbouring populations needs to be worked on.

Project Tiger (now converted into National Tiger Conservation Authority)

Project Tiger covers 28 Tiger Reserves encompassing an area of 37,761 km^2 in 17 States. In all cases, PAs constitute whole or part of Tiger reserves. During the Tenth Plan period, 100% Central Assistance was made available to the States for expenditure on all non-recurring items. For recurring items, the Central Assistance is restricted to 50% of the expenditure, while the matching grant is provided by the States. The outlay of Rs. 150 crore is expected to be fully utilized.

India Eco-development project was taken up in 7 tiger reserves during Tenth Plan at a cost of Rs. 142 crore. The investments made for evolving a PA management strategy with village eco-development as an important component are yet to be evaluated for suitability for adoption. The lessons learnt from the project remain to be analyzed in perspective of utility and cost efficiency and follow up for other protected areas also for similar results.

The Tenth Plan period saw the depletion of tiger population from Sariska Tiger reserve, resulting in the introspection through the Tiger Task Force. The recommendations of the Task Force are equally important for not only PA management but also general forest management. The follow up of the recommendations has resulted in setting up of a Tiger Conservation Authority and a Wildlife Crime Control Bureau at the Centre. Critical activities like promoting a positive engagement of local communities with conservation efforts, inclusive protection strategies and identification of areas feasible for relocation remain to be worked out.

Project Elephant

Project Elephant presently covers 25 Elephant Reserves in 14 States spread over 61,200 km^2 of National Parks/Sanctuaries and areas used by elephant outside. Total allocation under this scheme during the Tenth Plan was Rs. 71.0 crore out of which Rs. 67.25 crore have been made available and Rs. 64 crore are expected to be spent. The assistance is provided to States based on the action plans.

One of the major aims of Project Elephant was the long-term conservation of viable elephant populations in the larger landscapes through strengthening or creation of corridors. Not enough attention has been paid towards creating long-term assets to ensure the survival of elephants and reduce conflicts. On the other hand, much of the activities have been short-term responses to problem situations such as conflict. With increasing population, wild elephants are observed to be increasing their range by dispersing into new areas (into States such as Maharashtra, Madhya Pradesh, Chhattisgarh, Haryana and Himachal Pradesh) and this situation has to be effectively dealt with to avoid human wildlife conflicts.

Inadequate attention has also been paid to the management of the large population of captive elephants in the country, an issue that need more attention especially in the light of our

new consciousness of the welfare of a large, intelligent animal that has shared a close relationship with people for several thousand years.

Protection of Wildlife outside Protected Areas

The scheme was introduced in Tenth Plan with an objective of rehabilitation and management of the ecologically important degraded habitats outside protected areas. It was proposed to provide financial assistance to the States for restoration of ecologically important degraded habitats in non-PA locations like wetlands, swamps, Alpine s, tropical rain forest, shola habitats, corridors connecting already protected habitats, and dwindling populations of important species like red sanders, sandalwood, chinar, maple, bhojpatra, white cedar, rosewood, ebony etc. The scheme could not be launched during Tenth Plan.

Research and Education

ICFRE, with its network of eight National Institutes and four advanced centres, caters to the forestry research needs of the different eco-climatic zones of the country. A National Forestry Research Action Plan has been formulated taking into account the management priorities of the State forest administrations. World Bank aided Forestry Research Education and Extension Project (FREEP) was implemented in Ninth Plan period for capacity building of the Institutions for undertaking researches especially in the fields of genetic improvement of planting stock, seed technology, micro-propagation and extension.

During Tenth Plan, an outlay of Rs. 210 crore was provided. An amount of Rs. 226.86 crore has been allocated. An amount of Rs. 221.92 is the likely expenditure. Presently, the grants-in-aid from the Central Plan form the major source of funding for the Institutes and the council. Sponsored researches are undertaken on a limited scale and the council is hard pressed for funds for promotion of research through its own and other Institutions . One of the reasons could be the limited clientele of forestry research in Government sector only. Further, most of the State Forest Departments have their own research wings as well as State Institutes for forestry research. Considering that the forestry research has trans-boundary scopes, integration of research programmes with State and other research organizations should be taken up. For example, the genetic improvement programmes and ecological studies usually involve diverse provenances and landscapes beyond administrative boundaries. For such programmes, collaborative integration of partner Institutions will be imperative.

Considering the need to expand afforestation activity beyond the Government forest lands especially in the States with limited forest lands like UP and Bihar and those with large populations depending on forest resources like Orissa, priority should be accorded to the social and farm forestry related researches. In spite of the specific recommendation of Planning Commission, the Allahabad based Centre for Social Forestry and Eco-rehabilitation (CSFER) is yet to be strengthened.

The changed management mechanism for forestry research has not shown any appreciable impact on outcomes of forestry research. Change over from specialized mandates of institutes to regional mandates is yet to indicate a positive outcome. While the forestry research continuing for more than 100 years, with the specific shift in management paradigm, a relook on management of research in the council and clear vision in context of research and administration of institutes needs to be developed. The ecological and social dimensions and

biodiversity values being the priority areas of management, orientation of research in these directions are needed. Over the last decade, several Non-Governmental research Institutions have been functioning with high quality research outputs especially in modern dimensions of forestry and biodiversity. Linkages with such Institutions could complement the outputs.

Indian Plywood Industries Research and Training Institute (IPIRTI)

IPIRTI has been a part of the MOEF since 1990. It carries out applied research and training on all aspects of technology for manufacturing plywood, panels and other engineered/ reconstituted products from ligno-cellulosic materials. With diminishing wood resources, efficient utilization of wood and alternatives like bamboo become more essential and the Institute has played an important role in bringing back the plywood industry facing raw material crunch for conventional wood products, to better capacity utilization.

Wild Life Institute of India (WII)

The WII imparts training to Government and Non-Government personnel, carries out research and advice on matter of conservation and management of wildlife. A National Wildlife Action Plan has been formulated for the period 2002-2016 focusing on strengthening and enhancing the protected area network of the country. Institute provides forensic advice for investigations, assistance to States for management planning and co-ordinates studies relevant for wild life monitoring of status of life forms and habitats. Out of Rs. 50 crore outlay, Rs. 45 crore has been allocated.

Indian Institute of Forest Management (IIFM)

The Institute has emerged as one of the leading Institutions in India and around the world in the area of natural resource management. The Institution awards a post-graduate diploma in forest management and M.Phil level programme in Natural Resource Management for resource managers, administrators and NGOs. In policy research field, the Institute has set up an International Centre for Community Forestry. Development of Bhopal – India process for criteria and Indicators for Sustainable Forest Management (SFM) has been an achievement of this Institution. The products of this organization have a niche clientele at present. However, with the widening scope of natural resource management in the growing socioeconomic milieu the need of expertise will only grow in future.

Forestry Training

Forestry and Wild life training is a mandate of the Central Government and the Institutions under it perform the function within 3 existing plan schemes. Indira Gandhi National Forest Academy (IGNFA), Dehradun is the seat of training to the Indian Forest Service officers. Since Tenth Plan, there has been a specific Central Scheme for training of IFS officers through short term refresher courses and a few long term courses for specialized skill development.

Directorate of Forest Education is responsible for the training of State Forest Service and Forest Range Officers of the State Forest Departments, Forest Corporations and forest

based organizations. Three SFS colleges and one Rangers College are functioning as organizations of the MOEF.

The forestry sector is passing through a very critical crucial paradigm change from a regimental timber trade enterprise towards a socially and scientifically sensitive natural resource management regime. The entirely new responsibilities to be played by the personnel in this changing scenario necessitate fundamental changes in the orientation and capabilities of the personnel. This includes attitudinal changes towards much more social sensitivities and understanding of the scientific basis of the processes of nature. MOEF has specific mandate for training and research and has been working to revamp of curricula and packages for training and thematic inputs for personnel of Forest & Wildlife, other Government and public stakeholder groups. These efforts need to be carried further.

Forest Survey of India (FSI)

FSI releases a comprehensive State of Forests Report (SFR) including National Forest Vegetation Map using remote sensing data once in every two years. Preparation of thematic maps based on interpretation of aerial photographs is another important activity of FSI. Tenth Plan provided for a district level field inventory for assessment of growing stock, biodiversity, carbon sequestration assessment and wood utilization. The inventory is planned on a 20 year cycle basis.

The State of Forests Report provides the forest and tree cover assessment at National level with the data till district level. However, the data provided by satellite data is limited to the canopy cover and temporal changes in that. The report is not able to provide the dynamics of the area used as forests in terms of change in canopy cover, degradation status, impact of afforestation and other influences and other landscape features important for tracking ecological and biodiversity changes.

Resource Assessment and Information Base

In view of the fact that the MoEF does not have a well-established system of monitoring State level forestry developments, essential in view of the concurrent nature of the subject, and the need of national level upkeep of data and information for use in planning and policy deliberations, the need to integrate the State databases into a national information system in the MoEF was suggested in MTA of the Tenth Plan. This obviously needs to be coordinated with broader activities in the area of environmental information management.

Animal Welfare

Animal Welfare scheme was transferred to MoEF in the Tenth Plan period with an outlay of Rs 175 crore, which was subsequently revised to Rs 100 crore. The composite scheme has several components. A National Institute of Animal Welfare has been set up in Ballabhgarh, Haryana. Two statutory bodies are created under the prevention of Cruelty to Animals Act 1960 namely, the Animal Welfare Board of India and The Committee for the Purpose of Supervision and Control of Experiments on Animals (CPCSEA). The expenses of these organizations are borne under this scheme.

The activities taken up in this field include the following programmes:

1. Provision of shelter houses for animals: implemented through agencies like VO, universities, panchayats etc. The agencies receive grants-in-aid for 90% of the cost.

2. Animal birth control and immunization of stray dogs: Local bodies, NGOs and Societies for Prevention of Cruelty to Animals are provided assistance for care and relocation. The programme also includes capture and relocation of monkeys in urban areas for medical examination and treatment.

3. Ambulance Services to Animals in Distress: Vehicles are provided to competent organizations to ensure immediate attention to distressed animals, assist poor owners of cattle involved in accidents or sick, mobile clinics to villages for vaccination of animals and under take anti rabies programmes etc.

4. Relief to animals during natural calamities: Assistance to NGOs for providing relief to animals in circumstances like flood, cyclone, drought, snowfall etc.

5. National Institute of Animal Welfare: The Institute has been set up to impart relevant training and education in animal welfare to the stakeholders in Government and outside. The Institute is running short in-service training programmes at present and the deliberations on the future scope and mandate in terms of higher education, research, and extension are yet to be decided.

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Chapter 4: Environment: Strategies, proposals and allocations for the Eleventh Five Year Plan

In the Eleventh Plan, the management of environment must be at the centre stage of policy and planning. Environment is the key natural asset on which development will be based. It is also the asset on which vast numbers of people depend for their daily survival. The degradation of the environment impacts on poverty. The sustainable and equitous management of environmental resources will be critical for India's economic future. This is the first challenge of environment as a development imperative.

The second challenge is where development degrades the environment: the challenge of the balance. Industrial and economic growth is built on the use of resources—energy and materials — which then generates enormous waste. The prevalent model of economic growth is highly capital-intensive and so tends to reinforce the social divides; because it is material and energy-intensive it generates waste and so is highly polluting. The industrialized world has learnt to mitigate the adverse impacts of its economic growth by investing enormous financial and managerial resources in environmental and social security. But this model is inappropriate for countries like India, as it demands incremental and continuous investment, which would be difficult for us. Furthermore, the industrialized world is finding increasingly that it stays many steps behind the problem. India therefore, as it grows economically, will also have to make investments critical to equity and sustainability. But the key is to use our inventiveness and ingenuity to find new pathways to growth. In other words, even as the whole world looks for little solutions to pollution and environmental degradation, we must reinvent the answer itself.

The direction of the 'environmental' component of the Eleventh Five Year Plan must be to guide and incentivise equitous and sustainable growth. It can do this by:

a) Strengthening the environmental imperative in other sectors of the economy – from transport, water supply, sanitation, industrial growth, commodities, agriculture and anti-poverty programmes.

b) Strengthening regulatory framework for environment so that development decisions do not impinge on sustainability.

Environment and Development

The regulatory challenge

In the past some years, intensive economic growth, which has increased economic wealth, has led to massive pollution and degradation of the natural environment. One of the main reasons for this is that the regulatory and Institutional framework to control pollution and degradation of natural resources is unable to keep pace with the rapidly changing economic, social and environmental situation in the country. The number of polluting

activities -- and the quantum of pollution generated -- has increased in the last several years. Furthermore, newer and newer environmental challenges are thrown up – from solid waste disposal, to disposal and recycling of hazardous waste, to toxins like mercury, dioxins and activities like ship-breaking to management of vehicular pollution.

But our Institutional capacity to regulate, monitor and control pollution has remained more or less static or has even weakened during this same decade of economic growth and environmental toxification. Most SPCBs are poorly staffed and existing staff are poorly trained for the job. Most boards also lack requisite instrumentation and monitoring tool kits. On the other hand, the legal route to enforce compliance is not working. Most boards have stopped filing cases in the court. The use of complimentary regulatory mechanisms – from public scrutiny to public rating schemes – also requires internal capacity. There is therefore an urgent need to upgrade the capacity of the boards and expand and strengthen enforcement mechanisms by using other enforcement tools like economic instruments. Our regulations are also restricted to production plants and are concentration based. There is a need to develop and implement load-based standards that are in tune with the assimilative capacity of the local environment. Also, we must start regulating products, chemicals and packaging to reduce pollution from product and services.

Therefore, the primary thrust during the Eleventh Plan period must be to update, expand and strengthen pollution regulation; expand and strengthen enforcement mechanisms; and strengthen regulatory Institutions with adequate resources and skilled human power and most importantly, the participation of affected communities. It is also important to note that if the process of decision-making for environmental assessment and clearance of projects is not rigorous or reliable it will also impinge on development. The people who are affected by the bad industrial project – because it pollutes their water or land or displaces them without compensation – will protest. The protest will hold up the project. Alternatively, if the project leads to environmental damage – destroys forest ecosystems, biodiversity gene pools, or the cultural and natural heritage of vulnerable communities – the project will be contested. An abused process will lead to abused outcomes. Regulation and its implementation is critical not because it will streamline clearances of projects but because it will build a process of development, which is less contested and more inclusive.

Two stages are crucial in environmental regulation. One concerns the integrity of the information, which assesses the environmental impact of the project. The second crucial stage concerns public consultation. It is not enough to hear people. It is vital to ensure that people are heard. The regulatory process led by Government must welcome scrutiny. It must also support knowledge-based critiques – by funding open research on the projects, by opening schools that teach people the science of environmental impact assessments. It must push the concerns of people as its concerns. This has to be the guiding principle for environmental management in the coming years.

Strengthening the framework of governance

Commission for Sustainable Development & District Paryavaran Vahinis

In order to integrate environmental concerns into all planning and decision-making processes across all sectors and developmental activities of the central Government, it is

proposed to set up an independent, statutory Commission on Sustainable Development (CSD). This Commission would have the specific responsibility of guiding Government policies and programmes towards becoming more socially and environmentally sustainable, and to monitor and evaluate the outcome. The Commission should comprise eminent environmental experts and citizens with a long and publicly known record in environmental research or action.

A related activity would be the posting of Internal Environmental Advisers in key Ministries, on the pattern of Internal Financial Advisers. These officers should be empowered and trained to provide in-house advice to the Ministry regarding the options available in order to make their activities/programmes environmentally sensitive.

At the district level, the scheme of Paryavaran Vahinis, or committees of concerned citizens to serve as environmental watchdogs and undertake selective first hand monitoring of the environmental situation in the district, should be revived.

Research and action priorities of this sub-sector

The rapid process of industrialization-led development is placing huge challenges in front of the environment sector. The process of integrating environmental concerns into developmental decision-making can only happen if it is backed up by a deep understanding of the factors driving and shaping the developmental process and the factors relating to environmental and natural resource degradation. The research priorities for this sub-sector are:

- Integration of environmental concerns into micro- and macro-level indicators of sustainable development and well-being, including (but not only) environmental corrections to national income accounts. Suitable indicators would include per capita availability of environmental services such as clean air and water, sanitation, forests and other natural ecosystems, reduction in the rates of biodiversity loss, clean and sustainable energy production and consumption, health standards linked to a clean environment, and so on. Countries such as the United Kingdom have developed a large number of such indicators, which could be assessed for suitability in Indian conditions.
- Development and implementation of additional indicators of environmental impact of developmental and consumption processes, such as ecological footprint; a specific activity under this could be to work out the ecological footprint of major cities, and redesign them under the JNNURM or other schemes to reduce the ecological damage they cause; another would be the ecological footprint of the energy and infrastructure sectors, in order to redesign them over the course of the Eleventh Plan.
- Developing, in collaboration with the National Land Use Board and through a nation-wide participatory exercise, a long-term land use policy and plan. It should aim to identify ecologically and socially sensitive and critical areas including important areas wildlife/biodiversity conservation, water sources, coasts, etc., where large-scale developmental projects would not be located, and a gradation of other areas where different kinds of projects and processes are permitted or prohibited. Such a Plan should then be given legal backing.
- Designing Institutions for environmental and natural resource governance.

Environmental Impact Appraisal and clearance including forest clearance

The Environmental Impact Notification of 2006 draws its objectives from the Report on Reforming Investment Approval and Implementation Procedures, by a Committee headed by V. Govindarajan. In view of this development, improving the quality, independence, and transparency of the EIA process, including full public participation, complying with PRI statutes, and building capacity for EIA at local levels are high priorities for the Eleventh Plan. To do this, the following is recommended.

1. Setting up of a National Environment Clearance Authority (NECA), headed by a retired Supreme Court Judge and comprising scientists/ academics, professionals working in the relevant fields and NGO/community representatives. The NECA should be a statutory body independent of the Government, and its Chairman and members should be appointed by a Committee comprising of the Prime Minister, the Leader of the Opposition in the Lok Sabha, and the Chief Justice of India, after following the due process of identifying the qualifications/expertise.[3]
2. Setting up of State Environmental Clearance Authority (SECA) in each State, headed by a retired High Court Judge and comprising scientists/academics, professionals working in relevant fields, and NGO/community representatives. The SECAs should be statutory bodies independent of the Government, and its chair and members should be appointed by a Committee comprising of the Chief Minister, the Leader of the Opposition in the State Legislature, and the Chief Justice of the High Court after following the due process of identifying the qualifications/expertise.
3. Public hearings must be mandatory for all projects that are likely to have environmental and social impacts, without exception; the public must have the option to approach the Appellate authority in case of an unsatisfactory hearing. Public hearings should be preceded by full public disclosure of information relevant to the proposed project or process, in local languages and well in advance.
4. Clearance procedures should require proof of written consent having been obtained from each of the *gram sabhas* or *panchayats* that are to be affected by the project.
5. Expert Appraisal Committees (EACs) including for forest clearances, need to be reconstituted at the National level that would assist the NECA in appraising projects and activities, and State EACs set up to assist the SECAs;
4. The Environmental Appellate Authority should be immediately activated, to become a forum for grievance redressal of those affected by decisions related to development projects. This forum should be easily accessible to people from various parts of the

[3] The NECA should have a) the power to grant prior environmental and forest clearances under the Environmental Protection Act (as envisaged for the Government of India) and the Forest Conservation Act (and any successor acts) and to monitor the compliance of conditions of clearance, and to revoke clearances or impose penalties, as required; b) the power to assess, in terms of their environmental impacts, plans, schemes, policies and laws of the Government and to give clearance for them. c) the power to hear appeals against all decisions and orders of the State Environment Clearance Authority (SECA); c) the power to review the guidelines, notifications and requirements prescribed under the relevant acts and have them revised, as appropriate; d) the mandate and power to require the setting up and proper administration of a system for accreditation of consultants authorized to prepare environmental impact Statements and conduct related investigations and surveys; and e) the power to disqualify for a specified period individual consultants or consultancy firms for professional misconduct.

country including remote rural areas, including having the ability to conduct hearings in local languages, and should treat redressal as a right of the affected people or those helping the affected people rather than as a favour being done to them.

5. EIAs must be conducted by agencies selected by and paid by NECA/SECA (the cost of the EIA process to be recovered in from the project proponent).
6. Ex post facto clearances should be prohibited by law.

Activities proposed:

- Core support for NECA and partial support for SECA
- Core support for the Environmental Appellate Authority and Environmental Authorities, Commissions
- Training and capacity building in EIA and environmental clearance matters to Zilla Parishads and other local bodies
- Retrospective EIAs of past projects
- Support for Environment management in heritage, pilgrimage and tourist centres including Taj

Strengthening and repositioning the Central and SPCBs as Environmental Protection Authorities

It is critical that the pollution regulatory Institutions are urgently upgraded, strengthened and repositioned to meet the challenges that confront this sector. The base of the regulatory Institution must start at the municipal level to tackle the pollution created by municipal, transport and infrastructure sources. A detailed study to assess the status, strength and weakness and regulatory demand-supply gap of the SPCBs and CPCB should be undertaken. The aim should be to upgrade the pollution regulatory bodies into an effective Institution, modeled along the lines of an Environment Protection Authority. Based on this assessment, a road map must be developed to deepen reform and strengthen the Environment Regulatory Institutions.

The regulation must also introduce new toolkits involving a mix of command and control, economic; financial penalty, incentives for compliance and pollution taxes etc., market and society-based instruments to regulate and control pollution. There is a need for direct pricing of ecologically important input factors and taxing and controlling pollution and use of polluting inputs.

It is essential that the regulations be re-worked to incentivise water conservation. To do this, a "burden neutral water price" should be designed to encourage base water recycling and reuse in industrial installations and consider equivalent tax relief in related areas.

It is also imperative that regulations and pollution standards should take into account the receiving medium – the specific water body, the ambient air of the city etc. There is a need to develop and implement a load-based standard that is in tune with the assimilative capacity of the local environment. This will allow for more careful, science and health based standards and policies to be developed.

It is also important that we must begin to regulate more than the production processes. We must regulate the products and their packaging as well. To do this, there is a need to formulate systems to regulate products, chemicals and packages

Recommendation: To undertake a detailed study to assess the status, strength and weakness and regulatory demand-supply gap of the SPCBs and CPCB during the coming year. Based on this assessment, a road map must be developed to deepen, reform and reposition the environment regulatory Institutions and budgets proposed accordingly.

