Report of

Working Group

Forests and Sustainable Management of Natural Resources

Twelfth Five Year Plan (2012-2017)

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Planning Commission
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Acronyms

ACU	Adult Cattle Unit
AFDP	Accelerated Fodder Development Programme
ANR	Assisted Natural Regeneration
ASEAN	The Association of Southeast Asian Nations
ASHA	Accredited Social Health Activist
BIS	Bureau of Indian Standards
BSI	Botanical Survey of India
C&I	Criteria & indicator
CAG	Comptroller and Auditor General
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
CBD	Convention on Biological Diversity
CBFO	Capacity Building of Forest Officials
CBNRM	Community-based natural resource management
CCD	Convention to Combat Desertification
CDH	Conservation, Development and Harvesting
CDM	Convention on Climate Change
CITES	Convention of International Trade in Endangered Species
CoE	Centre of Excellence
COFO	Corporate Social Responsibilities
CPM	Computerised Project Monitoring
CPRs	Common Property Resources
CSIR	Council of Scientific and Industrial Research
CSO	Civil Society Organizations
CTFs	Conservation Trust Funds
DDP	Desert Development Programme
DEA	Department of Economic Affairs
DFE	Directorate of Forest Education
DFID	Department for International Development
DIC	District Industries Centre
DOE	Department of Environment
DoPT	Department of Personnel and Training
DPAP	Drought Prone Area Programme
EAP	Externally Aided Projects
EU	European Union
FAO	Food and Agriculture Organisation
FCA	Forest Conservation Act
FD	Forest Department
FDA	Forest Development Agency
FPC	Forest protection committee
FRA	Scheduled Tribe & Other Traditional Forest Dwellers(Recognition of Forest Rights) Act
FRLHT	Foundation for Revitalisation of Local Health Traditions
FSI	Forest Survey of India
FTC	Forest and Tree Cover
FYP	Five Year Plan
GCC	Girijan Cooperative Corporation
GDP	Gross domestic product
GEF	Global Environment Facility
GIM	Green India Mission
GIMD	Green India Mission Document
GIS	Geographical Information System

GoI	Government of India
GPS	Global Positioning System
GS	Gram Sabha
GTZ/GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HDI	Human Development Index
HRD	Human Resources Development
IC	International Cooperation
ICAR	Indian Council of Agricultural Research
ICFRE	Indian Council & Forestry Research & Education
ICT	Information and communications technology
IEC	Information, Education, and Communication
IFA	Indian Forest Act
IGNFA	Indira Gandhi National Forest Academy
IIFM	Indian Institute of Forest Management
INBAR	International Network for Bamboo and Rattan
IPIRTI	Indian Plywood Industries Research and Technology Institute
ITTO	International Tropical Timber Organization
IUFRO's	International Union of Forest Research Organizations
JFM	Joint Forest Management
JFMCs	Joint Forest Management Committees
JICA	Japan International Cooperation Agency
LISS IV	Linear Imaging Self-Scanning System
LVA	Lok Vaniki Act
LWE	Left Wing Extremism
M&E	Monitoring & Evaluation
MDF	Moderately Dense Forests
MDG	Millennium Development Goals
MDGs	Millennium Developmental Goals
MFF	Multi-stakeholder Forestry Forum
MFP	Minor forest produce
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Act
MIS	Management Information System
MoPR	Ministry of Panchayati Raj
MoTA	Ministry of Tribal Affairs
MSP	Minimum Support Price
MTE	Mid Term Evaluation
NABARD	National Bank for Agriculture and Rural Development
NAEB	National Afforestation and Ecodevelopment Board
NAP	National Afforestation Program
NBA	National Biodiversity Agency
NEP	National Environmental Policy
NFC	National Forest Commission
NFP	National Forest Policy
NGO	Non-government organization
NIC	National Informatics Centre
NMPB	National Medicinal Plants Board
NRAA	National Rainfed Area Authority
NTFPs	Non-timber Forest Products
NWFP	National Wood Forest Products
NZP	National Grazing Policy
OF	Open Forests
PAs	Protected Areas
PDS	Public distribution system
PES	Payment for Ecosystem Services
PESA	Provision of Panchayats (Extention to Schedule Areas) Act
PPC	Permanent Parliamentary Committee
PPP	Public Private Partnership
PSUs	Public Sector Units
R&D	Research and Development
RCDC	Regional Centre for Development Cooperation

REDD	Reducing Emissions from Deforestation and Forest Degradation
RKVY	Rashtriya Krishi Vikas Yojana
SAARC	South Asian Association for Regional Cooperation
SAWEN	South Asia Wildlife Enforcement Network
SEZs	Special Economic Zone
SFDA	State Forest Development Agency
SFDC	State/ Forest Development Corporation
SFDs	State Forest Departments
SFIs	State Forest Institutions
SFM	Sustainable forest management
SFTs	State Forest Training School
SHG	Self Help Group
TDCC	Tribal Development Cooperative Corporation
TEEB	The Economics of Ecosystems and Biodiversity
TERI	Tata Energy Research Institute
ToR	Terms of Reference
ToT	Training of trainers
TPP	Twenty Point Programme
TRIFED's	Tribal Cooperative Marketing Development Federation of India Limited
UBFDB	Uttarakhand Bamboo & Fibre Development Board
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Naions Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCC	United Nations Framework Convention on Climate Change
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
USAID	United States Agency for International Development
VAT	Value added tax
VDF	Very Dense Forest
VFPCs	Village Forest Protection Committees
VP	Van panchayat
VSSs	Vana Samrakhshana Samities
VVKs	Van Vigyan Kendras
WII	Wildlife Institute of India
WWF	World Wildlife Fund

Foreword

The report of the Working Group on Forestry and Sustainable Management of Natural Resources is a collective effort to introduce and explain the concerns and challenges faced by the sector and the strategy to address them in the Twelfth Five Year Plan. Forests can no longer be considered as nature's factory that produces wood alone. The focus of the report is the contemporary relevance of the forests, its immense potential and relative neglect. This sector has suffered from financial constraints and there is a growing apprehension that the socio economic relevance of the forests would be severely limited if the disadvantaged sections continue to be restricted by such constraints. The crucial role of forests in socioeconomic inclusiveness is hard to exaggerate, and if used with deliberation and commitment can be extremely important in resisting economic inequities and reducing poverty and deprivation.

To prepare a roadmap for Sustainable Management of Natural Resource of the country with an approach for more inclusive and sustainable growth in the 12th Five Year Plan was not an easy task. After extensive discussion we felt the need for the formation of five sub groups namely Forestry, Non-Timber Forest Produce, Fodder and Pasture Management, Institutional and Technology Management, and International Cooperation and Law.

I take the opportunity to extend my sincere thanks and gratitude to all the Members whose commitment and coordinated efforts formed the basis of the Group Report. It has been our prime concern to meet the expectations of the people and every effort has been made to accommodate divergent views of all stake holders; at the same time the group did not fail to capture the writing on the wall particularly on the issue of Left Wing Extremism, implementation of FRA, PESA, JFM and Biodiversity Acts. The Group has examined the contributions the forestry sector can make in the emerging national and international scenario and has made an effort to highlight the enormous potential hidden in conservation and development of forests. It also gives me pleasure to state that the group report is immensely enriched with the valuable inputs, innovative ideas and out of box suggestions received from all the Members of the Working Group.

I am much indebted to Planning Commission, particularly Dr. K. Kasturirangan, Mr. Ranjan Chatterjee and Dr Indrani Chandrashekhar for the opportunity to share the platform with them for formulation of the Report. My heartfelt thanks to Smt Archana Singh Katiyar and Shri Biswajit Banerjee for their sincere efforts throughout the assignment. I am grateful for the joint support from Shri A.K.Bansal and Shri R.K.Goel; without their contribution and co-operation, this task could not have been completed successfully. Finally, I must also record my appreciation for the members of the drafting committee for compiling and editing a very comprehensive and excellent report, placing forward all the crucial components expressed by the group.

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Executive Summary

1.1. In order to achieve faster, more inclusive and sustainable growth, the bulk of improvement must come from a substantial improvement in land productivity and rising income of landless poor through livelihoods opportunities. **It is here that the role of forestry assumes a hitherto unrecognized yet important dimension.**

1.2. As far as improvement in land productivity is concerned, there are many reports to show that the watershed interventions in the forest areas have led to increase in water availability in the adjoining agricultural fields leading to change in cropping pattern, intensity and enabling multi-cropping with increased productivity and yield.

1.3. Enhancing incomes of landless poor through livelihoods activities, it is estimated that nearly 27% of the total population of the country, comprising about 300 million rural people, depend partly or completely on forests for livelihood. NTFP contributes to about 20% to 40% of the annual income of forest dwellers who are mostly disadvantaged and landless communities with a dominant population of tribal. About 270 million tonnes of fuel wood, 280 million tonnes of fodder, over 12 million cubic meter of timber and countless non-timber forest products are removed from forests annually. Forests meet nearly 40% of the energy needs of the country, of which more than 80% is utilized in rural areas mainly through removal from forests by head load or otherwise.

1.4. Thus, the forestry sector has the potential to play a greater role in the equitable and inclusive growth along with protecting natural resource base for ensuring sustainable development. Forest development provides an opportunity to broad-based development and poverty reduction of the forest-dependent communities in tune with Millennium Development Goals, 2015 as well as addressing global concerns of climate change and conservation of biological diversity. **One of the important issues identified in the 12th plan which requires focused attention therefore, is securing ecology of watershed and catchments.**

1.5. The other Ecological Services provided by forests are regulation of hydrological cycle, soil & water conservation, flood control, carbon sequestration, fresh air generation, climate stabilization, bio-diversity conservation and amelioration of overall environment including urban and semi-urban amenity, eco-tourism etc. Forest plays a vital role in sequestration of carbon and Carbon stocks in our forests stood at 6662 m MT in the year 2005.

1.6. The sector however, faces serious biotic stress. With 2.4% of world's geographical area, India at present is supporting 16% of global human population and 18% of cattle population. The per capita forest in India is dismally low at 0.06 ha. as compared to world average of 0.64 ha. MoEF report on "India State of Forest, 2009" has indicated that unsustainable withdrawals of fuel wood, timber and fodder from forest areas is causing degradation of forests in India as gap in demand & supply of fuel wood alone is about 86 million tones, Two million ha of forest areas are subjected to shifting

cultivation, annual diversion of forests under FCA 1980 is about 25000 ha per annum besides honey-combing of forests due to encroachments and recognition of forest dwellers' rights on the principle of 'As is where is basis'.

1.7. Recognizing the importance of Forests, the Eleventh Finance Commission had recommended implementation of scientific work plans for management of forests. The Twelfth Finance Commission recognized that the entire nation has responsibility to maintain the forests as a national wealth, and recommended a grant of Rs.1000 Crore spread over the period of 2005-10 over and above regular allocations for maintenance of forests. The thirteen Finance Commission has recognized the paramount need of taking this grant further and recommended a grant of Rs 5000 crore spread over 2010-15. Invariably, the various Finance Commissions has recognized the need for higher allocation for the forestry sector. While the National Forest Commission has recommended allocation of 2.5% of national budget to the forestry sector, the Planning Commission in the 11th Plan Mid Term Evaluation also recommended "increasing the allocation of at least 5% of annual state and central sector outlay to the forestry sector preferably by 12th Plan". **However, the allocation for the environment, forests & wildlife has remained below 1%** and Forest and wildlife sector received **only 0.4% to 0.5% of the overall 11th FYP allocation. Besides, t**he tendency in the states to reduce the state funding to forestry considering grants like CAMPA and from 1^{3th} Finance Commission as part of regular allocation has resulted in loss of focus on restoration of degraded forest lands In many of the states, funding from central government and externally aided projects remained the main plan resources for afforestation. However the State Government must treat External Assistance, Campa Funds, Thirteenth Finance funds, etc. as additionality .

1.8. The review of afforestation programme clearly indicated that fund availability to the major afforestation programme (National Afforestation Programme) of the Central Government has not only been stagnating but diminishing in the 11th Plan in spite of increasing costs of inputs, which gets reflected in the decreasing annual targets set for afforestation. The National Development Council stipulated monitorable target for the forest cover at 25% and 33 % by the end of 10th and 11th plan respectively. However, the targets set in the National Forest Policy **were not provided matching allocation which affected the afforestation drive aimed to achieve the targeted growth in forest cover** and affected adversely the ecological stability and environmental stability in the long run which **in turn, gets reflected in the vicious circle of perennial drought and floods witnessed in the country, years after years**. If the present rate of plantation from this allocation has resulted in an increase of 0.5% in the FTC during 2005-07(FSI-2009), the rate has to be increased by at least 10 fold to achieve an increase of 5% which would be visible in the satellite report after 3 to 4 years only. **Since plantations during 11th plan are not substantial, FTC may show nil or marginal increase during 12th plan. With the current rate of withdrawal of forest resource and current level investment, it may not be surprising that FTC growth may become** negative very soon.

1.9. One causative factor for apathy reflected in allocation of financial resources to the sector is that the **contribution of this sector to GDP has been underestimated at** 1.0 to 2.5% only as **a range of non-priced as well as undervalued products such as fuel-wood, fodder and Non-timber Forest Products (NTFPs) including medicinal plants that are exchanged in an informal manner are not measured**. Moreover **the ecological services contributed by the forests are totally ignored** for income accounting.

1.10. Apart from the financial constraints in the forestry sector , its spin off effects are visible in lack of development of appropriate capacity building, access to technology and policy constraints. The approach to improve forest cover must encompass both canopy cover improvement (intensification) and extension of afforestation of degraded forest lands including lands which have lost cover due to mining in past. **While a comprehensive approach encompassing horizontal as well as vertical**

use of space is needed in forest areas, forestry extension can only be achieved by adopting farm and agro forestry practices.

1.11. There is also a need to revisit the existing monitoring and reporting systems for the implementation and achievements of physical targets. The findings of physical monitoring of plantations raised in a particular year may not match with the satellite based monitoring particularly for the same year as it takes minimum four to five years for a plantation to develop a canopy which can be detected by high resolution satellite like CISS IV. Concurrent physical monitoring result on survival percentage therefore should be taken into account while reporting the achievements.

1.12. In addition to survival %, other important aspects which need to be introduced for monitoring are outcomes like growth parameters, ground flora, improvement in water ground water table and socio-economic indicators like participation of local community in the programs implemented through JFM committees and level of empowerment of the local people.

1.13. The Mid Term Appraisal of Eleventh Plan has pointed out that at least a preliminary version of SFR should be printed within a year of collection of data in the scale of 1:10,000 to start with. **Though there is need to go for mapping in the scale of 1:10000 and for annual cycle of assessment of forest cover in place of present biennial system of reporting in the country, it will be possible only when all SoI reference maps and geo-referenced revenue maps are available at these scales besides enhancing the infrastructure, manpower and budgetary support to FSI by at least 5-6 times of present level.**

1.14. For growth to be inclusive, it must create adequate livelihood opportunities and add to decent employment commensurate with the expectations of a growing labour force. The NTFP sector which at present provides livelihood in varying degree to 275 million disadvantaged poor mainly tribal, has been neglected since long. Absence of a comprehensive policy and harmonization of relevant acts and rules has adversely impacted healthy growth of NTFP. Depleting resource base, due to unsustainable harvesting practices, has been the major ecological challenge in the NTFP sector with potential impact of climate change. On the other hand, poor R&D focus, inadequate post-harvesting practices, insufficient funds & infrastructure, and unorganized nature of the trade have made it financially vulnerable particularly for the primary collectors whereas the differential and sometimes contradictory tax & transit regimes in the states have adversely affected not only the trade but even the production of NTFPs.

1.15. The grazing lands, considered to be one of the most productive ecosystems in the Indian subcontinent have been at the receiving end for long. As per an estimate, the country's pastures have reduced from 70 million ha. in 1947 to 38 million ha. in 1997. The remaining grazing lands have either been degraded or are in the process of degradation with average carrying capacity of less than 1 Adult Cattle Unit(ACU) . There has been management neglect and many of the ecologically sensitive pasture lands are on the verge of no return. Lack of comprehensive grazing cum fodder policy at national and state level and absence of any nodal agency to steer and coordinate the grassland and fodder development programme is the major cause of degradation and diversion of grazing lands.

1.16. Forestry sector has emerged as an important component in strategy for mitigation and adaptation of climate change at national as well as global level. India is signatory to major international conventions including both legally binding and non legally binding instruments. There is a need for a more systematic, dynamic and futuristic approach to international negotiations and programmes. This would require **capacity building of personnel for ensuring better negotiating skills and strengthening of institutions dealing with natural resource management in a coordinated manner to promote effective compliance, enforcement and monitoring international commitments.**

1.17. In the backdrop of above factors, the mandate of institutes involved in forestry research must also multiply and the forestry research should get adequate focus in order to meet new challenges especially addressing livelihood needs of the forest dependent communities including NTFP's issues arising out of **climatic change including mitigation and adaptation, etc. The sector should also capitalise on the gains of new space based technological advancements** like GPS, GIS and computational and analytical systems at hand for real time monitoring of forest fires, forest cover and growing stock in the sensitive areas and enable the system to make effective intervention, execution and **technological based monitoring. The professionalism in the forestry sector also needs to be broad based to bear multifunctional responsibilities**.

1.18. In the backdrop of above, the Working Group recommends the following thrust areas and strategies for the 12th plan.

1. Quantitative and qualitative improvement in Forest Cover and Carbon sequestration:
2. Protection of Forests, River Basins and Bio-diversity for Ecological Security of the nation and Ecosystem Services to the people
3. Shelter/Green-belt Development for Disaster Risk Management and Climate Change Adaptation
4. Greening of under-utilized and Problematic land to combat desertification
5. Participatory Management
6. Agro/ Farm-forestry to bridge the gap between domestic demand and supply
7. Rehabilitation of Grazing and pasture land including formulation of National Grazing Policy
8. Sustainable Non-Timber Forest Product (NTFP) Management and strengthening Livelihood of forest depended communities.
9. Urban and Recreational Forestry in urban and peri-urban areas
10. Productivity of Lands and Management of Invasive Species
11. Habitat Improvement and management of man-animal conflicts in Forests
12. Training and Capacity Building of Multiple Stakeholders
13. Strengthening Science and Technology for Forestry and Climate Change Research, Extension and Networking
14. Strengthening National Information Repository and collaborative Institutional Net-Work for Forestry and Biodiversity
15. Cross-sectoral synergy and convergence of integrated execution of schemes
16. International Cooperation and Commitment for Sustainable Natural Resource Management to achieve Millennium Development Goal.
17. Development of Integrated Investment Framework and innovative augmentation of finances to the Sector.
18. Streamline and leverage implementation of FRA, PESA and Biodiversity Acts through Amendments of Forestry Working Plan Code
19. Revamp and strengthen the institutional mechanism for effective delivery
20. Scientific and transparent GPS based evaluation and monitoring in GIS format and social auditing.

Proposed Schemes under 12th Five Year Plan

Ongoing Schemes

1. National Afforestation Programme (NAP) Scheme
2. Intensification of Forest Management Scheme

National Afforestation Programme (NAP) Scheme:

1.19. Under the scheme, the FDA has been conceived and established as a federation of Joint Forest Management Committees (JFMCs) at the Forest Division level to undertake holistic development in the forestry sector with people's participation **including women as well as local institutions**. The village is reckoned as a unit of planning and implementation and all activities under the programme are conceptualized at the village level. From the year 2010-11, State Forest Development Agency (SFDA) has been constituted at the State level to smoothen the fund flow to the FDAs. A substantial increase in allocation from Rs. 2000 crores in 11th Plan to Rs. 13500 Crores in XIIth plan is being proposed. In this proposal, enhanced provisions have been proposed for soil and moisture conservation to deal with different agro-climatic zones in the country including shifting cultivation areas in North East and other parts of the country, strengthening of JFM, entry point activities with a 'care and share' concept apart from keeping requirements of community foresters from among local youths for conservation and management of forests. The scheme has been expanded by including provisions for establishment cost of NAEB HQ, Communication strategy and Awareness component besides Support to regional centres of NAEB, which is part of existing NAEB Scheme.

Intensification of Forest Management Scheme:

1.20. The Scheme of Intensification of Forest Management intends to address both the general problems of forest protection and area specific requirements for managerial interventions. The components of the scheme include protection of forests, modernize Forestry administration by supporting infrastructure, use of modern technology, mobility of forestry force, improving communication, prevention and control of forest fires, consolidation of forest boundaries, control and eradication of forest invasive species, conservation of unique vegetation and ecosystems, preparing for meeting specific challenges being faced in the forests, preparation of working plans and involving people in forest management and protection of forests. A substantial increase in allocation from Rs. 335 crores in 11th Plan to Rs. 2000 Crores in XIIth plan is being proposed. The eco-task force scheme for involving retired defence / paramilitary personnel in afforestation in remote areas has also been merged in this proposed scheme. , It is also proposed to provide special allowance to the staff engaged in working plan and research in the states.

New Schemes

1. Scheme for Sustainable Livelihoods through NTFP Management
2. Capacity Development of the Gram Sabha including JFMCs and other Stakeholders
3. Green India Mission Scheme
4. Rangeland and Silvi-pasture Development Scheme
5. Satellite based Forest Resource Assessment and technological based M & E
6. Forestry Institutional and Technology Management Scheme

Scheme for Sustainable Livelihoods through NTFP Management:

1.21. A sum of Rs. 6590 crores has been proposed for this scheme, which include provisions for resource management, value addition, marketing, minimum support price, capacity building and IEC, research and development, policy and institutionalization for development of the sector for enhancement of the livelihood options of the people especially in north-east, mountain areas and left wing extremist affected areas.