International Agreements and Conventions

India has participated in major international events on the environment since 1972. The country has signed and ratified a number of key multilateral agreements on environment issues in recognition of the trans-boundary nature of several environmental problems, impact on chemical industry and trade and has made efforts to comply with its commitments. Efforts have been made to network and enhance environmental cooperation by participating in regional and bilateral programmes. The need to enhance our own capacity to comply with our commitments and enable flow of resources is clearly evident.

Recommendation: To integrate the global environmental agreements at the international level with work at the national level. We also need to assess the time and cost of participating in the international meetings and our strategies for the future.

Recommendations: work to do on International agreements

1. The Basel Convention

a) An action plan for efficient, cost effective recycling and disposal strategy for electrical and electronic waste be drawn up.

b) Recommendations in the Expert Committee Report on ship breaking be implemented.

c) Basel ban and Basel Protocol be studied for ratification.

d) Amendments to exclude recyclables from the Hazardous Waste (Management and Handling) Rules, 1989, amended 2000, 2003.

2. The Rotterdam Convention (PIC)

a. Legislation or amendments to existing legislations to implement the provisions / obligation of the convention be notified.

b. A study to document status of 41 chemicals now covered be conducted.

c. A National Action Plan for implementation be drawn up.

3. The Stockholm Convention (POPs)

a. National Implementation Plan preparation be completed by 2008.

b. Investment projects be drawn up in parallel.

c. Status of new POPs, POP's covered under **OSPAR & LRTAP** in the country be got prepared.

4. SAICM

1. A work plan prioritizing the activities in the Global Plan of Action {GPA} for the country be drawn up.
2. An Inter-ministerial Coordination Committee be established to ensure timely action and implementation.

5. Biosafety

a) Ensure the conservation of biodiversity and human health when dealing with Living Modified Organisms (LMO's) in transboundary movement in a manner consistent with the Bio Safety Protocol.

b) Review the regulatory processes for LMOs so that all relevant scientific knowledge and international regimes are taken into account, and ecological, health, and economic concerns are adequately addressed.

c) Periodically review the National Bio-safety Guidelines, and Bio-safety Operations Manual to ensure that these are based on current scientific knowledge and international understanding.

Global Climate Change

Global climate change has assumed great importance for all countries; more so, for developing countries like India. Currently key agencies and research institutes are engaged in global change activities only in a marginal or ad hoc manner. There is no integrated comprehensive programme, which studies the impact of climate change on India. We recommend a new major programme providing for long-term sustained activities in different aspects of global change, including but not limited to climate change. These would include the following:

a. Identify key vulnerabilities of India to climate change, in particular impacts on water resources, forests, coastal areas, agriculture, and health. Monitoring of Alpine vegetation dynamics in Himalayan Alpine s will be of particular importance in this context.
b. Assess the need for adaptation to future climate change, and the scope for incorporating these in relevant programmes, including watershed management, coastal zone planning and regulation, forestry management, agricultural technologies and practices, and health programmes.
c. Drive and set the priorities for participation in the Clean Development Mechanism (CDM) through capacity building for identifying and preparing CDM projects, including investment.

Recommendation: To launch an Inter-ministerial high level programme for climate change assessment and global mitigation at the earlier.

Pollution Abatement

Air pollution management

The CPCB monitors ambient air quality at 315 stations covering 115 cities/towns in 28 States and 4 Union Territories in the country. The air quality monitoring carried out over the last decade bears out that some criteria pollutants have begun to stabilize, while some pollutants have begun to show rising trend. Given the rapidly accelerating pace of industrialization and urbanization, air pollution is going to be one the most pressing issues in the coming decades. All Central programmes on Out Door Pollution should be re-organised under National Air Quality Planning (NAQP), the city based programmes as Clean Air Action Plan (CAAP) for cities and Pollution Control and Prevention in Industrial Areas (PCPI) programmes.

The thrust areas of the NAQP during the Eleventh Plan shall include review of standards, expanded monitoring, setting of pollution reduction targets, use of multiple instruments for regulation, assessment of health impacts. The National Programmes for Monitoring air and water quality will be taken forward for achieving real time data. This would be important in creating early warning systems for pollution watch and enforcing the plan target of conforming to the WHO standards for air and water quality. Collaboration with SPCBs for monitoring various pollution processes and working on mitigation models would need added impetus.

Under Air Quality Monitoring, the entire monitoring network will be expanded from the current 315 stations to 1000 stations. Continuous and real time monitoring of PM2.5, Ozone, VOCs, PAH, secondary pollutants – sulphates and nitrates in about 15 cities per year, to cover all current 76 non compliant cities, source monitoring, of VOC, BTX and toxic heavy metals to develop control measures are to be initiated.

The programme must estimate and set emissions load reduction targets based on source monitoring of criteria, and hazardous air pollutants in major air polluting industrial sectors like pesticides, pharmaceuticals, dye and dye intermediates, refineries, and petro-chemicals, among others.

It must develop air pollution management plan for small-scale industries including emission load estimation from small-scale industry and control strategies. It must identify and promote pollution prevention technologies.

A single comprehensive CAAP covering criteria pollutants, air toxics and hazardous air pollutants shall be prepared. 33 cities including the key State capitals to be included in the priority list for the introduction of Euro IV emissions standards. Bio-fuels program to be encouraged.

The focus up till now has been on engine technology and fuel choice reinforced by a regulatory regime. While this has provided a limited time cushion for some cities, the problem

is increasing significantly in both large and medium cities across the country. CAAP shall integrate the National Urban Transport Policy and JNNURM which has special focus on development of public transport including both bus and rail-based mass rapid transit systems. The Annual Economic Surveys note with pride the increase in automobile manufacture but the inability of the cities to cope with this increasing volume is not adequately recognized. Addressing vehicular pollution needs to cover a range of issues such as proliferation of private automobiles, demand management, severely inadequate measures for allocating limited urban space for vehicle use, significant distortions in the taxation and pricing system indicating unjustified subsidies. For instance, one time registration charges for cars, inequitable incidence of vehicle taxation must be addressed. There is a need for increased public expenditure and investment favouring private transport further distorts the situation.

Recommendation; To upgrade and reorganise the programme for monitoring air pollutants and to direct the programme into policies for mitigation by integrating with the National Urban Transport Policy.

Recommendation: Redesign programmes for air pollution management

1. Separate policy groups should be created and strengthened within identified Institutions to deal with research and development, enforcement and compliance. Further these groups should be strengthened with adequate skills and personnel.
2. The city based action planning has proved to be effective in improving local planning, implementation and also the pollution levels. It is therefore recommended that this model be developed further as the foundation of a more robust air quality planning exercise nationwide.
3. Specific programme and studies be initiated to design tax incentives for early introduction of tighter vehicle and fuels standards, improvement in fuel economy of vehicles, for promotion of alternative fuelled vehicles and use of public transport and clean technology in industries. Disincentive should be designed to discourage polluting activities and polluting technologies and vehicles.
4. All Central programmes on Out Door Pollution be reorganised under NAQP, the city based programme as Clean Air Action Plan (CAAP) for cities and Pollution Control and Prevention in Industrial Areas (PCPI) program.
5. The Key thrust areas of NAQP during the Eleventh Plan shall be; Air Quality Monitoring, Review of Air quality standards, Assess, Set and Monitor city wise air pollution reduction targets and Quality Control and Assurance.
6. Under Air Quality Monitoring the entire monitoring network will be expanded from the current 315 stations to 1000 stations. Continuous and real time monitoring of PM2.5, Ozone, VOCs, PAH, secondary pollutants – sulphates and nitrates in about 15 cities per year, to cover all current 76 non compliant cities, source monitoring, of VOC, BTX and toxic heavy metals to develop control measures are to be initiated.
7. GIS based Decision Support System (DSS) for scientific management of air pollution and Networking of existing manual and continuous air quality monitoring stations and data

transmission on a daily basis from these stations to environmental data bank established in CPCB to be introduced.

8. Air Quality standards shall be based on health considerations to protect sensitive populations, vegetation and property with margin of safety and the practice of land-use based air quality standards to be discontinued. Till such standards are set for new pollutants, the relevant 2005 WHO guidelines to be followed.
9. Multi-city studies on air pollution inventory and source profiling, source apportionment, air quality modelling on an ongoing basis to assess the trend in sources of pollution, pollution load, set air quality targets, and the impact of action on air quality, to further strengthen the city action plans to be conducted.
10. Initiate multi-city health studies (time series epidemiological studies and exposure studies) with wide geographic and population coverage for proper risk assessment. Establish rigorous methodology and scientific protocol and conduct them in a manner that they have policy relevance.
11. Strengthen the technical capacity for quality control and quality assurance, calibration facilities for air pollution analysis, network audits, data review and management, development of laboratory facilities and skill.
12. A single comprehensive CAAP covering criteria pollutants, air toxics and hazardous air pollutants shall be prepared. 33 cities including the key State capitals to be included in the priority list for the introduction of Euro IV emissions standards. Bio-fuels program to be encouraged. CAAP shall integrate the National Urban Transport Policy and Jawaharlal Nehru National Urban Renewal Mission which have special focus on development of public transport including both bus and rail based mass rapid transit systems.
13. Estimate and set emissions load reduction targets based on source monitoring of criteria, and hazardous air pollutants in major air polluting industrial sectors like pesticides, pharmaceuticals, dye and dye intermediates, refineries, petro-chemicals, among others.
14. Develop air pollution management plan for small-scale industries including emission load estimation from small-scale industry and control strategies. Identify and promote pollution prevention technologies.
15. Design and implement economic instruments to improve enforcement and also speed up transition to good environmental practices and clean technologies as an important thrust area during the Eleventh Plan period.
16. Strengthen and consolidate the current fragmentary science advisory structure and clearly establish the role and responsibilities of the science advisory groups
17. A dedicated Institution be created for medium to longer term technical training and skill building related to air quality monitoring, instrumentation, laboratory analysis, calibration, quality audits, and regulation development based on the available scientific information.

Water Pollution

CPCB for the last 25 years has carried out water quality monitoring with respect to physical parameters, nutrients, major ions, organic and pathogenic pollution in water bodies. Effluent standards, environmental laboratories, and Government analysts have been notified

under the Environment (Protection) Act. Under the National River Action Plan (NRAP), in the first phase, the GAP (Ganga Action Plan), 29 towns were selected along the Ganga River. Special drive to ensure compliance of standards in respect of 17 categories of polluting industries is underway. A scheme of Common Effluent Treatment Plants (CETPs) was initiated.

There is a need for much stronger monitoring and enforcement and more expanded coverage are both necessary. The former can only happen with greater awareness and involvement of local (affected) communities and local Governments in the monitoring. This monitoring must be done independently of the work to implement the river action programmes so that there is credibility in the information and this knowledge can drive policy. The role of the CPCB must be clarified. It is also essential that monitoring of water bodies should be both expanded in scale as well as in the parameters to assess quantity and toxicity of pollutants.

Solid and Hazardous Waste

Collection, treatment and disposal of solid waste are basically the mandate of the urban local civic bodies. Solid waste handling and disposal presents another major challenge in an era of rapid urbanization and industrialization. Collection of waste continues to be a problem. Efforts to mobilize community participation or privatization have been rather modest and limited to a few cities, while up-scaling of the models is not taking place.

The Supreme Court directions for solid waste collection and management requiring segregation, sanitary landfills and other safe options of treatment are being looked at by an increasing number of cities. But these cities face real problems in operationalisation of solid waste management at the scale that is needed.

Technologies for waste minimization are not being pursued. The existing regulations including Court orders have to be revisited to see the changes needed as well as the investments required.

Regarding hazardous wastes, in particular, medical wastes, the problem is increasing in many cities. The regulatory framework does not take into account the financial and Institutional inadequacies of urban local bodies.

Efforts on this front will have to be expanded and also decentralized as the problem is localized and largely within the mandate of local Governments. There is a need for integration with JNNURM which will help achieve some of the objectives.

Recommendation: To rework the existing regulations and programmes for waste management and minimisation to integrate with the JNNURM. The role of CPCB and MoEF must be clarified as being the key standard setting, pollution monitoring agency.

A co-ordinated programme will be pursued for analysis of trends for monitoring and work on strategies and support for development of suitable technologies and implementation thereof in an effective manner. Assistance for projects for treatment and disposal of hazardous and biomedical waste will be provided as incentive for compliance.

Recommendations: Waste minimization action plan

Hazardous Waste

(1) To strengthen the SPCBs, facilitating them in development of technical skills.

(2) To identify organizations and agencies for carrying out the field level activities

(3) To identify Institutions for carrying out R&D activities that could be applied in the field directly.

(4) Strengthening of laboratories for carrying out analytical work.

(5) Develop and implement viable models of public-private partnerships for setting up and operating common Treatment Storage Disposal Facilities (CTSDF) for toxic and hazardous waste, industrial and biomedical wastes, on payment by users.

(6) Develop and implement strategies for clean up of pre-existing toxic and hazardous waste dumps, in particular, in industrial areas, and reclamation of such lands for future, sustainable use.

(7) Give legal recognition to, and strengthen the informal sector systems for collection and recycling of various materials; in particular enhance their capacity and provide access to appropriate technologies and Institutional finance.

(8) Provide subsidy or tax exemption to waste management activities.

(9) Sales and service tax exemption for recyclable waste that is recycled in an environmentally sound manner.

(10) Facilitate demonstration projects and provide subsidies for application of new technologies such as Plasma technology for more efficient and environment friendly disposal of hazardous wastes.

Municipal Solid Waste

(1) Continuation of demonstration projects which are being given one project to one State during the Tenth Plan period for the demonstration of MSW Rules will continue in the Eleventh Plan period also. A second project will also be considered in bigger States depending upon the need.

(2) Municipal Solid Waste disposal facility to be planned and developed on the basis of the population, quantum of the waste generation and the waste characteristics.

(3) Planned disposal facilities to be developed in the form of scientifically designed landfills.

(4) Waste segregation into biodegradable and non-biodegradable wastes at appropriate sites.

(5) Waste Disposal to be in a phased manner along with plantation.

(6) Training programmes for all the stakeholders to continue.

(7) Area specific research projects and projects on the policy review and quantification will be considered.

(8) Area based MSW management and Integrated Solid Waste Management approach will be given importance during the Eleventh Plan period.

(9) Technology interventions for treatment technologies, and waste to energy and composting projects

(10) The Ministry to devise the technical guidelines for the development of scientific landfills.

(11) Encourage Municipal bodies to participate in CDM through capacity building including investment for identifying and preparing CDM projects based on waste management. To involve communities, NGOs and participatory agencies.

Bio-medical Waste

(1) To facilitate in establishing more common and shared facilities.

(2) Specific Training Programmes to be funded and organized for the medical professionals, paramedical professionals and other staff working in the health care Institutions .

(3) Special Training Programmes for Safai Karamcharis.

(4) Awareness programmes to be organized through media and other sources for general public.

(5) To involve local communities and NGOs

Used Lead Acid Batteries Waste

(1) To facilitate in establishing collection centres.

(2) To promote studies on Environmentally Sound Technologies for used Lead Acid Battery recycling.

(3) Funding R&D studies for lead smelting technologies in secondary lead smelters.

(4) Facilitate and monitor take back of used lead acid batteries to registered recyclers.

(5) To involve local communities and NGOs.

(6) To organize planned Training programmes for retailers and distributors

(7) Awareness programme for consumers, users and general public.

Fly-ash utilization

(1) R&D for fly ash utilization & management.

(2) Assessment and application of available technologies for fly ash utilization

(3) To strengthen the implementing agencies

(4) To facilitate in collection and transportation of fly ash to units manufacturing fly ash products**.**

Management of Plastic Wastes

(1) R&D for waste plastic utilization & management

(2) Assessment and application of available technologies for waste plastics utilization

(3) Incentive pilot projects for waste plastic utilization and replication and field application of successful R&D

Waste Minimization and Cleaner Production Processes.

(1) Integration of waste minimization and cleaner production schemes
(2) Enlarge scope of R&D studies for additional sectors
(3) Planning and funding of Demonstration projects through SPCBs

Aquatic Ecosystems

National River Conservation Plan

Freshwater ecosystems such as lakes and rivers are under serious threat across India. Over 60% of them have already been estimated to be drained out or badly polluted. Their conservation is an urgent necessity, and will be boosted by a special project or scheme dedicated to it. The experience of the first 20 years must be used to design an effective and affordable river cleaning programme for the future. This can be done. But it calls for new thinking on sewage and its treatment. It will also require us to rework the Institutional and financial aspects of the river cleaning programme.

In 2007, the country's first river action programme – Ganga Action Plan – completes over 20 years and the NRCP completes 10 years. It would be an important juncture to review the programmes and to direct the work for the future. This is particularly important as rates of urbanization are bound to go up in the country. We know that cities exchange clean water with dirty sewage and that if this sewage is not intercepted, transported and treated before disposal into our rivers, it will add to pollution to our critical lifelines. This review should examine the integration of NRCP, NLCP and Common Effluent Treatment Plants (CETP). It must also integrate with the investment being made under the JNNURM.

Although the rivers possess significant natural capacity to assimilate and render harmless many pollutants, the existing pollution inflows in many cases substantially exceed such natural capacities. Pollution loads are similarly linked to pricing policies leading to inefficient use of agricultural chemicals, and municipal and industrial water use. The programmes of the Government, without a tied up responsibility of mitigation of the pollution on the agencies responsible for sanitation, are likely to elude success. The assistance needs to be directed towards the local bodies along with specific statutory responsibility for operating and maintaining it.

The JNNURM and UIDSSMT programmes of urban development also aim at reforms in processes and compliances. The City Development Plans incorporate environmental services as the number one priority sector. Mechanisms are needed to ensure that the urban areas covered under these programmes provide for full treatment of sewage generated. For the plan period, the River Conservation Programme should aim at only the already progressing projects and new projects should be considered only in the towns which are not covered under these programmes.

Re-design river cleaning

The NRCP should graduate from being a 'sewage treatment plan' to a programme with a more broad based approach with the following components:

- The Plan shall aim at discouraging conveyance of sewage over large distances by promoting sewage treatment as close to source as possible (especially for the upcoming colonies and the unconnected population). Wherever this is not feasible, Centralized facility could be planned. Availability of sewage and reuse possibilities and not the availability of land shall govern the location of the treatment facilities.
- Reduce the wastewater generation by reducing water consumption by cities to say 135 lpcd or 180 lpcd by promoting water efficient flushes and gadgets.
- Promoting recycling and reuse of treated sewage by cities
- Discouraging the disposal of treated wastewater into streams/drains carrying untreated waste into waterbodies
- Revival and restoration of waterbodies/lakes
- Maintaining minimum freshwater flow in rivers.

National Lake Conservation Plan

While the lakes conservation plan focuses on pollution abatement in the lakes, larger objective of conservation of lakes encompass the measures required for maintaining the resilience of the aquatic ecosystems with sustainability of the economic well being of the dependent population. Similar objectives are set up for the conservation of wetlands also. Keeping this in view, National Lake Conservation Plan will be integrated with wetlands and objectives will cover conservation of life forms apart from mitigating pollution and augmenting catchments.

Coastal Zone Management

The earlier Coastal Regulation Zone Notification prescribed regulation of activities based on uniform principles of vulnerability of the coastal areas from vulnerability of life support systems against human activity. The Swaminathan Committee reviewed the prescriptions and after a wider consultation, prescribed that the local circumstances and vulnerabilities may be made the basis of coastal zone management and regulations. Use of scientific, social, and local information will be imperative for formulating environmental management plans for coastal areas. The first stage of plan formulation for mapping of coastal areas based on the suitable indicators will be taken up. Elements of conservation of life forms, including recognized habitats like nesting/ spawning sites of specific species and integration of their environments with human well being will be the essential components.

It is critical that in all marine areas, the twin imperatives of conservation and the livelihood security of traditional fisherfolk are assured. This would entail a serious review of fisheries and aquaculture development programmes, and the development of programmes that give clear priority to conserving aquatic habitats and species, and promoting the livelihood interests of traditional/artisanal fishworkers through their customs, practices, and habitats. It is important to ensure participation of civil society representatives in the State level coastal zone management committees, and empower fishing/coastal communities to carry out conservation and ensure sustainable harvest.

Environmental Education, Monitoring and Information Management

Environmental Awareness and Education

Ministry of Environment and Forest's programme of Environmental Education, Training and Extension has been functioning in an efficient manner with large outreach of about 75000 eco-clubs, about 10000 participants in National Environment Awareness Campaign and National Green Corps. The programme may be continued with further linkages with the publicity and awareness mechanisms of State forest departments also. As a component of the Environmental Awareness programmes a manual on public participation in each of the MoEF's activities should be prepared and widely disseminated.

Environmental Education is now a compulsory component of educational activities at all stages from Primary through University education. The National Council of Educational Research and Training and the University Grants Commission are guiding this process, being implemented at the State level. It would be very fruitful to establish links between the activities supported by the Ministry of Environment and Forest and these extensive educational activities during the Eleventh Five Year Plan. The National Curriculum Review 2005 has made a number of significant suggestions in this context. These include the need to ground Environmental Education in student activities relating to local environmental issues and to use the information so generated to create a publicly accessible, transparent database on India's environment. The Eleventh Plan should support this process through linking the results of the school and college student projects to the proposed National Environmental Monitoring Programme.

The environmental science curriculum in schools needs to be strengthened. There is an urgent need for high quality, site-specific educational material that is relevant to local environmental and social contexts, developed by or with the participation of local people, teachers, students, and available in local languages (including dialects). A scheme on this may be initiated in the Eleventh Plan, learning from the experience of some environmental NGOs that have produced such material.

Also to be explored is the enormous potential of using public transport as a vehicle of environmental awareness. The railways, the bus service, and even the airways could be used with little additional resources, to provide awareness of the regions that travelers are passing through or going to, through well designed signage, handouts, announcements, etc. A pilot project on this should be launched in the Eleventh Plan, with trial runs on a few rail/bus/flight sectors.

National Environmental Monitoring Programme

Instead of separate, disparate programmes on forest monitoring, air quality and river pollution as in the past, it is recommended to develop a unified National Environmental Monitoring Programme. This NEMP would function under the guidance of a committee of experts drawn from various disciplines, including not only ecology and environmental chemistry but also public health and socio-environmental studies. The focus of this programme will be on tracking the status and change in the socially relevant biophysical parameters, and their social impacts where possible, and on making this information available as widely as possible. Recognizing the federal polity and ecosystemic diversity of the country,

and recognizing that both the needs and capacities for environmental monitoring are not uniquely located at the National level, the NEMP will consist of a mix of national, regional and local programmes. It will be distributed, bottom-up, Governmental plus Non-governmental and flexible.

Governance pre-requisite:

- Permission to access data collected by other agencies (such as Central Water Commission, IMD, or State Groundwater authorities).
- Permission to access and make publicly available one-time datasets prepared by specialized (non-MoEF) agencies (such as SOI or Geological Survey of India) on topography, soil, geology, etc.
- Administrative reforms within MoEF to free subordinate agencies such as FSI and BSI from direct control, and also to make them much more independent of the line departments

Activities proposed:

The NEMP will have sub-programmes on:

Biodiversity Inventory and Monitoring,

- Support to research organizations and civil society groups
- Completion of People's Biodiversity Registers at a number of sites, and their validation by taxonomists and other concerned scientific experts.

Biodiversity Information management through

- Pilot effort on digitization of collections
- Indian Biodiversity Information System (IBIS) and Biodiversity Knowledge Portal through a consortium of research organizations

Forest cover monitoring:

- Setting up of collaborative, bottom-up forest cover monitoring system involving independent research organizations, State remote sensing centers, civil society groups and FSI

Ecosystem Service Flows & Values (Hydrological regulation, soil conservation, carbon sequestration, pollination services of forests)

- Collaborative network of research organizations, colleges, schools and grassroots groups

Information Management and Dissemination

The National Environment Policy calls for developing and operating an online, real time, publicly accessible environmental information system to provide all relevant information on key environmental resources and parameters, and making archival data available in convenient format. The following steps will be taken to fulfill the information

provision requirement at different levels/types. Eventually, these activities as also the NEMP may be transferred to the jurisdiction of the CSD.

- Compliance with the suo moto disclosure requirements of RTI of all MoEF agencies and subordinate offices as a part of MoEF's e-governance initiative.
- Real-time sharing of data on environmental parameters collected under the NEMP.
- One-time archival, legal, research and other information to be made available through various 'knowledge portals' or clearing houses including the biodiversity portal.
- Special portal for environmental data from school and college student projects and Technical Support System for the same**.**
- All key information should also be available in Indian languages, including in hard copy form.

Indian Institute of Forest Management

IIFM has emerged as a premier Institution in the field of natural resource Management especially in participatory processes. As suggested in an independent evaluation, IIFM intends to enlarge its educational and management development programmes as well as policy-relevant research focused on forestry and its linkages with rural Institutions and natural resource based rural livelihoods. The Institute will take up policy and development research including the valuation of ecosystem services, evaluation of the economy of participation in natural resource, especially forest management and modeling of impact of climate change in the livelihood of forest dwellers as well as sustainability of forest resources. Other Institutions will continue to provide research and training supports to the contemporary issues in the mandated fields.

Capacity Building in Forestry Sector

The forestry sector is facing the most crucial paradigm change of all the social and economic sectors. This change necessitates fundamental changes in the orientation and capabilities of the personnel. This includes attitudinal changes towards much more social sensitivities and understanding of the scientific basis of the processes of nature. This necessitates intensive efforts for capacity building of the personnel and also the stakeholder groups including the Government functionaries working with people.

Foresters today are required to play multifarious roles to deal with a variety of externalities besides coping with traditional forestry management practices. It is, therefore, very essential to develop expertise in the field of forestry and wildlife management as well as to create awareness among the personnel of other services and all other stakeholders who directly or indirectly influence the development and management of forests and wildlife eco-systems.

Recommendations of the Task Force on "Capacity Building in Forestry Sector" should be implemented during the Eleventh Plan and State run Forestry Training Institutions should be strengthened. The existing schemes on IGNFA (Indira Gandhi National Forest Academy), DFE (Directorate of Forest Education) and Training of IFS officers will be replaced by an integrated capacity building programme for forestry personnel at all levels including training

of trainers for State frontline staff training Institutions . The integrated programme will also enable motivation of stakeholders in understanding the perspective of conservation in human well being by providing them the State of art information and knowledge base.

Environmental Research and Development

In keeping with the principles laid out in the National Environment Policy, the implementation programmes in the Environment sector under the Eleventh Plan are to be backed by strong research inputs and support. For this purpose, research priorities have been identified in various sub-sectors, and these priorities are to be met by a combination of open, competitive research grant programmes and dedicated support to special organizations and centres of excellence. The thrust will be towards opening up the doors of the sector to inputs from a broad cross-section of independent, high quality researchers. Special support will be given to hitherto under-researched areas. Emphasis will also be put on seeking out and supporting interdisciplinary research that links natural or biophysical understanding to analysis of social, economic and political dimensions of environmental problems. Special mechanisms will be set up to promote coordination of research support and management amongst the many agencies involved, including Min of Environment & Forest, ICFRE, ICAR, CSIR, DBT, DST, UGC as well as multilateral and bilateral donors and private foundations.

Administrative pre-requisite:

- Streamlining and professionalizing the grant making process within MoEF
- Providing autonomy to fully supported organizations such as IIFM,
- Rigorous review of functioning and contribution of fully supported organizations

Activities proposed:

- Environmental Research Grants programme on the relevant subjects in clean technologies, preventive strategies, hazardous substances management etc.
- Special Programmes on Ecosystem Health, Pollution and Health, Ecological Footprint, NTFP regeneration ecology, Invasive species, Pollination Services of Forests, Fire Ecology, Forest-watershed services, Environmental Law and Institutions etc.
- A review of the national target of 33% tree cover in relation to the objective of enhancing the health status of country's ecosystems
- Documentation of and investigation into traditional and community knowledge.
- Support for existing 10 Centres of Excellence
- Establishment of a Mangrove Research and Management Institute as recommended by the Swaminathan Committee on CRZ.
- New centres in Aquatic Ecology, Environmental Services & Governance;
- Upgradation of facilities for environmental research
- Support for professional societies dedicated to environmental issues

Botanical Survey of India and Zoological Survey of India

The Botanical and Zoological Survey of India are today facing major challenges in view of the new regime of sovereign rights of countries of origin over genetic resources, provisions of the Biological Diversity Act and the fast evolving knowledge and information environment. The work on use of recent trends in organizing information and use of modern skills in explorations and documentation needs to be given priority. In Eleventh Plan these Institutions will develop into prime repositories of information on plant and animal biodiversity, and as referral institutes. At the same time, it should be ensured that these Institutions evolve a culture of openness, working with other Institutions and functioning as a part of a network.

Taxonomy Capacity Building

The implementation of Biological Diversity, Act 2002, and Rules 2004 and National Environmental Policy 2006 calls for an adequate number of trained taxonomists. Taxonomy being a key discipline for inventory, monitoring, and conservation of biodiversity, the existing All India Coordinated Project on Taxonomy (AICOPTAX) should be continued and augmented for capacity building (including human resources) in Taxonomy. ZSI and BSI will be the key Institutions to organize taxonomic capacity building programmes and train young Indian taxonomists for professional inputs in forest, wildlife and biodiversity management arenas in Government and academic Institutions.

Mountain Ecosystems

GB Pant Institute of Himalayan Environment and Development will reorient its activities to evolve as a resource centre for the Himalayan States and Government of India for advice on sustainable development. The focus of research will include socio-economic development of the mountain habitations.

An Indian Alpine Initiative will be started by establishing 3 to 4 sites for tracking the dynamics of Alpine vegetation. In climate change context, indicators will be developed and periodical observations will be taken in a coordinated project under G B Pant Institute of Himalayan Environment and Development. Other Institutions like Wild Life Institute of India, Kumaon University, High Altitude Plant Physiology Research Centre Uttarakhand, Himachal Pradesh University of Agriculture and Forestry, North Eastern Hill University Shillong, Himalayan Forest Research Institute, Shimla etc will be the partners in the programme. Compatibility with GLORIA will provide interface with global coordination for development of forecast systems.

Wild Life Institute of India

Apart from the training, research, advisory and advocacy role of WII, the new approaches would include developing workable framework for mainstreaming conservation in development projects and policies, empirical studies on ecological impacts of developmental projects and human activities, strengthening common property resource management and developing expertise in managing wildlife in isolated, fragmented patches across landscapes. The use of modern tools and technology and development of analytical capabilities will be undertaken.

Indian Council of Forestry Research and Education

The Council was created to evolve the scientific environment in forestry, in view of the widening scientific scope of its genetic, ecological, climatic and economic roles compared to pre-1988 mandates, which were largely limited to silviculture based management systems and ancillary applied aspects on regeneration, harvest, and utilization systems. Accordingly, the responsibility of co-ordination and management of research and education needs to be provided support by enabling the decision-making through consultation and professional capacity. The Council should have specific separate mandates regarding administration of its institutes and co-ordination of research. For this purpose, a Task Group may be set up involving the top level research managers, forest managers, and policy makers, to propose a working mechanism including the resource mobilization for its research and education components. This group may also deliberate on integrating wildlife, biodiversity and habitat/ landscape/ ecological research concerns with the council.

For the plan period, the component for research and education will be earmarked for 50% of the total grants-in-aid to ICFRE. The Council will encourage its institutes to collaborate with other Institutions of repute in the relevant fields. Research programmes will be oriented towards meeting the priority areas of productivity, genetic improvements, ecosystem research and updating growth and yield parameters required for analysis in management planning. The research and training being part of the mandate of the ICFRE, the programme for support for research in the field of utilization of wood and wood products should also include IPIRTI. Nation wide long term genetic improvement programmes for indigenous species, screening of Indian species for fast growing, short rotation alternatives for traditional species for meeting demands of industry and protocols for survey, inventory and management planning for NTFP, medicinal and aromatic plants in forests will be launched.

Specific thrust will be given for developing technologies and processes for agro-forestry and social forestry. A forest biodiversity network will be established for integrating the available information at one platform and studies in the left out areas. Inter-sectoral impacts, trade and market aspects of forest economics, ecosystem research, policy research and concerns of climate change including carbon trade methodologies will be taken up.

Indian Plywood Industries Research and Technology Institute

The Institute has a specific mandate of developing technologies for efficient utilization of wood in structural material. Additional thrust needs to be provided for development and promotion of technologies for alternative and efficient use of residual materials in structural materials like bamboo, particle boards, residual wood waste, small wood etc. Processes for better utilization of the fast growing agro-forestry species for structural purposes, including treatments for longevity of the products will be the focus of utilization research. Apart from its own grants in aid, IPIRTI will be integrated with ICFRE for wood utilization research and technology development. Technology transfer being an important component of the mandate of IPIRTI, professional courses on wood technology will be planned.

Forest Survey of India

During the XI Plan FSI should develop a culture of openness and collaboration and become active partners in the National Environmental Monitoring Programme. Present scope

of the forest survey is limited to the canopy cover over density classes. The resultant information requires to be supplemented by other aspects in order to provide a better basis in planning for productivity, enrichment, biodiversity and regeneration of forests managed by State Governments.

In order to work on these aspects, the scope of interpretation of satellite data for monitoring tree cover will be enlarged to canopy cover in forest lands, patterns of degradation within forests, extent, status and growing stock of commercial plantations. Based on broadening of the scope of forest related studies to include ecologically active habitats, appropriate indicators compatible with the technologies used by FSI should be developed. The survey should include ecological status of landscapes/habitats in terms of dynamics of vegetation over landscapes and habitats profile and early warning regimes based on the observations. Studies will be taken up on forest produce productivity, consumption and supply from forest and non-forest resources. Based on these priorities, rationalization of the present network of regional units and manpower will be taken up.

An important part of the process development will be to set up a Steering group to decide on the scope, definition, and components of the studies and results of FSI inventories in order to render them compatible for various national and international formats and definitions, and to link to other data sets in the NEMP.

Biodiversity, Wildlife, and Animal Welfare

The strategy in this sub-sector so far has been centered on setting up of protected areas and implementing strict conservation measures. However, the experience with this approach has been mixed. The costs imposed on local communities have been too high, the effectiveness has been limited, and the focus was too narrow. The responses to this have been of a piece-meal nature. In the meanwhile, the concept of biodiversity has broadened far beyond the wildlife supported by protected areas. The National Biodversity Authority has been set up.

The Eleventh Plan must, of course, continue to strengthen the traditional wildlife conservation efforts in the form of support for habitat and infrastructure development. Alongside, it is proposed to take up major initiatives for mitigation of wildlife-human conflicts, experimenting with new ways of involving and compensating local communities, including in areas outside PAs and organisms other than large mammals such as amphibians, rehabilitation of hunting communities, and strengthening and protection of indigenous knowledge while improving research and monitoring systems.

Conservation of Natural Resources and Ecosystems

Conservation & Management of Wetlands, Mangroves and Coral Reefs

Conservation of ecological resources and biodiversity are broad concerns that extend beyond the traditional focus on forested ecosystems. It is also imperative that conservation efforts build stronger linkages with livelihood concerns. In view of this it is proposed to extend the existing programmes on wetlands, mangroves, and coral reefs to mountains, grasslands and Alpine ecosystems.

The Scheme on Conservation & Management of Mangroves, Coral reefs and Wetlands has been too small to make an impact on conservation of these ecosystems. As most of these habitats are in non-government, common property resource category, most important factor for conservation will be development of appropriate Institutions to motivate people to cooperate in the conservation efforts.

Initiatives on conservation need to be more effectively integrated with development and poverty reduction in coastal areas. The principles of the Community Reserves under the Wild Life (Protection) Act may be useful in such conservation efforts. The CSS may attempt to sensitize the implementing agencies to draw up long term plans for conservation of such habitats; proposals for assistance under the CSS may be part of these long term plans. A comprehensive strategy should be drawn for conservation of these habitats listing priority activities for establishing the baseline information essential for location specific management plans. Following specific proposals will be considered in eleventh plan.

- NLCP will be integrated with wetlands and objectives will cover conservation of life forms apart from mitigating pollution and augmenting catchments.
- Creation of a Biodiversity Information System for Islands, Coral Reefs, Mangroves and Wetlands by developing a consolidated and easily accessible database of all recorded species and existing specimens of plants and animals located in various herbaria, museums and other collections, as an important component of the Biodiversity Information System under the National Environment Monitoring Programme. This activity would feed into the creation of a Biodiversity Conservation Atlas for Islands, Coral Reefs, Mangroves and Wetlands
- To establish an Oceanarium on the lines of those at the Great Barrier Reef, Sydney and in Florida.
- A River and Wetland Regulation Zone notification or law should be considered, akin to the CRZ, to enable more effective regulation of developments along/around such ecosystems, through or with the participation of communities traditionally dependent on these areas for their livelihoods. This should be part of the wetland conservation scheme of the MoEF. Support activities include participatory research to inventorise and valuate freshwater ecosystems, measures to tackle serious threats to them, and other measures to ensure conservation as also the livelihood security of dependent communities.

Biosphere Reserves

The CSS on Biosphere Reserves is no longer supported by UNESCO. All the Biosphere reserves in the country have at their core one or more Protected Areas. The principles of management of Biosphere Reserves have many elements in common with eco-development as evolved and recognized in PA Management. Biosphere Reserves Programme should be focused on working on cross-sectoral linkages between biological resources and human livelihood issues. The studies should be indicating the critical facets of the conservation links with the human life support systems. Thus keeping in view the facts that programmatic interventions for management of habitats and eco-development of fringe villages are part of the PA management, the primary objectives of this programme will be research, documentation, and monitoring of dynamics of human ecosystem interface.

National Biodiversity Authority and State Biodiversity Boards

The National Biodiversity Act was passed in 2002 with the objectives of conservation, sustainable use and equitable sharing of benefits from the country's heritage of biodiversity. As per the Act, the constitution of State Biodiversity Boards has been completed in a majority of States. Setting up of Biodiversity Management Committees at the local level has begun and is a vast task that requires major support under the Eleventh Plan. It also requires modifications in the Governance arrangements and must be supplemented by documentation of existing biodiversity and people's knowledge, linked to a national biodiversity information system.

The decisions related to regulation of use of Biodiversity and modalities for benefit-sharing etc. need be taken in transparent and consultative manner. To perform the regulatory functions mandated to it, the National Biodiversity Authority will need specialized consultative groups drawn from science and civil society apart from official groups.

Governance pre-requisites:

- Biodiversity Rules need to be modified so that Biodiversity Management Committees are selected by village/ward assemblies (instead of being nominated by elected PRI representatives as currently provided), and are given powers and responsibilities relating to the full range of conservation, sustainable use, and equity functions dealt with in the Biodiversity Act.
- Where Village Forests, Van Panchayats, or other democratic forestry Institutions (including community Institutions not formally recognized by the Government) are set up, there should be provision to harmonise BMCs with them.
- In the north-east, the BMCs must similarly become part of pre-existing customary and multi-village Institutions .
- The Biological Diversity Rules 2004 need to be added to/modified, to make it mandatory for all Government agencies to integrate biodiversity conservation and sensitivity into their programmes and policies.

The programme for biodiversity conservation would include support to States for organizing the following activities:

- **Awareness Programmes for State Biodiversity Boards** and support to civil society organizations for process of awareness building about BMC rules amongst grassroots communities and PRIs, to carry out integration of biodiversity into their respective planning processes.
- **Integrating biodiversity into planning:** In order to integrate biodiversity into plans and budgets at all levels MoEF will take up a pilot programme in some panchayats/districts/states/ministries. Experience of States like Madhya Pradesh, which have issued guidelines on district level integration of biodiversity, should be used.
- **Reviewing implementation of India's commitments under the CBD:** A review should be made within the first 6 months of the Eleventh Plan, to assess implementation of the various commitments made by India under the Convention on Biological Diversity (CBD), especially those under the various programmes of work for ecosystems, traditional knowledge, and so on. This assessment should be consultative and transparent, and

involve civil society groups that are known to have been engaged in CBD and biodiversity processes.

- **Biodiversity Conservation Parks:** At State Level
- **Support to Biodiversity Management Committees**
- **Documentation of and research into traditional and community knowledge on biodiversity**

Considerable erosion of traditional knowledge is taking place due to a host of factors, including modernization, inadequate valuation of such knowledge, and the weakening of Institutional structures that were earlier the propagators of this knowledge. Yet, it is becoming clearer that traditional knowledge, in its continuously evolving form, has considerable significance for achieving conservation, sustainable use and equity. Hence the need to take urgent steps for its revival, protection and modification to suit current contexts, as well as its wider application to generate benefits for its holders.

Governance pre-requisites: Appropriate rules under the Biological Diversity Act's provision regarding protection of traditional knowledge need to be framed, which would include and give backing to some of the actions given below.

Supported activities would include:

1. Building capacity of communities to value and protect their knowledge, through their own relevant Institutional structures and with the help of Institutions working with these communities including PRI training institutes, civil society organizations, and educational Institutions .

2. Using traditional knowledge in biodiversity management programmes, including biodiversity surveys carried out by Government and private Institutions , protected area management, forestry, fisheries, agriculture, coastal and marine area management, etc. For this, it would be necessary to sensitize and increase awareness about traditional knowledge and its application through training of formal sector scientists and managers.

3. Carrying out community-based documentation of traditional knowledge, including through various methodologies such as community and people's biodiversity registers, seed banks, compilations of song/dance/ritual/art forms depicting biodiversity, and other means. The resulting outputs should be in the control of the village communities, and legally protected against biopiracy or other misuse.

4. Creating a network of traditional knowledge holders and databases at district, State, and national levels, including through exchange programmes, workshops, and so on, and linking this to the proposed biodiversity monitoring and database systems.

5. Developing a community-based intellectual rights systems, sensitive to gender and socio-economic status, and suited to India and its communities. This can be done under the appropriate provisions in the Biological Diversity Act, 2002, or as a separate legislation. It must be developed through widespread consultation with communities. The regime should also encompass community ownership rights and benefit-sharing rights over germplasm/ knowledge that has already been collected from them, and stored in gene banks, museums, libraries, and databases.

6. Developing guidelines to ensure equitable sharing of benefits arising from the use of traditional/community knowledge, building on the lessons learnt from exploratory initiatives such as the Kani-TBGRI example, and using/creating member-governed cooperatives or other collective approaches to enable organized negotiations by communities.

7. Developing and applying a code of ethics for researchers using traditional knowledge, including elements such as joint authorship with traditional communities or their members in cases where they have provided substantial knowledge and inputs; revisions in Ph. D and other dissertation guidelines to allow for such joint authorship; requirement of prior informed consent of the traditional communities or their members whose knowledge is to be used; and full and informed participation of the concerned women and men of such communities in the research programme.

Domesticated Biodiversity

Agro-biodiversity and GMOs

Governance pre-requisites:

- Harmonising National Biodiversity Act and PPVFR Act, and Seed Act with PPVFR, in both cases ensuring priority to the conservation, sustainable use, and equity imperatives that the Biodiversity Act enshrines, and which India is committed to under the Convention on Biological Diversity.
- Development of *sui generis* form of traditional and community knowledge protection, under the relevant provision of the Biological Diversity Act, to grant community-based rights to fishers, farmers, pastoralists/herders, and craftspersons who use natural resources and have knowledge about such resources, over the crop or animal genetic resources or crafts developed by them, and protecting their rights of access to relevant habitats for resources they or their livestock need.
- Critical review of agricultural and agriculture-related policies and programmes, to identify elements that lead to agro-biodiversity loss and suggest appropriate modifications to ensure the conservation and maintenance of agro-biodiversity.
- Set up a process to restructure the composition and functions of the bodies that are designated to manage GM technology. The legally mandated State Level Committees and District Level Committees for release, monitoring and documentation and analysis of GMOs must be set up immediately.
- An inter-ministerial coordinated policy framework for the regulatory oversight of Agbiotech/GMOs involving all ministries with jurisdiction over the subject is required. This coordination should be at policy, administrative and implementation levels.

Activities proposed:

(a) National Agrobiodiversity hotspot mapping and conservation of important agrobiodiversity landscapes. This would involve identification of such areas (within or cutting across States) through the participation of farmers' and pastoralists' groups, and measures to conserve and sustainably use them including legal steps (e.g. declaration as ecosensitive areas under the Environment Protection Act or Biodiversity Heritage Sites

under the Biodiversity Act), as also economic and social incentives such as diversity-based income generation and compensation for opportunity cost along with Institutional support and enhanced capacity, links to food security programmes such as the Public Distribution System and mid-day meals, etc by mandating local procurement of local foodgrains, encouraging especially nutritious local millets, pulses, and other grains/foods. Such areas could also be promoted for sensitive agro-based community-owned eco-tourism.