Capacity Development of the Gram Sabha including JFMCs and other Stakeholders:

1.22. To ensure decentralized and democratic forest governance on a sustained basis and to enable forest-fringe poor and tribal realize sustainable livelihoods outcome, **JFMC are required to be adequately and strategically revitalized and empowered. Involvements of women, who are the major gatherers of forest produce, are to be prioritized in forest management and regeneration operations**. This will require adequate capacity building of JFMC members in forest resource management, livelihood issues, community mobilization and decentralized governance on a large scale and a new scheme for their capacity building has been proposed with an outlay of Rs. 1500 crores.

Green India Mission Scheme:

1.23. Government of India has taken initiatives by formulating National Mission for a Green India (GIM) as one of the eight Missions under the National Action Plan on Climate Change (NAPCC). The Mission has been approved by the Prime Minister's Council on Climate Change Total Mission cost is Rs.46,000 crore over ten years starting from the year 2012-13, and coinciding with the 12th and 13th Five Year Plan Period. The Green India Mission (GIM) has been conceived as a multi-stakeholder, multi-sectoral and multi-departmental mission, GIM recognizes that climate change phenomena will seriously affect and after the distribution, type and quality of natural resources of the country and the associated livelihoods of the people. GIM puts the "greening" in the context of climate change adaptation and mitigation, meant to enhance ecosystem services like carbon sequestration and storage (in forests and other ecosystems), hydrological services and biodiversity; along with provisioning services like fuel, fodder, small timber through agro and farm forestry, and NTFPs.

1.24. During the 12th five year plan, a provision for Rs. 23000 crores have been kept for the GIM for increased forest and tree cover on 2.5 m. ha area (non forest through agro / social / farm forestry), improved quality of forest cover on another 2.5 m ha area, improved ecosystems services, increased forest based livelihood income and enhanced annual CO2 sequestration.

Rangeland and Silvi-pasture Development Scheme:

1.25. Livestock rearing is one of the major occupations in India and is making significant contribution to the country's GDP but as per estimates, the country's pastures have reduced from about 70 million ha in 1947 to just about 38 million ha in 1997. One of the recommendations under the Forestry sector's mid-term review of 11th Plan was that 'grassland and other ecologically important eco-systems need to be conserved. Rangeland and Silvi-pasture Development Scheme" with a proposed outlay of Rs. 900 crores has been formulated to take care of the aspirations of the local people living in and around forests. Rehabilitation and productivity enhancement rangelands and common / revenue lands around forest areas, fodder storage/ value addition facilities, development of Centre of Excellence on fodder and pasture management, germ plasm banks and nurseries etc. are the major components of the scheme.

Satellite based Forest Resource Assessment and technological based M & E:

1.26. An amount of Rs. 1000 crores has been proposed for this scheme during 12th Plan period. In order to achieve the adequate level in the monitoring and evaluation system, a dedicated forest satellite for monitoring forest cover, NTFP resource, bio-diversity on periodical basis etc. and change monitoring has been proposed. The improved real-time, web-based monitoring system under this scheme would be extended to other schemes by strengthening the Forest Survey of India (FSI) and Remote Sensing / Geomatics Units in the states.

Forestry Institutional development and support:

1.27. The role of the forests in providing food and ecological security becomes all the more important, if India has to sustain 9% plus rate of growth in our economy. In this regards the setup **for Forestry Institutions and the professionalism in the forestry sector would also need to be more broad based so as to bear multifunctional responsibilities in future.** To meet the challenges as enumerated above, the foremost requirement is to strengthen the forest research infrastructure in the states and to build scientific,ecological thinking among masses through continuous extension strategies. Support to forestry institutions for capacity building and motivation of forestry personnel including provisions for fellowships, technology up-gradation, forestry database and knowledge management, infrastructure development of the forestry institutions, forestry research in the emerging field keeping in view the needs of the society and anticipating the requirements in the near future to make it meaningful, organization of forest congress, development of new institute for Sustainable Forest Management and Forest Policy and payment of contributions to international institutions are some major part of the scheme. Proposed outlay of Rs. 3000 crores has been proposed for implementation of this scheme in the 12th plan.

Item No.	Proposed Scheme/ Program during 12th Plan	Proposed Demand (Rs. Crores)	Proposed Physical Targets
1.	**Ongoing Schemes**		
1.1	National Afforestation Programme (detailed breakup annexed at 1.1)	13500	2.0 million Ha. Afforestation and ecorestoration including shifting cultivation areas by adopting local, specific, viable model, Soil & Moisture Conservation including water harvesting structures and Eco-development for people residing in forests, treatment of problem soil, coastal and shelter belt plantation. Creation of a cadre of trained Community Foresters (About 50000) for activities \ programmes \ schemes of forest conservation and management including NTFP's. The scheme would also include provisions for establishment cost of NAEB HQ, Communication strategy and Awareness component and support to regional centres of NAEB.
1.2	Intensification of the Forest Management	2000	Forest Fire Management, Boundary Demarcation including areas allotted under FRA, Forest Infrastructure, Control of Invasive Alien Species including their utilization as a resource through R&D, Strengthening of Working Plan Mechanism for sustainable livelihood of people and Conservation of Forest Resources incentives to working plan and research staff in the state. Involvement of retired defence / paramilitary personnel in eco-restoration has also been envisaged.
2.	**New Schemes**		
2.1	Sustainable livelihoods through NTFP and Bamboo Management	6590	Conservation and development of NTFP resource over 6 lakh Ha.,Value addition, Marketing Support, Minimum Support Price and overall management of NTFP and Bamboo Sector

2.2.	Capacity Development of the Gram Sabha including JFMCs and other stakeholders	1500	Capacity building of members of one lakh JFM Committees and Gram Sabha through Master Trainers in each Forest Divisions for management & conservation of forests.
2.3	Green India Mission	23000	Increased FTC on 2.5 million Ha and improvement in Quality of Forest Cover over another 2.5 million Ha.
2.4	Rangeland and Silvi-pasture management	910	Rehabilitation and productivity enhancement rangelands and common / revenue lands around forest areas, fodder storage/ value addition facilities, strategic research, education, capacity building and extension activities on fodder and pasture management, germplasm banks and nurseries etc.
2.5	Satellite based Forest Resource Assessment and technological based M & E	1000	To put in place a system of technology based collection of base line data, monitoring & evaluation of forestry schemes, including GIS based monitoring of areas allotted under FRA 2006 to prevent their enchrochments & programmes in states and central level.
2.6	Forestry Institutional development and support	3000*	**Grants-in-aid to institutions**, Support to forestry institutions engaged for capacity building and motivation of forestry personnel including provisions for fellowships, technology up-gradation, Forestry database and knowledge management, infrastructure development of the forestry institutions, forestry research, Forest Congress, New institute for Sustainable Forest Management and Forest Policy and payment of contributions to international institutions.
	Total:	51500	

*excludes corpus through CAMPA proposed by subgroup

Expected Outcome:

1.28. The implementation of the forestry sector schemes recommended in previous para would result in increase in forest and tree cover by about 3.5 million ha and improvement in quality of forests over another 3.5 million ha. This will take India's forest & tree cover to around 82 million ha, which will be above 25% of geographical area of the country. Further, the protection & conservation measures envisaged will improve the quality of forest cover in terms of density, growing stock, quantum of carbon sequestered by way of implementation of these schemes. Improvement in quality and area of FTC would enhance eco-system services like carbon sequestration, hydrological services and bio-diversity conservation in addition to increase in tangible goods like fuel-wood, fodder, timber and NTFPs from forests. **The implementation of the forestry and wildlife sector schemes would benefit people living in and around forests especially tribals and forests dwellers through employment generation & low key economic activities, so vital for respectable sustenance as well as augmentation of income**.

1.29. From the year 1995 to 2005, carbon stock in forests of the country were estimated to increase from 6245 million tonnes to 6662 million tonnes, registering in annual increment of 37 million tons of Carbon**. With the implementation of proposed forestry sector schemes, annual carbon sequestration will enhance at least by about 50 million tonnes at the end of the 12th plan which will increase with the maturity till it attains mean annual increment & rotation period.**

1.30. Forests are also **essential for maintaining favourable conditions for sustainable agriculture productivity and farmers' income is expected to increase by soil and moisture conservation works. Forests are also important for maintaining underground water table, for recharging the aquifers and for maintaining of water in rivers and rivulets. This has been**

established in various studies of catchments like Shimla forest catchment for securing water supply to Shimla town and Borivali National Park forests for maintaining water supply to the part of the Mumbai city.

1.31. Implementation of the recommended forestry schemes would augment forest based livelihood income of the people living in and around forests.

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2

Constitution of Working Group and Sub Groups

2.1. The Working Group on Forestry and Sustainable Management of Natural Resources was set up by Planning Commission under the chairmanship of Dr. P. J. Dilip Kumar, Director General of Forests & Special Secretary, Ministry of Environment and Forests to formulate proposals for 12th Five Year Plan. The composition and Terms of Reference for Working Group are given in Annexure 2. The Working Group met on 25.07.11, 16.08.11 and 16.09.11. The Minutes of the meeting held are at Annexure 7, 8 and 8 respectively.

2.2. To facilitate the entrusted task, the Working Group constituted 5 subgroups for critical analysis and examination of different aspects of Forestry Programmes under specific themes as follows:

S. No	Sub Group	Chairman	Co-Chairman	Theme
1	Sub Group I	Shri A.K. Bansal	Shri R.K. Goel	Forestry
2	Sub Group II	Dr. R.B.S. Rawat	Shri A.K. Singh	Non Timber Forest Produce
3	Sub Group III	Shri S. Roy	Dr. S.K. Nanda	Fodder and Pasture Management
4	Sub Group IV	Dr. V.K.Bahuguna	Dr. A.K. Mukherjee	Institutional and Technology Management
5	Sub Group V	Shri Jagdish Kishwan	–	International Cooperation and Law

3

Background

3.1. The 12th plan targets a growth rate of over 9% as compared to likely achievement of 8.2% for the 11th Plan and 7.8% in the tenth plan. In addition to faster growth, the plan also aims at more inclusiveness and sustainability. The achievement of 7 major flagship programmes aiming at inclusiveness in the 11th plan is no doubt impressive but these have acted only at margin. The bulk of improvement therefore, must come from a substantial improvement in land productivity and rising income of landless poor through livelihood opportunities[1]. At present average forest productivity and average agricultural productivity, both are stagnating at 1 ton per ha. **Thus there is a direct correlation between forests and agricultural productivity. Forest is therefore, foster mother of Agriculture and agriculture productivity cannot be enhanced without conserving and developing forests It is here that the role of forestry assumes a hitherto unrecognized yet important dimension.**

3.2. There has been a decline in net sown area of approximately 2 million ha. over the past decade. Apart from that large chunks of land including forest and private lands are wastelands. Though there have been varying estimates of the wasteland in the country, Society for Promotion of Wastelands Development, (SPWD) in nineties estimated 129 MHA **of which 70 m Ha is private wastelands. Large quantum of private wastelands coupled with the increasing population pressure & the need to meet their multifaceted requirements necessitates the need for large scale scientific and management interventions in such lands to improve their productivity.**

3.3. An important contribution of forests by way of improving the underground water regime is, its impact on agricultural productivity. Irrigation accounts for 80% of our total water usage and 60% of irrigation water comes from ground water. India is a water stressed country as water availability is at 1050 cu m against a water scarce indicator of 1000 cu m2. Evidence also suggests that we are resorting to increased use of water in an unsustainable manner pushing the country to a grave crisis. The key ecological services of the forests are watershed and biodiversity. According to Chopra Committee Report, 45% of the Net Present Value (NPV) of forest is due to watershed[2]. **The watershed interventions in the forest areas have led to increase in water availability in the adjoining agricultural fields leading to change in cropping pattern, intensity and enabling multi-cropping with increased productivity and yield.** Forests are also important reservoirs of

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1 Planning Commission, (Sept,2011), Draft Approach Paper, 12th plan, http://planningcommission.nic.in/plans/planrel/12appdrft/appraoch_12plan.pdf

2 *The Report of the Expert Committee on Net Present Value*, (Kanchan Chopra Committee), TERI Report No.2007EM04 submitted to Supreme Court, 2006-25 ftp://ftp.fao.org/ag1/ag11/ladadocs/theme1.doc1.adress on 18 July 2008.

genetic resources which provide some foods at present and hold the potential to nourish a wider public in the future. The wild relatives of many common crops represent an important global heritage.

3.1. Enhanced Agriculture Productivity through Soil & Moisture Conservation Activities in Bundelkhand Region of Madhya Pradesh

The project area under Bundelkhand special package of M.P., was marked by acute shortage of water, forage and nutritional sleight of cattle. The irrigation facilities were just not available in the region leading to perpetual famine type conditions resulting in low productivity of land. During FY 2009-10 and 2010-11, 150 check dams, 192 contour trenches, 177 percolation tanks, 53 ponds were constructed and other SMC activities were carried out in 49678 ha forestland. The catchment areas have been regenerated by artificial seeding of Mohua, ber, *Stylosantus hamata*, *Thimida quadriwalivis*, *Cenchrus ciliaris*, guner and denanath grass. This has shown significant bearings on water levels. The water table has come up significantly in almost all villages of project area leading to rise in water table. The progress note submitted by the Add. PCCF (JFM) of M.P. based on his field observations shows that people have started shifting from rainfed maize to Soyabean crop in the project area of Chatarpur and Tikamgrah districts. Similarly, SMC works such as staggered contour trenching, gully plugs, earthen check dams, banding, etc. and plantation activities carried out in in Banda, Chitrakoot, Jhansi and Mahoba districts has resulted in recharging of ground water in adjoining non-forestland. The field inspection by the Chief Executive Officer and the Technical Expert (Water Management) of NRAA near Pahra, Katral and Bhagwanpura villages and Ratoli Block in the said districts revealed recharging of ground water in dug wells in adjoining agriculture fields, as confirmed by the farmers, as a result of water retention in the newly constructed check dams by the Forest Dept. There is a marked increase in total Kharif and Rabi Crop coverage, production and productivity in the Bundelkahnd region of M.P. and U.P. The coverage area under six districts of Bundelkhand region of M.P. has seen increasing trend from 23.39 lakh ha in 2007-08 to 27.61 lakh ha in 2009-10, production from 15.51 lakh tonnes to 26.7 lakh tonnes and yield from 743.65 kg/ha to 996.52 kg/ha in 2009-10.

3.4. The 12th plan recognizes the need of paying attention to the challenge posed by the growing demands of rapid growth and the need to exploit the scarce natural resources i.e. water, land and forest in a sustainable manner. **One of the important issues identified in the 12th plan which requires focused attention is securing ecology of watershed and catchments[3].** The mandate of the Ministry of Environment & Forests in accordance to the National Forest Policy 1988 & National Environmental Policy-2006 is to ensure ecological security of the country including conservation of forests for land and water development which are keys to meet the demands of rising population especially for poverty reduction apart from providing a pollution free environment.

3.5. Forestry constitutes the second largest land use in India after agriculture, covering about 78.37 million hectare including Trees outside Forests (ToF), or 23.84 % of the total land base (SFR, 2009). India is a mega diverse country and accounts for 7-8% of recorded plant & animal species of the world. India has four global biodiversity hotspots ie., Eastern Himalayas, North East region, Sunderbans and Western Ghat. Total numbers of Protected Areas (PAs) in India is 661 encompassing 4.8% of the total geographic area of the country. Four Biosphere reserves viz Nilgiri, Nandadevi, Sundarbans & Gulf of Mannar have been recognized by UNESCO under world network of Biospheres. Presently 25 Indian Wetlands have been designated as Ramsar sites in the country and six new sites are under consideration.

[3] Planning Commission, (Sept,2011), *Draft Approach Paper, 12th plan*, http://planningcommission.nic.in/ plans/planrel/12appdrft/appraoch_12plan.pdf

3.2. India – A Mega Diverse Country

- Out of India's land area of 328.7 million hectare, 76.95 million hectare (23.41%) is recorded forest area. Total Forest and Tree cover of the country is 78.37 million hectare which is 23.84 percent of geographical area of the country (SFR, 2009).
- India is considered one of the world's 17 "megadiverse" countries in terms of biodiversity
- India accounts for 7-8% of recorded plant & animal species of the world.
- India has four global biodiversity hotspots – Eastern Himalayas, North East region, Sunderbans and Western Ghat.
- Total numbers of Protected Areas (Pas) in India is 661 consisting of 100 National Parks, 514 Wildlife Sanctuaries, 43 Conservation Reserve, 4 Community Reserves, encompassing 4.8% of the total geographic area of the country.
- 15 biodiversity rich areas of the country covering an area of approximately 74000 sq kms have been designated as Bio-sphere reserve and four Biosphere reserve viz Nilgiri, Nandadevi, Sundarbans & Gulf of Mannar have been recognize by UNESCO under world network of Biospheres.
- Presently 25 Indian Wetlands have been designated as Ramsar sites in the country and six new sites are under consideration.

3.6. It is estimated that about 270 million tonnes of fuel wood, 280 million tonnes of fodder, over 12 million cubic meter of timber and countless non-timber forest products are removed from forests annually[4]. Forests meet nearly 40% of the energy needs of the country, of which more than 80% is utilized in rural areas mainly through removal from forests by head load or otherwise. Nearly 27% of the total population of the country, comprising about 300 million rural people, depend on forests for livelihood. NTFP contributes to about 20% to 40% of the annual income of forest dwellers who are mostly disadvantaged and landless communities with a dominant population of tribal.

3.7. The other Ecological Services provided by forests are regulation of hydrological cycle, soil & water conservation, flood control, carbon sequestration, fresh air generation, climate stabilization, bio-diversity conservation and amelioration of overall environment including urban and semi-urban amenity, eco-tourism etc. Forest plays a vital role in providing carbon sequestration and Carbon stocks in our forests stood at 6662 m MT in the year 2005.

3.8. Anyinam (1995) reports that in India alone, some 2 500 plants are used medicinally, and Shankar and Majumdar (1997) add that for 400 million to 500 million Indians, traditional medicine is the only option. Besides, traditional Indian Ayurvedic medicines account for substantial share of the formal medicine market in India. The domestic trade in Ayurvedic and herbal products in the country is about Rs 23 billion and is expected to substantially increase. The ubiquity of serious health problems, such as human immunodeficiency virus and acquired immunodeficiency syndrome (HIV and AIDS), Ebola and malaria, is counterbalanced by the (sometimes) recognized value of traditional knowledge and use of medicinal plants as alternatives to modern medicine[5]. Traditional health care systems are based on significant local knowledge of medicinal plants in all major tropical areas. The market for traditional medicines is large and expanding, and much of it is in the hands of women, particularly that involving less commercially valuable medicinal plants. At the same time, medicinal plants are threatened. Some of the threats include slow growth patterns of desirable species, loss of traditional

[4] Report of the Working Group on Forestry, 11th Plan

[5] Colfer, C.J.P., Sheil, D., Kaimowitz D. and Kishi , M. Forests and human health in the tropics: some important connections, : URL: http://www.fao.org/docrep/009/a0789e/a0789e02.htm

mechanisms that contributed to sustainable use, and competing uses of the same species, in tandem with growing commercialization and global markets. Certification of medicinal plants and better forest management techniques offer two possible partial solutions. Pharmaceutical companies have sometimes been charged with reaping unacceptably large benefits from forest peoples' knowledge given the widespread poverty in forested areas. Issues relating to intellectual property rights, implications for cultural integrity, and amounts and recipients of benefits are complex. The Convention on Biological Diversity (CBD) aims to protect benefit-sharing rights, but adequate mechanisms for doing so are not in place.

3.9. Thus, the forestry sector has the potential to play a greater role in the equitable and inclusive growth along with protecting natural resource base for ensuring sustainable development. Forest development provides an opportunity to broad-based development and poverty reduction of the forest-dependent communities in tune with Millennium Development Goals, 2015 as well as addressing global concerns of climate change and conservation of biological diversity.

3.10. The sector however, faces serious biotic stress. With 2.4% of world's geographical area, India at present is supporting 16% of global human population and 18% of cattle population. **The per capita forest in India is dismally low at 0.06 ha. as compared to world average of 0.64 ha.** MoEF report on "India State of Forest, 2009" has indicated that.

1. Unsustainable withdrawals of fuel wood, timber and fodder from forest areas is causing degradation of forests in India as gap in Demand & Supply of fuel wood alone is about 86 million tonnes.
2. Two million ha of forest areas are subjected to shifting cultivation.
3. Annual diversion of forests under FCA 1980 is about 25000 ha per annum.
4. Honey-combing of forests due to encroachments and recognition of forest dwellers' rights on the principle of 'As is where is basis'.

3.11. A study by Madras School of Economics[6] suggests that while India's forest wealth is substantial, net changes in this wealth are arguably not so large at least in relation to GNP. However, neither is the overall size of these flows trivial and when viewed in the context of the wealth-diluting effects of population growth in India, it implies a far larger additional savings effort is required to cover the (net) loss in forest values than otherwise appears to be the case.

3.12. Recognizing the importance of Forests, the Eleventh Finance Commission had recommended **implementation of scientific work plans for management of forests**. The Twelfth Finance Commission recognized that **the entire nation has responsibility to maintain the forests as a national wealth, and recommended a grant of Rs.1000 Crore spread over the period of 2005-10 over and above regular allocations for maintenance of forests.** The thirteen Finance Commission has recognized the paramount need of taking this grant further and recommended a grant of Rs 5000 crore spread over 2010-15. Invariably**, the various Finance Commissions has recognized the need for higher allocation for the forestry sector**. While the National Forest Commission has recommended allocation of 2.5% of national budget to the forestry sector, the **Planning Commission in the 11th Plan Mid Term Evaluation also recommended "increasing the allocation of at least 5% of annual state and central sector outlay to the forestry sector preferably by 12th Plan".**

3.13. The review of afforestation Programme clearly indicated that fund availability to the major afforestation program (National Afforestation Programme) of the Central Government has not only

[6] Atkinson, Giles., 2006. *Accounting for India's Forest Wealth,*. : Madras School of Economics, WORKING PAPER 5/2006, http://www.mse.ac.in/pub/HP_WP.pdf

been stagnating but diminishing in the 11th Plan in spite of increasing costs of inputs, which gets reflected in the decreasing annual targets set for afforestation. **The National Forest policy of 1988, while reiterating the "Directive Principles of State Policy" mandated the forest cover to one-third and two-third in the country and the hilly region respectively. This was further reinforced by the National Development Council by stipulating monitorable target for the forest cover at 25% and 33 % by the end of 10th and 11th plan respectively**. However, the targets set in the National Forest Policy **were not provided matching allocation which affected the afforestation drive aimed to achieve the targeted growth in forest cover & affected the ecological stability and environmental stability in the long run which in time, gets reflected in the vicious circle of perennial drought and floods witnessed in the country, years after years**. The allocation for the environment, forests & wildlife has remained below 1% and Forest and wildlife sector received **only 0.4% to 0.5% of the overall 11th FYP allocation.**

3.14. There is also a general tendency in the states to reduce the state funding to forestry arguing that some financial resources have been made available for afforestation through Finance Commission grants and CAMPA funds ignoring the very purpose and the objective with which these grants are provided. While the CAMPA funds are meant for compensatory afforestation, to make up for the loss of forest cover due to diversion, the finance commission grants are very specific and given over and above the regular allocation to forestry sector. The states should consider these grants as additionality rather than treat these as part of regular allocation. The reduction in state sector funding due to allocation of these grants has resulted in loss of focus on restoration of degraded forest lands, which has been further aggravated by increasing vacancies at the level of forest field staff affecting implementation of the afforestation and wildlife management program. In many of the states, funding from central government and externally aided projects remained the main plan resources for afforestation.

3.15. One causative factor for apathy reflected in allocation of financial resources to the sector is that the **contribution of this sector to GDP has been underestimated at** 1.0 to 2.5% only. Firstly, only the direct material benefits like timber, and other products are accounted for. Secondly, due to transaction of large extent of these material benefits outside the market system their value reflected in the system of national accounts (GDP) is less **than 10% of its real value** and **a range of non-priced as well as undervalued products such as fuel-wood, fodder and Non-timber Forest Products (NTFPs) including medicinal plants that are exchanged in an informal manner are not measured**. Thirdly, **the ecological services contributed by the forests are totally ignored** for income accounting. Fourthly, the economic development also results in to depletion of natural resources, deforestation, and pollution but such negative effects are left out in current system of GDP calculation. The present system of **GDP estimation may be good at measuring the size of the economy but does not take into account social welfare and sustainable development as well as environmental services and ecological security of the nation.**

3.16. Apart from the financial constraints in the forestry sector its spin off effects are visible in lack of development of appropriate capacity building, access to technology, and policy constraints. The Mid Term Appraisal of Eleventh Plan states that there is a need to change our mindset away from a 'quantity' focus towards a 'quality' focus with greater emphasis on increasing the density of our existing forests, regenerating our degraded forest land, eco-restoration of our scrub and grassland, mangroves, wetlands, and other ecological assets**. The approach to improve forest cover must encompass both canopy cover improvement (intensification) and extension of afforestation of degraded forest lands including lands which have lost cover due to mining in past. While a comprehensive approach encompassing horizontal as well as vertical use of space is needed in forest areas, forestry extension can only be achieved by adopting farm and agro forestry practices**, through afforestation of non conventional areas, raising fuel wood and fodder plantations

on village common and other such lands. This would also result in reducing pressure on conventional forests considerably and gradually bring about improvement in the quality of forests and the resulting outcomes would ensure that the natural forests can perform their legitimate role of maintaining the country's ecological security.

3.17. There is also a need to revisit the existing monitoring and reporting systems for the implementation and achievements of physical targets. The findings of physical monitoring of plantations raised in a particular year may not match with the satellite based monitoring particularly for the same year. There are several reasons for this. The first and foremost reason is that it takes minimum four to five years for a plantation to develop a canopy which can be detected by high resolution satellite like **LISS** IV. Survival of the plantation for three years along with other growth indicators is therefore required to be monitored physically. The survival percentage of a plantation depends not only on the timely and quality inputs, it is also dependent on the pressures specially the biotic pressures it is subjected to and therefore may vary despite the best efforts. Concurrent physical monitoring result on survival percentage therefore should be taken into account while reporting the achievements. Secondly, while the plantations raised as block plantations may result in increase in extent of FTP, plantation carried out in degraded forests to improve the stocking will only result in increase in canopy density and not in extent of cover and should be accordingly reported.

3.3. Afforestation Status

The average rate of planting is of the order of 0.15-0.20 million ha per annum under the National Afforestation Programme(NAP) The State/ Forest Development Corporation add another 0.2 – 0.3 million ha. To the block planting. Thus, the annual planting in block form is 0.4-0.5 million ha. However, annual achievement of afforestation/ planting reported under Twenty Point Programme (TPP) data is about 1 – 1.2 million hectare per year, which consist of Roadside plantations, Railway line/ canal side plantations and other public land plantations by agencies other than forest department also. These reported figures under TPP do not inspire confidence due to inadequate monitoring mechanism on survival by other agencies. If this rate of plantation has resulted in an increase of 0.5% in the FTC during 2005-07(FSI-2009), the rate has to be increased by at least 10 fold to achieve an increase of 5% which would be visible in the satellite report after 3 to 4 years only. Since plantations during 11^{th} plan are not substantial, FTC may show nil or marginal increase during 12^{th} plan. With the current rate of withdrawal of forest resource and current level investment, it may not be surprising that FTC growth may become negative very soon.

3.18. In addition to survival %, other important aspects which need to be introduced **for monitoring are outcomes like growth parameters, ground flora, improvement in water ground water table and socio-economic indicators like participation of local community in the programs implemented through JFM committees and level of empowerment of the local people.**

3.19. The Mid Term Appraisal of Eleventh Plan has pointed out that at least a preliminary version of SFR should be printed within a year of collection of data in the scale of 1:10,000 to start with. At present, Forest Survey of India assesses forest cover in India on biennial basis on a 1: 50000 scale. Forest Survey of India is working in tandem with Survey of India (SoI) for the purpose of forest and tree cover mapping. At present Survey of India (SoI) reference maps are available in the scale of 1:55000 for whole country and for few areas in the scale of 1:10000. **Though there is need to go for mapping in the scale of 1:10000 and for annual cycle of assessment of forest cover in place of present biennial system of reporting in the country, it will be possible only when all SoI reference maps and geo-referenced revenue maps are available at these scales besides enhancing the infrastructure, manpower and budgetary support to FSI by at least 5-6 times of present level.** However, in urban areas, forest and tree cover mapping on a scale of 1:4000 may be

possible with the availability of enhanced human and financial resources to FSI. **With the existing level of technology, it is possible to improve the scale of mapping as indicated above, periodicity of reporting assessment of forest cover besides other parameters such as inventory of bio-diversity and NTFP, as and when sufficient manpower, infrastructure, budgetary support are available in the 12th five year plan.**

3.20. For growth to be inclusive it must create adequate livelihood opportunities and add to decent employment commensurate with the expectations of a growing labour force. The NTFP sector which at present provides livelihood in varying degree to 275 million disadvantaged poor mainly tribal, has been neglected since long. Absence of a comprehensive policy and harmonization of relevant acts and rules has adversely impacted healthy growth of NTFP. Depleting resource base, due to unsustainable harvesting practices, has been the major ecological challenge in the NTFP sector with potential impact of climate change. On the other hand, poor R&D focus, inadequate post-harvesting practices, insufficient funds & infrastructure, and unorganized nature of the trade have made it financially vulnerable particularly for the primary collectors whereas the differential and **sometimes contradictory tax & transit regimes in the states have adversely affected not only the trade but even the production of NTFPs. What is needed today is a workable model which ensures that collectors of NTFPs become shareholders in an institution or otherwise that helps them to climb up the value chain and retain more value through professional post harvest technology.**

3.21. The grazing lands, considered to be one of the most productive ecosystems in the Indian Subcontinent have been at the receiving end for long. As per an estimate, the country's pastures have reduced from 70 million ha. in 1947 to 38 million ha. in 1997. The remaining grazing lands have either been degraded or are in the process of degradation with average carrying capacity of less than 1 Adult Cattle Unit **(ACU)**. There has been management neglect and many of the ecologically sensitive pasture lands are on the verge of no return. Lack of comprehensive grazing cum fodder policy at national and state level and absence of any nodal agency to steer and coordinate the grassland and fodder development programme is the major cause of degradation and diversion of grazing lands.

3.22. Forestry sector has emerged as an important component in strategy for mitigation and adaptation of climate change at national as well as global level. India is signatory to major international conventions including both legally binding and non legally binding instruments. There is a need for a more systematic, dynamic and futuristic approach to international negotiations and programmes. This would require capacity building of personnel for ensuring better negotiating skills and strengthening of institutions dealing with natural resource management in a coordinated manner to promote effective compliance, enforcement and monitoring international commitments.

3.23. In the backdrop of above factors, the mandate of institutes involved in forestry research must also multiply and the forestry research should get adequate focus in order to meet new challenges especially addressing livelihood needs of the forest dependent communities including NTFP's issues arising out of climatic change including mitigation and adaptation, etc. **The sector should also capitalise on the gains of new space based technological advancements like GPS, GIS and computational and analytical systems at hand for real time monitoring of forest fires, forest cover and growing stock in the sensitive areas and enable the system to make effective intervention, execution and technological based monitoring. The professionalism in the forestry sector also needs to be broad based to bear multifunctional responsibilities.**

3.24. If India has to sustain an inclusive 9 % plus growth rate during 12th plan, role of forests in providing food and ecological security becomes extremely important and massive investments will have to be made on the lines of transport, power and infrastructure sector.

4

Review of the 11th Five Year Plan Schemes

Emphasis in Eleventh Plan

4.1. The Eleventh Plan was committed to pursue development agenda which was environmentally sustainable based on a strategy that not only presumes and maintains natural resources but also provides equitable access to those denied**. The eleventh plan emphasized the socio-economic goals for forestry sector in terms of monitorable targets. Out of four monitorable targets, the monitorable target for forestry was fixed to increase the forest and tree cover by 5%.** The emphasis was more on "quality" of the forests cover. Till the 10th plan, focus was more on increasing area rather than focusing on increasing the density of existing forests, regenerating degraded forests and eco-restoration of scrubs and grasslands.

4.2. Funds for the forestry sector flows through Central budget, State budget and through externally aided projects. Central sector scheme for afforestation are National Afforestation Program (About Rs. 310 Crore/year), Integrated Forest Management scheme (for forest infrastructure, boundary demarcation, forest fire management -about Rs. 70 crore/ year), Thirteenth Finance Commission Grant provided by Ministry of Finance (25% for forest development/ forest infrastructure and 75% for other development purposes - Rs. 625 crore for each of the first two years and Rs. 1125 crores for each of the rest three years, totaling Rs. 5000 crores for five years starting from 2010-11), CAMPA fund (Rs. 1000 -1500 crore per year for mandatory compensatory afforestation in lieu of diverted forest area for non-forestry purpose, catchment area treatment, strengthening the protection and management of forests, infrastructure development and maintenance of older plantation etc.), Integrated development of Wildlife Habitat (Rs. 75 crores per year) and 11 state sector externally aided projects under which approximately Rs. 500-600 crores per year loan taken by state governments flow for specified activities in accordance to the Project document of the state governments. Besides these programmes, State Forest Departments operate many state schemes for restoration of degraded forests and management of wildlife by taking mult-sectoral and multi-stakeholder approach.

4.3. National Mission for a Green India (GIM) has been approved by the Prime Minister's Council on Climate Change for Rs 46000 crore over 10 years coinciding with 12th and 13th FY Plan. Rs 200 crores have been allocated for the preparatory activities in the year 2011-12**. The Green India Mission as it is known, aims at both increasing the forest and tree cover by 5 million ha, as well as increasing the quality of existing forest cover in another 5 million ha. The Mission proposes a holistic view of greening and focuses not only on carbon sequestration targets alone, but, on multiple ecosystem services, especially, biodiversity, water, biomass etc, along with carbon sequestration as a co-benefit.** While convergence is desirable, and GIM also envisages the same, **a program of this dimension should have budget support to the extent of atleast 70% so that it can attract funds for convergence with other scheme. This additionality**

would be required to address the need to increase the forest and tree cover and its outcome to a large extent.

Review of Eleventh Plan Schemes under Implementation:

4.4. Pursuant to directions from the Planning Commission and the Finance Ministry, large number of ongoing Plan schemes of the Ministry was clubbed/merged into 22 broad thematic schemes as a measure of rationalization exercise carried out by the Ministry for its 11th Five Year Plan. Out of these, 13 schemes pertain to Forestry and Wildlife. The following 7 thematic schemes pertaining to forestry, with each scheme having further components/programmes, have been approved by the Planning Commission for the 11th Plan of the Ministry:

1) Intensification of Forest Management
2) Grants-in-aid to forestry and Wildlife institutions
3) National Afforestation and Eco Development Board , NAEB
4) Capacity building in forestry sector
5) Strengthening of Forestry Division
6) International Cooperation Activities
7) Gregarious Flowering of Muli Bamboos

4.5. The following table gives broad outlay and expenditure for 10th and 11th plan

Table 4.1. Plan Outlays / Expenditure on Environment and Forest – l0th and 11th Plan

Sl. No.	Sector	10th Plan		11th Plan	2007-08		2008 - 2009		2009-10		2010-11		2011-12	
		Outlay	Exp.	Outlay	Outlay	Exp.	Outlay	Exp.	Outlay	Exp.	Outlay	Exp*	Outlay	Exp#
1	Environment	1200	918	1246	259	223	261	240	291	253	480	464	621	101
2	National River Conservation Directorate	1670	1548	2540	340	321	340	326	577	427	752	755	752	127
3	Forestry & Wildlife	1600	1280	2949	372	363	475	521	600	572	592	582	573	141
4	National Afforestation and Eco-development Board	1300	1291	3150	359	422	399	371	387	355	352	354	330	45
5	Animal Welfare	175	75	120	21	21	25	25	25	24	24	24	24	3
	Total	5945	5112	10005	1351	1351	1500	1483	1880	1631	2200	2180	2300	416

* Provisional
# As on 31.08.2011

4.6. The Following table gives 11th plan outlay and expenditure (for 4 years) for the 11th plan under Forestry and wild life schemes.

Table 4.2. Outlay and Expenditure for forestry and wildlife scheme for 11th Plan

(Rs. in Crore)

Sl. No.	Name of the Scheme	Nature of the Scheme	Eleventh Plan Approved Outlay	Actual Outlay	Total Exp. From 2007-08 to 2010-11
1	2	3	4	5	6
	Forestry and Wildlife				
1	Grant in aid to Forests & Wildlife institutions	CS	450.00	531.78	482.50
2	Capacity building in forestry sector	CS	110.00	202.21	94.68
3	Gregarious Flowering of Muli (Melacanna baccifera) Bamboos	CSS	37.00	42.00	35.71
4	Intensification of Forest Management (former IPS) Schemes	CSS	600.00	407.65	271.42
5	Strengthening Forestry Divisions	CS	100.00	83.06	68.16
6	Strengthening of Wildlife Divisions	CS	150.00	124.93	94.92
7	Integrated Development of Wild Life Habitats	CSS	800.00	362.00	290.70
8	Project Tiger	CSS	615.00	755.63	619.57
9	Project Elephant	CSS	81.99	102.00	80.95
10	National Afforestation & Eco-Development Board (NAEB)	CS	250.00	161.66	135.85
11	National Afforestation Programme	CSS	2000.00	1619.81	1366.12
12	Animal Welfare	CS	120.00	119.00	93.68
	Total of Forestry and Wildlife		**6213.99**	**4556.83**	**3634.26**

Scheme wise review

Grants-In-Aid to Forests and Wildlife Institutions-CS

4.7. Four schemes have been grouped under this head viz. grants in aid to ICFRE ; the Indian Plywood Industries Research and Training Institute (IPIRTI); the Indian Institute of Forest Management (IIFM); and the Wildlife Institute of India (WII). The objectives of the institutions are: (i) to promote research, education, and extension in forestry and wildlife sectors, (ii) undertake R&D of technologies for plywood and other panel products, including plantation of timber, bamboo, and fibres, (iii) training to include training of managers of protected areas and undertaking research to build capacity for effective management of natural resources in the country, including training of managers of protected areas, (iv) advise the government on conservation and management of forestry and wildlife resources, and (v) support research in the field/area of forestry and wildlife.

4.8. For the Forestry Institutional and Technology Managements, the XI Plan emphasized that ongoing paradigm change in the forestry sector necessitated fundamental orientation and attitudinal changes of the personnel in line with multifarious roles of forests, corresponding variety of externalities, and for coping with traditional forestry management practices. This includes social sensitivities along with the scientific basis of the processes of nature. It was envisaged to design an

integrated capacity building programme for forestry personnel including training of trainers for State frontline staff training institutions and to enable stakeholders to understand the perspective of conservation by providing them state-of-the-art information and knowledge base.

Capacity Building in Forestry Sector

4.9. Six schemes have been grouped under this head. These are Training to Indian Forest Service (IFS) Officers; Directorate of Forest Education (DFE); Indira Gandhi National Forest Academy (IGNFA) (1987); Training of Personnel of Other Services; Foreign Training of Forestry Personnel; and Training of Other Stakeholders. The primary objective is to conduct short-term courses of one/two week(s) duration for the IFS officers in the country and for updating their knowledge skills with a training component abroad. The scheme has been revised to add an EAP component.

4.10. The Forestry sector recognizes its increasing role to provide sustained benefits to the people and strives to attain it by integrating new frontiers of knowledge & science in planning, management, research & capacity building with forest management. The professionals, who manage the forest resources, are being regularly provided with the cutting edge knowledge, technology and skills to deal with new challenges. Indira Gandhi National Forest Academy (IGNFA), Dehradun, FRI Deemed University, Dehradun, Wildlife Institute of India (WII), Indian Institute of Forest Management (IIFM) Bhopal, Indian Council & Forestry Research & Education (ICFRE), State Forest Training School and state forest institutions are making extensive efforts to fulfill the knowledge gap. Further, specific mandates were given to different forestry institutions such as for ICFRE, WII, FSI, IIFM IPIRTI. Presently, one-two years long induction training, refresher courses through week long training on yearly basis and Mid-career trainings are arranged for senior forest officers and frontline staff. The state training institutions are being upgraded to provide frontline staff trainings on regular basis for updating their knowledge to take care of developing needs. However, training of members of JFM committees and other local level institutions like gram sabha in forestry and allied activities need to be stepped up.

4.11. The existing training infrastructure for training needs to be augmented and training curriculum of forest officials should incorporate conservation and sustainable utilization of forest resources, besides equipping them to address issues of livelihoods and low key economic activities, etc.

Gregarious Flowering of Muli (Melacanna Baccifera—Bamboos)-css [2002]

4.12. The scheme was completed in 2008–09 .

Intensification of Forest Management (Former IFPS) Scheme-Css (Eleventh Plan)

4.13. The objectives of this scheme are: (i) Forest Fire Control Management, (ii) Strengthening of Infrastructure, (iii) Survey and Demarcation, (iv) Preparation of Working Plans which includes fire lines creation and maintenance, construction of forest boundary pillars and approach roads, etc. The scope of the scheme has recently been expanded by adding four new components: (i) Protection and Conservation of Sacred Groves, (ii) Conservation and Restoration of Unique Vegetation and Eco-systems, (iii) Control and Eradication of Forest Invasive Species, and (iv) Preparedness for Meeting Challenges of Bamboo Flowering and Improving Management of Bamboo Forests.

4.14. However, the scheme needs to be implemented by widening its scope to include Rehabilitation and productivity enhancement of rangelands and common / revenue lands around forest areas, fodder storage/ value addition facilities, development of Centre of Excellence on fodder

and pasture management, germplasm banks and nurseries etc. and also with much higher financial allocation.

Strengthening Forestry Divisions

4.15. Five schemes have been grouped under this head. These are the Forest Survey of India (1981); Strengthening of Regional Offices; National Forestry Information System; National Coordinated Programme for Assessment of Non-Timber Forest Product Resources (2009); and Certification Programme for Wood and Non-Wood Forest Resources. The thrust is to assess: (i) forest cover, (ii) undertake forest inventory, (iii) conduct research on applied forest survey techniques, (iv) capacity building of forestry personnel, (v) establishing zonal offices, and (vi) monitoring forest plantations.