(b) National Biodiversity Authority - regulated programme for in situ and ex situ conservation of agro-biodiversity and animal genetic resources, to be coordinated with the Agricultural Research sector, through farmers and pastoralists' organizations and communities taking into account their own priorities, knowledge, and Institutional arrangements. The regions with high concentration of genetic diversity on major and strategically important crops may be declared as 'gene sanctuaries'. Unlike the sanctuaries of wild diversity, agro-biodiversity can be conserved and enhanced only with continuous interaction with farming communities. Therefore, communities within such gene sanctuaries are to be encouraged for conservation and enrichment of diversity involving diversity-based income generation and compensation for opportunity cost along with Institutional support and enhanced capacity. This would include an award and incentive programme for individual farmers and communities who are practicing or trying out innovative means of conserving agrobiodiversity. A slightly modified approach may be used for promotion of conservation of agro-biodiversity outside such gene sanctuaries.

(c) Training and orientation of agricultural extension service personnel, agricultural universities, and other formal sector Institutions related to agriculture, to sensitize them on agro-biodiversity conservation issues and techniques; this would include mutual learning exercises between such Institutions and farmers/pastoralist groups that are working on agro-biodiversity.

Strengthening Wildlife Management

The central sector scheme will cover monitoring the traffic of wildlife contrabands and regulating movement of wildlife articles across the country through regional offices of the Directorate of Wildlife Preservation. The following components will be added to the programme.

- The National Wild Life Crime Control Bureau, provided in the Wild Life Protection Act in the latest amendment, will be set up, augmenting the existing network of the regional offices of the Directorate of Wildlife Preservation. This Bureau should also investigate and be empowered to take action on industrial crimes against wildlife habitats, including prosecution of companies/agencies indulging in illegal or unauthorized take-over of natural ecosystems, pollution or other activities that destroy wildlife.
- The programme will include provision of studies and consultations needed to be organized for important areas of concern, like conservation values of areas to be included in PA network.
- Specific pilot projects or demonstration projects required for decision making on priority for species focused programmes will be taken up under this programme. The grants in aid

for relocation of viable populations of wildlife species to different habitats, data collection for monitoring of the impact of rescue/conservation/outreach efforts etc will form part of this programme.

- The programme will serve for expenses for high level consultations etc required for national/international matters.
- A number of communities, especially characteristic of dry tracts, traditionally pursued hunting and wildlife based entertainment as their means of livelihood. Examples of these communities include Ahans pardhi, Baheliya, Banelia, Baria, Bauria, Bawaria, Bazigar, Chitta pardhi, Fulvadi, Garudi, Hakkipikki, Haran Shikari, Irula, Kalbelia, Lal vadi, Langoti pardhi, Madari, Mang garudi, Moghia, Pal pardhi, Pardhi, Pardhi Advichincher, Phasepardhi, Raj pardhi, Sapera, and Vadi. Their way of life became illegal with the enactment of 'Wild life (Protection) Act, 1972'. However, these communities have remained neglected, and no attempts have been made to generate alternative employment for them. The tragic result has been that many of them have turned to poaching, including involvement in international trade in tiger and other animal skins. Rehabilitation of these communities will be supported with the participation of individuals from traditional hunting communities, NGOs, activists, forest department, and revenue department. Assistance will be made available for setting up feasible livelihood options building upon the community's traditional skills. It will include training and capital assistance in case of an enterprise in form of interest-free loan. The programme may be started with identified communities to begin with, to be evolved subsequently based on performance. The countrywide activities may be coordinated by a national level Shikar Mukti Samiti as a sub committee of National Board of Wildlife. Similar committees at State and district, and where appropriate at lower levels may help coordinate the programme.

Central Zoo Authority

The CZA provides financial assistance to recognized public sector Zoos having adequate land, potential and willingness to improve to develop as modern Zoos. No financial assistance is provided for creation of new Zoos. However, existing Zoos which are being relocated to new sites will be provided assistance on the pattern of existing Zoos.

The CZA has created seven Rescue Centres for rehabilitation of lions, tigers, leopards, bears and monkeys whose performance has been banned in the Circuses at Chennai (Tamil Nadu), Bangalore (Karnataka), Tirupathi & Visakhapatnam (Andhra Pradesh), Madarihat (West Bengal), Bhopal (Madhya Pradesh) and Jaipur (Rajasthan). Support will be provided for rehabilitation of these animals and upkeep of these centres.

The Indian Veterinary Research Institute (IVRI), Bareilly (Uttar Pradesh), has been identified for developing as a National Referral Centre (NRC) for specialized services and diagnostic facilities for health care of wild animals in Indian Zoos. The IVRI shall be provided financial grants for this purpose. A Centre for Zoo Science will be developed in National Zoological Park, New Delhi.

Trainings for the Zoo keepers and other staff will be organized on annual basis in different regions of the country in local languages. To provide exposure to the Zoo managers, Zoo veterinarians and other officers would be sent for trainings in identified Institutions outside India.

The CZA has not yet acquired an office befitting to the quantum of work of the Authority. Suitable land shall be acquired for construction of the Office building during the plan period.

National Zoological Park has been functioning under the Central Zoo Authority Scheme of the MOEF. As the Government of NCT of Delhi has a full fledged forest Department, the National Zoological Park may be transferred to the State. The NZP will be eligible for receiving plan assistance from the Central Zoo Authority.

Integrated Development of Wildlife habitats

This scheme was earlier called "Development of National Parks and Wildlife Sanctuaries". It is renamed as "**Integrated Development of Wildlife habitats**" in order to broaden its scope and to include the new PA categories of Community Reserves and Conservation Reserves under its ambit. This programme will continue the current support to PAs across the country for management, protection, and development.

Governance pre-requisites:

- Guidelines on transparent settlement of rights;
- Setting up of Sanctuary Advisory Committees as per WLPA
- Improved mechanism for disbursement of crop damage and other compensation
- Guidelines on relocation of people from within PAs, and on co-existence of communities that will continue to remain within PAs

Evaluation of the non-recurring investment made in the PAs shall form the basis of further non-recurring assistance. The Central Assistance can also be linked to the deployment of sanctioned frontline staff strength in the first place. The modalities will be on the concept of project based assistance with a provision of yearly third party appraisal by a group of experts drawn from a recognized panel in the Ministry.

The supported activities will include

- Assistance for inventories, assessments, and management planning for the protected areas and identified special habitats, to be covered under the scheme. One or more specialized units may be set up in all States for undertaking surveys, inventories, and socio-economic analysis required for management planning and baseline landmarks.
- Assistance for development of National Parks and Sanctuaries based on the management plan prescriptions and appraisal of impact assessment of the past interventions. Village eco-development will be an earmarked component of the development of National Parks and Sanctuaries.
- Assistance for habitat improvement, village eco-development and participatory management of the identified special vulnerable habitats of high conservation value on similar terms as that for sanctuaries and National Parks. This will include assisted regeneration for the vegetation components of the habitats.

- Assistance for taking up species recovery and conservation projects for endangered species/ecosystems like Snow Leopard, Great Indian Bustard, Dolphin and their habitats.
- Assistance for management of human-wildlife conflict, namely compensation for damage from wildlife in remote areas, and measures to mitigate and avoid possibility of ingress of wild life movement into habitations.
- Assistance for tracking, capture and translocation of population of wildlife found in high conflict areas in excess to the carrying capacity, to other suitable habitats on case to case basis.
- Assistance for settlement of rights.
- Assistance for careful resettlement of communities as per recent amendments to WLPA.
- Assistance for establishing, re-orienting, and providing for resource use activities of communities that remains within PAs, to enable harmonious co-existence.
- Assistance for wildlife monitoring and research.

Landscape or ecoregional planning

It is clear from past and ongoing experience, that planning for protected areas or other specific sites as isolated patches within the larger landscape/seascape, without co-terminously reorienting the planning for the latter, creates various problems of sustainability, incompatibility, and conflicts. No "island" of conservation will survive for long if its surrounds are getting degraded, or if activities that are damaging the "island" from outside its boundaries are not tackled. The concept of ecosystem or landscape or ecoregional planning is gaining ground across the world, and India too needs to apply it. This is particularly challenging not only because wider landscapes encompass a wide variety of land/water uses and many different rights-holders and stakeholders, but also because they often cut across political boundaries such as State or international borders.

Since this is a relatively new activity in India, it is proposed that during the Eleventh Plan, a few pilot sites will be chosen for experimentation. Already MoEF is undertaking an assessment for a landscape conservation project over a few sites, which could be enhanced and further areas added.

Activities to be supported would include:

- Assessment of the success and failures of similar approaches in and outside India, e.g. river basin planning, Chilika Development Authority's planning for the Chilika lagoon and catchment, people's initiatives such as planning for the Arvari Basin in Rajasthan, and others;
- Pilot projects in 10 selected landscapes and seascapes, some within States, some cutting across States, and some cutting across international boundaries.
- Implementation of the recommendation of the National Wildlife Action Plan to declare a 10 km radius around PAs as ecosensitive areas under the Environment Protection Act, with due process of planning involving the communities living in this zone, and with the main aim of keeping destructive activities out of this zone.

- Special emphasis should be laid on PAs in the Andaman and Nicobar Islands that have not only strategic importance to the country but are also extremely rich in marine diversity and harbour many endemic and endangered species of flora and fauna.

JPAM and community-owned or community-based eco-tourism: Pilot scale

There is an urgent need to move towards a model of PA management that involves local communities as key and statutorily recognized stakeholders. The lessons from the India Eco-development Project need to be built upon to make use of ecologically sustainable opportunities of livelihood from Protected Areas like ecotourism. A pilot programme for Joint Protected Area Management with ecotourism will be developed.

Governance pre-requisites:

- Amendment to WLPA to create JPAM framework that gives statutory role to local communities along with outside wildlife experts and civil society representatives. It will also give the local community the right to share in all PA related revenues including from tourism, and to carry out regulated harvest of forest, aquatic, and other produce in consonance with conservation objectives.
- Development of community based and community owned eco-tourism guidelines/ standards.

The supported activities will include:

- Setting up of JPAM committees in a set of pilot PAs,
- People-sensitive rationalization of PA boundaries and final notification,
- Financial support to local bodies including JPAM committees to develop community-owned eco-tourism ventures.
- Monitoring mechanism for harvest of forest/aquatic/other produce.

Support for Community Conserved Areas

CCAs (such as sacred groves, heronries and wintering wetlands, catchment forests, turtle nesting sites, pastures for wild herbivores, etc) exist in a wide spectrum of legal regimes ranging from Government owned lands (owned/controlled by forest department, revenue department, irrigation dept. or others) to community/panchayat/tribal council/clan lands, as well as private owned lands. Such CCAs may not necessarily be officially notified but should still be eligible for financial and other kinds of support as an incentive for community-led conservation practices. Most critically, while there are thousands of forest-based CCAs, there are also several CCAs that are in grassland, montane, coastal and freshwater ecosystems. Support to such CCAs will ensure coverage to relatively neglected ecosystems and taking the focus of conservation attention beyond forests. It is proposed that separate budgetary support may be made available to such initiatives, while considering an appropriate legal status for them as available in the Wild Life Act (Community Reserves), Biological Diversity Act (Heritage Sites), ST and Other Forest Dwellers (Recognition of Forest Rights) Act (community conserved forests), and Environment Protection Act (ecosensitive areas), without imposing changes in the Institutional arrangements that communities have developed for managing them. The MoEF has commissioned a directory of CCAs and an initial

prioritisation from this may be used for providing funding support to CCAs that appear to be conserving critically threatened wildlife or ecosystems, or are in other ways important for wildlife and biodiversity.

Urban Biodiversity

Biodiversity in urban areas in India is seriously neglected. Other than some tree protection acts and heritage acts, there are few laws and programmes that help to conserve urban wetlands, forests, parks, and other wildlife spaces. It is proposed that in the Eleventh Plan a few pilot projects in identified cities/towns be taken up to document and conserve urban biodiversity; these should be adequately documented and monitored to enable lessons from them to be applied to the subsequent extension of such processes in other cities/towns.

Critically endangered species & habitats

National Tiger Conservation Authority

Project Tiger was launched in 1973 and produced significant results. Considering the urgency of the situation faced by the tiger population in India, Project Tiger has been converted into a Statutory Authority (NTCA) by providing enabling provisions in the Wildlife (Protection) Act, 1972 through an amendment, viz. Wildlife (Protection) Amendment Act, 2006. This forms one of the urgent recommendations of the Tiger Task Force appointed by the Prime Minister. The NTCA would address the ecological, social, as well as administrative concerns for conserving tigers, by providing a statutory basis for protection of tiger reserves, apart from providing strengthened Institutional mechanisms for the protection of ecologically sensitive areas and endangered species, and positively engaging local community members in conservation efforts. The prerequisites for efficient management, namely, filling up vacancies of frontline staff, providing necessary inputs for capacity building for working in conservation areas, management planning in conformity with the acceptable principles of participatory processes and scientifically sound systems for documentation and monitoring of the key constituents of the habitats will be set up.

- Identification of the villages feasible for relocation in the existing tiger reserves will be completed for making suitable provisions in the annual plans. The resources for this purpose will be earmarked in the Annual Plans based on the project reports based on feasibility.
- Village Eco development will be the core activity in the Project. The assistance for the tiger reserves will be linked to the eco development strategy based on micro plans developed with full participation of local communities.
- Specific arrangement for documentation of landmarks and progress based on socio-economic, population, habitat and ecological indictors will be laid down for effective monitoring of the impact of management inputs in the tiger reserves.
- For notification of any new tiger reserves, norms will be finalized based on scientific data as well as assessment of impact on local communities.

Project Elephant

The project will focus on developing strategies for strengthening and developing elephant movement corridors as the efforts to acquire the corridor areas have generally met with difficulties. Possibility of relocation in areas with potential of restoration of habitats will be explored. For the captive elephant population, a complete database for monitoring the status of health and productivity will be aimed at. For State Governments maintaining the domestic elephants, component for improving the kraals and training of mahouts etc will be provided.

Animal Welfare

The Animal Welfare Board of India has been working on ensuring a humane dealing of animals in experimentation, during stress, stray animals and general protection from cruelty. The Animal Welfare movement has been largely functional based on NGO participation. Following components of Animal Welfare are dealt by the Ministry under Plan.

1. Provision of Shelter Houses
2. Provision of Ambulance Services for animals in Distress
3. Animal Birth Control and Immunization of Stray Dogs
4. Scheme for Relief to Animals during Natural Calamities and Unforeseen circumstances
5. Assistance to Animal Welfare Board of India (AWBI)
6. Assistance to Committee for the Purpose of Control and Supervision of Experiments on Animals, (CPCSEA)
7. National Institute of Animal Welfare

Proposed programmes for rabies control, Gaushalas and capacity building will be structured within the existing scheme components and modalities. An information base along with fact sheets on the voluntary groups working in the field of animal welfare will be prepared for better linkages. For National Institute of Animal Welfare, curricula need to be designed based on the larger scope of career opportunities and subject related courses. A good programme of monitoring the status of stray dog population in the country needs to be taken up. This is an ideal theme for developing a collaborative, free, public domain knowledge resource on Indian environment based on student projects, as suggested under Environmental Awareness and Education activities.

Forestry

The vital role that the natural resources play in providing livelihoods, and securing life-support ecological services is reflected in the principal objectives of the National Environment Policy resolving to protect and conserve critical ecological systems and resources with equitable access to environmental resources and quality for all sections of society, particularly to those most dependent on environmental resources for their livelihoods. The Eleventh Five Year Plan for the Environment, Forest, and Animal Welfare sector is designed to address these emergent concerns, and is based on a serious re-examination and re-thinking of the functioning of the sector. Underlying this proposed strategy is a focus on inclusiveness and

coherence, and integration of natural and social perspectives, involvement of civil society and academics in planning and monitoring, learning from the past, and enhancing devolution, accountability, and transparency.

The National Forest Policy 1988 represented a historic shift in official thinking about the objectives of forest management in India. For the first time, environmental and subsistence objectives were given primacy over all other uses of forests. Simultaneously, it was recognized that forest protection requires the involvement of local communities. The Joint Forest Management concept initiated in 1990 was meant to enable such involvement. After one-and-a-half decades of experience with JFM, the National Forestry Commission recommended that democratic forestry Institutions be set up everywhere in the country at the village/hamlet level and above. This is in line with the objectives of decentralization and equitable and secure access to environmental resources for poor communities laid down in the National Environment Policy 2006 and the argument that the most secure basis for conservation is to ensure that people dependent on particular resources obtain better livelihoods from the fact of conservation.

For historical reasons the current Forestry and Wildlife Conservation regimes, especially in areas used by local communities, are not fully consistent with these goals, although there has been substantial progress in the direction through initiatives such as Joint Forest Management and the recent Tribal Forest Rights Act. Hence this sector has to pay special attention to community-oriented forestry and biodiversity conservation, with a realignment of the programmes with the core concepts of sound forest and biodiversity governance. The latter include clear, secure and operationally autonomous rights, adequate spatial coverage and economic benefits, sensitivity to and rational incorporation of locally-specific and historic rights, interface with PRIs and PESA Institutions , and clarifying and strengthening regulatory role and protection support by State forest and wild life departments. This is proposed to be achieved through a variety of programmes for most of India. A separate approach is required for the complex situation in the Northeastern States.

The interventions proposed will be aimed at thrust areas in programme mode, to be dealt by the agencies with the support of Central Plan. Ultimately, it is the State forest administration that is responsible for management of its resources. Hence, the focus of the central interventions will be on reinforcing the commitment and capacity of States to undertake the national policy mandates towards conservation, sustainable use, and equitable sharing of benefits. The strategy for Eleventh Plan, therefore will aim at creating an enabling environment for achieving a sustainable forestry and wildlife management paradigm with specific focus on the socioeconomic targets.

The Approach Paper to the Eleventh Plan includes amongst its monitorable targets an increase in the forest and tree cover by 5 percentage points. One of the recent interests in the discipline of ecology relates to defining and measuring ecosystem health. The objective of enhancing India's tree cover needs to be viewed in this perspective, as a component of an overarching effort to enhance the status of health of country's ecosystems. Notably, the health status of an ecosystem is not necessarily fully captured by its tree cover. Thus the grassy blanks in higher reaches of southern Western Ghats are a climax ecosystem rich in a number of endemic, often threatened, species of herbaceous flowering plants, insects as well as mammalian species like Nilgiri Tahr. These grassy blanks have been considered as wastelands

and planted with monocultures of exotic tree species such as Australian wattle. This, in fact, renders the ecosystem less, not more, healthy; and this should not be counted as a positive achievement although it does increase the tree cover of the country. Similarly, large areas in higher reaches of Himalayas lie above tree line, indeed at altitudes where not even lichens can grow. Administratively, these may be classified as "Forest" lands. An insistence that these too be counted in implementation of the target of 66% tree cover in hill areas is clearly inappropriate. Furthermore, ecosystem health needs to be assessed while viewing humans as an integral component of the ecosystems. As the approach to Eleventh Plan pointed out survival of pastoralism is crucial for sustainable land use. Besides conserving domestic biodiversity, it is a means of producing food in dry lands without depleting groundwater resources. However, many traditional grazing sites have been converted into tree crops exacerbating the already severe shortages of fodder and engendering social conflicts. A natural grass cover under a properly regulated grazing regime may be the healthiest form of ecosystem in this context. During the Eleventh Plan it would be appropriate to revisit this issue and amplify the goal of bringing 33% of the country under tree cover in terms of restoring the health status of some appropriate proportion of India's ecosystems. Working through this issue could be an important objective of Environmental Research Programme in the Eleventh Plan. In view of these considerations, it may be fitting to begin using the term "Ecorestoration" to complement the term "Afforestation", or "Sasya" in place of "Vana". After all our motherland has been praised as "sasya shyamala"!

The objective of enhancing the health status of country's ecosystems, of which enhancing the tree cover would be one element, has to be pursued in conjunction with other targets such as creation of 70 million new work opportunities, which will largely have to come from small scale rural enterprises based on processing of agricultural and forest produce. Such programmes of ecorestoration, enhancing green cover and of consolidating participatory management systems can be effective if suitable policy and legal measures are taken to back up the programmatic interventions. The proposed steps, important for creating an enabling environment for all round growth of greening movement beyond the limits of the programmes envisaged in the plan, are therefore an integral part of the strategy and need to be carried out simultaneously. Following cardinal principles in this respect will be the basis of programmes.

1. Enabling environment for furthering the objectives of forestry is crucial considering the slow pace of paradigm shift in the regulatory to social and participatory regimes. Thus Central Assistance should be linked to the strengthening of democratic forestry Institutions , required incentives for afforestation/ecorestoration, and rationalization of transit regulations to be worked on in the States. The provisions of Forest (Conservation) Act can be suitably applied for ensuring this. The provisions of FCA should be applied prudently and made clearly understood to the non-forest Institutions to dispel the apprehension of nationalization of afforested land resources.
2. An ecosystems-based mapping of habitats other than those under cultivation / habitation should become the basis of assessment of ecosystem health including its tree cover by FSI. Such areas, based on their ecological status, will be managed for their ecological values. The policy objective of 33% tree/forest cover should accordingly be approached in terms of an overarching objective of conserving and enhancing the health status of natural ecosystems within which the tree cover constitutes a sub-set and the total includes all the ecosystems.

3. The main objective of the centrally sponsored schemes is to create the orientation of the sector towards fulfilling the national priorities. The forests being a concurrent subject, the central interventions should be aimed at building capacity of the States to perform the functions in the spirit of the policy and priorities. Thus the focus of CSS should be on process rather than physical targets in terms of number of hectares planted or number of sanctuaries funded.
4. Implementation of the programmes at central level has met with difficulties about problems of fund flow management at State level. It may be considered to take the activities in project mode with earmarked funding as is done in the externally aided projects.

With the above mentioned steps proposed, the following programmes will be taken up during the Eleventh Plan period, in pursuance of the national objectives.

Afforestation, Ecorestoration and Forest Management

Strengthening Forestry Division

The network of regional offices of the Ministry for implementation and monitoring of Forest (Conservation) Act was set up under this programme. While the establishment expenses of the network should be transferred to non-plan, the programme should serve for undertaking consultations and studies on relevant matters for effective management of the sector. Following specifically earmarked components will be added in this programme.

- A national coordinated programme for assessment of non timber forest product resources of the country will be launched.
- A mechanism for internationally recognized independent sustainable forest management certification regime will be established for wood and non-wood forest resources and products.
- National Working Plan Code will be revisited for incorporating aspects dealing with ecological and biodiversity concerns of the forests areas, and to incorporate new concepts such as adaptive management.
- A National Forestry Information system will be set up, networking with the States, for tracking the changes in forest development, harvesting, trade and utilization scenario. This Information System will particularly focus on issues of ownership and rights over land and forests. This system will be linked to the National Environment Monitoring Programme.