4.16. However, there is a need to put in place a system of technology based collection of base line data, monitoring & evaluation of forestry schemes & programmes in states and centre. There is also a need to strengthen support to forestry institutions for capacity building and motivation of forestry personnel including provisions for fellowships, technology up-gradation, Forestry database and knowledge management, infrastructure development of the forestry institutions, forestry research in the new emerging areas, and setting up a new institute for Sustainable Forest Management and Forest Policy .

4.17. Work on the SFR 2011 should be undertaken in a manner that allows for a timely release. The National Coordinated Programme for Assessment of Non- Timber Forest Product Resources and Certification Programme for Wood and Non-Wood Forest Resources need to become operational. Forest cover assessment needs to be taken on an annual basis on a scale of 1:4000 or 1:10000 by strengthening the infrastructure, scientific base and enhancing the financial allocation by at least five to six times.

National Afforestation and Eco-Development Board (NAEB) and **National Afforestation Programme (NAP)**

4.18. The two schemes grouped under NAEB are: NAEB and Eco-Task Force (ETF). The board supports the implementation of schemes relating to: (i) afforestation and eco-development, including monitoring and evaluation; (ii) communication and awareness generation; (iii) supports projects approved under the grants-in-aid scheme for greening India; (iv) increases forest/tree cover in inaccessible areas like deserts and mountain slopes through regular/retired territorial army personnel; and (v) continuation of six of the existing ETF battalions in of Jammu and Kashmir, Uttarakhand, Rajasthan, and Assam.

4.19. The objectives of NAP are to: (i) increase forest and tree cover; and (ii) support Forest Development Agencies (FDAs) for natural and artificial regeneration and perennial herbs and shrubs in existing FDAs. Target for the Eleventh Plan is to cover 1,00,000 (ha) and operationalize 3,000 new Joint Forest Management Councils (JFMCs) in existing FDAs. The expenditure so far has been Rs 135 crore only.

4.20. National Afforestation and Eco-development Board implements the National Afforestation Program (NAP), a major afforestation drive of the Ministry through the state forest departments in the country. During the XI th Plan, the allocation of funds to the National Afforestation Programme (NAP) is Rs. 393 cr, Rs. 346 cr., Rs. 318 cr., Rs. 310 cr and Rs. 303 cr for the years 2007-08, 08-09, 09-10, 10-11, and 2011-12 respectively. The targets of planting were accordingly set as 4.93 lakh ha (including that of 2005-06 carried over to 2007-08, first year of eleventh plan), 1.73 lakh ha, 1.03 lakh

ha, 0.59 lakh ha and 0.50 lakh ha. The allotment of grants for the NAP since beginning of the program is shown in the figures below-

Chart 4.1.

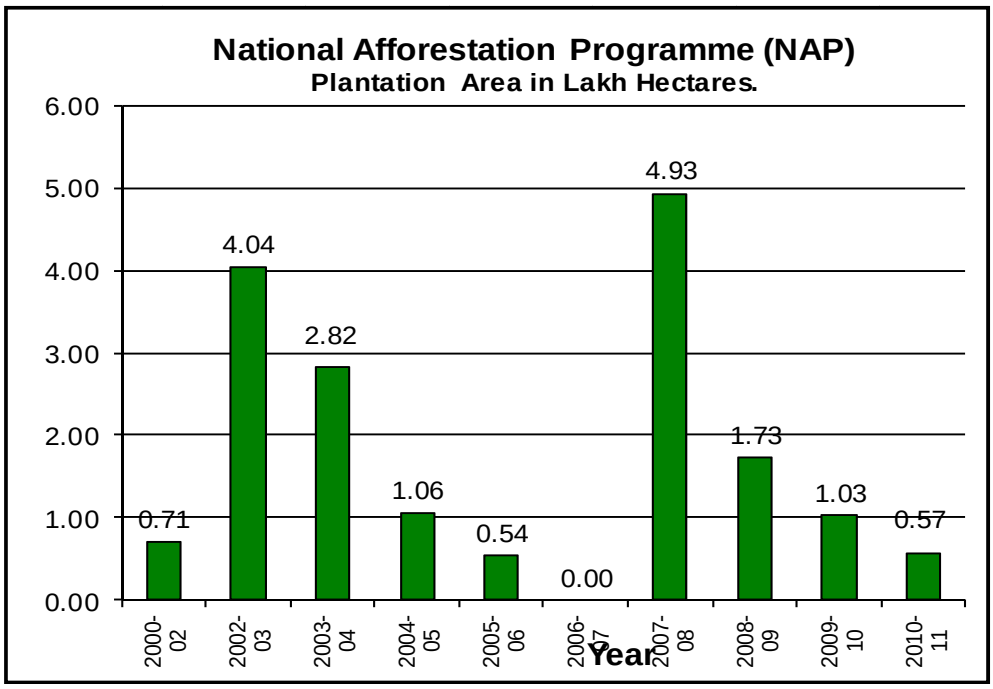
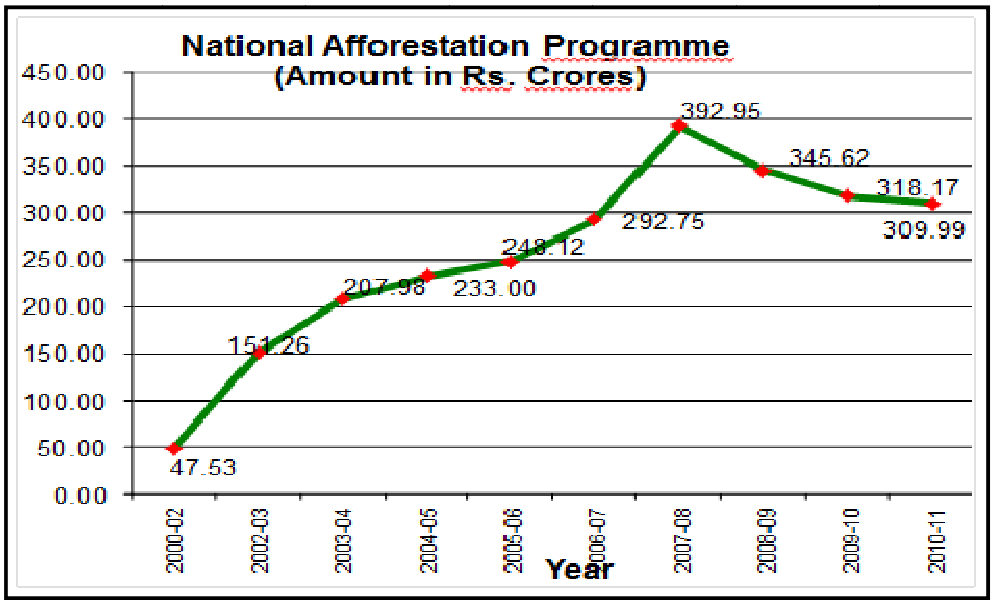


Chart 4.2.



4.21. National Afforestattion Program (NAP) is implemented through decentralized structure of Forest development Agency (FDA) and JFM Committees. From the year 2010-11, State Forest Development Agency (SFDA) has been constituted at the State level to smoothen the fund flow from the Ministry to the FDAs. This decentralized three-tier institutional structure (SFDA, FDA and JFMC) allows greater participation of the community, both in planning and implementation, to improve forests and livelihoods of the people living in and around forest areas. JFM approach of "Care & Share" draws its strength from National Forest Policy 1988 and subsequent guidelines of MoEF in 1990, 2000 and 2002, **which lay emphasis on the involvement of local communities in protection, afforestation and sharing of benefits with the communities, making their gradual empowerment possible.** While JFM committees in the existing system are constituted from the Gram Sabha members for management of forest resources**, there is a need for urgent emphasis on making them as permanent technical committees under the guidance and supervision of Gram Sabha during 12th five year plan period.**

New Initiatives during 11th Plan

Compensatory Afforestation Management & Planning Authorities - CAMPA

4.22. The Supreme Court, vide its order dated 29th October, 2002 in I.A. No 566 in Writ Petition Civil No. 202/1995, had directed creation of a Compensatory Afforestation Fund in which all monies received from user agencies towards compensatory afforestation, penal compensatory afforestation, Net Present Value, Catchment Treatment Plan, etc. shall be deposited. The Compensatory Afforestation Management and Planning Authority (CAMPA) was approved by the Union Cabinet in March, 2008 with a proviso to frame legislation constituting a Compensatory Afforestation Fund. A Compensatory Afforestation Fund Bill, 2008, introduced in Lok Sabha on 5th May, 2008, was passed by the Lok Sabha and referred to the Standing Committee of Parliament on Science & Technology & Forests. The Standing Committee, however, recommended that the Bill be withdrawn. The Bill finally could not be passed by the Rajya Sabha and lapsed with the constitution of new Lok Sabha.

4.23. To resolve the deadlock of CAMPA, it was decided to create State Level CAMPAs after intensive consultations with states and based on model guidelines for State level CAMPAs. The State CAMPAs thus provide an integrated framework for utilization of multiple sources of funding and activities relating to afforestation and would work through JFMCs. By the end of January, 2010 in pursuance of the guidelines issued by the Government of India for establishment of state CAMPAs, 22 States/UTs have operationalised their accounts. Out of the received amounts of approximately 13,000 crore in the ad hoc CAMPA, the State CAMPAs have so far been allocated approximately Rs.730 crores.

Forestry

4.24. The National Forest Policy 1988 stipulates that 33% of the geographical area of the country should be under tree/forest cover. According to the 10th Five Year Plan of the Planning Commission, a target of 25% by 2007 and 33% by 2012 was stipulated. Efforts are being made to bring more area under tree/forest cover by taking afforestation on degraded wastelands. The recently held 11th Five Year Plan (FYP) Mid-Term Appraisal exercise has recommended afforestation/reforestation of 10 MHa by 2012, implying 2.0 MHa be afforested in 2009-10 and 2.5 MHa/year in the remaining two years of the Plan. The remaining 6 MHa to be taken up with additional resources as part of Greening India. **However, lack of adequate financial resources has been a major constraint in achieving even 1/10th of the stipulated target in the 11th plan.**

4.25. Efforts are being made to enhance community participation through a new scheme of Afforestation through PRIs (Panchayat Van Yojana) to undertake afforestation on various categories of vacant public land involving PRIs. The objective of the scheme would be to bring all unutilized /underutilized non-forest village lands under tree cover with village institutions having full decision making authority on its management, use of products for value addition or otherwise, and rights over the benefits generated. The scheme would be dovetailed with other rural development schemes intended to conserve, develop, and optimally utilize land and water resources.

4.26. Decentralization of forest management involving local people in regeneration and management of degraded forests would continue to be the focus of development assistance to States and UTs. To this end, National Afforestation Programme (NAP) was to be further strengthened, by enhanced financial allocation, supporting development of forest-based small and micro enterprises and capacity building. A new state Plan Scheme entitled "Accelerated programme of Restoration and Regeneration of Forest Cover" has been introduced during 2009-10 by providing additional central assistance.

4.27. Ministry has prepared and submitted to the PM's Council for Climate Change a mission document for the National Mission on Green India. The Green India Mission will be the world's largest afforestation project covering six million hectares of degraded forestland. The Mission has been approved by the Prime Minister's Council on Climate Change Total Mission cost is Rs.46,000 crore over ten years starting from the year 2012-13, and coinciding with the 12th and 13th Five Year Plan Period.

4.28. Forest Certification has emerged as a market-driven mechanism in support of Sustainable Forest Management (SFM). Certification initiatives rely on consumers exercising purchasing choice in favour of products labelled as originating from forests certified as being sustainably managed. Certification and Eco-labelling are the new mantras to enhance the product positioning for a premium price on one hand and ensuring better forest management practices on the other hand.

4.29. The Ministry has constituted a **National Working Group/Governing Body to frame the policy guidelines for forest certification for timber and Non-timber forest products. Three Committees were constituted to prepare a road map and the necessary criteria and processes for the development of National Certification mechanism in the country, which were subsequently, merged into single committee namely the 'National Forest Certification Committee' for the development of Certification Criteria, Certification Process and Accreditation Criteria & Process towards Forest Certification of timber, Non-timber Forest Products. It has also been proposed to constitute an independent Forest Certification Council.**

4.30. National Forest Certification Committee, in consultation with various stakeholders, is in the process of preparing a road map for operationalsing the certification process. The long term strategy involves defining the structure of the National Forest Certification Council including its framework, composition, terms of reference, setting of standards, process for chain of custody and procedures for accreditation. The short term goal for 2010-11 involved formulating policy and guidelines on Forest Certification which can be circulated to all the States and UTs to deal with the issue till long term strategy is put in place.

4.31. In order to operationalise certification process in forestry, Criteria & Indicators of sustainable forest management developed by IIFM (Bhopal-India Process) would need to be approved & notified after getting endorsed by an International Certification Agencies (like FSC and PEFC). To strengthen the database on forestry sector, the Ministry plans to collect, compile and disseminate forestry statistics by strengthening mechanism at ICFRE.

Evaluation and Monitoring

4.32. Schemes/projects of the ministry are monitored regularly in Headquarters and by on the spot field visits by officials. Senior officers visit the states regularly and monitor progress of schemes/programmes through the mechanism of nodal officers under which each state/UT has been assigned a senior officer as its nodal officer for such regular interaction with state/UT. Monitoring process, inter alia, include mandatory audit of accounts of grantee organization, submission of audited utilization certificates, expenditure statement and a progress report on the activities conducted by the grantee organization besides field visits by officers of the Ministry. While NRCD has a detailed MIS system for monitoring in place, research projects are monitored/ reviewed by the concerned Expert Review Committees. Regional offices of the Ministry also review/monitor and follow up on various issues/programmes in the environment, forestry and wildlife sectors.

4.33. Under forestry, a **multi level monitoring and evaluation system of projects is being pursued under NAP. This includes intensive review of projects at the state and central levels by the State Level Coordination Committee and National Level Coordination Committee, independent concurrent evaluation by implementing agencies, independent concurrent evaluation** for selected projects at national level and monitoring of area coverage and survival percentage of FDAs by agency like FSI. **The system of monitoring and evaluation needs to introduce technology based monitoring by involving well tested system of satellite imageries, GPS etc. combined with adequate ground truthing to introduce transparency reliability.**

4.34. The adoption of e-governance has also aided in good management and regulation of environmental resources. The adoption of Electronic Clearance of funds for various schemes is an important improvement for ensuring a quick and faster disbursement of funds, as also to serve as a means of preventive vigilance in respect of these schemes.

5

Approach and Strategy for the 12th Five Year Plan

5.1. In an era of globalization and rapid economic integration in a fast changing world and consequent pressure on the natural resources, the role of forests too has become very crucial for sustaining the food and water security; maintaining the hydrological cycle; conservation of biodiversity; mitigating the effects of climate change and providing livelihood support to millions of forest dependent people living in India. The tropical climate and fragile ecological situation prevailing in many parts of the country necessitate that, massive investment in forestry sector during Twelfth Five Year Plan on the lines of roads, power and other infrastructure sectors for sustainable growth and sustain 9% plus rate of growth in our economy. **For inclusivity and sustainability, the role of the forests in providing food, livelihood and ecological security to the nation becomes all the more important and unavoidable.**

5.2. In tune with the approach of Twelfth Five Year Plan, favoring a faster, sustainable and more inclusive growth, the management of 23.84 % land resources under forests and tree cover for the **ecological security of the country and equitable access of its one-third population for livelihood, assumes utmost significance.** Coupled with our international commitments for sustainable management of the forests, conservation of wetlands, enrichment of biodiversity, achieving Millennium Development Goals besides meeting the objectives of the National Forest Policy 1988, the country should **formulate a comprehensive strategy for the sector. A strategy that suitably addresses the issues of Left Wing Extremism, unprecedented water scarcity, decreasing land productivity, unstoppable desertification, and deterioration of ecological services is need of the hour. The timing of the Working Group report coincides with the International Year of Forestry. Similarly, 12th Five Year Plan coincides with the International Decade of Biodiversity in which India has an opportunity to lead and showcase its strength to the international community.**

5.3. Forest is foster mother of Agriculture, which can be seen from the **fact that agriculture productivity & forest productivity are stagnating** at 1 tonne per ha. per annum signifying a correlation between agricultural & forest productivity. **Hence the agriculture productivity alone cannot be enhanced without conserving and developing forests and its ecological services**. Unabated degradation of forests is a serious concern and will not only lead to further desertification and floodings, but will also affect food and water security needed for ensuring livelihood security of the people of the country. **In order to maintain good agricultural growth, higher investment in forestry sector is a pre-condition, as the characteristics of forest floors regulate the water availability, extent of soil erosion & sedimentation and overall micro-climate of the locality**.

5.4. The expansion of forest cover to 25% and 33 % by the end of 10th and 11th plan respectively required large plan allocation to forestry sector, which did not happen in 10th/11th Five Year plan. **This was due to decrease in funding to forestry & wildlife sector to 0.4% -0.5% of the overall size of 11th Plan. It makes the plan support to Green India Mission and other forestry programmes even more important and critical to achieve even modest targets**. In comparison to

our neighboring country like China which has set a huge target of afforestation under their 12th Plan of 'Transformation' as termed by them, India plans to make a modest begining under Green India Mission.

5.5. In the background of the above, the Working group recommends following multipronged strategy for the management of country's mega floral and faunal diversity, scarce land resources, precious wetlands, livelihood of 280 million people and ecological services of the country.

Quantitative and qualitative improvement in Forest Cover and carbon sequestration

5.6. Though there has been continuous increase in forest cover (653,898 sq. km. in 2001 to 690,899 sq.km. in 2009), **the country could not take a positive stride in improving the quality of forest or meeting the target of 11th Five Year Plan i.e. achieving the target of 5%increase in forest and tree cover by 2012, due to unavailability of matching financial resources**. Sustainable renewal of forest and its ecological security are embedded in the management principles encoded in the Divisional Forestry Working Plans. Prescriptions of Working Plan are held supreme and binding for management of forests by the National Forest Policy, 1988 and related directions of the Apex Court of India. Matching fund for the forestry activities is the major constraint for realizing the goal for quantitative and qualitative improvement in Forest Cover. Unlike the greater emphasis assigned by the most of the developed and other neighboring countries, India allocates only 0.7 % of total budget to the sector which contributes more than 2% to the national GDP even at undervalued forestry products. To arrest further depletion of ecosystem services and biodiversity resources of forests there is an emergent need to bridge the critical gap and increase flow of fund into the sector. This should showcase not only our international commitment for sustainable and inclusive growth but also ensure intra and intergenerational equity in natural resource management. **The strategy for Twelfth Plan would be to meet the total financial requirement for forestry activities as prescribed in the Forestry Working Plans through convergence of cross sectoral schemes and innovative financing mechanisms. Thirteenth Finance Commission has allotted Rs. 5000 Crore (2011-2015) forestry grant to different States and tied it with the completion of all Forestry Working Plans in the Country. Various schemes likely to support this important activity would be the existing National Afforestation Programme, MGNREGA, National Green India Mission (New), Integrated Watershed Management Programme (IWMP) etc.**

Protection of Forests, River Basins and Bio-diversity for Ecological Security of the nation and Ecosystem Services to the people

5.7. Almost 300 million people living in the forest fringe area including forest dwellers derive their livelihood from forests completely or partially. Forests meets their need for firewood, cattle grazing, small woods for agricultural equipments, foods and medicines, ropes, clean water, fishes, housing material etc. **Sustainable management of such Non-timber Forest Products (NTFP) and equal access to uninterrupted ecological services to the people are ever greatest a challenge for the country amidst national and international commitments signed under different conventions and protocols.** Forests in steep slopes, river banks, gullies, gorges, micro water sheds, biodiversity spots and of sensitive native grooves are managed under a protection working circle or overlapping working circles under the Forestry Working Plan. The areas under this circle ranges from 80 -90% of the total forest areas which over the years supplied food, medicine, Non-Timber Forest Products to the Tribal people. **There are 188 such Tribal Districts covering 26 States having 60% of the total forest cover of the country. Most of these areas overlap with the Fifth Schedule and Sixth Schedule areas, Hill Districts and Districts affected by Left Wing Extremism in the Country. Not only economical but socio-cutural and political inclusion of these areas also assume utmost significance to achieve sustainable and inclusive growth during 12th Five Year Plan.**

5.8. For the first time the Working Group is proposing a new Scheme for rehabilitation of Ecosystem, Biodiversity Conservation with a multipronged approach. The strategy would be sustainable Management of soil, water, NTFP and biodiversity through a participatory landscape approach, to ensure employment and better livelihood of forest fringe dwellers and tribal people.

Shelter/Green-belt Development for Disaster Risk Management and Climate Change Adaptation

5.9. Length of India's shoreline is 7517 km. (mainland 6100 km.). These coastal areas are densely populated and also disaster prone to tsunami, cyclone, storm-surges tidal effects etc. **Coastal green / shelterbelt and mangroves forests act as natural barrier or bio-shield against natural disaster as successfully demonstrated in Orissa as well as Andhra Pradesh which incidentally helps in Climate change adaptation.** Intertidal zone and the tidal influenced water are very sensitive to natural disaster which need demarcation and protection as enshrined in the Coastal Regulation Zone Notification.