Increasing green cover and strengthening participatory processes

The target of increasing the forest cover/ ecorestoration basically aims at increasing the resource base of the income generating productive assets in State, community controlled and other accessible land and water resources for fulfilling the needs of the rural poor for ensuring their access to these for bolstering their ability to sustain themselves through self-employment.

The principle of "Public Trust Doctrine", namely, that the State is a trustee of the natural resources, as provided in the National Environment Policy 2006, indicates the centrality of participatory conservation and sustainable utilization in the mainstream of social development. The strategy of inclusive growth proposed in the Approach to the Eleventh Five

Year Plan can command broad based support only if growth is seen to demonstrably bridge divides. Lack of economic development in many areas has led to severe social problems and the resultant perception of alienation and neglect has often deteriorated into adverse security environment like Naxalism. A responsible participation of community Institutions and corresponding support for sustainable utilization of income generating productive assets from State and community controlled land, forest and water resources and thereby bolstering their ability to sustain themselves through self-employment could particularly help rural poor in maintaining the productive capacity of these resources. This theme is taken as the basis for strengthening partnership processes for achieving the conservation and productive State of forests.

National Afforestation, Ecorestoration and Eco-development Board

It is proposed to rename the NAEB as the National Afforestation, Ecorestoration and Eco-development Board to broaden its vision to include the task of enhancing the health status of non-tree covered ecosystems that may be best maintained under grass or lichen/ moss or some other type of vegetation cover. The amplification of the name would be useful in view of the ambiguity in the use of the term "afforestation". The common meaning of the term is development of tree cover on the land. However, it has another connotation, namely, bringing land under the control of Forest Department, attracting many restrictions including application of Forest Conservation Act. One may therefore use the term "ecorestoration" instead of afforestation in the context of developing tree cover on land under degraded vegetational cover, clarifying that ecorestoration need not automatically imply control of State Forest Departments.

The programmes of dealing with enrichment of forests are dealt by the NAEEB, which is specifically mandated to deal with Participatory Forest Management including afforestation /ecorestoration. The activities within the programme of NAEB include monitoring of afforestation /ecorestoration programmes, grants in aid to voluntary agencies for greening India, and education/ awareness programmes like Indira Priyadarshinin Vrikshamitra Awards etc. The mandate of the Board has widened and need of support in enhancing productivity and providing scientific outlook to the afforestation/ ecorestoration efforts need further augmentation of efforts. Accordingly the programme NAEEB will have the following components.

- **Grants-in-Aid for Greening India Scheme** for capacity building, producing quality planting material, and awareness generation. A comprehensive programme for building up QPM resources will include assistance for setting up well equipped nurseries of not only tree but suitable shrub, climber and herbaceous species in all the forest management units, supported by well networked genetic improvement plans and well monitored seed/clone testing and certification programme. Competent agencies in the private sector as well as in Institutions such as Agricultural Universities may also participate in these activities. These aspects will be the focus of scientific research and management of States, which will develop appropriate linkages with this programme.
- **Monitoring and Evaluation** of desertification and afforestation/ecorestoration programmes and coordination of programmes for combating desertification. A significant component of this programme will be assessment and monitoring of desertification based on the criteria and indicators to be developed through a consultative process. This will

form the basis of review and coordination of programmes for combating desertification, as mandated within UNCCD.

- **Building mass awareness**, information exchange and augmenting conflict resolution processes by drawing and implementing structured communication strategies at national and State levels.
- **Support to Regional Centres of the NAEEB** to assist in dissemination of technologies and NAEEB programmes through training and workshops, conduct studies relevant to afforestation, ecorestoration, eco-development, and community oriented forestry etc.
- **Eco Task Forces** for afforestation/ecorestoration of specific problem areas of specific significance. The existing programme for maintaining Eco Task Forces for tackling afforestation/ecorestoration programmes in special problem areas will be limited to the areas where afforestation/ecorestoration is not possible with participation of people due to remote, unfriendly and harsh conditions.

National Afforestation, Ecorestoration and Village Forest Programme

National Afforestation /Ecorestoration programme, as a Centrally Sponsored Scheme will be the flagship programme of Central Government for augmenting Afforestation/ Ecorestoration and participatory efforts of the States. For this purpose, the programme will be designed for ensuring more participation of States. The main concern in participatory systems is the required impetus on augmenting the degraded and non-degraded forest/ ecological resources and resultant benefits to the participating community.

- For improving the degraded and non-degraded forests as well as strengthening the participatory systems, the National Afforestation /Ecorestoration Programme will involve States through FDAs and JFMCs. To ensure synergy, States will also need to implement their degraded forest rehabilitation programmes and non-degraded forest improvement programmes through the FDA mechanism. Main objective should be to empower all participatory Institutions to ensure Forest Development /Ecorestoration.
- Choice of species to be used for afforestation /ecorestoration is an important element in which the local communities must be involved fully so that their priorities are taken on board. This is likely to ensure that medicinal plant species, NTFP species, bamboos and other such national priorities would be incorporated in the programme with local ownership.
- Gujarath FD's proposal of developing "Medicinal Plants Conservation Development Areas" focusing on certain flagship species and their associates and involving development/ process/ value addition/ marketing to support JFMC and on a cluster of village basis may be considered as one possible model.
- The JFM framework will be revised to enable autonomous functioning of the existing Van Panchayat and diverse formal and informal community forestry Institutions and honouring their democratic decisions related to management of forests. The gram Sabhas as defined under the PESA Act will act as community forestry Institutions in schedule V areas while in the Northeast, traditional Institutions will be provided direct support for managing their community resources according to their own plans. The green cover of the community forests managed by such Institutions shall be treated as the share of the State

while the entitlement to harvest products for community needs and enjoy the environmental services shall be treated as the share of community Institutions. The nature and extent of distribution of benefits to individual members of Gram Sabhas will be decided by the Gram Sabhas in open meetings.

- The constitution, role and mandate of the FDAs will be widened to enable them to function as democratic federations of JFMCs or other community/village forestry Institutions. Accordingly one of the chairpersons of the member JFMCs/community/ village forest Institutions shall be the FDA Chairperson by election. Financial management would be facilitated by the official counterpart, who will serve as the ex-officio secretary of the FDA. Devolution of forest management authority to JFM/community/village Institutions will be legally supported under section 28 of Indian Forest Act or the corresponding provisions in the State Forest Acts. The community Institutions will be empowered to frame their own rules for regulating use and management within an agreed framework for ensuring sustainable use. The rules governing the constitution and functioning of such empowered JFMCs/community/ village forest Institutions shall be developed through broad based consultations with existing community Institutions .
- The programme may also include a component for encouraging forest based small enterprises, so that barriers to accessing forest produce will be removed, and procedural requirement will be streamlined. Self-employment programmes will be supported with training and capacity building of educated unemployed youth. Capital assistance for setting up individual enterprises may be facilitated from the existing self employment programmes of RD or VSI sector. Marketing support to SHGs to ensure their sustainability in processing and marketing of forest produce will be worked on.
- Appropriate guidelines on the above mentioned principles may be issued after due deliberations and consultations. A normative index will be issued for deciding on the break up of outlay into components.
- The National Rural Employment Guarantee Act 2005 (NREGA) attempts to ensure a social safety net as it provides guaranteed employment in rural areas. It can also become instrumental in building rural infrastructure especially if resources from other programmes are pooled in. In this context, the programme for afforestation/ ecorestoration should be linked to NREGA for augmenting the ecological resource base.

It is proposed to launch two important new initiatives under the National Afforestation / Ecorestoration and Village Forest Programme. These will be an intrinsic part of the endeavor on strengthening the participatory systems and their harmonization with the legislative provisions of the community rights.

TFRA implementation

In areas where the Scheduled Tribes and other Forest Dwellers (Recognition of Forest Rights) Act is applicable, the State Governments will be provided support to facilitate implementation of the Act's provisions in cooperation with the Ministry of Tribal Affairs and working with Gram Sabhas and forest right holders to develop forest management plans for their community forest resources. A governance pre-requisite is the clarification of forest land

records, with a clear mapping of community forest resources under community management on them, which will be supported under a separate programme.

Activities proposed include:

- Re-training of forest staff on provisions and implementation of TFRA,
- Support to PRIs and civil society organizations to spread awareness about the rights and responsibilities under TFRA, the procedure for claiming rights and to help village/hamlet assemblies set up under TFRA or PESA to draft forest management plans and rules for regulating use,
- As the principles of participatory forest management will include the Institutions constitutionally, legally, socially and traditionally working on forest planting and conservation, assistance to village/hamlet assemblies will be provided on similar norms.

Mission Village Forest

The TFRA will only cover part of the community-used forest landscape. A substantial fraction of the landscape will remain outside the purview of the TFRA and corresponds to various forests and even other common lands that are used by local (non-tribal or mixed) communities with less than 3 generations of residence in the locality to meet their subsistence requirements and to harvest NTFPs. They fall under various legal categories and the existing arrangements range from historical Van Panchayats in Uttarakhand, to officially recognized JFM committees, to informal Community Forestry Institutions in many States, to areas that are *de facto* open access, although meant to be regulated by the forest department.

Governance pre-requisites:

- Harmonization of JFM rules with the concept of Village Forests under Sec.28 of the Indian Forest Act 1927 and also with the BMC rules, or appropriately defined Biodiversity Heritage Sites (BHSs) rules under the Biological Diversity Act 2002;
- Developing village forest rules through an open and consultative process with existing community Institutions , ensuring maximal autonomy to them on the lines of the 1931 VP rules;
- In Schedule V and Schedule VI areas, allowing Institutional flexibility and autonomy to village Institutions under PESA and other laws/traditions governing them as per constitutional provisions.

Economic policy pre-requisites:

To give local communities maximum possible economic benefits within the overarching requirement of sustainable forest use, all commercial NTFPs (including tendu) must be denationalized; State forest development corporations or MFP Federations must become supporters or facilitators of NTFP marketing, not monopoly buyers and, where possible, replaced by marketing federations of NTFP gatherers/processors.

VFCs/BMCs/VF gram sabhas should also not have the right to buy and sell these products; they should only have the right to levy a small fee from NTFP gatherers/ processors /sellers to support protection and regeneration activities of the VF.

Proposed activities under this programme will include:

- Technical support programme to State Governments to clarify State Forest Acts, introduce VF provisions where missing, as also to adopt guidelines for Biodiversity Heritage Sites, and review all forest rights including customary and British-assigned rights. This should be done through an open and transparent process as provided for in the TFRA, starting from the Gram Sabha and supported at the sub-division and district levels by committees with representatives of revenue, forest and tribal/social welfare officials and PRIs, and draw up a road map for resettlement of forest rights not covered by the Tribal Forest Rights Act. This should lead to demarcation and notification of all community-used forest areas as Village Forests under Sec.28, and constitution of village/hamlet-level bodies for the management of these VFs.
- Support to civil society organizations for a major campaign to spread awareness about the proposed changes in forest governance and capacity building at the grassroots, and re-training of forest, tribal, PRI, RD and revenue staff
- Capacity-building of Gram Sabhas for micro-planning for VFs, or Biodiversity Heritage Sites and of forest and rural development department staff to facilitate micro-planning process including scientific setting of sustainability norms within an adaptive management framework giving due recognition to local scientific knowledge.
- Demand based (rather than supply/target driven) planting support to Gram Sabhas/VFs through Zilla Panchayats or equivalent PESA bodies.
- Support for women's nurseries to provide planting material to the community based afforestation projects

Communities Based Panchayat Community Resource Programme: Panchayat Sasya Yojana

More than 4 lakh villages in the country do not have forest as one of the land use categories. For augmenting the resource base of the income generating productive assets, community controlled and other accessible lands need to be made optimally productive through ecorestoration, including afforestation and development of grazing lands etc as appropriate, so that these could fulfil the needs of the rural poor for their livelihood and gainful self-employment.

Panchayat Institutions will access such available lands and empower the community Institutions for regeneration and management of these areas on agreeable and locally relevant terms. State will provide technology through social forestry establishment, which will broaden its mandate to include not only tree planting but development of grazing lands, medicinal herb gardens etc and financial resources with support of Central Government through a CSS. Thus the funds and technical support under this programme will be available to the Panchayats willing to put the available underproductive culturable lands under optimum production regimes.

This scheme will also include a component of support to urban forestry through urban local bodies, in particular in conjunction with programmes like slum development. Thus the access of community groups would be facilitated by Panchayat Institutions and decision on nature of production and management will lie with the community Institutions . The choice of

species will entirely depend on the requirement and prevalent skills of the community groups empowered by the Panchayat Institution.

The National Rural Employment Guarantee Act 2005 (NREGA) attempts to ensure a social safety net as it provides guaranteed employment in rural areas. It can also become instrumental in building rural infrastructure especially if resources from other programmes are pooled in. In this context, the programme for ecorestoration of common lands can be linked to NREGA for augmenting the ecological resource base.

Intensification of Forest Management (former Integrated Forest Protection Scheme)

The Intensification of Forest Management scheme will provide assistance to States for building capacity and basic infrastructure for forest management. Improving Management Planning and Survey (land records) set up will be the first priority for Central Assistance. States will be required to keep the manpower fully available for this purpose. The programme will have following components for supporting the modernization of the State forest management.

- Modernization of the management planning (Working Plan) units with equipment, infrastructure and manpower. This may include forest inventories, training and setting up satellite image processing and GIS set up. This will also include professional services like ecologists and sociologists for assessment of features conforming to the ecological considerations emphasized in the National Forest Policy 1988.
- Putting together a land record system, in collaboration with Revenue and other concerned departments, equipped with modern and empowered survey and land record maintaining mechanisms, for accounting the legally recognized individual rights, concessions, ownerships including those under the newly enacted Scheduled Tribes and other Forest Dwellers (Recognition of forest rights) Act.
- Facilitating forest boundary demarcation by providing assistance for State of art infrastructure and training/outsourcing survey work and fixing permanent boundary pillars.
- Updating the forest block indices and compartment histories with non-spatial database for each parcel of forest land that indicate its settlement history and status. Simultaneously assembly of the spatial component of the database with a GIS interfaced information system will be taken up to keep the forest land records up to date.
- Installation of forest fire surveillance and warning systems, along with fire management planning in participatory mode. Kerala model of participatory forest fire protection systems may be studied for this purpose. This fire management system will also be integrated with a national network for forest fire surveillance and monitoring, to be set up in the MOEF/FSI.
- Assistance for general infrastructure for accommodation in remote areas, communication and improvement of road network etc will also be a part of this programme.

An important component of this programme will be a Forest Land Information System.

Forest Land Information System

The major issue confronting forest managers and users alike is the question of who has what rights in which kind of forest land. The series of judgments passed by the Supreme Court in the context of the Godavarman and other cases, and legislation such as the Tribal Forest Rights Act draw attention to the need to set our house in order with respect to forest rights. Studies in many parts of the country have highlighted the complex and haphazard settlement of rights in different public land parcels in the country, and the unsettled or confusing nature of forest land records. The report of a recent committee set up by Karnataka Forest Department strongly recommends the setting up of a public domain forest land information system in each State. It is proposed to set up such a system in a phased manner during the Eleventh Plan. The activities would include:

- Putting together a non-spatial database with records for each parcel of public land (forest and revenue) that indicate its settlement history and status. This database would be initially created using Forest and Revenue Department records, and then opened up for scrutiny and comment by the public, and by Revenue and other departments.
- Simultaneously assembly of the spatial component of the database at two levels:
  - Scanning, digitization, and eventual geo-spatial registration of forest survey maps wherever they exist.
  - Scanning, digitization, and eventual spatial registration of village cadastral maps (at least in forested and forest fringe areas and areas with significant common lands).
- Training of frontline survey and working plan staff as well as community members in the use of GPS and other sophisticated instruments (such as Total Station) in their survey work, and in registering their survey work onto the geo-referenced database.
- Experimenting with manual and participatory GIS approaches in the micro-planning setting, and on integration of these micro-plans into higher level working plans.
- This activity should be taken up on a pilot basis in three States (one southern, such as Karnataka, one in the central forest belt, such as Jharkhand, and one in the north, such as Himachal) before being extended to other parts of the country. The activity should be supervised in each State by a State level committee consisting of experts from the forest, revenue, and tribal/rural development and PRI departments with equal representation of elected and civil society representatives. The State level committee should be supported at the district and subdivision levels with committees with similar multi-agency composition as provided for in the Tribal Forest Rights Act. At the village/gram sabha level, all compiled data shall be presented in open gram sabha meetings for verification of its accuracy and gram sabha representatives should be associated with its collection.

Administrative pre-requisite:

Where State Governments have already computerized land records and/or are scanning and digitizing the cadastral maps, the same need to be made to available to the FLIS free of cost.

Economic and policy imperatives

Tribals, NTFP and PESA

In order to make available maximum possible economic benefits to the local communities within the overarching requirement of sustainable forest use, the available mechanisms for dealing with NTFP will need to be reviewed. As the large volume NTFP require dealing and trading at higher scale, professional services can be organized through the marketing federations of NTFP gatherers/processors. We may build upon the MP MFP Federation model by ensuring fully democratic functioning. Nationalized system of collection through Corporations and contracts needs to be done away with in the light of the settled policy and legal position.

In areas where the Scheduled Tribes and other Forest Dwellers (Recognition of Forest Rights) Act is applicable, the State Governments will be provided support to facilitate implementation of the Act's provisions in cooperation with the Ministry of Tribal Affairs.

The benefits from the trading of NTFP should be available to the VFCs/BMCs/VF Gram Sabhas for equitable distribution for individuals, to support protection and regeneration activities of the forests under their management and for community development activities.

Ensuring strengthening of livelihood from forests through creating gainful employment opportunities will be possible by organizing value addition of NTFP at community level, for eventual trade. The example of MP again can serve as a possible model wherein, the value added NTFP products are traded through an organized system in the trade name of Vindhya Herbal Products with franchise in the Village Forest Committees.

Financial assistance is prescribed to be provided for this purpose under the National Afforestation, Ecorestoration and Village Forest Programme. However, Institutionalized assistance systems need to be developed for capacity building and technology assistance. For this purpose, it will be important to evolve linkages with agencies already working in such areas like Voluntary organizations and programmes like National Bamboo Mission, National Mission on Bamboo Applications, Small Scale Industries agencies, Village Industries and institutes of rural development and rural technologies.

Mobilization of resources for afforestation

Apart from enrichment activity for forests, afforestation/ ecorestoration serves as an asset for sustaining the livelihood for the rural poor. In this context, the importance of creation of multipurpose resources in the underproductive forest or non-forest areas becomes an important component of any employment generation programme. Therefore, it is suggested that the Forest establishment generates a shelf of afforestation/ ecorestoration programmes for the village communities for implementation of the National Rural Employment Guarantee programme. As provided in the NREGA guidelines, the planning of these works is the full responsibility of the concerned Gram Sabha, and its priorities including choice of species should be followed. However, for this purpose, necessary Institutionalized initiatives from the implementing agencies will be required. This includes notification of afforestation/ ecorestoration (including outside water conservation measures) as one of the activities, provision of dovetailing of the programmes of afforestation/ ecorestoration with NREG programme for synergizing capital investment with employment guarantee and long term

project funding for 4-5 years programmes, which are crucial for any afforestation/ ecorestoration activity.

CAMPA

The collection of Compensatory Afforestation Fund with the CAMPA basically is aimed at earmarked Compensatory afforestation projects. However, the amount collected as NPV (Net Present Value) of the forest lands diverted is also available for forest conservation measures. It is understood that the presently an amount of about Rs 5000 crore is available for utilization in forest conservation activities. The amount may be made available in the current plan period based on specific project proposals from the States.

Forest Plantations

The monitorable Socio-Economic Targets of the Eleventh Plan include increasing forest and tree cover by 5 percentage points. As the conversion of natural forests into plantation was stopped long back, commercial plantation forestry now is limited to harvesting of mature/failed plantations and replanting thereof. While commercial plantations of economically important wood and other species are to be maintained with optimum productivity, activities towards for afforestation/ ecorestoration need to be taken up with specific context and habitat profile in mind. Afforestation/ ecorestoration activities will be taken up in participatory mode only in consultation with and participation of local communities. The species to be planted should be selected by local communities, in conformity with the microplans drafted with communities involving experts in ecology and sociology. Central Government has the responsibility of approval and monitoring of implementation of Working Plans. Therefore, MoEF will ensure that no new commercial plantations are created in the name of afforestation/ ecorestoration.

Agro-Forestry Development

The focus on building a mutually beneficial relationship between farmers practicing agro-forestry and the Forest based Industries will be a special thrust of Eleventh Plan. Considering the production of only less than half of the requirement of wood products, replacement of wood by non-green structural material and entry of uncertified grey market material in the market is proving to be a bane of environmental stability and sustainability of development. India today imports large quantities of timber as well as pulpwood. For ensuring impetus in greening in farm sector, organizing markets and facilitating fair trade should be the priority for motivating farmers. In this context Government must review its decision to allow cheap and duty free import of pulp. While free import of timber may continue, appropriate market options and incentives should also be made available to the farmers. R & D for enhancing productivity and testing indigenous alternatives, suitable for the farm sector, for fast growing short gestation forestry species like eucalyptus and Acacias should be taken up.

Agro forestry will be a focus area for attention. Enabling Environment for this will need to be created by taking up several policies, legal, fiscal and economic measures in consultation with the concerned agencies. Ministry will constitute a Working Group for suggesting specific steps for programmatic, policy and administrative measures for promoting markets and improving farmer industry interface for encouraging agro-forestry.

Private Forestry Initiatives

Central Government has been deliberating on modalities of public private partnership in various sectors. The concept of multi-stakeholder partnership in the Forestry Sector is primarily based on the grant of tenure on degraded forest lands to investors with benefit sharing on an administrative basis. Considering the substantial demands of many local communities over most degraded forest lands, and the accepted position of first charge on natural resources of these communities, such partnership with industry is not desirable. Instead the industry should focus on establishing appropriate linkages with the farmers with respect to cultivation of tree crops on private lands as suggested in the National Forest Policy 1988. The examples of ITC and other similar initiatives within the private sector are worth emulating in this context.