5.10. During 12th Five Year Plan, **huge grid of shelterbelt plantation will be raised as future bio-shield against natural disasters**. Shelterbelt plantation also can be taken up along river basin to reduce the impact of flood, sand storm and strategic boundaries (sea buck thorn in Himalayas), linking corridor connecting important wildlife habitats. Such a programme will help to check erosion and sand casting as well as improve the microclimate.

Greening of under-utilized and Problematic land to combat desertification

5.11. The optimum productivity of farm and common lands is a pre-condition for future food security of the country. We have big chunk of areas under-utilized and permanent fallow land. At the same time factors of land degradation & tremendous biotic pressure coupled with water shortage, soil erosion etc. accelerate the desertification process. Salinity and alkalinity, attack from invasive weeds, water logging are also increasing at an alarming rate**. Land degradation results in soil erosion, decline in water table, reduced agricultural productivity, loss of bio-diversity, decline in groundwater storage and availability of water in the affected regions. All these affect the lives and livelihoods of the populations, eventually inducing forced migration and socio-economic conflicts**. This constitutes a vicious cycle linking deteriorating natural resources to deteriorating livelihoods as people need to encroach further on fragile soils, sparse vegetation and limited water resources to meet their basic needs for food, shelter and livelihood. These areas need to be identified and treated through large scale R&D interventions by specialized institute of ICFRE etc. These also need to be brought under the Forestry Working Plan prescription during 12th Five Year Plan as degradation of these lands has severe implications for the livelihood and food security of millions. An integrated strategy to combat the threat with a cross-sectoral approach only would help us in achieving our Food Security Mission.

Participatory Management:

5.12. Participatory management approach to forest management is vital for livelihood security of communities and individuals specially for women to provide wider support to people. Since there is delay in fund transfer to the state forest departments, the State Forest Development Agency (SFDA), Forest Development Agency (FDA) in the districts and the Joint Forest Management Committees (JFMCs) as Committees of the Gram Sabha at village level may implement the forestry activities. **These agencies may however require further strengthening to take care of changing paradigm in forest management and meeting the democratic aspirations of the people.**

5.13. Local level institutions like JFM in various styles and forms in different parts of the country should be promoted for forest management in the country and JFM Committees should be formed as standing committees of the Gram Sabha. **JFM needs to be evolved into a higher platform "JFM Plus" where the livelihood promotion of the communities** specially women SHGs formed for such activities, gets increased importance in the conservation and development of forests. Broad basing of JFM to Community Management is need of the hour with convergence of different schemes of the other Ministries.

Agro/ Farm-forestry to bridge the gap between domestic demand and supply

5.14. Till eighties India had strategically gone for raising plantation of fast and high yielding species of plants to produce raw materials for the industry. In the National Forest Policy 1988, a reversal to this trend was embraced stating

> *"The principal aim of forest policy must be to ensure environmental stability and maintenance of ecological balance including atmospheric equilibrium, which are vital for sustenance of all lifeforms, human, animal and plant. The derivation of direct economic benefit must be subordinated to this principal aim".*

5.15. At the same time it has laid emphasis on increasing productivity of the forests. Presently felling of trees are banned from areas lying 1000 metre above MSL, National Parks and Sanctuaries, all types of notified reserves and from any forest lands for which there is no Forestry Working Plans or Working Schemes. More than 80% of domestic timber products in the market are of private origin. India imports huge quantity of raw material for paper and plywood industry for its domestic consumption.

5.16. One of the strategies for sustainable inclusive growth in the 12th Five Year Plan would be **large scale promotion of agro\farm-forestry & research inputs to increase productivity and to enhance income of people with simultaneous diversion of pressure from natural forests.**

Rehabilitation of Grazing and pasture land including formulation of National Grazing Policy

5.17. India has 18% livestock population and 16% of human population over 2.4% Geographical areas in the world. Because of heavy pressure on land resources from competing demands of other sectors, **traditional grazing and pasture lands have either vanished or shrunk drastically. This has resulted into heavy pressure on other productive forest lands dislodging ecological security of the locality.** Recent study in higher reaches of Himalayas has confirmed further migration of pastoral population down the hills as an outcome of climatic changes and deterioration of grassland ecosystem. No more the assigned grazing rights of the people recorded in the Forestry Working Plans remained operational due to increase in number of animals/unit area and reduction of carrying capacity of the forest areas.

5.18. The country requires a National Grazing Policy and schematic support to extend, improve and scientifically manage grazing and pasture lands with ex-situ and in-situ efforts. Every village should have common grazing lands, fodder banks for meeting needs in the lean season. Village common lands, permanent fallow land of marginal productivity, fringe forest lands are the areas to be strategically covered in the Twelfth Five Year Plan. Appropriate provisions at comprehensive rehabilitation of these degraded grasslands will be made under the 12th Plan -

Sustainable Non-Timber Forest Product (NTFP) Management and strengthening Livelihood of forest depended communities.

5.19. In spite of special prescription for sustainable NTFP management in forest areas under overlapping Working Circles in most of the Forestry Working Plans, we failed to meet the aspiration of forest dwellers and traditional collectors. The failure was partly due to excessive pressure for NTFP over and above the carrying capacity, at times leading to destructive extraction, and partly due to missing thrust for institutional motivation and matching financial support for sustainable management. None the less, people participation in the management of NTFP plays an important role in this realm. There has been a paradigm shift in the ownership of NTFP with respect to access, manage and market as well as benefit sharing mechanism over the past decade. Such changes are well documented and captured in different enactments of the contemporary period like Biodiversity Act, 2002, Biodiversity Rules, 2004, The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.

5.20. Forests play a very important role in rural and tribal economy as many of the NTFPs provide succor to more than 250 million poor people. Special efforts are required for reduction of pressure on forests for NTFPs by cultivating selected species in forest fringe areas and undertaking intensive conservation in existing forests through Aided Natural Regeneration (ANR) and other conservation activities. The increased production thereby would not only reduce the gaps between demand and supply but also shall become the ground for sustainable NTFP development. Detailed inventory of NTFPs and prioritization of agro-climatic zone with specific management interventions needs to be taken up during 12th Plan. In such effort PPP model may also be explored which may help achieve **the objectives of private sector involvement for bringing technology and capacity in the remote areas.**

5.21. The overall development of NTFP sector, despite its vast potential, has not been a priority in the past**. To develop the NTFP sector in a holistic way by coordinating/guiding various government sponsored activities/programmes on the same along with managing the knowledge, developing package and practice, ensuring capacity development of stakeholders and providing overall guidance over the NTFP sector, an apex & autonomous agency like the Rubber Board or Spice Board would be very much required. This agency may be called the NTFP Development Board,** and can have its state offices/branches.

5.22. Minimum Support Price (MSP) for NTFPs*:-* Procurement of collected products providing an uniform minimum assured price will immensely help the gatherers who are often exploited by the local level trader. Although NTFPs are not same as agricultural products, some of them (particularly medicinal plants) are cultivated too while others are vital to the poor forest dwellers, which is why MSP for NTFPs has been advocated for since long. The Ministry of Panchayati Raj had constituted a Committee on ownership, price fixing, value addition and marketing of minor forest produce under the Chairmanship of Dr. T. Haque, Member, Planning Commission. The Committee has submitted its report in May, 2011. Just to start, the Committee has recommended for MSP for 13minor forest produce initially. However, the mechanism for successfully implementing this recommendation is being formulated.

Urban and Recreational Forestry

5.23. Urban areas need special attention as pollution levels and radiating heat from the concrete buildings requires dissipation through vegetative means. In urban areas, local level institutions such as RWAs, schools, colleges, NGOs etc. should be involved in the implementation of greening activities. A case of Delhi will be good example to provide insight in the process of greening. Delhi

State had been able to increase its forest cover from 1.8 % in 1996 to 20% now despite scarce availability of land, high cost of land and heavy pressure on open areas. Other cities like Chandigarh, Ahmadabad, Hyderabad have done equally well in increasing green cover, which need to be be replicated in other cities and towns. This is very urgent as cities and towns are expanding fast and all efforts need to be made to preserve existing forests and open lands as public amenity spaces and to add new spaces within the urban plans, wherever possible.

5.24. To prevent encroachment of open spaces, users' associations should be formed to manage them jointly with the custodian (Forest, Horticulture or other departments) for safeguarding the interests of walkers, joggers and nature lovers.

5.1. Salient Features of Greening Delhi Action Plan

- Increase in Vegetation by
  - Massive plantation by all Govt. Agencies
  - Motivating people to plant atleast one tree
  - Free distribution of seedlings
  - Involve NGOs, resident welfare associations
- Enlist people's participation to make greening a people's movement
- Mass Awareness Campaign to educate people especially schools students to increase awareness for greening
- Need for coordination with other Greening Agencies
- Protection of existing Vegetation by implementation of Delhi Tree Preservation Act

Productivity of Lands and Management of Invasive Species

5.25. Identification and assessment of invasion are precursory steps before designing a management protocol or strategy to contain or physical/mechanical/biological/chemical removal of FIS. This issue will be discussed by the other Working Groups dealing with Wildlife Management, Biodiversity and environment. A special scheme for mapping the extent of invasion, managing the infestation for increasing forest land productivity including the utilization aspects of uprooted biomass meaningfully by developing suitable technology by ICFRE needs to be introduced during 12th Plan.

5.2. The Chandigarh Forest Department initiated a specific program to clear the Sukna Catchment of exotic weeds, mainly Lantana. The program has, over the past ten years, resulted in near elimination of exotic weeds and springing back of native vegetation, including grasses and fodder shrubs and trees. The moisture regime of the area has also improved and silt load has substantially reduced due to these interventions.

Habitat Improvement and management of man-animal conflicts in Forests

5.26. Compared to protected areas, a large no of Wildlife species and population are present in non-protected forest areas. Protected areas constitute only 4-5% of total geographical areas of the country where as forest cover extends over 21.02% areas. Important corridors are also situated mostly in non-protected areas. Incidences of man-animal conflicts are not less in such areas either. Twelfth Five Year Plan must provide schematic support for habitat improvement and ex-gratia

component for sustainable management of non-protected areas and provide compensation amount uniformly to address man animal conflict. These issues will be covered broadly by other Working Group dealing with Wildlife Management.

Training and Capacity Building of Multiple Stakeholders

5.27. Most important management strategy for the 12th Five Year Plan is capacity building of local bodies for sustainable management of forest resources. The main focus for capacity building should be on the convergence of all the Acts/Regulations for all the stakeholders to provide better economic benefits and social empowerment through sustainable forest management of natural resources. **Existing infrastructure and human resources of State Forest Department shall be strengthened and streamlined for capacity building and training of all the stakeholders up to grassroot level in natural resource management. This will enable them to take informed decision for preparation of site-specific micro plan to achieve the ultimate objectives of sustainable forest management**. Convergence of all schemes of MoTA and MoRD can bring expected outcomes where the Forestry Extension Officer of Department (to be created) can take the role of a facilitator.

Strengthening Science and Technology for Forestry and Climate Change Research, Extension and Networking

5.28. Indian Council of Forestry Research and Education (ICFRE), is nodal institute undertaking the holistic development of forestry research through need based planning, promoting, conducting and coordinating research and extension covering various aspects of forestry. **There is a need for coordination and collaboration between these Central and State Forestry Research Institutes. Even collaboration amongst international research centres and Universities under different bi-lateral and multi-lateral arrangements are essential for high quality research, particularly, on issues and challenges of international dimensions like climate change, biodiversity, combating desertification,** etc.

5.29. One of the strategies for the 12th Plan should be to support schematically **the research efforts on a sharing basis with technical networking and collaboration between all institutions under a central Body/Forum. Reorientation of ICFRE on the line of ICAR with a Head Quarter in Delhi and augmentation of funding are important steps to be taken up during Twelfth Five Year Plan**

Strengthening National Information Repository and collaborative Institutional Net-Work for Forestry and Biodiversity

5.30. Forest Survey of India (FSI), is a premier national organization, responsible for assessment and monitoring of the forest resources of the country regularly. **FSI also functions as a nodal agency for collection, compilation, storage and dissemination of spatial database on forest resources.** Most of the States have developed their scientific and technological capability for advanced survey, data management and monitoring related to Forests cover, forest carbon stock, status of coral reef, mangroves, wetlands, wildlife and drainage characteristics. **There is a need for coordination and collaboration between State and Central efforts for continuous comprehensive data management and technology transfer. Madhya Pradesh has developed advanced forest-fire monitoring system. Gujarat has excellent data management and survey report on the status of its coral reef and mangrove forests**. On the context of sustainable and inclusive economic development, reliable dynamic information back up to meet the inevitable

challenges from climate changes, disaster, biodiversity loss, depletion of ecosystem resilience, loss of mangroves, negative socio-political fall out like left wing extremism etc. is required.

5.31. This Working Group strongly recommended that a **comprehensive net-work should be established taking all the institutions on board with a provision of continuous strengthening of its scientific and technology base to develop an open and transparent National Repository of Information and Forestry Data management net-work to support decision** making in the 12th Five Year Plan with FSI as the nodal institute to collaborate and coordinate these efforts.

Cross-sectoral synergy and convergence of integrated execution of schemes

5.32. In the 12th Five Year Plan there have been many instances of non-convergence and lack of synergy between different schemes. Intra-ministerial as well as inter-ministerial synergy and convergence of schemes would result in better outcomes and delivery to the people. In the 12th Five Year Plan synergistic and comprehensive implementation of different schemes would be the strategy for maximum output. A informal forum for intra and inter-Ministry coordination and to develop Integrated Investment Framework for convergence of schemes must be developed in the 12th Plan including tentative earmarking of funds under convergence of scheme to facilitate planning and implementation of plantations and their maintenance so that forest department / FDAs can do the planning in advance.

Forest Certification

5.33. Forest Certification has emerged as a market-driven mechanism in support of Sustainable Forest Management (SFM). Certification initiatives rely on consumers exercising purchasing choice in favour of products labelled as originating from forests certified as being sustainably managed. Certification and Eco-labelling are the new mantras to enhance the product positioning for a premium price on one hand and ensuring better forest management practices on the other hand. The subject of Certification is emerging very fast and promotion of certification of NTFPs including medicinal and aromatic plants has many direct and indirect benefits. Works initiated by some of the national institutes such as IIFM in this regard can be taken as a bench mark and the Ministry of Environment & Forests can take forward the initiative to have a proper mechanism in place for forest product certification.

International Cooperation and Commitment for Sustainable Natural Resource Management to achieve Millennium Development Goal.

5.34. There is greater need for cooperation in forestry and wildlife between developed countries and developing countries to achieve common global goals. **India being a signatory to the major International Conventions on forestry and wildlife, it is imperative to have proper understanding of their impacts on India's internal policies and programmes. This calls for institutionalizing the approach for taking a more systematic and proactive stand during future international negotiations**. It is important to have an institutional arrangements and proper mechanism to develop negotiating capability, research and data back-up, think-tank for critical analysis etc. including follow up, monitoring and reporting on International Conventions, Treaties, bilateral agreements, MoUs etc.

5.35. The Working Group recommends **establishment of a Centre to work as 'Multi-stakeholder Forestry Forum' (MFF) for continuous analysis, consultation, evaluation, and to strategize development of country's position in respect of important international conventions and agreements**. The Centre/ Forum will also help in drafting and finalizing inputs for specific meetings of the sessions of international conventions and agreements in collaboration with other institutions and

stakeholders, wherein India is participating. The Centre of Forest Policy and International Cooperation Studies (MFF) is proposed to be established in Delhi under MoEF, which will enable participation of all concerned ministries, departments and research organizations of the Central and State Governments, reputed scientific and educational institutions in the private sector, and individual experts and subject matter specialists outside government. The Group has identified few Constraints in International Cooperation, which can be strategically overcome in the 12th Five Year Plan. **These are Inadequate Capacity, lack of Institutional Network, inadequate collaboration/ partnership with international institutions, Lack of continuity of officials/ ad-hoc approach, lack of specified budget to meet expenses/ annual contributions for international organizations such as ITTO, INBAR.**

5.36. The recommended strategies are intended to strengthen the institutional framework and build capacity to negotiate in respect of international instruments and ensure follow up of compliance, monitoring and reporting besides development of a platform for regular interaction of experts and stakeholders, improved follow up of international commitments and better implementation of our obligations & futuristic orientation of our approach

Development of Integrated Investment Framework and innovative augmentation of finances to the Sector.

5.37. The sector remained perpetually **deprived of fund**s starved for major part of the 9th, 10th and 11th Five Year Plan period**. Even during 11th Plan there has been a major reduction in the allocation. Total allocation to the forestry sector varies from 0.6 - 0.7% of the total budgetary outlay of the Centre and State** compared to 2% allocation of our neighboring country China.

5.38. The midterm appraisal of 11th Five Year Plan by **Planning Commission states that 5% of total annual outlay (Central and State) should be allocated for the environment and forestry sector separately. Since the allocation had been around 0.4% to the forestry & wildlife sector,** it has become necessary to find ways and means to generate funds for forestry and wildlife sector to transform our economic growth environmentally sustainable. Otherwise, **fall out of natural resource depletion would result in to intra-generational inequity (non-inclusive growth) and inter-generational inequity(depriving future generation**). Time and again, it has been emphasized to explore innovative funding mechanism to promote forestry activities in the past five year plans. However, **efforts in this line could not achieve any result even for the profitable commercial organizations, not to talk of Forestry sector, which has a long gestation period, lacks financial and political priority, and has no market for intangible benefits it offers to the mankind.** However, Working Group suggests following steps to augment the financial flow in to the sector.

- The ecosystem services of forest like hydrological benefits, soil conservation, flood control, carbon sequestration, access to clean air and water, climate stabilization, biodiversity conservation etc. are now accepted worldwide. **The Forestry sector need to be looked at differently especially for ecological services rather than tangible outputs and must be compensated for the ecological services it provides. Initially, a fee of at least 5% on the valued of the services generated from dams/ power generation, Oil/Gas/ Coal may be stipulated in Forest clearance of projects under Forest (Conservation) act 1980.** The fees collected need to be ploughed back in the forestry sector for its conservation and development. The valuation of eco-system services from forest need to be undertaken on priority basis. A system should be put in place for benefiting rural and tribal communities involved in forest conservation. The apex court has already upheld a direction indicating investment of a certain percentage of profit from mining for rehabilitation of people and for

ecological restoration. The Group recommends fixing of percentage for ecological rehabilitation of forest, biodiversity and environment, which will ultimately strengthen the livelihood of the poor forest dweller and other affected population.

- As the funds for greening are scarce even in developed states including forest deficient states, there is an urgent need for providing the **additional resources to the forest deficient districts / states on the lines of grants provided to the forest rich states by 13th Finance Commission**.
- There is need for creation of "**Green fund**" by pooling **forest development tax (About 5% of value) levied on sale of forest products, 3% forest conservation tax levied on the sale of petroleum products/ coal and similar taxes like Eco-tax in Himachal Pradesh**, which may be utilized specifically for forestry activities.
- There is need to attract funds from international institutions / bodies/ organisations for carbon sequestration, REDD+, biodiversity conservation etc. to enhance the domestic investment for afforestation and to pass it on to local communities for their role in conservation and development of the forests.
- **Multi-Stakeholder Partnership** involving **industries (requiring forest based raw material) for pooling of financial resource, Forest Corporations for implementation and local JFM Committees for participation in the afforestation of the degraded forest lands in a phased manner holds the key for optimum utilization of land capability and optimizing its productivity.**
- Big business houses/ corporate houses/ Public Sector Units should provide funds for conservation and development of forest under their **Corporate Social Responsibilities**. This has been supported by the Permanent Parliamentary Committee on E & F and S & T.
- **Incentives for implementation of agro-forestry models to encourage utilization of wasteland are required to be introduced. This is a strategy intervention for efficient utilization of under-utilized and wasteland or permanent fallows**. When the country is striving for Food Security, there is a need to infuse components of extensive as well as intensive integrated farming **like agro forestry, inter-cropping, agro-silvi-pusture, multi-tier cropping etc. Local fast growing and remunerative forestry species mixed with agricultural crops stand a potential for successful farming for these category of lands.** This will earn **extra income for the farmer and qualify for climate change adaptation or even combat desertification.**

Streamline and leverage implementation of FRA, PESA and Biodiversity Acts through Amendments of Forestry Working Plan Code

5.39. The main objective of 12th Five Year Plan being an inclusive and sustainable growth, the economic inclusion of fifth and sixth schedule areas corresponding to 188 tribal districts in the country is very critical. **Empowerment of local bodies and economic inclusion of the families residing in far flung areas of the country would definitely improve the governance needed to achieve inclusive growth**. As one-third population of our country derives some portion of **their livelihood in one form or another from forest at their different degree of dependency, forest resource augmentation, use and sustainable management through a participatory management assumes greater significance. Joint Management and sharing of its fruits are preconditioned by conferment of rights to the stakeholder (forest dwellers and tribal population).** The country has taken quite a number of legislative measures to confer the rights of forest land, NTFP, Management of Biodiversity, marketing etc. to democratically-elected local bodies. No activities other

than those prescribed in the Forestry Working Plan are allowed in the forest. Working Plans are prepared based on National Working Plan Code. Hence the Working Plan code needs immediate revision in view of changing scenario incorporating the contemporary issues. The strategy of the 12th Plan would be to amend the Working Plan Code to incorporate new dimensions along with assigning specific responsibility to the cutting edge level workers for transferring the rights in the field with proper documentation. It is recommended that the working plan should reflect scientific temperament by engaging scientific manpower i.e. Ecologist, Texonomist, Bio-Engineers and Sociologist etc. A committee of experts should evaluate the working plans and monitor its implementation on regular basis.