Areas under shifting cultivation

Shifting cultivation, or Jhum, particularly in Northeastern Hill States, is an area that calls for fresh initiatives in the Eleventh Plan. This is because this region furnishes a very special setting, in many ways quite different from the rest of the country. The Northeastern hills have an extensive tree cover. However, unlike in Peninsular India where most tree covered lands are under control of State Forest Departments, and hence are "Forest lands" in administrative parlance, the tree clad lands of Northeast are largely owned by people. To avoid confusion, therefore, it may be advisable to avoid the term "forest" with its ambiguities in the context of Northeast. There is a similar ambiguity in the use of the term "afforestation". One connotation of term is transfer of the land to the control of Forest Department, attracting many restrictions including application of Forest Conservation Act. One may therefore use the term "ecorestoration" instead of afforestation in the context of developing tree cover on land under degraded vegetational cover, clarifying that ecorestoration need not automatically imply control of State Forest Departments.

The Northeastern hill areas may therefore be viewed in terms of a cultivated and an uncultivated domain- both with extensive tree cover, and both owned by people, either individually, or by clan or by village, some rare cases even by the whole tribe. The cultivated domain is largely under Jhum, a practice of forest-cultivation-forest-cultivation. In this system there is a jungle first, then people cut it, let it dry, set fire to it, then clear the land and sow seeds of paddy (or some other food crop), then harvest the paddy, then once again take a paddy crop. After this, the land is given over to nature, for the next few years it starts gathering vegetation cover of various species. After a few years, people come back to this land, cut the jungle, and then resume the activities once more. If there be about 10000 villages in the hilly areas of northeastern States, of the size of about 100 families per village, then there are about a million families, almost all practicing Jhum.

We have to evolve a strategy for both the cultivated and uncultivated domains of the Northeast. These strategies must address themselves to two contexts. The first is that of the physical geography in which this Jhum is practiced. The second is the social context in which this happens. First, consider the physical geographical limits. Roughly, the highest altitude at which Jhum is done is 1800M above mean sea level. Above this, Jhum is not feasible because

the climate is not suitable for annual plants from which food grains are obtained. Apply this to all the hill areas

Arunachal Pradesh – Roughly, half the area of the State is above this level, and therefore not subjected to Jhum. Here the hills are covered by various types of forests. The slopes which lie between 1800M and 2500M have forests composed of species which yield considerable litter which turns into nutrients. The Jhum fields below 1800M benefit from the flow of nutrients coming from above. The land in the State above 3000M is variously used or not at all used. The foresters call it "unclassed" forest land, people contest this; they say, "it is ours".

Nagaland – Roughly one fifth of the land lies above 1800M. In the lands below this level, most, not all, of the villages practice Jhum. Those who do not practice Jhum or who practice this very little, have mountain slope terraces for paddy, from about 1700M and below.

Manipur – Three fourth of the State's land is hilly, inhabited by people very similar to those of Nagaland, and there the physical geography is also similar.

Mizoram – The highest point in the Mizo hills is about 2200M. Thus there is very little or no land which is not used in the Jhum mode. There is therefore very little humus producing, biodiversity rich land in Mizoram.

Tripura – All the State's land is below the 1800M limit, thus all the hill land in the State is under the Jhum domain, with no land under undisturbed, humus producing tree cover.

Meghalaya – The situation is like in the Nagaland or Manipur (hills) areas. Some lands are of the Mizoram or Tripura types.

Assam - There are two districts in Assam which are hilly and inhabited by tribal people. The lands here are much lower than the 1800M limit, thus without the benefits of the upslope undisturbed forests. These districts are Karbi Anglong, and North Cachar Hills.

Secondly, consider the social context in which Jhum is practiced, more specifically those social aspects which deal with ownership, title to land etc. In all villages, where people are predominantly practitioners of Jhum, every year, the land for Jhum is selected – either by the Village Chief, or by the Traditional Council of Village Elders (Village Council). Thereafter, the apportionment of family plots takes place – where there is a Chief, by him, or in the other villages individual families cultivate their own plots. In the "Village Chief" scenario, a family has no assurance that after the entire Jhum cycle of whatever period, it would get the same plot of land that it got earlier. In the other villages, the family owns its plot, so it is sure of coming back to the same plot after the cycle. These two systems become significant when considering strategies for action, since a family is far more motivated to raise long duration tree crops when it has the assurance that it can reap its benefits. The boundaries between family plots have not been formally put down in "maps", yet this has never been seen to become a matter of any serious disputes, except when two whole villages are parties to a dispute, in which case the District Administration/District Judiciary, have the ball in their courts.

Throughout northeast Indigenous Community Institutions (ICIs) continue to play a vital role in managing village society and natural resource use. Yet, these Indigenous Community Institutions are under growing pressure and receive little external support or recognition. There is a need to strengthen the ICIs to allow them to function effectively and interact with outside actors. Appropriate policy reforms are required to include ICIs in Government programmes and schemes, and provide support for capacity building within the Indigenous Community Institutions to enable them to function in a democratic and transparent manner, ensuring social and gender equity. Programmes like Nagaland Village Development Boards furnish an example of working in a sensitive and fruitful fashion with Indigenous Community Institutions.

The Jhumlands are degrading over much of Northeast, the main determinant being the length of the Jhum cycle. A contributing factor for the difficulties is the growing privatization of the communal lands, often resulting in their alienation from the community and their possession by absentee landlords. This process has reduced the amount of land available for jhum cultivation, shortening the fallow period and has put increased economic pressure on low-income families. In Mizoram and more so in Tripura, and Assam hills district, and some parts of Meghalaya, the cycle lengths have fallen to as few as 3 to 5 years, a period not sufficient for nature to revive the vegetation to its "cruising" level of productivity. In Nagaland, Manipur(hills), and in Arunachal, about one third of the Jhum lands have now come under below 10 years cycles, and thus the lands are degrading, though not as badly as in Mizoram and Tripura. Thus the Jhum Domain of land is divisible into two – one where the cycles have fallen below 10 years, and one where the cycles are above 10 years. This "ten" years dividing line is related to the fact that the fast growing among tree species do grow up sufficiently in ten years. There are many in this category, both natural, e.g. *Macaranga spp, Trema orientalis*, and cultivated such as *Melia azederach/composita, Cedrela serrata, Acrocarpus fraxinifolius,* and *Schima wallichii*.

Jhum, or shifting cultivation is best viewed as an agricultural and an adaptive forest management practice based on sound practical ecological knowledge. State interventions should therefore aim at empowering shifting cultivators as practitioners of rotational agro-forestry to become active participants in decision making and policy processes that impact them most. As mentioned above, there is tremendous variation in the context in which interventions will take place due to topographic and tenurial arrangements. Most of shifting cultivation is practiced on lands in which communities have extensive customary rights but which, may be recorded as 'unclassed State forests' although the lands do not belong to the State and on which State agencies have little or no control. In the context of these difficulties it is advisable not to initiate programmes labeled as "afforestation programmes" in shifting cultivation areas. Rather, the State-level agricultural and forest departments must work together and develop programmes of ecorestoration to help shifting cultivators make the transition from destructive forms to more sustainable forms of *jhum*.

Where the degradation is proceeding fast, people themselves see it and there is no need to tell them that some alternative is required. They know the situation. They look forward to guidance. Here, failure lays with Governments extension agencies both in the Agriculture and Forestry domains. Here and there people themselves, or as advised by these officials, have switched from Jhum to settled agriculture, including some horticultural plants such as *Sechium edule, Passiflora edulis* etc, as in Mizoram, Manipur etc. In this connection, the

IFAD funded "livelihoods" project which ran from 2000 to 2007, in Meghalaya, Hills Districts of Assam and Manipur (hills), has done first-rate work and provides an excellent model which needs to be built into a strategy for the future

Where degradation is not yet perceived by people, or where the cycles are above 10 years, Jhumming will continue, there is no escape from this, and here is where some breakthrough is long over due. This is where the **NEPED phase I** project of Nagaland, a successful demonstration of an intervention in Jhum cultivation, which could be called "Tree Farming" is relevant. The **NEPED** strategy involved the jhum farmer planting about 1000 trees per ha. in his Jhumland just when he sows seeds of paddy. The species selected are such that they yield a crop of trees of girths from 3 to 4 feet in 10 to 12 years, so that it will be sold as round logs in the local timber market. The choice of species is done by the farmer, as advised by the project team. The farmer's choice is, of course, final. In the subsequent two years, when the farmer takes two crops of paddy, the seedlings of the trees grow up, well attended and protected and nursed by the farmer, when he goes to the field for weeding the paddy field. Then, the fallow period begins. At this stage the trees, now 2 years old, have grown up to heights of 6 to 12 feet. These 1000 trees now create their own ambience, in which some shade loving annuals other than paddy, can be grown – in the Project, there was a small research component supervised by a senior agriculture officer, to see what plants could be planted by the farmer in the shade of the trees.

In 1995, 1996 and 1998 some 6 Million trees of 65 species were planted all across the 1000 villages in Nagaland, covering about 6000 hectares of Jhumland. The other fallow management experiment yielded a list of 10 different species of annuals, biennials which could be planted for the first two years of the fallow period. Another very startling thing happened – seeing that the trees did not interfere with the productivity of paddy, and the healthy growth of trees, people on their own undertook vigorous tree planting – an assessment done by the funding agency in 2000 showed that this "spontaneous" replication was to the extent of six times the plantations of the project i.e. the number of trees planted was about 35 million. Another encouraging thing was – women's groups also took up tree plantation in lands allotted to them by their village councils. NEPED phase I ended in 2000.

The NEPED project then entered phase II, this time concentrating on the agronomic packages for individual families in about 100 villages, funded through a revolving fund for giving loans to the beneficiary families. This phase lasted till 2006. The tree plantation activities were picked up by the MoEF, under which funds started flowing in 2002. This activity continues. The Forest Department of Nagaland reports that to date some 60,000 hectares of Jhumlands have been put under trees from 2002. The MoEF funded tree farming scheme is also operating in Mizoram, though here the land tenure system earlier described means that farmers are not sure that they will return to the same plot after the jhum cycle. But perhaps the Village Councils in Mizoram have given people the first right over the harvest of trees. This needs to be ascertained. In both the NEPED and the IFAD projects, the operations were handled by specially formed teams whose members did their work with remarkable dedication and tenacity.

Alongside these successes, there have been difficulties. These have been noticed, especially in connection with the National Afforestation Programme. The difficulties primarily relate to the fact that NAP employs an inappropriate model. This model is that of

Joint Forest Management Schemes that were designed for areas designated as reserve and protected forests in peninsular India in order to provide rural communities with benefits in return for assistance with protection and regeneration. In the uplands of Northeast India communities already hold management rights for forests and face different management problems. The Joint Forest Management Scheme needs to be reoriented at both the policy and field project level to reflect these differences, support Indigenous Community Institutions, and create incentives for sustainable forest management.

Hence, in the Northeast a fresh set of policies and schemes need to be devised to support decentralized, participatory, multi-stakeholder, interdisciplinary, eco-regional and adaptive management approaches that respect human and cultural diversity, gender equity, livelihood security and enhancement as well as environmental sustainability where we value and build upon both traditional and scientific information and knowledge. This is the task that may be addressed by the Ministry of Environment & Forest's Task Force on the Northeast. For the cultivated domain, the NEPED and the IFAD strategies offer good models. For the uncultivated domain, which is at least one third of the total land in these States, there is no project yet on record. Serious efforts need to be launched to conserve and sustainably use the rich biodiversity resources of these lands. Given the strong claims of the people over these lands, it would be best to attempt to develop some models of management through local Biodiversity Management Committees employing the provisions of the Biological Diversity Act.

Ecotourism

Ecotourism offers excellent possibilities of taking the benefits of nature conservation to local communities in many ways including homestead tourism. The Eleventh Plan should include a substantive programme along these lines based on the suggestions of the Tiger Task Force.

While the protected areas and the adjoining terrestrial and wetland ecosystems have the potential to contribute to the rural economy and community development, there are several factors that need to be addressed. These include a clear-cut long term policy on eco-tourism which is complementary with the conservation objectives and modalities of participation of the local stakeholders which involves maximum people from the serving communities and create a sense of ownership project amongst the local people.

A proactive planning for meeting the need of the tourism while managing the ecological and socio-economic integrity of the area, designed to strengthen the capacities of locally formed Institutions , for example the land management committee, waste management committee, alternative fuel technology Institution, tour operators committee etc. can contribute significantly in conservation. The programmes need to build on community ownership tourism to promote equitable distribution of the net benefits. In the long run community owned facilities such as camp sites, lodges, and micro water harvesting sites will become an asset for generating income and employment to the rural people. Following definite steps in this matter, investment in the tourism sector may be available for promotion of ecotourism.

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Recommended outlays

S. No.	Sector	Recommended 11th Plan Outlay Rs (crores)
1	Environment- Development Interface	320
2	Pollution Abatement	400
3	Aquatic Ecosystems: NRCP, NLCP, Wetlands, Mangroves, Coastal Zone, Marine zone	3,150
4	Education & Awareness, Monitoring & Information Management	950
5	Environmental Research and Development	1,250
6	Biodiversity & Wildlife	3,500
7	Forestry	10,150
	Total	**19,720**

Appendix 1

No.M-13033/1/2005-E&F
Government of India
Planning Commission
(E&F Division)

Yojana Bhawan, Sansad Marg,
New Delhi -110001, dated 22.3.2006

Subject: Setting up of Steering Committee on Environment, Forests & Wildlife for the Eleventh Five Year Plan (2007-2012).

It has been decided to set up a Steering Committee on Environment, Forests & Wildlife and Animal Welfare for the Eleventh Five Year Plan. The composition of the Steering Committee will be as follows:

1. Prof. Madhav Gadgil, Indian Institute of Science, Bangalore	Chairman
2. Prof V L Chopra, Member, Planning Commission	Co-chairman
3. Principal Adviser (E&F), Planning Commission	Member
4. Secretary, Ministry of Env. & Forests	Member
5. Secretary, Ministry of Rural Development	Member
6. Secretary, Department of AYUSH	Member
7. Secretary, Department of Land Resources	Member
8. Secretary, Ministry of Water Resources	Member
9. Secretary, Ministry of Urban Development	Member
10. Secretary, Ministry of Tribal Affairs	Member
11. Secretary, Deptt. of Biotechnology	Member
12. Secretary, Dept. of Ocean Development	Member
13. Secretary, Dept. of Industrial Policy and Promotion	Member
14. DG Forests & SS, Ministry of Env. & Forests	Member
15. Director General, ICFRE, Dehradun	Member
16. Director General, ICAR, New Delhi	Member
17. Chairman, National Biodiversity Authority, Chennai	Member
18. Chairman, Central Pollution Control Board, New Delhi	Member
19. Dr Sukumar Devotta, Director, NEERI, Nagpur	Member
20. Prof J S Singh, Member, Forestry Commission	Member
21. Ms Sunita Narain, Director, CSE, New Delhi	Member
22. Shri K.P.Nyati, Head, Environment, CII, New Delhi	Member
23. Shri A.K. Mukherjee, Former DG, MoEF	Member
24. Dr. Ram Prasad, IIFM, Bhopal	Member
25. Shri H.S.Pawar, Founder Director, WII	Member
26. Prof A N Purohit, Dehradun	Member

27. Shri B K Jagdish Chandra, Former PCCF, Karnataka	Member
28. Dr Asad Rehamani, Bombay Natural History Society	Member
29. Dr. A.P. Mitra, NPL, New Delhi	Member
30. Prof. Shekhar Singh, Convenor, NCPRI, New Delhi	Member
31. Principal CCF, Himachal Pradesh	Member
32. Principal CCF, Mizoram	Member
33. Principal CCF Chattisgarh	Member
34. Principal CCF, Gujarat	Member
35. Chief Wildlife Warden, M. P.	Member
36. Chief Wildlife Warden, Rajasthan	Member
37. Chairman, Pollution Control Board, Maharastra	Member
38. Chairman, Pollution Control Board, Tamilnadu	Member
39. Chairman, Pollution Control Board, Uttar Pradesh	Member
40. Chairman, Pollution Control Board, Delhi	Member
41. Adviser, E&F, Planning Commission	Member-Secretary
42. Director (Forestry), Planning Commission	Convenor

2. The Terms of Reference of the Steering Committee will be as under:

(i) To make recommendations for an effective and efficient paradigm for environment and forestry sector for the Eleventh Five Year Plan based on a review of the existing programmes, policies and taking into account the issues related to Institutional, legislative and enforcement structures;

(ii) Identify thrust areas for the Environment, Forestry and wildlife sub sectors for the Eleventh Five Year Plan;

(iii) To analyse the trade and environment interface from the point of view of protecting vital national interest including IPRs, use of frontier technology such as biotechnology, clean technologies etc.; and

(iv) To recommend strategy for a proactive national stance on international environmental issues such as climate change, biodiversity and desertification.

3. Within the broader socio-economic objectives of the Eleventh Five Year Plan and recognizing that the economic and social development and the protection of environment/forests are inter-dependent and mutually reinforcing components of sustainable development, the Committee may especially focus, *inter alia*, on the following items:

A. ENVIRONMENTAL ISSUES

a. Strategies for sustainable development to achieve environmental integrity and alleviation of poverty.

b. Initiatives for tackling the problem of air, water and noise pollution and safe disposal of hazardous waste etc.

c. Evolving environmental education as a people's movement for ensuring their participation in environmental awareness campaign including involvement of NGOs.

d. Strengthening the role of State and Central Pollution Control Boards/Committees in environmental management through monitoring and enforcement.

e. Strategies for rationalizing the environmental regulations governing issues like Environmental Impact Assessment, Coastal zone management, environment management in industries and incorporating valuation of environmental impact in the National System of Accounting.

B.FORESTS, WILDLIFE & ANIMAL WELFARE ISSUES

f. Co-ordination of programmes between Centre and the States in view of national and regional circumstances.

g. Greening the country through joint forest management, agro-forestry, urban forestry and afforestation of underutilized lands through local self Governments.

h. Capacity building for Management Planning for conservation and development of natural resources rooted in the principles of ecology, economics, social and gender equity, energy conservation, employment generation and social auditing.

i. Optimizing productivity of forests, reducing demand and supply imbalances, rationalizing export and import regulations for improving opportunities for marketing of wood and other forest produce.

j. Technological and manpower requirements for forest protection against forest fires and illegal activities including encroachments and poaching.

k. Recognizing the symbiotic relationship between forest and forest dwellers, integration of poverty alleviation schemes, gainful employment generation programmes with due empowerment of communities including tribals and women.

l. Policy prescriptions for strengthening linkages between forestry, agriculture, pastures, watershed development in rural and tribal development programmes.

m. Suggest ways of imparting special programmatic and policy focus on development and sustainable use of medicinal plants, bamboo and canes and other Non-timber forest produce (NTFP) resources.

n. Promoting efficient and quality value addition for realization of worth of the forest produce collected by the communities

o. Conservation and development of wildlife habitats, protected areas, and evolve workable participatory systems with communities for conservation of biodiversity.

p. A community centered Animal Welfare strategy with vigorous role for voluntary agencies.

q. Innovative ways for augmenting flow of resources into the sector.

4. The Chairman may constitute specific Working Groups for the relevant sub-sectors as may be considered necessary. The Steering Committee will suggest a portfolio of schemes,

corresponding measurable objectives and financial requirements. The Committee may consider any other issue, which it may consider relevant.

5. The Chairman may co-opt other Experts and constitute sub-groups for specific tasks. The Steering Committee would be serviced by E&F Division of the Planning Commission.

6. The expenditure on TA/DA of official members of the Steering Committee will be borne by their respective Ministry/Department as per the rules of entitlement applicable to them. TA/DA for non-official members will be borne by the Planning Commission as per SR190(a).

7. The Steering Committee will submit its report to the Planning Commission by the 30th September, 2006.

8. Dr. S.K. Khanduri, Director (Forestry), Planning Commission [Tel. No. 23096732, Room No. 349, Yojana Bhawan, New Delhi], will be the nodal officer in the Planning Commission for this Steering Committee and any further correspondence in this regard may be made with him.

(K.K. CHHABRA)
Under Secretary to the Government of India

To

Chairman and all Members (including Member-Secretary and Convenor) of the Steering Committee.

Copy to:-

1. PSs to DCH/ MOS (Plg.)/ Members/ Member-Secretary, Planning Commission
2. Prime Minister's Office, South Block, New Delhi.
3. Cabinet Secretariat, Rashtrapati Bhavan, New Delhi.
4. All Principal Advisers/ Advisers/ JS (SP & Adm.), Planning Commission.
5. All Ministries/ Departments of the Govt. of India [addressed to their Secretaries].
6. All State Governments/ UT Administrations [addressed to their Chief Secretaries].
7. Pay & Accounts Officer, Planning Commission.
8. Information Officer, Planning Commission.
9. Drawing and Disbursing officer, Planning Commission.
10. Accounts I Section, Planning Commission.
11. I.F. Cell, Planning Commission.
12. For general information in Yojana Bhavan through e-mail

(K.K. CHHABRA)
Under Secretary to the Government of India

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Appendix 2

M-13033/1/2006-E&F
Planning Commission
(Environment & Forests Unit)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 21st August, 2006

Subject: Constitution of the Working Group on Environment and Environmental Regulatory Mechanisms for the Environment & Forests Sector for the Eleventh Five-Year Plan (2007-2012).

It has been decided to set up a Working Group on Environment and Environmental Regulatory Mechanisms for the Environment & Forests Sector for the Eleventh Five-Year Plan. The composition of the Working Group will be as under:

1. Secretary, Min of Environment & Forests, New Delhi	Chairman
2. Principal Adviser (E&F), Planning Commission	Member
3. Shri Naresh Dayal, Special Secretary, MoEF	Member
4. Shri R. Chandramohan, Joint Secretary (CCI), MoEF	Member Secretary
5. Shri Jagdish Kishwan, IG Forest, (FC) MoEF	Member
6. Joint Secretary dealing with environment issues, MoEF	Member
7. Joint Secretary, Ministry of Non conventional Energy Resources	Member
8. Joint Secretary, Ministry of Women and Child Development	Member
9. Representative of Ministry of Transport	Member
10. Representative of Ministry of Industries	Member
11. Representative of Ministry of Urban Development	Member
12. Representative of Ministry of Agriculture	Member
13. Representative of Ministry of Petroleum	Member
14. Representative of Ministry of Science & Technology	Member
15. Chairman, CPCB, New Delhi	Member
16. Prof. Dilip Biswas, Ex-Chairman, CPCB	Member
17. Secretary, Environment Dept, Govt. of Maharashtra	Member
18. Dr. S K Wate, Dy Dir & Head EIRA, NEERI	Member
19. Dr. S.R. Shetye, Director, National Institute of Oceanography, Goa	Member
20. Chairman, Rajasthan State Poll. Control Board	Member
21. Chairman, West Bengal State Poll. Control Board	Member

22. Chairman, Tamil Nadu State Poll. Control Board	Member
23. Shri K.P. Nyati, Head, Environment, CII, New Delhi	Member
24. Ms. Rita Roy Choudhury, FICCI	Member
25. Dr. N. H. Ravindranath, IISc Bangalore	Member
26. Prof. M. K. Ramesh NLSIU, Bangalore	Member
27. Representative from CSE, New Delhi	Member
28. Prof. Shekhar Singh, IIPA, New Delhi	Member
29. Dr. Pratap Narayan, Director, CAZRI, Jodhpur	Member
30. Shri P N Asari, Advisor (E & F), Planning Commission	Member
31. Shri M. Ravindranath, Joint Adviser (E&F), Planning Commission	Member Convener
32. Shri Somnath Nayak, Nagarika Seva Trust, Karnataka	Member
33. Shri Srikanth Nadhmuni, E-Government Foundation, Bangalore	Member
34. Shri Anupam Misra, Gandhi Peace Foundation, New Delhi	Member
35. Shri Ravi Agarwal, Director, Toxic Links, New Delhi	Member
36. Economic Adviser, MoEF, New Delhi	Member

Terms of Reference of the Working Group will be as follows:

1. Review of the existing schemes/programmes of the Ministry of E & F in Environment Sector and suggest ways to improve the efficiency of delivery through administrative, programmatic and resource interventions.
2. Evaluate the sustainability concerns in the developmental planning processes in the country and suggest ways to integrate environmental concerns with it. The evaluation would include review of the existing policy/approach and take into account the weaknesses in Institutional, legislative, regulatory and enforcement structure. *Specifically evaluate the role of local bodies, which have the responsibility for management of local natural resources, in promoting sustainable development.*
3. Examine ways of creating positive incentives for sustainable management of natural resources through payment of service charges following the Costa Rica model for payment of service charges for watershed conservation services.
4. For the imperative need for integrating environment in development planning, policy and decision-making, the Committee may focus, *inter alia*, on the following items:
5. Strategies for integrating environmental concerns into development planning for achieving sustainable development along with poverty alleviation.
6. Strategy for strengthening the monitoring and addressing the problems of air pollution, water pollution, noise pollution and safe disposal of hazardous waste, etc.
7. People's access to environmental information, especially in the context of the Right to Information Act.

8. People's participation with involvement of NGOs and Corporate social responsibility for a national campaign on environmental awareness and education.
9. Enhancing of usefulness of State and Central level environmental administration including Pollution Control Boards/Committees.
10. Review the efficacy of the present environmental regulatory mechanisms such as various authorities created under environmental laws and recommend ways to inculcate a culture of voluntary environmental compliance in place of clearance systems.
11. Review and recommendations for strengthening the present mechanisms for implementation of global commitments like Kyoto Protocol, Montreal Protocol, UNCCD etc.
12. Recommend the policy and programme interventions with corresponding outcomes, deliverables, physical targets, measurable indicators and financial requirements for the sector adopting the concept of zero-based budget. To include any other issue, which the Working Group considers important
13. Official members of the Working Group will be paid TA/DA by their respective Departments as per the rules of entitlement applicable to them. The non-official members will be paid TA/DA by the Planning Commission as per SR 190 (a) for attending meetings of the Working Group.
14. The Working Group will submit its report to the Planning Commission by 31.10.2006.
15. Shri M. Ravindranath, Joint Adviser (E&F), Room No. 301, Yojana Bhavan (Tel No. **23096536**) will be the Nodal Officer for this Working Group for all further communications.

(Dr S K Khanduri)
Director (Forestry)

Copy forwarded to: All Members of the Working Group

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Appendix 3

M-13033/1/2006-E&F
Planning Commission
(Environment & Forests Unit)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 21st August, 2006

Subject: Constitution of the Working Group on Forests for the Environment & Forests Sector for the Eleventh Five-Year Plan (2007-2012).

It has been decided to set up a Working Group on Forests for the Environment & Forests Sector for the Eleventh Five-Year Plan. The composition of the Working Group will be as under:

1. Director General, Forests, MoEF, New Delhi	Chairman
2. Principal Adviser (E&F), Planning Commission	Member
3. Advisor (E & F), Planning Commission	Member
4. Addl. DGF, MoEF, New Delhi	Member
5. Shri K.B. Thampi, IG, Forests, NAEB, MoEF	Member-Secretary
6. Shri J Kishwan, IG (FC), MoEF	Member
7. Inspector General of Forests (EAP), MoEF	Member-Convener
8. Director General, ICFRE, Dehradun	Member
9. Dr S S Negi, Director, FRI, Dehradun	Member
10. Dr D Pandey, Director, Forest Survey of India, Dehradun	Member
11. Dr C N Pandey, Director, IPIRTI, Bangalore	Member
12. Representative of the Dept of Biotechnology	Member
13. Representative of Ministry of Rural Development	Member
14. Representative of Ministry of Panchayati Raj	Member
15. Representative of Ministry of Tribal Affairs	Member
16. Representative of Ministry of Women & Child Devp	Member
17. Shri S K Das, PCCF, Andhra Pradesh	Member
18. Shri A Ghosh, PCCF, Rajasthan	Member
19. Shri CS Joshi, Chief Conservator of Forests Maharashtra	Member
20. Shri B A Khan, PCCF, Bihar	Member
21. Shri V R Khare, MD, MPMFPF, Madhya Pradesh	Member
22. Shri Pankaj Khullar,PCCF, Himachal Pradesh	Member

23. Director, Botanical Survey of India	Member
24. Director, IIFM, Bhopal	Member
25. Executive Director, Foundation for Ecological Security, Gujarat	Member
26. Representative, CII, New Delhi (for Paper & Pulp Industry)	Member
27. Mr. Jaydeep Chitlangia, Secretary General, FIPPI	Member
28. Shri A K Mukerji, New Delhi	Member
29. Shri S.K. Pandey, Former DG, MoEF	Member
30. Dr. A.P. Dixit, New Delhi	Member
31. Dr. S K Khanduri, Director, Planning Commission	Member
32. Dr. Anand Maslekar, Pune	Member
33. Shri Mohan Hirabai Hiralal, Chadrapur	Member
34. Dr. Madhu Sarin, Chandigarh	Member
35. Dr. Nandidni Sunder, New Delhi	Member
36. Shri Pradeep Prabhu, Mumbai	Member
37. Mr Sayeed S Rizvi, Gurgaon, Haryana	Member
38. Ms. Nilima Khetan, Sewa Mandir, Udaipur	Member
39. Shri N G Hegde, BAIF, Pune	Member

Terms of Reference of the Working Group will be as follows:

1. Based on a performance appraisal of the tenth Five Year Plan of the Ministry of E & F, evolve an effective policy and programmatic approach for forestry sector for the Eleventh Five Year Plan taking into account the existing Institutional, legislative, regulatory and enforcement structures. Forestry & wildlife being a concurrent subject, the group may propose policy and administrative measure to ensure that the centrally sponsored programmes of the sector effectively result in the desired focus on the policy priorities in the States.
2. Assess the possibility of attaining one third of the land area of the country under green cover and suggest appropriate measures including revival of social forestry through local self Governments for optimum production of biomass on the underutilized land resources outside forests, integrated with livelihood and community management.
3. Examine ways of creating positive incentives for sustainable management and regeneration of forest resources through payment of service charges to the local communities following the Costa Rica model for payment of service charges for watershed conservation services.
4. Policy and programmatic interventions for enabling environment for providing desirable impetus to facilitating markets as the motivating factor for development of agro forestry and farm forestry.
5. Appraisal of the participatory forest management approach and recommend ways to consolidate the regime in order to generate empowered commitment among stakeholders

for conservation and protection of forests. This may include integration of local self Governments, community Institutions and delivery mechanisms through instruments of empowerment like *PESA, the provisions for functioning of Biodiversity Management Committees under the Biological Diversity Act and* the Right to Information Act

6. To make recommendations for optimizing the symbiotic relationship between forest dwellers and forest by promoting efficient and quality value addition for realization of gainful employment opportunities through development and sustainable use of medicinal plants, bamboo and canes and other Non-timber forest produce (NTFP) by tribals and other forest dweller communities.
7. Policy prescriptions for integrating the forestry with all natural resource development and human development programmes to evolve a landscape approach for development planning in forest fringes.
8. Capacity building for Management Planning for conservation and development of forests on the principles of ecology, economics, social and gender equity, energy conservation, employment generation and social auditing.
9. Optimizing productivity of forests, reducing demand and supply imbalances, rationalizing export and import regulations for improving opportunities for marketing of wood and other forest produce.
10. Technological and manpower requirements for forest protection against forest fires and illegal activities including encroachments and poaching.
11. Innovative ways for augmenting flow of resources into the sector.
12. To recommend a portfolio of schemes, corresponding physical targets, measurable objectives and financial requirements for the sector adopting the concept of zero-based budget.
13. To make recommendations regarding required administration reforms, adequacy of outlays, management of available resources like Compensatory Afforestation Funds, Forest Development Funds etc. and mobilization of requisite financial resources for fulfillment of various goals and objectives set for the sector. To include any other issue, which the working group considers important.
14. Official members of the Working Group will be paid TA/DA by their respective Departments as per the rules of entitlement applicable to them. The non-official members will be paid TA/DA by the Planning Commission as per SR 190 (a) for attending meetings of the Working Group.
15. The Working Group will submit its report to the Planning Commission by 31.10.2006.
16. Shri M. Ravindranath, Joint Adviser (E&F), Room No. 301, Yojana Bhavan (Tel No. **23096536**) will be the Nodal Officer for this Working Group for all further communications.

(Dr S K Khanduri)
Director (Forestry)

Copy forwarded to: All Members of the Working Group.

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Appendix 4

M-13033/1/2006-E&F
Planning Commission
(Environment & Forests Unit)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 21st August, 2006

Subject: Constitution of the Working Group on Research, education, training, capacity building and information management for the Environment & Forests Sector for the Eleventh Five-Year Plan (2007-2012).

It has been decided to set up a Working Group on Research, education, training, capacity building and information management for the Environment & Forests Sector for the Eleventh Five-Year Plan. The composition of the Working Group will be as under:

1. Secretary, Ministry of Environment & Forests, New Delhi	Chairman
2. Principal Adviser (E&F), Planning Commission	Member
3. Secretary, Deptt. of Biotechnology	Member
4. Secretary, Deptt. of Science & Technology	Member
5. Director General Forests & Special Secretary, MoEF	Member
6. Director-General, ICFRE, Dehradun	Member-Secretary
7. Dr S S Negi, Director, Forest Research Institute, Dehradun	Member-Convenor
8. Dr D Pandey Director, Forest Survey of India, Dehradun	Member
9. Director-General, ICAR	Member
10. Director General, CSIR, New Delhi	Member
11. Chairman, UGC, New Delhi	Member
12. Vice-Chancellor, YS Parmar University, Solan (HP)	Member
13. Director, National Bureau of Plant Genetic Resources	Member
14. Dr. P.S Roy, Dy. Director, NRSA, Hyderabad	Member
15. Prof. C.R.Babu, ICEMDE, Delhi University	Member
16. Dr Ulhas Karanth, Wildlife Conservation Society India, Bangalore	Member
17. Shri Kartikeya Sarabhai, Director, CEE, Ahmedabad	Member
18. Shri B K P Sinha, Director, Amity School of Natural Resources	Member
19. Dr. K.A. Singh, Director, Fodder Research Inst. Jhansi	Member
20. Dr P Neema, Dy Dir & Head, APC Div NEERI	Member
21. Representative of Centre for Science and Environment, N. Delhi	Member
22. Director, IPIRTI, Bangalore	Member

23. Representative of The Energy & Resource Institute, N. Delhi	Member
24. Dr P J Dilip Kumar, PCCF Karnataka	Member
25. Adviser (EE), MoEF	Member
26. Joint Adviser (E&F), Planning Commission	Member
27. Director (Forestry), Planning Commission	Member
28. Director, WII, Dehradun	Member
29. Dr. Lalit Pande, Almora	Member
30. Dr. S R Shetye, Dona Paula, Goa	Member
31. Dr. Sharad Lele, Bangalore	Member
32. Dr. C S Rathore, Bhopal	Member
33. Dr. Erach Bharucha, Bharati Vidyapeeth, Pune	Member
34. Dr. Jaishree Sharma, NCERT, New Delhi	Member
35. Dr. K.S. Swaminath, CCF Karnatka Forest Deptt.	Member
36. Dr. K.D. Singh ex-FAO Sr. Forestry Officer, ATREE, Delhi.	Member
37. Director, IIFM, Bhopal	Member
38. Director, IGNFA, Dehradun	Member

Terms of Reference of the Working Group will be as follows:

1. To make a critical review of the achievements in the field of environment and forestry research & education with special reference to the programmes undertaken in the sectors in tenth five year plan. This will include evaluation of the outcomes of the programmes.
2. To evaluate adequacy and recommend strategy and approach for management of research, education & training with reference to target groups, specific areas and infrastructural development, in the field of Forestry & Wildlife, Environment and Animal Welfare. This may also include the problems of private and public sector activities for research back up.
3. Examine possibilities of uploading all environmental information accessible to the public under the Right to Information Act on a public web site.
4. Review proposals for establishment of data and information base for understanding, assessment, planning and monitoring of the sectors at local, State and national level on various spatial and temporal scales. This will also include establishment of a national network for the forest biodiversity *as well as other environmental* information.
5. Recommend a strategy for implementing the recommendation of the National Curriculum Framework Review 2005 that the knowledge on environmental parameters generated through student projects on environment be used to create a publicly accessible database on Indian environment.
6. Recommend a strategy for greater involvement of folk taxonomists, ecologists and scientists outside the Government Institutions in forestry, wildlife and environment research.

7. Recommend guiding principles for deciding the research priorities based on the global commitments on conservation and national needs.
8. Suggest measures for ensuring effective coordination in the field of forestry research in the State Sector with ICAR/ICFRE system.
9. Examine the existing system of forest education in the States/ country and scope of linkages between management and conservation research. This will include the existing forestry education paradigm in the universities, management Institutions and its utility in career planning.
10. Suggest measures for effective coordination between the scientific Ministries/ Departments of the Govt. of India who are also dealing with environmental & forestry related activities.
11. Official members of the Working Group will be paid TA/DA by their respective Departments as per the rules of entitlement applicable to them. The non-official members will be paid TA/DA by the Planning Commission as per SR 190 (a) for attending meetings of the Working Group.
12. The Working Group will submit its report to the Planning Commission by 31.10.2006.
13. Shri M. Ravindranath, Joint Adviser (E&F), Room No. 301, Yojana Bhavan (Tel No. **23096536**) will be the Nodal Officer for this Working Group for all further communications.

(Dr S K Khanduri)
Director (Forestry)

Copy forwarded to: All Members of the Working Group.

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Appendix 5

M-13033/1/2006-E&F
Planning Commission
(Environment & Forests Unit)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 21st August, 2006

Subject: Constitution of the Working Group on Working Group on Rivers, lakes, and aquifers for the Environment & Forests Sector for the Eleventh Five-Year Plan (2007-2012).

It has been decided to set up a Working Group on Rivers, lakes, and aquifers for the Environment & Forests Sector for the Eleventh Five-Year Plan. The composition of the Working Group will be as under:

2.

1. Additional Secretary & Project Director, NRCD, MOEF	Chairman
2. Shri Chetan Pandit, Central Water Commission, New Delhi	Member
3. Joint Secretary, Ministry of Urban Development, New Delhi	Member
4. Joint Secretary, Ministry of Water Resources, New Delhi	Member
5. Joint Secretary, NRCD, MoEF, New Delhi	Member
6. Adviser, NRCD, MoEF, New Delhi	Member-Secretary
7. Adviser (E & F), Planning Commission, New Delhi	Member
8. Chairman, CPCB, New Delhi	Member
9. Ms. Sunita Narain, Director, Centre for Science & Environment	Member
10. Prof. Brij Gopal, School of Environmental Science, JNU, Delhi	Member
11. Shri Arun Kumar, Alternate Hydro Energy Centre, IIT, Roorkee	Member
12. Prof. H. S. Shankar, Dept Chemical Eng. IIT Mumbai	Member
13. Shri Veer Bhadra Mishra, Sankat Mochan Foundation, Varanasi	Member
14. Dr. Sukumar Devotta, Director, NEERI, Nagpur	Member
15. Secretary (E&F), Govt. of Tamilnadu	Member
16. Chairman, U.P. Jal Nigam, Kanpur	Member
17. Secretary, Delhi Jal Board, New Delhi	Member
18. Commissioner, Municipal Corporation of Delhi, New Delhi	Member
19. Secretary (*Pey jal*), Govt. of Uttranchal	Member
20. Principal Secretary (UD), Govt. of West Bengal	Member
21. Ms Tanveer Jehan (VC) J&K Lakes & Waterways Dev. Authority	Member

22. Engineer in Chief (Yamuna Action Plan), PHED, Govt. of Haryana	Member
23. Chairman, Loktak Development Authority, Manipur	Member
24. Principal Secretary (UD), Govt. of Andhra Pradesh	Member
25. Secretary (UD), Govt. of Jharkhand	Member
26. Joint Adviser, E&F, Planning Commission	Member-Convenor
27. Director, NRCD, MoEF	Member
28. Prof. R.K.Sinha, Professor of Zoology, Patna Univeristy, Patna.	Member
29. Dr Shyam R Asolekar, Prof., Centre for Env. Sci.& Eng, Mumbai	Member
30. Dr Dilip B Boralkar, Member Secretary, PCB, Maharashtra	Member
31. Prof. Soli Arceivala, Mumbai-400 005.	Member
32. Shri Paritosh Tyagi, NOIDA 201301	Member
33. Shri S.S.Gahalot, Sr Director, N.I.C. , Delhi	Member

Terms of Reference of the Working Group will be as follows:

1. To evaluate the impact of ongoing projects under National River Conservation Plan and National Lake Conservation Plan in improving the water quality of rivers and lakes respectively, the procedure of approval and implementation of schemes and funds flow to the State and local bodies and mechanism for timely implementation of projects.
2. Recommend improvisation in the scheme by involvement of Public Private Partnerships, adoption of effective technologies and practices etc.
3. Consider the status and possible options for addressing the problems of natural and anthropogenic contamination of groundwater resources of the country in context of handling of industrial effluents, use of pesticides/insecticides and resultant health hazard for the life forms.
4. Explore the possibility of integration of programmes under NRCP and NLCP with related schemes of other Ministries i.e. Urban Development, Water Resources etc. thereby providing for optimal utilization of resources.
5. Strategies for meeting O&M requirements of the installations created under NRCP/NLCP and making the operation of these projects self sustainable
6. Explore the sources of external funds and grants for the programmes.
7. Suggest additional infrastructure requirements, human resources etc. if necessary to make the programme more meaningful
8. Recommend criteria for selection of new rivers and lakes keeping in view the broader socio-economic objectives of the Eleventh Plan. Accordingly, recommend a portfolio of river and lake conservation projects in various States, corresponding physical targets, measurable objectives/outcomes and financial requirements. To include any other issue, which the Working Group considers important

9. Official members of the Working Group will be paid TA/DA by their respective Departments as per the rules of entitlement applicable to them. The non-official members will be paid TA/DA by the Planning Commission as per SR 190 (a) for attending meetings of the Working Group.
10. The Working Group will submit its report to the Planning Commission by 31.10.2006.
11. Shri M. Ravindranath, Joint Adviser (E&F), Room No. 301, Yojana Bhavan (Tel No. 23096536) will be the Nodal Officer for this Working Group for all further communications.

(Dr S K Khanduri)
Director (Forestry)

Copy forwarded to: All Members of the Working Group.

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Appendix 6

M-13033/1/2006-E&F
Planning Commission
(Environment & Forests Unit)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 21st August, 2006

Subject: Constitution of the Working Group on Wildlife, biodiversity, traditional knowledge, and animal welfare for the Environment & Forests Sector for the Eleventh Five Year Plan (2007-2012).