Revamp and strengthen the institutional mechanism for effective delivery

5.40. There has been a paradigm shift in management of forests and the participatory approach to community involvement specially in biodiversity and NTFP management. Several Acts have conferred the rights of management harvesting and marketing rights to the local communities/Gram Sabha and local elected bodies of Panchayats and Municipalities. On the one side it requires their capacity building & on the other hand building of the institution for effective delivery. Sensitization and awareness building of local bodies at the cutting edge level are as much important as organizational motivation for the Forest Department. **There is a strong need to have a strategy framework to institutionalize training, awareness and capacity building for local bodies in the 12th Five Year Plan.** Funding can be assured through convergence of different schemes of the MoTA, MoRD, and Ministry of Panchayati Raj.

Scientific and transparent GPS based evaluation and monitoring in GIS format and social auditing.

5.41. Openness and transparency of implementation enhances the credibility of the institution. This can be improved manifold **through technological upgradation of our evaluation and monitoring system. Geo-referencing of field works with the use of GPS and management and spatial data on GIS format remove bias and improves the authenticity of evaluation and monitoring.** Continuous data management over a time line also enhances modeling as a better policy tool for decision making. In the 12th Plan there is an **increase need for transparency in implementation, monitoring and evaluation of schemes and quality delivery. Social and Third party auditing should be made mandatory for all schemes.**

6

Proposal for the 12th Five Year Plan

6.1. The sound and efficient management of the natural resources is essential for achieving inclusive and sustainable development. It is related to realizing optimum productive capacity of agricultural land. It is also related to economic inclusion of one third of population of country who derive their livelihood from forest. Conservation and development of forests for land and water development in the country is key component of management of natural resources for meeting the demands of rising population. **Forests have assumed greater significance due to its emerging role in the field of climate change, ecological security, biodiversity conservation, international commitment for sustainable growth and livelihood issues especially the food and water security of the country besides its traditional importance through supply of timber, fuel-wood, fodder, medicinal plants and range of NTFPs.** Therefore, for sound management of the natural resources, it is essential to accord sufficient importance in our planning process to the conservation & development of forest resources.

6.2. In recognition of these aspects of the forests, the main thrust areas for intervention during 12th Five Year Plan are-

- Conserving forests for bio-diversity and enhancement of ecological services
- Development of forests for enhancing livelihood options of forest dependent communities
- Optimizing productivity of the under-utilized/ degraded lands and forest lands by growing multi-tier vegetation / plantations / forests through judicious combination of grasses, creepers, herbs, shrubs and trees in various tiers / storey for density improvement etc.
- Sustainable development of NTFPs including its value addition and marketing linkages
- Soil and Moisture conservation to ensure water security and better productivity of agricultural land
- Agro-forestry and silvi-pasture development in rangelands**, energy plantation, fodder farms at appropriate distances to reduce the drudgery of women, in areas adjoining forests**
- Greening the urban and peri-urban spaces
- Institution building for promoting enhanced participation of people in forest management and for better governance
- **Technology based monitoring and evaluation to know the performance of interventions** made and its outcome for mid-course corrections / changes, if required
- **Capacity building of local communities and forestry officials to sustainably manage the forest resources and augmentation of livelihood of local people including women.**
- Develop negotiation potential for attracting international funds like REDD^{+}, CDM, ITTO etc.

After detailed deliberations in the working group, existing small schemes with similar objectives have been merged as per the recent suggestions of the Planning Commission to have Flagship Scheme, Major Scheme and Umbrella Scheme for better management of proposed schemes and for smoother operations in the field.

Proposed Schemes under 12th Five Year Plan

Ongoing Schemes

3. National Afforestation Programme (NAP) Scheme
4. Intensification of Forest Management Scheme

National Afforestation Programme (NAP) Scheme:

6.3. NAP scheme provides support both in physical and capacity building terms to the Forest Development Agencies (FDAs) which in turn are the main organs to move forward institutionalization of Joint Forest Management. The FDA has been conceived and established as a federation of Joint Forest Management Committees (JFMCs) at the Forest Division level to undertake holistic development in the forestry sector with people's participation including women as well as local institutions. From the year 2010-11, State Forest Development Agency (SFDA) has been constituted at the State level to smoothen the fund flow to the FDAs. This decentralized three-tier institutional structure (SFDA, FDA and JFMC) allows greater participation of the community, both in planning and implementation, to improve forests and livelihoods of the people living in and around forest areas. The village is reckoned as a unit of planning and implementation and all activities under the programme are conceptualized at the village level. The three-tier approach, apart from building capacities at the grassroots level, significantly empowers the local people to participate in the decision making process. Under Entry Point Activities, community assets are created with a 'care and share' concept. The objectives of the scheme are as follows:

- Protection, and conservation of natural resources through active involvement of the people, **specially women.**
- Checking land degradation, deforestation and loss of biodiversity
- Ecological restoration and environmental conservation and eco-development
- Involving village level people's organization **including women groups and local institutions** which can manage the natural resources in and around villages in a sustainable manner
- Fulfillment of the broader objectives of productivity, equity, and sustainability for the general good of the people
- Improve quality of life and self-sustenance aspect of people living in and around forest areas
- Capability endowment and skill enhancement for improving employability of the rural people.

6.4. A substantial increase in allocation from Rs. 2000 crores in 11th Plan to Rs. 13500 Crores in XIIth plan is being proposed. In this proposal, enhanced provisions for soil and moisture conservation to deal with different agro-climatic zones in the country **addressing including shifting cultivation areas in North East and other parts of the country,** strengthening of JFM, entry point activities have been included apart from keeping requirements of community foresters from among local youths for conservation and management of forests. The scheme has been expanded by including provisions for establishment cost of NAEB HQ, Communication strategy and Awareness component, support to regional centres of NAEB, which is part of existing NAEB Scheme.

Intensification of Forest Management Scheme:

6.5. The Scheme of Intensification of Forest Management intends to address both the general problems of forest protection and area specific requirements for managerial interventions. The components of the scheme include protection of forests, modernize Forestry administration by supporting infrastructure, use of modern technology, mobility of forestry force, improving communication, prevention and control of forest fires, consolidation of forest boundaries, control and eradication of forest invasive species, conservation of unique vegetation and ecosystems, preparing for meeting specific challenges being faced in the forests, preparation of working plans and involving people in forest management and protection of forests, providing special allowance to the staff engaged in working plan and research in the states.

6.6. A substantial increase in allocation from Rs. 335 crores in XIth Plan to Rs. 2000 Crores in XIIth plan is being proposed. The eco-task force scheme for involving retired defence / paramilitary personnel in afforestation in remote areas has also been merged in this proposed scheme. Under the existing scheme, the establishment and operational expenditure on the Eco Task Force (ETF) Battalions raised by Ministry of Defence is reimbursed by Ministry of Environment and Forests while the inputs like sapling, fencing, etc. and also the professional and managerial guidance is provided by the State Forest Departments. In ETF battalions, the Ministry of Defence deploys its ex-servicemen, preferably from within the area of operation, whereas the nuclear core of the force is constituted of regular servicemen. Some of the ETF Battalions have undertaken successful eco-restoration of highly degraded sites, for example the limestone mining areas in the Mussoorie Hills.

New Schemes

7. Scheme for Sustainable Livelihoods through NTFP Management
8. Capacity Development of the Gram Sabha including JFMCs and other Stakeholders
9. Green India Mission Scheme
10. Rangeland and Silvi-pasture Development Scheme
11. Satellite based Forest Resource Assessment and technological based M & E
12. Forestry Institutional and Technology Management Scheme

Scheme for Sustainable Livelihoods through NTFP Management:

6.7. NTFPs have a tremendous potential to involve local collectors for establishing micro-, small- and medium enterprises through clear tenured rights, better collection methods, financial support, capacity development, infrastructure and institutional support in near future. With these efforts there is a potential to create large scale employment opportunity thereby, **helping in reducing poverty and increasing empowerment of particularly women, tribal and poor people of the poorest and backward districts of the country.** After the ban on green felling, the income from NTFPs in the total income of the Department became the major one with that from timber marginalized, in many states.

6.8. Export of NTFPs and its products contributes 68% of the total export from forestry sector. Herbal raw materials from NTFP source contribute to 90% of the supply for the industry, which are practically sourced from natural forests. Of the 7000 plants used in Indian System of Medicine, 960 have been recorded in trade and 178 are traded in high volumes in quantities exceeding 100 MT per year. According to a study, a total annual demand of botanical raw drugs in the country for the year 2005-06 has been estimated as 3,19,500 MT with cross ponding trade value of Rs.1069 crores. Thus a separate scheme for the NTFP including Bamboo Regeneration & Management is very much required.

6.9. Livelihoods of forest fringe villagers who form majority of the tribal, poor and vulnerable population of the country, is also required to be promoted on a mission mode through locally available forest and non-forest natural resources and skills. They should be encouraged to take up regeneration of NTFP and Forest Food species in the under storey (herbs, shrubs and climbers) including tubers and medicinal plants apart from potential return from intermediate harvest through thinning, which is silviculturally desired option in most degraded forests, regeneration of rootstocks (viz. sal coppice forests) etc. to optimize economic and livelihoods return to the community.

6.10. A sum of Rs. 6590 crores has been proposed for this scheme, which include provisions for resource management, value addition, marketing, minimum support price, capacity building and IEC, research and development, policy and institutionalization for development of the sector for enhancement of the livelihood options of the people especially in north-east, mountain areas and left wing extremist affected areas.

Capacity Development of the Gram Sabha including JFMCs and other Stakeholders:

6.11. Joint Forest Management has become the key agenda of decentralized forest governance in forest-fringe villages of India. It also continues to mobilize people's acceptance and policy attention with about 1.5 lakh JFMCs actively involved in management of about 30 million ha. of Forests in India. There is a compelling need to address sustainability of JFMC as an institution. **Joint Forest Management Committees are emerging as technical institution of Gram Sabha to take up forest conservation and eco-restoration through implementation of perspective micro plans in linkage with forest working plans while continuing its forest governance functions.**

6.12. To ensure decentralized and democratic forest governance on a sustained basis and to enable forest-fringe poor and tribal realize sustainable livelihoods outcome, **JFMC are required to be adequately and strategically revitalized and empowered. Involvements of women, who are the major gatherers of forest produce, are to be prioritized in forest management and regeneration operations. This will require adequate capacity building of JFMC members in forest resource management, livelihood issues, community mobilization and decentralized governance** on a large scale and a new scheme for their capacity building has been proposed with an outlay of Rs. 1500 crores.

Green India Mission Scheme:

6.13. Government of India has taken initiatives by formulating National Mission for a Green India (GIM) as one of the eight Missions under the National Action Plan on Climate Change (NAPCC). The Mission has been approved by the Prime Minister's Council on Climate Change Total Mission cost is Rs.46,000 crore over ten years starting from the year 2012-13, and coinciding with the 12th and 13th Five Year Plan Period. The Green India Mission (GIM) has been conceived as a multi-stakeholder, multi-sectoral and multi-departmental mission, GIM recognizes that climate change phenomena will seriously affect and after the distribution, type and quality of natural resources of the country and the associated livelihoods of the people. GIM puts the "greening" in the context of climate change adaptation and mitigation, meant to enhance ecosystem services like carbon sequestration and storage (in forests and other ecosystems), hydrological services and biodiversity; along with provisioning services like fuel, fodder, small timber through agro and farm forestry, and NTFPs.

6.14. During the 12th five year plan, a provision for Rs. 23000 crores have been kept for the GIM for increased forest and tree cover on 2.5 m. ha area (non forest through agro / social / farm forestry), improved quality of forest cover on another 2.5 m ha area, improved ecosystems services, increased forest based livelihood income and enhanced annual CO2 sequestration.

Rangeland and Silvi-pasture Development Scheme:

6.15. Livestock rearing is one of the major occupations in India and is making significant contribution to the country's GDP but, as per estimates, the country's pastures have reduced from about 70 million ha in 1947 to just about 38 million ha in 1997. In view of the large number of resource-poor households dependent upon open grazing for their livestock, it is neither desirable nor possible to simply wish away open grazing. Similarly, with increasing demands of food grains on the available arable land resources, the opportunity cost to divert cultivable land for fodder production in a big way might be very high. **The only plausible option, therefore, is to revitalize the degrading common fodder and pasture resources in the country and improve their productivity. However, there does not seem to be any program by these departments to develop fodder resources on CPRs.**

6.16. The forest departments have been, over the past Plans, engaged in managing grazing lands that have been legally classified as forests. A centrally sponsored scheme titled "Area Oriented Fuel and Fodder Project Scheme" under National Afforestation & Eco-development Board (NAEB) has also been implemented over the 11th Plan period. The issue has also been engaging the attention of the Ministry of Environment and Forests that has been trying to formulate a special National Grazing Policy. But the budgetary outlay has been too meager to have any significant impact. **One of the recommendations under the Forestry sector's mid-term review of 11th Plan was that 'grassland and other ecologically important eco-systems need to be conserved**

6.17. "Rangeland and Silvi-pasture Development Scheme" with a proposed outlay of Rs. 900 crores has been formulated to take care of the aspirations of the local people living in and around forests. Rehabilitation and productivity enhancement rangelands and common / revenue lands around forest areas, fodder storage/ value addition facilities, **linkages with existing institutes/Centre of Excellence on fodder and pasture management, research, developing models, germplasm banks and nurseries etc. are the major components of the scheme.**

Satellite based Forest Resource Assessment and technological based M & E:

6.18. Monitoring and Evaluation is an integral part of any program for assessment of the works underway and effectiveness of investments made. Continuous monitoring and periodic evaluation of the selected parameters, performance efficiency and impact of the projects / programs will have to be undertaken for proper implementation of afforestation program. Besides, monitoring of input level activity at the level of Ministry, Forests Departments and other stakeholders, **outcome level parameters should be assessed by technological based M & E system at the field level by application of modern technology like Remote sensing, GIS combined with ground truthing.**

6.19. Remote-sensing-based forest cover monitoring in close collaboration with Forest Survey of India, National Remote Sensing Agency and Indian Institute of Remote Sensing for developing a countrywide mosaic of high resolution satellite images (LISS IV, Cartosat) and overlaying polygons of areas taken up for interventions to help develop a centralized spatial data base in the GIS domain.

6.20. An amount of Rs. 1000 crores has been proposed for this scheme during 12th Plan period. In order to achieve the adequate level in the monitoring and evaluation system, a dedicated forest satellite for monitoring forest cover, NTFP resource, bio-diversity on periodical basis etc. and change monitoring has been proposed. **The improved real-time, web-based monitoring system under this scheme would be extended to other schemes by strengthening the Forest Survey of India (FSI) and Remote Sensing / Geomatics Units in the states.**

Forestry Institutional development and support:

6.21. The role of the forests in providing food and ecological security becomes all the more important, if India has to sustain 9% plus rate of growth in our economy. It would need massive investment in the forestry sector on the lines of roads, power and other infrastructure projects. In this regards the **setup for Forestry Institutions and the professionalism in the forestry sector would also need to be more focused so as to bear multifunctional responsibilities in future.**

6.22. To meet the challenges as enumerated above, the foremost requirement is to strengthen the **forest research infrastructure in the states and to build scientific ecological thinking among masses through continuous extension strategies**. Support to forestry institutions for capacity building and motivation of forestry personnel including provisions for fellowships, technology up-gradation, forestry database and knowledge management, infrastructure development of the forestry institutions, forestry research in the emerging field keeping in view the needs of the society and anticipating the requirements in the near future to make it meaningful, organization of forest congress, development of new institute for Sustainable Forest Management and Forest Policy and payment of contributions to international institutions are some major part of the scheme.

6.23. Proposed outlay of Rs. 3000 crores has been proposed for implementation of this scheme in the 12th plan.

7

Policy and Administrative Changes

7.1. Forests, wildlife and depended communities if tribal have been given their due recognition in our Constitution. Special status to the Fifth and Sixth Schedule areas, conferring autonomy of natural resource management to the traditional forest dwellers and assigning the responsibility of safeguarding the forests and wildlife to States under Article 48A, bear the testimony of such recognition. Fundamental duties with respect to protection of natural resources are also added to the Constitution through 42nd Amendment under Part V – A of Article 51, which reads as "It shall be the duty of every citizen of India - (g) To protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures". Forest is included in the concurrent list of our Constitution.

7.2. Three types of forests such as reserve forests (RF), village forests (VF) and protected forests (PF) are recognised in the Indian Forest Act, 1927 under chapters II, III and IV respectively. Village forests are those reserve forests which are assigned to the village Communities for management. This leads to two conclusions: first, that RFs and PFs are to be managed by the Government (Forest Department), and second, legally speaking, there are only two types of notified forests, RF and PF

7.3. The first public policy statement on the subject of forests was enunciated in 1894. The Policy of 1894 gives the impression that forestry was not given the importance it deserved and in respect of land use it was placed second to agriculture. It reflects the then prevalent abundance of forests. Another in 1952 replaced this Forest Policy, after independence. The policy that was enunciated in 1988 and is in effect on date, is a comprehensive document with directives on afforestation, forestry and farm forestry, management of forests, rights and concessions, diversion of forestland, wildlife conservation, tribal communities, discouragement of shifting cultivation, management of forest fires and grazing, forest based industries, forest extension, forest education, forestry research, personnel management, forest survey and database, and legal and financial support. The evolving policies supported by various Acts and Rules and the administrative set-up checked to some extent the downhill trend in forest resources. Among the various steps taken, two, viz. creation of protected areas and joint forest management, are briefly recalled here. Details appear in subsequent sections of the report. Joint Forest Management (JFM), which has taken firm roots in the country since 1990, is now [2011] the central policy of forestry sector in various states/UTs

7.4. Basic objectives of our National Forest Policy are

- Maintenance of environmental stability through preservation and, where necessary, restoration of the ecological balance that has been adversely disturbed by serious depletion of the forests of the country.

- Conserving the natural heritage of the country by preserving the remaining natural forests with the vast variety of flora and fauna, which represent the remarkable biological diversity and genetic resources of the country.
- Checking soil erosion and denudation in the catchment areas of rivers, lakes, reservoirs in the "interest of soil and water conservation, for mitigating floods and droughts and for the retardation of siltation of reservoirs.
- Checking the extension of sand-dunes in the desert areas of Rajasthan and along the coastal tracts.
- Increasing substantially the forest/tree cover in the country through massive afforestation and social forestry programmes, especially on all denuded, degraded and unproductive lands.
- Meeting the requirements of fuel-wood, fodder, minor forest produce and small timber of the rural and tribal populations.
- Increasing the productivity of forests to meet essential national needs.
- Encouraging efficient utilisation of forest produce and maximising substitution of wood.
- Creating a massive people's movement with the involvement of women, for achieving these objectives and to minimise pressure on existing forests.

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

7.6. Concomitant with the domestic Forest Policy the country also honours the international commitment for sustainable natural resource management and inclusive growth embracing the Millennium Development Goals. Apart from all legally binding and non-legally binding commitments, the country in the last decade experienced a paradigm shift in its domestic legal landscape too. The Indian Forest Act, 1927; and Wildlife Act 1972 have been amended with respect to their penal provisions and constitution of statutory bodies for the protection of Forests and Wildlife. There has also been changes in the provision of Forest Conservation Act 1980 to accelerate the infrastructural development in Left Wing Extremism affected Districts. Few legislations related to ownership right to forest produces, NTFP, forest land and biodiversity etc were enacted to empower the local bodies like Gram Sabha and Municipal bodies. These Acts are Forest Right Act, 2006; Panchayatraj Extension to Scheduled Areas Act (PESA), 1996; Biodiversity Act,2002, etc.

7.7. Presently our forests are administered by the officers of Indian Forest Service (IFS). The authorized cadre strength of IFS is 3079 (2146 Direct Recruits and 933 Promotion posts). Cadre management in all the states are not uniform as a result many of the States the officers suffer from stagnation(without propmtion to next higher posts). Officers are in many states are not promoted for 10 -15 years after crossing the eligibility. Stagnation is seriously impeding the professionalism of the officer and major cause of low morale of the organization. When the whole dynamics of forestry management are changing, the process change in the organization has taken a beating because of low morale of staff and lack of individual and organizational motivation. Much of the success of JFM and Community Forestry depends on the motivation and organizational sensitization about the process change in the Department.

7.8. Implementation of programme related to Bio-diversity, ecosystem rehabilitation, restoration of wet-land etc are currently delinked from the institution (Forest Department) in whose jurisdiction they exist. The responsibility to manage and execute programme are delegated to other organization. In the 12th Five Year Plan a balanced and pragmatic view is to be taken to make the institution deliver in the system.