It has been decided to set up a Working Group on Wildlife, biodiversity, traditional knowledge, and animal welfare for the Environment & Forests Sector for the Eleventh Five-Year Plan. The composition of the Working Group will be as under:

1. Director General, Forests, MoEF, New Delhi	Chairman
2. Principal Adviser (E&F), Planning Commission,	Member
3. ADG (WL), MoEF	Member
4. IG, Wildlife, MoEF, New Delhi	Member Secretary
5. Joint Secretary (BC & AW), MoEF	Member
6. Joint Secretary (CS & NAEB), MoEF	Member
7. Joint Secretary in charge of Eco tourism, Ministry of Tourism	Member
8. Director, Wildlife Institute of India, Dehradun	Member
9. Maj. Gen. (Retd) K M Kharb, Chairman, Animal Welfare Board	Member
10. Director, Project Tiger, MoEF, New Delhi	Member
11. Director, Project Elephant, MoEF, New Delhi	Member-Convener
12. Member Secretary, Central Zoo Authority, New Delhi	Member
13. Director, Zoological Survey of India, Calcutta	Member
14. Director, National Institute of Oceanography, Goa	Member
15. Director, BNHS, Bombay	Member
16. Dr R Sukumar, Indian Institute of Science, Bangalore	Member
17. Representative of Centre for Wildlife Studies, Bangalore	Member
18. Chief Wildlife Warden, Tamil Nadu	Member
19. PCCF, Assam	Member
20. Chief Wildlife Warden, Orissa	Member
21. Shri M.K.Ranjitsinh, Global Tiger Forum, New Delhi	Member
22. Director, Centre for Environment Education, Ahmedabad	Member
23. Ms. Sejal Vohra, WWF, New Delhi	Member

24. Smt. Pratibha Pandey, Kalpavriksha, Maharashtra	Member
25. Shri M. Ravindranath, Joint Adviser, Planning Commission	Member
26. Dr. S K Khanduri, Director, Planning Commission	Member
27. Shri H S Pabla, APCCF, Biodiversity Forest Department, Bhopal	Member
28. Shri Samar Singh, New Delhi	Member
29. Dr D S Srivastav, Nature Conservation Society, Bihar	Member
30. Dr. Madhusudan, Nature Conservation Foundation, Mysore	Member
31. Dr. Rucha Ghate, Institute for Research and Development, Nagpur	Member
32. Dr. Gazala Shahbuddin, Council for Social Development, New Delhi	Member
33. Dr. Arpan Sharma Samrakshan, New Delhi	Member
34. Chief Wildlife Warden, Kerala	Member
35. Dr. Darshan Shankar, FRLHT, Bangalore	Member
36. Director, Centre for Environment and Development, Kolkata	Member

Terms of Reference of the Working Group will be as follows:

1. Review of the existing schemes/programmes of the Ministry of E & F in Wildlife and Animal Welfare Sectors and suggest ways to improve the efficiency of delivery through legislative, administrative, programmatic and resource interventions.
2. To suggest development goals, strategy, portfolio of schemes/programmes for the management of wildlife and Animal Welfare sectors in the Eleventh Plan along with financial outlay.
3. To evaluate the present status of zoo management, its contribution in conservation of biodiversity and suggest the future plan including possible coverage of botanical gardens/biological parks within the sub sector.
4. To review the status of management planning of various national parks, sanctuaries and conservation reserves and suggest specific role of Govt of India in improving the quality of interventions in view of national and international commitments.
5. Recommend possible road map for developing and integrating eco-tourism in the eco development of the communities living in the vicinity of forests and protected areas.
6. To review the existing organizations and suggest a strategy for coordinating implementation of various programmes for the control of poaching and illegal trade in wildlife products.
7. To deliberate on the *strengths and weaknesses including the extent of community involvement* and the outcome of the recently concluded India Eco development Project and suggest the utility of the approach for adoption in future conservation plans for Protected Areas.
8. Deliberate on the various social, economic and conservation aspects of the Biological Diversity Act and suggest a roadmap for its implementation conforming to the socio-

economic and management objectives emanating from the Convention on Biological Diversity, *in particular the ecosystem approach, and the provisions for benefit sharing therein.*

9. Recommend how an Indian Biodiversity Information System (IBIS) may be organized with appropriate provisions for safeguarding Intellectual Property Rights of individuals and communities providing knowledge on uses of biodiversity that may lead to commercial applications.
10. Examine the possibilities of extending programmes of joint forest management to protected areas.
11. Examine ways of creating positive incentives for conservation and regeneration of biodiversity resources through payment of service charges to the local communities following the Costa Rica model for payment of service charges for watershed conservation services following the Costa Rica model.
12. A community centered Animal Welfare strategy with vigorous role for voluntary agencies. Roadmap for effective role of the National Institute of Animal Welfare in fulfilling the desirable ethos in handling of animals and their welfare.
13. To make recommendations regarding mobilization of requisite financial resources for fulfillment of various goals and objectives set for wildlife sector.
14. Any other issue, which the working group considers relevant.
15. Official members of the Working Group will be paid TA/DA by their respective Departments as per the rules of entitlement applicable to them. The non-official members will be paid TA/DA by the Planning Commission as per SR 190 (a) for attending meetings of the Working Group.
16. The Working Group will submit its report to the Planning Commission by 31.10.2006.
17. Shri M. Ravindranath, Joint Adviser (E&F), Room No. 301, Yojana Bhavan (Tel No. **23096536**) will be the Nodal Officer for this Working Group for all further communications.

(Dr S K Khanduri)
Director (Forestry)

Copy forwarded to: All Members of the Working Group.

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Appendix 7

M-13033/1/2006-E&F
Planning Commission
(Environment & Forests Unit)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 21st August, 2006

Subject: Constitution of the Task Force on Biodiversity & Genetically Modified Organisms (GMOs) for the Environment & Forests Sector for the Eleventh Five-Year Plan (2007-2012).

It has been decided to set up a Task Force on Biodiversity & Genetically Modified Organisms (GMOs) for the Environment & Forests Sector for the Eleventh Five-Year Plan. The composition of the Task Force will be as under:

1.	Ms. Suman Sahai, Khanpur, New Delhi	Chairman
2.	Shri Devinder Sharma, Forum for Biotech. & Food Security, New Delhi	Member
3.	Dr. K.N.Ganeshiah, University of Agricultural Sciences, Bangalore	Member
4.	Dr. V. Arunachalam, MSSRF, Chennai	Member
5.	Shri R S Kulkarni, Head, Genetics & Pl Br, GKVK Bangalore	Member
6.	Prof Deepak Pental, Vice Chancellor , Delhi University	Member
7.	Prof. S. K. Sopory, ICGEB, Delhi	Member
8.	Dr. S. K. Raina, Nath Seeds , Aurangabad	Member
9.	Dr Bala Ravi, MSSRF, Chennai	Member
10.	Shri Dinesh Abrol, Delhi Science Forum	Member
11.	Ms. Rajeshwari Raina, NISTADS, Delhi	Member

Terms of Reference of the Task Force will be as follows:

1. Review the current laws, policies, procedures and practices related to conservation and sustainable use of agro-biodiversity and proper management of GMOs and recommend correctives.
2. Similarly review the Institutional and individual capacities available to address issues related to conservation and sustainable use of agro-biodiversity and proper management of GMOs and recommend how they may be adequately strengthened.
3. Specifically examine the implementation of Biological Diversity Act and the Protection of Plant Varieties and Farmers' Rights Acts and ways of promoting synergies in their operation.
4. Also examine the possibilities of enacting an act to protect domesticated animal diversity and herders' rights.

5. Explore ways of promoting the much needed inter-sectoral dialogue amongst Environment and Forest, Agriculture and Animal Husbandry Ministries to address issues related to conservation and sustainable use of agro-biodiversity and proper management of GMOs.
6. Ministry of Environment & Forests will provide basic information and data input to the Task Force as and when required.
7. The Chairperson of the Task Force will be free to co-opt any official / non-official as special invitee for its meeting.
8. The non-official members will be paid TA/DA by the Planning Commission as per SR 190 (a) for attending meetings of the Working Group.
9. The Task Force will submit its report to the Chairman, Working Group on Wildlife, Bio-diversity, traditional knowledge and Animal Welfare by 31.10.2006.
10. Shri M. Ravindranath, Joint Adviser (E&F), Room No. 301, Yojana Bhavan (Tel No. 23096536) will be the Nodal Officer for the for Task Force all further communications.

(Dr S K Khanduri)
Director (Forestry)

Copy forwarded to: All Members of the Working Group.

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(This Task Force was subsequently combined with the Task Force on Governance, Transparency, Participation)

Appendix 8

M-13033/1/2006-E&F
Planning Commission
(Environment & Forests Unit)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 27th Sept, 2006

Subject: Constitution of the Task Force on Environment Impact Assessment for the Environment & Forests Sector for the Eleventh Five-Year Plan (2007-2012).

It has been decided to set up a Task Force on Environment Impact Assessment for the Environment & Forests Sector for the Eleventh Five-Year Plan. The composition of the Task Force will be as under:

1.	Shri R Rajamani, Hyderabad	Chairman
2.	Shri Dilip Biswas, Ex. Chairman, CPCB	Member
3.	Shri Sagar Dhara, Cerana Foundation, Hyderabad	Member
4.	Shri Shyam Chainani, Bombay Environmental Action Group, Mumbai	Member
5.	Ms. Manju Menon, Kalpavriksh, Pune	Member

Terms of Reference of the Task Force will be as follows:

1. Review the current laws, policies, procedures and practices related to the EIA regimes in India, and recommend correctives.
2. Similarly review the Institutional and individual capacities available for conducting and assessing EIAs, in consultation with the Task Force on governance, and recommend correctives.
3. Specifically, assess the measures in position, and their effectiveness, for ensuring transparency and level of participation in the EIA process, in consultation with the Task Force on governance, and recommend correctives.
4. Ministry of Environment & Forests will provide basic information and data input to the Task Force as and when required.
5. The Chairperson of the Task Force will be free to co-opt any official / non-official as special invitee for its meeting.
6. The non-official members will be paid TA/DA by the Planning Commission as per SR 190 (a) for attending meetings of the Task Force.

7. The Task Force will submit its report to the Chairman, Working Group on Environment by 31.10.2006.
8. Shri M. Ravindranath, Joint Adviser (E&F), Room No. 301, Yojana Bhavan (Tel No. 23096536) will be the Nodal Officer for the Task Force for all further communications.

(Dr S K Khanduri)
Director (Forestry)

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Appendix 9

M-13033/1/2006-E&F
Planning Commission
(Environment & Forests Unit)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 21st August, 2006

Subject: Constitution of the Task Force on Governance, Transparency, Participation for the Environment & Forests Sector for the Eleventh Five-Year Plan (2007-2012).

It has been decided to set up a Task Force on Governance, transparency, participation for the Environment & Forests Sector for the Eleventh Five-Year Plan. The composition of the Task Force will be as under:

1.	Prof. Shekhar Singh,New Delhi	Chairman
2.	Shri N.C.Saxena, New Delhi	Member
3.	Ms. Anjali Bhardawaj, NCPRI, New Delhi	Member
4.	Shri Ashish Kothari, Kalpavriksh, Pune	Member
5.	Shri M K Jewrajika, Central Empowered Committee	Member
6.	Shri Paritosh Tyagi, Noida	Member

Terms of Reference of the Task Force will be as follows:

1. To assess the current issues and systems of integrating environmental concerns into other sectors (ministries, departments) and to recommend required new or remedial measures.
2. To assess the mechanisms in positions (if any) for the MoEF and State environment and forest departments to interface with other departments/ministries in order to jointly carry out schemes and programmes, and recommends correctives.
3. To assess the Institutional structures within the Government of India and State Governments, in terms of their ability to carry out their environmental mandate, and recommend correctives.
4. To assess the appropriateness of the staffing pattern and staff abilities, in terms training and systems, to perform the required environmental functions, within MoEF and the State environment and forest departments, and to recommend correctives.
5. To recommend ways in which the functioning of the sector can be made more transparent and participatory, from planning, through implementation and monitoring, to evaluation.
6. Ministry of Environment & Forests will provide basic information and data input to the Task Force as and when required.

7. The Chairperson of the Task Force will be free to co-opt any official / non-official as special invitee for its meeting.
8. The non-official members will be paid TA/DA by the Planning Commission as per SR 190 (a) for attending meetings of the Task Fore.
9. The Task Force will submit its report to the Chairman, Steering Committee by 31.10.2006.
10. Shri M. Ravindranath, Joint Adviser (E&F), Room No. 301, Yojana Bhavan (Tel No. 23096536) will be the Nodal Officer for this Task Force for all further communications.

(Dr S K Khanduri)
Director (Forestry)

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Appendix 10

M-13033/1/2006-E&F
Planning Commission
(Environment & Forests Unit)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 21st August, 2006

Subject: Constitution of the Task Force on Grasslands and Deserts for the Environment & Forests Sector for the Eleventh Five-Year Plan (2007-2012).

It has been decided to set up a Task Force on Grasslands and Deserts for the Environment & Forests Sector for the Eleventh Five-Year Plan. The composition of the Task Force will be as under:

1.	Dr. Punjab Singh (already heads a group in Agriculture sector)	Chairman
2.	Dr. Asad Rahmani, BNHS, Mumbai	Member
3.	Mr. Sonam Wangchuk, SECMOL, Ladakh	Member
4.	Ms. Charudatta Mishra, Mysore	Member

Terms of Reference of the Task Force will be as follows:

1. Review the current laws, policies, procedures and practices related to conservation and sustainable use of grassland and desert ecosystems and recommend correctives.
2. Similarly review the Institutional and individual capacities available to address issues related to conservation and sustainable use of grassland and desert ecosystems and recommend how they may be adequately strengthened.
3. Assess the current issues and systems of integrating concerns relating to fragile grassland and desert ecosystems into other sectors (ministries, departments) and to recommend required new or remedial measures.
4. Review the current EIA laws, policies, procedures and practices as being applied in the grasslands and desert ecosystem context and recommend corrective measure to address significant issues that specifically arise in the context of these fragile ecosystems.
5. Ministry of Environment & Forests will provide basic information and data input to the Task Force as and when required.
6. The Chairperson of the Task Force will be free to co-opt any official / non-official as special invitee for its meeting.
7. The non-official members will be paid TA/DA by the Planning Commission as per SR 190 (a) for attending meetings of the Task Force.
8. The Task Force will submit its report to the Chairman, Working Group on Forests by 31.10.2006.

9. Shri M. Ravindranath, Joint Adviser (E&F), Room No. 301, Yojana Bhavan (Tel No. 23096536) will be the Nodal Officer for the Task Force for all further communications.

A report of the Task Force will be submitted to the Planning Commission.

(Dr S K Khanduri)
Director (Forestry)

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Appendix 11

M-13033/1/2006-E&F
Planning Commission
(Environment & Forests Unit)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 21st August, 2006

Subject: Constitution of the Task Force on Islands, Corals, Mangroves & Wetlands for the Environment & Forests Sector for the Eleventh Five-Year Plan (2007- 2012).

It has been decided to set up a Task Force on Islands, corals, mangroves & wetlands for the Environment & Forests Sector for the Eleventh Five-Year Plan. The composition of the Task Force will be as under:

1.	Shri J.R.B.Alfred, Director, ZSI	Chairman
2.	Shri Pankaj Shekhsaria, Kalpavriksh, Pune	Member
3.	Mr. Harry Andrews, Madras Crocodile Bank Trust , Tamil Nadu	Member
4.	Dr. V. Selvam, Programme Director, MSSRF, Chennai	Member

Terms of Reference of the Task Force will be as follows:

1. Review the current laws, policies, procedures and practices related to conservation and sustainable use of island, coral, mangrove and wetland ecosystems and recommend correctives.
2. Similarly review the Institutional and individual capacities available to address issues related to conservation and sustainable use of island, coral, mangrove and wetland ecosystems and recommend how they may be adequately strengthened.
3. Assess the current issues and systems of integrating concerns relating to fragile island, coral, mangrove, and wetland ecosystems into other sectors (ministries, departments) and to recommend required new or remedial measures.
4. Review the current EIA laws, policies, procedures and practices as being applied in the island, coral, mangrove and wetland ecosystem context and recommend corrective measure to address significant issues that specifically arise in the context of these fragile ecosystems.
5. Assess the potential impacts of climate change on island, coral, mangrove and wetland ecosystems and recommend required new or remedial measures of dealing with these impacts.
6. Ministry of Environment & Forests will provide basic information and data input to the Task Force as and when required.

7. The Chairperson of the Task Force will be free to co-opt any official / non-official as special invitee for its meeting.
8. The non-official members will be paid TA/DA by the Planning Commission as per SR 190 (a) for attending meetings of the Task Force.
9. The Task Force will submit its report to the Chairman, Working Group on Wildlife, Bio-diversity, traditional knowledge and Animal Welfare by 31.10.2006.
10. Shri M. Ravindranath, Joint Adviser (E&F), Room No. 301, Yojana Bhavan (Tel No. 23096536) will be the Nodal Officer for the Task Force for all further communications.

(Dr S K Khanduri)
Director (Forestry)

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Appendix 12

M-13033/1/2006-E&F
Planning Commission
(Environment & Forests Unit)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 21st August, 2006

Subject: Constitution of the Task Force on Mountain Ecosystems for the Environment & Forests Sector for the Eleventh Five-Year Plan (2007-2012).

It has been decided to set up a Task Force on Mountain ecosystems for the Environment & Forests Sector for the Eleventh Five-Year Plan. The composition of the Task Force will be as under:

1.	Shri R.S. Tolia, Chief Information Commissioner, Uttaranchal	Chairman
2.	Shri Upendra Dhar, Director, GBPIHED, Almora	Member
3.	Director, Wadia Institute of Himalayan Geology, Dehradun	Member
4.	Director, High Altitude Plant Physiology Research Centre, Srinagar	Member
5.	Prof. Jayanta Bandopadhyaya – IIM, Kolkata	Member
6.	Dr. G. S. Rawat, WII, Dehra Dun	Member
7.	Dr. P.S. Ahuja, Director, Himalayan Bioresource Institute, Palampur, H.P.	Member
8.	Major H.P.S. Ahluwalia, Director, IMF, New Delhi	Member
9.	Shri Amba Jamir Director, The Missing Link (TML), Assam	Member

Terms of Reference of the Task Force will be as follows:

1. Review the current status of knowledge on various environmental aspects of conservation and sustainable use of mountain ecosystems and recommend correctives.
2. Assess the potential impacts of climate change on mountain ecosystems and recommend required new or remedial measures of dealing with these impacts.
3. Review the Institutional and individual capacities available to address issues related to conservation and sustainable use of mountain ecosystems and recommend how they may be adequately strengthened.
4. Assess the current issues and systems of integrating concerns relating to fragile mountain ecosystems into other sectors (ministries, departments) and to recommend required new or remedial measures.

5. Review the current EIA laws, policies, procedures and practices as being applied in the mountain ecosystem context and recommend corrective measure to address significant issues that specifically arise in the context of these fragile ecosystems.
6. Ministry of Environment & Forests will provide basic information and data input to the Task Force as and when required.
7. The Chairperson of the Task Force will be free to co-opt any official / non-official as special invitee for its meeting.
8. The non-official members will be paid TA/DA by the Planning Commission as per SR 190 (a) for attending meetings of the Task Force.
9. The Task Force will submit its report to the Chairman, Working Group on Forests by 31.10.2006.
10. Shri M. Ravindranath, Joint Adviser (E&F), Room No. 301, Yojana Bhavan (Tel No. 23096536) will be the Nodal Officer for the Task Force for all further communications.

(Dr S K Khanduri)
Director (Forestry)

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Appendix 13

M-13033/1/2006-E&F
Planning Commission
(Environment & Forests Unit)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 21st August, 2006

Subject: Constitution of the Task Force on Social and Economic Aspects of Conservation and Restoration for the Environment & Forests Sector for the Eleventh Five- Year Plan (2007-2012).

It has been decided to set up a Task Force on Social and economic aspects of conservation and Restoration for the Environment & Forests Sector for the Eleventh Five-Year Plan. The composition of the Task Force will be as under:

1.	Prof. Kanchan Chopra, IEG, Delhi University	Chairman
2.	Shri Achyut G. Gokhale, New Delhi	Member
3.	Prof. Gopal Kadekodi, Director, ISEC, Bangalore	Member
4.	Dr. Madhu Sarin, Chandigarh	Member
5.	Dr. Mahesh Rangarajan, New Delhi	Member

Terms of Reference of the Task Force will be as follows:

1. Deliberate on the various social, economic and conservation aspects of the Biological Diversity Act and suggest a roadmap for its implementation conforming to the socio-economic and management objectives emanating from the Convention on Biological Diversity, *in particular the ecosystem approach, and the provisions for benefit sharing under article 8(j).*
2. Recommend a strategy for greater involvement of folk taxonomists and ecologists in forestry, wildlife and environment research and application of such research towards development of management plans.
3. Evaluate the role of local bodies, which have the responsibility for management of local natural resources, in promoting sustainable development.
4. Recommend ways of enhancing people's participation in sustainable management of water, fisheries and other related resources.
5. Examine ways of creating positive incentives for conservation and regeneration of biodiversity resources, and for sustainable management of natural resources through payment of service charges following the Costa Rica model for payment of service charges for watershed conservation services.

6. Examine the possibilities of extending programmes of joint forest management to protected areas.
7. Review the experience of the participatory forest management approach and recommend ways to consolidate the regime in order to generate empowered commitment among stakeholders for conservation and protection of forests. This may include integration of local self Governments, community Institutions and delivery mechanisms through instruments of empowerment like *PESA*, the provisions for functioning of Biodiversity Management Committees under the Biological Diversity Act and the Right to Information Act.
8. Suggest ways and means of optimizing the symbiotic relationship between forest dwellers and forest by promoting efficient and quality value addition for realization of gainful employment opportunities through development and sustainable use of medicinal plants, bamboo and canes and other Non-timber forest produce (NTFP) by tribals and other forest dweller communities.
9. Ministry of Environment & Forests will provide basic information and data input to the Task Force as and when required.
10. The Chairperson of the Task Force will be free to co-opt any official / non-official as special invitee for its meeting.
11. The non-official members will be paid TA/DA by the Planning Commission as per SR 190 (a) for attending meetings of the Task Force.
12. The Task Force will submit its report to the Chairman, Working Group on Forests by 31.10.2006.
13. Shri M. Ravindranath, Joint Adviser (E&F), Room No. 301, Yojana Bhavan (Tel No. 23096536) will be the Nodal Officer for the Task Force for all further communications.

(Dr S K Khanduri)
Director (Forestry)

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Appendix 14

M-13033/1/2006-E&F
Planning Commission
(Environment & Forests Unit)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 21st August, 2006

Subject: Constitution of the Task Force on Urban Environmental Issues for the Environment & Forests Sector for the Eleventh Five-Year Plan (2007-2012).

It has been decided to set up a Task Force on Urban Environmental Issues for the Environment & Forests Sector for the Eleventh Five-Year Plan. The composition of the Task Force will be as under:

1. Shri KC Shivaramakrishnan, RK Puram, New Delhi	Chairman
2. Dr. Shreekant Gupta, Director, National Institute of Urban Affairs, New Delhi	Member
3. Shri Miloon Kothari, B-28 Nizamuddin East, New Delhi	Member
4. Ms Sharvasree Gokhale, Principal Secretary, Env., Maharashtra	Member

Terms of Reference of the Task Force will be as follows:

1. Review the current laws, policies, procedures and practices related to management of urban environmental issues and recommend correctives.
2. Similarly review the Institutional and individual capacities available to address urban environmental issues and recommend how they may be adequately strengthened.
3. Explore ways of promoting the much needed inter-sectoral dialogue amongst Environment and Forest, Urban Development and Transport Ministries to address urban environmental issues.
4. Examine issues related to schemes/programmes with greatly overlapping objectives, with different Ministries, at Government of India level, to bring efficiency in implementation of programmes, to avoid duplication in funding from different Ministry and to help in achieving objectives in integrated manner, in particular with respect to NRCD, JNNURM, UIDSSMT.
5. Review the current EIA laws, policies, procedures and practices as being applied in the urban context and recommend corrective measure to address significant issues such as population and vehicular density, parking spaces, acceptable noise levels, and play grounds and spaces with green cover.
6. Ministry of Environment & Forests will provide basic information and data input to the Task Force as and when required.

7. The Chairperson of the Task Force will be free to co-opt any official / non-official as special invitee for its meeting.
8. Official member of the Task Force will be paid TA/DA by their respective Departments as per the rules of entitlement applicable to them. The non-official members will be paid TA/DA by the Planning Commission as per SR 190 (a) for attending meetings of the Task Force.
9. The Task Force will submit its report to the Chairman, Working Group on Environment by 31.10.2006.
10. Shri M. Ravindranath, Joint Adviser (E&F), Room No. 301, Yojana Bhavan (Tel No. 23096536) will be the Nodal Officer for the Task Force for all further communications.

(Dr S K Khanduri)
Director (Forestry)

Copy forwarded to**:** All Members of the Working Group.

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