7.9. Botanical Survey of India and Zoological Survey of India, whose mandates are to prepare inventory of species diversity, bio-prospecting for bio-technology, prepare herbarium, genetic coding for conservation and determine species-ecosystem links etc are not a part of Forestry and Wildlife. As a result there is a gap in communication between BSI/ZSI and Forest Department for smooth conduct of research works in Forests. **BSI and ZSI need to be constituted as autonomous body & must undertake the research on operational & emerging challenges so as to reflect the realities rather than undertaking research only for publishing research papers. The entire taxonomists and other field staff should be accorded the status of Forest Officer as any other staff of Forest Department (like NTCA and WLCCB through amendment of Wildlife Act to make ZSI and BSI as effective institutions in collaboration with other reputed national and international Universities carrying out similar works**. This is the first step towards conferring autonomy to BSI and ZSI. In the 12th plan both the organizations required to be restructured for efficiency to take up responsibility to meet the emergent need of the country like establishment of National Information Repository and Data Management System.

7.10. Administration of forest field staffs at the cutting edge level has become extremely difficult over the years of neglect in addressing their genuine problems. They are now crippled by the following circumstances.

- Majority of forest staffs have crossed the age of 50yrs and on the verge of retirement.
- More than 20 to 40 percent posts of the field staffs are vacant across the length and breadth of the country.
- Old staffs are not motivated and sensitized for participatory **forestry management**.
- The field staffs are stationed at the far flung remote areas of the country and mostly lack basic amenities, for education of their children, accommodations, patrolling, medical facilities etc. Forest staffs are not given ration allowances like other protection force working in similar disposition. Their counterpart in Police and other Defence Department is provided with most of these facilities.

7.11. In the 12th Plan with the increase in plantation target and required escalated efforts for sustainable management of forests, wildlife, ecosystem and biodiversity with the participation of community, a critical review and strengthening of forestry administration at the cutting edge level would be the critical determinant.

7.12. In the 12th Five Year Plan implementation of Biodiversity Act, 2002; FRA, 2006, and PESA 1996 etc. in letter and spirit is extremely important for inclusive and sustainable growth of our economy. **Economic inclusion of these areas is possible through smooth transferring the management and marketing responsibility of NTFP to Gram Sabha and local elected bodies. Creation of a village cadre/appointment of Village Forest Extension Worker or Village Green Guard at the Forest Department-Villagers interface is very important. This cadre can bridge the gap between forest administration and the local elected bodies and act as facilitator for community management of forest** resources.

8

Financial and Physical Projections

8.1. Considering the recommendation of **Mid-term Appraisal of Forestry & Wildlife Sector schemes in 11th Plan by the Planning Commission and the country's requirements in addressing the sustainable livelihood issues of forest dependent communities through Bamboo & NTFP based programmes as well as the need to mainstream them in country's development, to ensure ecological security by insulating the country from adverse impact of climate change by way of increasing the carbon sequestration potential apart from increasing forest cover, to enhance scale of involvement of village level institutions besides putting in place a system of technological based monitoring & evaluation,** following schemes are recommended for augmenting conservation and development of forests including afforestation and associated aspects in the 12th Plan keeping in view the ecological security of the country and livelihood support to the people.

Table 8.1. Proposed schemes during 12th plan

Item No.	Proposed Scheme/ Program during 12th Plan	Proposed Demand (Rs. Crores)	Proposed Physical Targets
3.	**Ongoing Schemes**		
1.1	National Afforestation Programme (detailed breakup annexed)	13500	2.0 million Ha. Afforestation and ecorestoration including shifting cultivation areas by adopting local, specific, viable model, Soil & Moisture Conservation including water harvesting structures and Eco-development for people residing in forests, treatment of problem soil, coastal and shelter belt plantation. Creation of a cadre of trained Community Foresters (About 50000) for activities \ programmes \ schemes of forest conservation and management including NTFP's. The scheme would also include provisions for establishment cost of NAEB HQ, Communication strategy and Awareness component and support to regional centres of NAEB.
1.2	Intensification of the Forest Management	2000	Forest Fire Management, Boundary Demarcation including areas allotted under FRA, Forest Infrastructure, Control of Invasive Alien Species including their utilization as a resource through R&D, Strengthening of Working Plan Mechanism for sustainable livelihood of people and Conservation of Forest Resources incentives to working plan and

			research staff in the state. Involvement of retired defence / paramilitary personnel in eco-restoration has also been envisaged.
4. New Schemes			
2.1	Sustainable livelihoods through NTFP and Bamboo Management	6590	Conservation and development of NTFP resource over 6 lakh Ha.,Value addition, Marketing Support, Minimum Support Price and overall management of NTFP and Bamboo Sector
2.2.	Capacity Development of the Gram Sabha including JFMCs and other stakeholders	1500	Capacity building of members of one lakh JFM Committees and Gram Sabha through Master Trainers in each Forest Divisions for management & conservation of forests.
2.3	Green India Mission	23000	Increased FTC on 2.5 million Ha and improvement in Quality of Forest Cover over another 2.5 million Ha.
2.4	Rangeland and Silvi-pasture management	910	Rehabilitation and productivity enhancement rangelands and common / revenue lands around forest areas, fodder storage/ value addition facilities, strategic research, education, capacity building and extension activities on fodder and pasture management, germplasm banks and nurseries etc.
2.5	Satellite based Forest Resource Assessment and technological based M & E	1000	To put in place a system of technology based collection of base line data, monitoring & evaluation of forestry schemes, including GIS based monitoring of areas allotted under FRA 2006 to prevent their enchrochments & programmes in states and central level.
2.6	Forestry Institutional development and support	3000	Grants-in-aid institution, Support to forestry institutions for capacity building and motivation of forestry personnel including provisions for fellowships, technology up-gradation, Forestry database and knowledge management, infrastructure development of the forestry institutions, forestry research, Forest Congress, New institute for Sustainable Forest Management and Forest Policy and payment of contributions to international institutions.
	Total:	51500	
Note: Break-up of the Schemes is annexed itemwise.			

Expected Outcome:

8.2. The implementation of the forestry sector schemes recommended in previous para would **result in increase in forest and tree cover by about 3.5 million ha and improvement in quality of forests over another 3.5 million ha**. This will take India's forest & tree cover to **around 82 million ha, which will be 25% of geographical area of the country.** Further, the protection & conservation measures envisaged **will improve the quality of forest cover in terms of density, growing stock, quantum of carbon sequestered by way of implementation of these schemes**. Improvement in quality and area of FTC would enhance eco- system services like carbon sequestration, hydrological services and bio-diversity conservation in addition to increase in tangible goods like fuel-wood, fodder, timber and NTFPs from forests**. The implementation of the forestry and wildlife sector schemes would benefit people living in and around forests especially tribals and forests dwellers through employment generation & low key economic activities, so vital for respectable sustenance as well as augmentation of income.**

8.3. From the year 1995 to 2005, carbon stock in forests of the country were estimated to **increase from 6245 million tonnes to 6662 million tonnes**, registering in annual increment of 37 million tons of Carbon. With the implementation of **proposed forestry sector schemes, annual carbon sequestration will enhance atleast by about 50 million tonnes at the end of the 12th plan which will increase with the maturity till it attains mean annual increment & rotation period.**

8.4. Forests are also essential for maintaining favourable conditions **for sustainable agriculture productivity and farmers' income is expected to increase by soil and moisture conservation works. Forests are also important for maintaining underground water table, for recharging the aquifers and for maintaining of water in rivers and rivulets.** This has been established in various 4s5studies of catchments like Shimla forest catchment for securing water supply to Shimla town and Borivali National Park forests for maintaining water supply to the part of the Mumbai city.

8.5. Forests also provide a range of tangible benefits like fuelwood, fodder, timber and NTFPs which are crucial to livelihood security of the local communities. **Nearly 27% of total population of the India comprising about 300 million people depend on forest for livelihood and implementation of the recommended forestry schemes would augment forest based livelihood income of the people living in and around forests.**

BREAK UP OF SCHEMES

Item 1.1.

National Afforestation Programme (NAP)

S.No.	Component	Model Cost
1.	**Eco-restoration and Afforestation** including shifting cultivation areas by adopting local, specific, viable model (ANR, AR, Silvi-pasture, Mixed Plantation, coastal and shelter belt plantation, Regeneration of perennial herbs etc.) including Eco-development involving retired defence / paramilitary personnel	**Rs. 8000 crores**
2.	**Ancillary activities (**Given below**)**	**Rs. 4000 crores**
(i)	Strengthening of JFM	Rs 100000 per JFMC
(ii)	Awareness Generation	1% of the Plantation Cost
(iii)	Microplanning	2% of the Plantation Cost
(iv)	Planting/ Regeneration	As per models
(v)	Fencing	5 –10% of the Plantation Cost
(vi)	Soil & Moisture Conservation	15- 25% of the Plantation Cost depending on agro-climatic zones
(vii)	Entry Point Activities (per Hectare)	Rs. 10,000/-
(viii)	Training & Capacity Building	Rs.10 Lakh per FDA
(ix)	Value Addition and Marketing of Forest Produce	Rs. 20 Lakh per FDA
(x)	Concomitant Monitoring & Evaluation	2% of the Plantation Cost
(xi)	Overheads[##]	10% of the Plantation Cost
(xii)	Treatment of Problem Lands	25% of the Plantation Cost
(xiii)	Use of Improved Technology	25% of the Plantation Cost
3.	**Community Foresters** from among tribal Youths/ People residing in forests for forest conservation and management (50000)	**Rs. 1500 crores**
	Total	**Rs. 13500 crores**

Item 1.2.

Intensification of Forest Management

Sr. No.	Components	Amount
(i)	Forest Fire Management: Action as per Fire Vulnerability Map/ Fire Hazard Map/ other parameters etc.	Rs. 500 crores
(ii)	Mapping and Boundary demarcation including areas allotted under FRA	Rs. 400 crores
(iii)	Forest Infrastructure	Rs. 300 crores
(iv)	Control of Invasive Alien Species including their utilization as a resource through R&D	Rs. 200 crores
(v)	Strengthening of Working Plan Divisions/ Research Wing, incentives to working plan and research staff in the state	Rs. 250 crores
(vi)	NAEB HQ Secretariat, Communication Strategy, Awareness Campaign, Support to Regional Offices of NAEB, Other Officials	Rs. 350 Crores

Item 2.1.

Sustainable livelihoods through NTFP and Bamboo Management

(Rs. in Crore)

Sl. No.	Proposed Activity	Total Budget
1	**Resource Management** (Resource augmentation through *in-situ* conservation and ANR / *ex-situ* cultivation [ha])	2500
2(a)	**Marketing** (Value Chain Development, Infrastructure / Enterprises)	1000
2(b)	**Minimum Support Price [MSP]**	2000
3	**Capacity Building & IEC** (Awareness building, Social Mobilization, National / international exposures and Capacity Development)	250
4	**Research & Development**	290
5	**Enabling Policy & Institutionalization** (Setting up of National NTFP Development Board with state centres, M&E Documentation, Manuals, Networking, Outreach, Administrative, compensation for NTFP crop failure, etc.)	550
	TOTAL	**6590**

* A 10% escalation in base rates would be applicable from year 2013-14 onwards.

Item 2.2.

Capacity Development of JFMCs / Gram Sabha / Other Stakeholders (Include exposure visit/ field training / livelihood issues/ record maintenance/ community organising etc.)

- Travel/ Boarding / Lodging of Experts/ Trainers
- Boarding / Lodging/ Travel of Participants
- Training Kits
- Honorarium to of JFMC / Gram Sabha/ non-officials to compensate wages lost during training.
- Contingency
- Proceedings/ Secretarial Assistance

Estimate: 1 lakh JFMCs (80 households (avg.) * Rs. 2.5 lakh per training (2-3 days) * 3-5 trainings/ refresher course in a five year plan = Rs. 8100 to 13500 crores for a plan. Initially, executive members/ Panch/ sarpanch/ presidents/ other functinaries of unit etc. to be trained (Demand in the plan period will be one-third to one-fourth of estimate)

Item 2.3.

Green India Mission

Sub Missions	Categories	Area (Million ha.)	Total Cost (Crores)
A. Eco-restoration through Sub-missions			
Sub Mission 1	Enhancing resilience of ecosystem/ landscopes high on vulnerability (increase in quality of forest cover and ecosystem services)	**2.45**	**5500**
Sub Mission 2	Restoration/ of ecologically challenged ecosystems (increase in forest cover)	**0.9**	**4200**
Sub Mission 3	Enhancing tree cover in Urban & Peri-Urban areas (including institutional lands)	**0.1**	**2000**
Sub Mission 4	Agro forestry and social Forestry (increasing biomass & creating carbon sink)	**1.5**	**4800**
Sub Mission 5	Restoration of Wetlands	**0.05**	**300**
Total Sub Missions		**5.0**	**16800**
Promoting alternative fuel energy	Biogas, solar devices, LPG, Biomass based systems, improved stoves	2.5 million households	**500**
	Total of A		**17300**
A. For Support Activities			
Activities		**Cost**	
Research		**340**	
Publicity/Media/outreach activities		**170**	
GIS/Monitoring and Evaluation		**170**	
Livelihood improvement activities,		**2900**	
Strengthening local level institutions		**650**	
Strengthening FDs		**650**	
Overheads, Mission Directorate		**700**	
	Total of B	**5580**	
		Grand Total A+B = 22880 crores Say Rs. 23000 crores	

Item 2.4.

Fodder and Grazing Land Management

(Rs. in Crores)

S. No.	Title of scheme (S)/ program (P)	Basis of Budget Calculation	Proposed Outlay
P-1.1	Development of National Grazing-cum-Fodder and Pasture Management Policy	LS (surveys/ studies/ consultations/drafting/ etc.)	1.00
P-1.2	Mapping of ecologically sensitive grasslands and developing rehabilitation packages	LS (maps/ landsat imageries/ analysis/ ground truthing/ development of rehabilitation models	10.00
P-1.3	Rehabilitation and productivity enhancement of pasture lands in forests	@ 2 lac ha x Rs. 0.25 lac per ha[7]	500.00
P-1.4	Revive/ develop pastures around forest fringe villages	@1 lac ha x Rs. 0.20 lac per ha	200.00
P-1.5	Develop seed/ germplasm banks & nurseries of fodder species	@2.5 crore/ state x 20 states)	50.00
P-1.6	Develop fodder storage/ value addition facilities	@2.5 crore/ state x 20 states)	50.00
P-1.7	Promote incorporation of fodder trees on agricultural lands	@500 lac trees @ Rs.10/- per plant)	50.00
P-1.8	Strategic research, education, capacity building and extension activities	LS (@Rs. 800 lac/year to support strategic research, education, capacity building, extension activities)	40.00
		Sub-total:	**901.00**
	Management Support/ Contingencies	(@1%)	9.00
		Grand Total	**910.00**

Item 2.5.

Satellite based Forest Resource Assessment and Technological based monitoring

Sr. No.	Components	Amount
(i)	Construction and Launch of Forest Satellite	Rs. 250 crores
(ii)	Strengthening of FSI etc.	Rs. 300 crores
(iii)	Strengthening of M & E Unit of State Forest departments including GIS based monitoring of areas allotted under FRA 2006 to prevent their enchrochments	Rs. 350 crores
(iv)	Field Station maintenance for monitoring of outcome parameters	Rs. 100 crores

[7] Based on Model Expenditure Norms in use by the Gujarat Forest Department

Item 2.6.

Institutional development and support

Sl. No.	Activity	Amount (Rs crore)
1	FSI New activities	280
2	Establishing Robust mechanism for Forest Resource Assessment	220
3	Establishment of centralized data node and Information Nodes in State Forest Departments	32
4	WII – Institutional and Technology Advancement	175
5	Research Support to ICFRE and the States	1000*****
6	Research Support to IIFM	230
7	Research Support to IPIRTI	40
8	WII – Augmentation of Wildlife Research	30
9	Capacity Building – IGNFA	183
10	Capacity Building – DFE	85
11	Capacity Building – IPIRTI	24
12	Capacity Building – IIFM	229
13	WII - Wildlife Training	20
14	Capacity Building – ICFRE	6
15	Technological Up gradation	105
16	Infrastructure Development	2575*
17	Motivation and Morale of Forest Personnel	1265
	TOTAL	**6399**

**Note: corpus through CAMPA fund*

Item 2.6.1 to 2.6.4

Total Financial Requirement for Forest Resource Assessment and Information Management

Activity	Amount (Rs crore)
New activities of FSI	280
Establishing Robust mechanism for Forest Resource Assessment	220
Establishment of centralized data node and Information Nodes in State Forest Departments	32
Proposed Technological Upgradation (Wildlife)	175
Total	**Rs 707 crore**

Item 2.6.4

Fund Requirements for Strengthening Knowledge, Technology Upgrading, Corpus, and Regional centres

Item of Work	Estimated Cost (in Rs. Crore)
Strengthening Knowledge Capability of the Wildlife Institute of India: Development of WII's staff capacity - specialized trainings, study tours/ overseas visits, visits by international consultants/resource persons for providing specialized training, scientific exchange, organization of national and international conference on emerging themes of wildlife Conservation, and networking with national and international organizations and sharing experience	**15**
Technology Upgrading at WII • National Wildlife Forensic Research Facility – **40.0 Crore** • Development of PAs Geodatabase at Enterprise Level – **10.0 Crore** • Development of Wildlife Health & Disease Research and Monitoring Facility – **15 Crore** • Remote Monitoring of Wildlife Populations – **10 Crore**	**75**
Revolving Fund – Facilitation of urgent EIA/ Cumulative assessment studies, preparation of management plans/conservation plans, and provision of essentially required scientific information on fragile ecosystems, endangered species for policy/decision making	**5**
Establishment and Running of Regional Centres	**80**
Total	**175**

Item 2.6.8

Financial requirement for Augmentation of Wildlife Research

Item of Work	Estimated Cost (in Rs. Crore)
Landscape level wildlife research – ecological assessments on threatened and rare species, and resource mapping	20
Adoption of adaptive management approach through experimental and All India Coordinated projects on priority conservation themes	10
Total	**30**

Item 2.6.9

Financial Requirements

Table 13.1.4 Financial Requirements for Centre for Forest Policy Research

Name of the work	Outlay Proposed
a. Training of IFS probationers	50.0 crores
b. MCT	81.0 crores
c. Training of other stake holders	1.0 crore
d. Infrastructure	30.00 crores
e. CFPR (Seed Money)	20.00 crores
f. Dr. Hari Singh Fellowship	1.0 crore
TOTAL	**183.00 crores**

Item 2.6.10

Activities proposed for Directorate of Forest Education (DFE)

Infrastructure and Maintenance

Sl No.	Details	Amount required for New Infrastructure	Amount Required for Renovation & Maintenance	Total
1	Directorate	-	2 crores	2.0 Crores
2	CASFOS, Dehradun	2 crores	3.8 crores	5.8 Crores
3	CASFOS Coimbatore	2.7 crores	2.3 crores	5.0 Crores
4	CASFOS Burnihaat	2.7 crores	3 crores	5.7 Crores
5	EFRC, Kurseong	0.7 crores	3 crores	3.7 Crores
	Total	**8.1 crores**	**14.1 crores**	**22.2 Crores**

Item 2.6.12

Budget Requirement for IIFM

Table 13.1.6 **Budget Requirement for IIFM**

Category	Year 1	Year 2	Year 3	Year 4	Year 5
Resource	8.5	10.2	11.5	13.5	14.4
Infrastructure	23.25	39.40	6.75	9.25	5.5
TEEB	5.0	5.0	4.0	4.0	2.0
Research	10.00	15.00	17.0	20.0	5.0

Total Rs 229.25 crores

Item 2.6.13

Item of Work	Estimated Cost (in Rs. Crore)
Planning and conduct of refresher, orientation and short duration specialized theme based training courses/workshops for field managers and other stakeholders	20
Total	**20**

Item 2.6.14

The Indian Council of Forestry Research and Education (ICFRE)

i) HRD of ICFRE - Domestic Training Rs. 1.0 crores

ii) HRD of ICFRE - International trainings/ exposure/seminars visits Rs. 5.0 crores

Total **Rs. 6.0 crores**

Item 2.6.16

Table 13.1.8 Financial Requirement for Infrastructure Development of Institutions

(Rs. in Crores)

Sl.No.	Particulars	Amount
1	State Forest Departments- Construction of residential quarters field staff, improvement of communication, mobility, protection of forests from fires and decision making : modernization, training and research facility	2000*
2	Research Organization - ICFRE Modernization of lab facilities and purchase of equipment, renovation of infrastructure, construction of ICFRE Head Quarter at Delhi, Establishment of field research facilities.	400
3	Forestry Education- FRI Deemed University and Other Universities - Modernization of teaching and grant of forestry universities.	5
4	Forestry Education- Grants to Universities Forestry Education- Infrastructural Development in 28 Universities Imparting Forestry Education	50

5	IPIRITI Bangalore- Expansion and up gradation of research and training facilities	15
6	IIFM Bhopal- Upgradation of teaching facilities, strengthening of existing infrastructure and expansion of FSI in the other parts of country.	85
7	Forest Survey of India- Expansion and Modernization	20
	Total	**2575**

Item 2.6.17

Budgetary Requirements New schemes for increasing motivation of forestry personnel

(Rupees in crores)

Sl.	**Items of Work**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**Total**
1	Scheme of Subsidized Ration to Forest Personnel	15	15	15	15	15	75
2	Scheme of Scholarships to the children of forest personnel	8	8	8	8	8	40
3	Formation of Forest Housing Corporations in the states	120	120	120	120	120	600
4	Beat system reforms to reduce the over-burden	100	100	100	100	100	500
5	Parity with the police personnel	0	0	0	0	0	
6	Incentive for anti-poaching operations.	10	10	10	10	10	50
	Total	**253**	**253**	**253**	**253**	**253**	**1265**

Annexure 1

Constitution and Terms of Reference of Working Group

No. M-13033/8/2009-E&F
Planning Commission
(E&F Division)

Yojana Bhawan, Sansad Marg,
New Delhi – 110 001,
Dated 15.07.2011

OFFICE MEMORANDUM

Subject: Constitution of a Working Group on Forestry and Sustainable Natural Resource Management for the 12th Five Year Plan 2012-2017.

The Steering Committee on Environment, Forests & Wildlife and Animal Welfare for the Twelfth Five Year Plan held its first meeting on 19th May, 2011 under the chairmanship of Dr. K. Kasturirangan, Member, Planning Commission. The Chairman has desired to constitute a Working Group on **Forestry and Sustainable Natural Resource Management**. The composition and Terms of Reference of the Working Group are as follows:-

1	Dr. P. J. Dilip Kumar, Director General of Forests & Special Secretary, Ministry of Environment and Forests, New Delhi	Chairman
2	Shri.A.K.Bansal, Additional Director General of Forests, Ministry of Environment and Forests, New Delhi	Co-Chairman
3	Shri Jagdish Kishwan, Addl. DGF, Ministry of Environment & Forest	Member
4	Sh. R.K.Goel, IGF, Ministry of Environment & Forest	Member & Nodal Officer
5	Shri. B M S Rathore, Jt. Secy, Ministry of Environment & Forest	Member
6	Officer nominated from the Ministry of Rural Development, New Delhi	Member
7	Officer nominated from the Department of Land Resources, New Delhi	Member
8	Officer nominated from the Ministry of Water Resources, New Delhi	Member
9	Officer nominated from the Ministry of Urban Development, New Delhi	Member
10	Officer nominated from the Ministry of Tribal Affairs, New Delhi	Member
11	Officer nominated from the Ministry of Earth Sciences, New Delhi	Member
12	Officer nominated from the Department of Industrial Policy & Promotion, New Delhi	Member
13	Officer nominated from the Department of Agricultural Research and Education & Indian Council of Agriculture Research, New Delhi	Member
14	Dr. A.K. Mukherjee, Retd. DG & Spl. Secy of Forests, New Delhi	Member
15	Dr. R.B. Lal, Director, Indian Institute of Forest Management, Bhopal	Member
16	Shri. Indu.B. Srivastava, Principal Chief Conservator of Forests, Karnataka	Member
17	Sh. Ramesh Kumar Dave, Principal Chief Conservator of Forests, Madhya Pradesh	Member
18	Prof. C.R. Babu, Former Pro-Vice Chancellor, Delhi University, Delhi	Member

19	Sh. A.S.Balanathan, Principal Chief Conservator of Forests, Tamil Nadu	Member
20	Dr. Kinsuk Mitra, President, Winrock International India	Member
21	Sh. H.D.Kulkarni, Chief of Plantation and Farm Forestry, ITC Limited - Paperboards & Specialty Papers Division,Bhadrachalam, Andhra Pradesh	Member
22	Sh. B.S.Sajwan, Pr.Secretary, Forest Department, Arunachal Pradesh	Member
23	Shri S.Roy, Additional Chief Secretary Forests Himachal Pradesh	Member
24	Sh. S.K.Nanda, Pr. Sec, Forest & Environ., Gujrat	Member
25	Dr. R.B.S.Rawat, PCCF, Dept. of Forest, Uttarakhand	Member
26	Dr. V.K. Bahuguna, DG, ICFRE, Dehradun.	Member
27	Shri P.R. Sinha, Director, Wildlife Institute of India, Dehradun	Member
28	Shri D.N.S. Suman, PCCF, Uttar Pradesh	Member
29	Shri Avay Shukla, Additional Chief Secretary (Forests), Himachal Pradesh	Member
30	Prof. Arun Kumar, Chairperson, Centre for Economic Studies and Planning, New Delhi	Member
31	Dr. M.K. Ramesh, Professor of Law, National Law School of India University, Bangalore	Member
32	Shri R.M.Misra, DIGF, Dept. of Land Resources, Ministry of Rural Development	Member
33	Dr. U. Sankar, Honorary Professor, Madras School of Economics, Chennai	Member
34	Shri. A.M.Singh, DIGF (SU), Ministry of Environment & Forest	Member
35	Shri. Subhash Chandra, DIGF (FP), Ministry of Environment & Forest	Member
36	Shri. Priya Ranjan, AIGF (RT), Ministry of Environment & Forest	Member
37	Dr. Indrani Chandrasekharan, Adviser (E&F), Planning Commission	Member
38	Dr. Biswajit Banerjee, Director (Forestry), Planning Commission	Member
39	Mrs. Archana Singh Katiyar, Director(SP), Planning Commission	Member Convener

2. The Terms of Reference of the Working Group

I. To make recommendations for the Forestry and Natural Resource Management for the Twelfth Five Year Plan based on a review of the existing programmes, policies and issues related to Legislation, Enforcement, Infrastructure and Institutional Mechanism;

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

b. 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 (Non-Timber Forest Produce) and promoting efficient and quality value addition to forest produce collected by the communities.

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

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

e. Policy prescriptions for strengthening linkages between forestry, agriculture, pastures and grazing land management, watershed development in rural and tribal development programmes.

II. Identify thrust areas for the Forestry and Natural Resource Management, viz., NTFP, sustainability, livelihood of Forest Dwellers, and eco-services. Assess current and emerging issues for integration with other sectors and recommend remedial measures and mechanisms;

III. To recommend strategy for a proactive national stance on national and international forestry related issues such as climate change, biodiversity and desertification, CDM, Global Green Fund, REDD+ etc.

IV. Review and recommend ways of strengthening the present mechanism of implementation of international commitments.

V. Recommended strategies for co-ordination of programmes between Centre and the States in view of national and regional circumstances in Forestry and Natural Resource Management sectors;

VI. Suggest mechanisms for capacity building for Management and 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; and

VII. Recommend Innovative ways for augmenting flow of resources into the sector through integrated investment framework.

3. General Terms of References

I. The Chairman may co-opt other Experts/Member, and constitute sub-groups for specific tasks. The Working Group would be serviced by E&F Division of the Planning Commission.

II. The expenditure on TA/DA of official members of the Working Group 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 SR 190 (a).

III. The Working Group will submit its report to the Planning Commission by the 30th August, 2011.

IV. Dr. Biswajit Banerjee, Director (Forestry), Planning Commission, Ph. 011-23096720, will be the nodal officer in the Planning Commission for this Working Group and any further correspondence in this regard may be made with him.

(Dr. Biswajit Banerjee)
Director (Forestry)
<biswajit.banerjee@nic.in>

Annexure 2

Constitution and Terms of Reference of Sub Group I

M-13033/1/11-E&F Part-III
Government of India
Planning Commission
(E&F Division)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 25.07.2011

OFFICE MEMORANDUM

Subject: Constitution of Sub-Groups under Working Group on Forestry and Sustainable Natural Resource Management – Sub Group I on Forestry

In the first meeting of the Working Group on Forestry and Sustainable Natural Resource Management held on 25.07.2011, it was decided to constitute five Sub- Groups under the Working Group. The composition and Terms of Reference of the Sub-Group I on Forestry is as follows.

S.No.	Name of Member	Designation
1	Shri A.K. Bansal, Addl. DGF, (FC), MoEF	Chairman
2	Shri.R.K.Goel, IGF, MoEF.	Co-Chairman
3	Shri. A.K.Mukherjee Retd. DG & Spl. Secy of Forests	Member
4	Shri. C. Madhukar Raj, PCCF, Andhra Pradesh	Member
4	Dr. Aurobindo Behera, Principal Secretary,Forest, Orissa	Member
5	Shri Pradeep Khanna, PCCF, Gujarat.	Member
6	Shri B.S. Sajwan, PCCF & Prl. Secy , Arunachal Pradesh	Member
7	Dr. V.K.Bahuguna, Director General, ICFRE, Dehradun	Member
8	Dr. Parvez Ahmed, PCCF, Haryana	Member
9	Shri. B M S Rathore, Jt. Secy, MoEF	Member
10	Representative of NRSC, Shri. Bahera, Deputy Director, Remote Sensing & GIS Applications, NRSC, Hyderabad	Member
11	Shri. D.K.Sharma, DIGF (NAEB), MoEF	Member Convenor

2. Terms of Reference for Sub-Group I on Forestry

I. To make recommendations for the Forestry for Twelfth Five Year Plan based on a review of the existing programmes, policies and issues related to Legislation, Enforcement, Infrastructure and Institutional Mechanism;

f. Greening the country through the mechanism of participatory management by involving local level institutions in agro-forestry, urban forestry and afforestation of under-utilized lands.

g. Optimizing productivity to improve quality of forests, reducing demand and supply imbalances, rationalizing export and import regulations for improving opportunities for marketing of forest products.

h. Assess technological and manpower requirements for forest protection including forest fires and illegal activities such as encroachments and poaching etc.

i. Recommend policy prescriptions for strengthening linkages between forestry and allied sectors such as agriculture, rural development, tribal affairs, panchayati raj, water resources and other developmental sectors.

II. Identify thrust areas for the Forestry and eco-services, assess carrying capacity for sustainable management, forest certification to promote high value export, eco-labelling, trade in eco-smart goods and services, green building technology, local value addition etc apart from identifying the emerging issues with other sectors as well as suggest remedial measures.

III. To assess the feasibility of switching over from present scale of mapping to a smaller and reliable scale to accommodate the requirement of micro-planning and monitoring of activities.

IV. Recommended strategies for co-ordination of programmes between Centre and the States in view of national and regional circumstances in Forestry; real time monitoring of activities and outcomes.

V. Suggest mechanisms for capacity building for Management and Planning for conservation and development of Forests

VI. Recommend Innovative ways for augmenting flow of resources into the sector through integrated investment framework.

3. General Terms of Reference

I. The Chairman may co-opt other Experts/Member and constitute Resource Groups for specific tasks if required

II. The expenditure on TA/DA of official members of the sub-Group 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 SR 190 (a)

III. The Sub-Group will submit its report to the Planning Commission by the 12th August, 2011.

IV. The Sub-Group will make a presentation on the report prepared on 17th August, 2011 at 11 A.M. in the second meeting of the Working Group

(Archana Singh Katiyar)

Director (SP)

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Annexure 3

Constitution and Terms of Reference of Sub Group II

M-13033/1/11-E&F Part-III
Government of India
Planning Commission
(E&F Division)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 25.07.2011

OFFICE MEMORANDUM

Subject: Constitution of Sub-Groups under Working Group on Forestry and Sustainable Natural Resource Management – Sub Group II on Non Timber Forest Produce

In the first meeting of the Working Group on Forestry and Sustainable Natural Resource Management held on 25.07.2011, it was decided to constitute five Sub- Groups under the Working Group. The composition and Terms of Reference of the Sub-Group II on Non Timber Forest Produce is as follows.

S. No.	Name of Member	Designation
1.	Shri R.B.S. Rawat, PCCF, Forest Department, Uttarakhand	Chairman
2.	Sh. A. K. Singh, MD, Chhattisgarh Minor Forest Produce Federation, Raipur Chhattisgarh	Co-Chairman
3.	Sh. S. K. Panwar, CCF and ED, MPMFP Federation, Madhya Pradesh	Member
4.	Dr. B. T. Rao, Addl. PCCF & MD, Girijan Cooperative Cooperation Ltd., Visakhapatman, Andhra Pradesh	Member
5.	S. T. S. Lepcha, CCF, Uttrakhand	Member
6.	Shri Balaprasad, CEO, National Medicinal Plants Board, New Delhi	Member
7.	Representative of Ministry of Tribal Affairs	Member
8.	Representative of Ministry of Panchayati Raj	Member
9.	Representative of Ministry of Rural Development	Member
10.	Representative from National Bamboo Mission	Member
11.	Sh. Bikash Rath, Regional Centre for Development Cooperation, Bhubaneshwar, Orissa – 751007	Member
12.	Sh. Utkarsh Ghate, Director, Covenant Centre for Development, North India HQ., 2/25, STR Complex, Dulgcity, Chhattisgarh	Member
13	Sh. Prodyut Bhattacharya, Professor, University School of Environmental Management, Guru Govind Singh University	Member
14.	Sh. D. D. Sharma, Joint Secretary, AYUSH	Member
15.	Representative from FRLHT, Bangalore	Member
16.	Sh. A. M. Singh, DIG (SU), Ministry of Environment & Forests	Member Convenor

2. Terms of Reference for Sub-Group II on Non Timber Forest Produce

I. To make recommendations for the Natural Resource Management for the Twelfth Five Year Plan based on a review of the existing programmes, policies and issues related to Legislation, Enforcement, Infrastructure and Institutional Mechanism;

   a) Recognizing the symbiotic relationship between forest and forest dwellers, integration of poverty alleviation schemes, gainful employment generation programmes with due empowerment of communities particularly tribal population and women, including imparting special programmatic and policy focus on development and sustainable harvesting and use of medicinal plants, bamboo and canes and other Non-timber forest produce (NTFP) resources

II. Identify thrust areas for Natural Resource Management, viz., NTFP, sustainability, livelihood of Forest Dwellers, and eco-services. Assess current and emerging issues for integration with other sectors and recommend remedial measures and mechanisms;

III. Optimizing productivity of forests, reducing demand and supply imbalances, rationalizing export and import regulations for improving opportunities for marketing of NTFP (Non-Timber Forest Produce) and promoting efficient and quality value addition to forest produce collected by the communities.

IV. Suggest mechanism for capacity building of all stake holders for Management and Planning for conservation and sustainable harvesting of NTFPs, Marketing & Trade, developing institutions.

3. General Terms of Reference

I. The Chairman may co-opt other Experts/Member and constitute Resource Groups for specific tasks if required

II. The expenditure on TA/DA of official members of the sub-Group 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 SR 190 (a)

III. The Sub-Group will submit its report to the Planning Commission by the 12th August, 2011.

IV. The Sub-Group will make a presentation on the report prepared on 17th August, 2011 at 11 A.M. in the second meeting of the Working Group

(Archana Singh Katiyar)

Director (SP)

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Annexure 4

Constitution and Terms of Reference of Sub Group III

M-13033/1/11-E&F Part-III
Government of India
Planning Commission
(E&F Division)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 25.07.2011

OFFICE MEMORANDUM

Subject: Constitution of Sub-Groups under Working Group on Forestry and Sustainable Natural Resource Management – Sub Group III on Fodder and Pasture Management

In the first meeting of the Working Group on Forestry and Sustainable Natural Resource Management held on 25.07.2011, it was decided to constitute five Sub- Groups under the Working Group. The composition and Terms of Reference of the Sub-Group III on Fodder and Pasture Management is as follows.

S.No	Name of Member	Designation
1	Shri S.Roy, Additional Chief Secretary (Forests), Himachal Pradesh	Chairman
2	Dr. S. K. Nanda, Principal Secretary, Forests and Environment., Gujrat	Co-Chairman
3	Shri Dinesh Misra, Add. PCCF, JICA., Gandhinagar	Member
4	Sh. Ashwani Upadhyaya, Add. PCCF, Rajasthan	Member
6	Shri. D.K.Sharma, DIGF (NAEB), MoEF	Member
7	Dr. K.K.Singh, Director, IGFRI, Jhansi	Member
7	Dr. Kinsuk Mitra, President, Winrock International India	Member
8	Shri. N.C.Saravanan, AIGF (NAEB), MoEF	Member Convenor

2. Terms of Reference for Sub-Group III on Fodder and Pasture Management

I. Suggest mechanisms including capacity building for Management and Planning for conservation and development of fodder and pastures/ grasslands in forests, nonconventional forest areas, village common lands and other potential areas rooted in the principles of ecology, economics, social and gender equity, sustainability, carrying capacity, energy conservation, employment generation and social auditing;

II. Policy prescriptions for strengthening convergence of forestry, agriculture, watershed development programmes with pastures and grazing land management in forests, nonconventional forest areas, village common lands and other potential areas

3. General Terms of Reference

I. The Chairman may co-opt other Experts/Member and constitute Resource Groups for specific tasks if required.

II. The expenditure on TA/DA of official members of the sub-Group 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 SR 190 (a)

III. The Sub-Group will submit its report to the Planning Commission by the 12th August, 2011.

IV. The Sub-Group will make a presentation on the report prepared on 17th August, 2011 at 11 A.M. in the second meeting of the Working Group

V. Shri. N.C.Saravanan, AIGF (NAEB), Ministry of Environment & Forests, will be the Member-Convenor. The members may also communicate with Smt. Archana Singh Katiyar, Director (SP), Planning Commission in this regard.

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Annexure 5

Constitution and Terms of Reference of Sub Group IV

M-13033/1/11-E&F Part-III
Government of India
Planning Commission
(E&F Division)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 25.07.2011

OFFICE MEMORANDUM

Subject: Constitution of Sub-Groups under Working Group on Forestry and Sustainable Natural Resource Management – Sub Group IV on Forestry Institutional & Technology Management

In the first meeting of the Working Group on Forestry and Sustainable Natural Resource Management held on 25.07.2011, it was decided to constitute five Sub- Groups under the Working Group. The composition and Terms of Reference of the Sub-Group IV on Forestry Institutional & Technology Management is as follows.

S.No	Name of Member	Designation
1	Dr. V.K.Bahuguna, Director General, ICFRE, Dehradun	Chairman
2	Dr. A.K.Mukherjee, Retd. DG & Spl. Secy of Forests	Co-Chairman
3	Dr. H.D.Kulkarni, Chief of Plantation and Farm Forestry, ITC Limited	Member
4	Dr. R.B. Lal, Director, IIFM, Bhopal	Member
5	Dr. S.S.Negi, Director, FRI, Dehradun	Member Convenor
6	Shri P.R. Sinha, Director, Wildlife Institute of India, Dehradun	Member
7	Director, IPIRTI	Member
8	Director General, FSI, Dehradun	Member
9	Director, IGNFA, Dehradun	Member
10	Director, DFE, Dehradun	Member
11	Jt. Secy, DoPT	Member
12	Shri. Priya Ranjan, AIGF (RT), Ministry of Environment & Forest	Co-Convenor

2. Terms of Reference

To identify thrust areas for an enabling environment for forestry sector and make recommendations for policy initiatives/ programmes for Forest Information Management, strengthening of forest research, capacity building, technological Upgradation, infrastructural development, forest resource assessment, augmenting flow of funds in the forestry sector, and motivation and morale of forest personnel

3. General Terms of Reference

I. The Chairman may co-opt other Experts/Member and constitute Resource Groups for specific tasks if required

II. The expenditure on TA/DA of official members of the sub-Group 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 SR 190 (a)

III. The Sub-Group will submit its report to the Planning Commission by the 12th August, 2011.

IV. The Sub-Group will make a presentation on the report prepared on 17th August, 2011 at 11 A.M. in the second meeting of the Working Group

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Annexure 6

Constitution and Terms of Reference of Sub Group V

M-13033/1/11-E&F Part-III
Government of India
Planning Commission
(E&F Division)

Yojana Bhavan, Sansad Marg,
New Delhi, Dated 25.07.2011

OFFICE MEMORANDUM

Subject: Constitution of Sub-Groups under Working Group on Forestry and Sustainable Natural Resource Management – Sub Group V on International Cooperation and Law

In the first meeting of the Working Group on Forestry and Sustainable Natural Resource Management held on 25.07.2011, it was decided to constitute five Sub- Groups under the Working Group. The composition and Terms of Reference of the Sub-Group V on International Cooperation and Law is as follows.

S.No	Name of Member	Designation
1	Shri Jagdish Kishwan, Addl. DGF (Wildlife), MoEF	Chairman
2	Shri. R.K. Goel, IGF (EAP), MoEF	Member
3	Shri. Gautum Dey, PCCF, Tamil Nadu	Member
4	Shri. Madhukar Raj, PCCF, Andhra Pradesh	Member
5	Shri. Ravi Singh, Secy. General & CEO, WWF, New Delhi	Member
6	Joint Secretary, DEA, Ministry of Finance, New Delhi	Member
7	Joint Secretary, Ministry of External Affairs, New Delhi	Member
8	J.V.Sharma, CCF, Lucknow, UP	Member
9	Renu Singh, ADG (Climate Change), ICFRE	Member
10	P.C Tyagi, Representative from WII, Dehradun	Member
11	Dr. Yogesh Dubey, Representative from IIFM, Bhopal	Member
12	A Representative from TERI, New Delhi	Member
13	Prof. Bharat Desai, JNU, New Delhi	Member

S.No	Name of Member	Designation
14	Sanjay Upadhyay, Advocate, Supreme Court of India, New Delhi	Member
15	Prof.M.K. Ramesh, Professor of Law, National Law School of India University, Nagarbhavi, Bangalore	Member
16	Alok Agarwal, Dy. Secretary (IC), MoEF	Member
17	Subhash Chandra, DIGF (FP), MoEF, New Delhi	Member Convenor

2. Terms of Reference for Sub-Group V on International Cooperation and Law

I. To recommend strategy for a proactive national stance on national and international forestry related issues such as climate change, biodiversity and desertification, CDM, Global Green Fund, REDD+ etc.
II. Review and recommend ways of strengthening the present mechanism of implementation of international commitments.
III. Recommend Innovative ways for augmenting flow of resources into the sector through integrated investment framework.

3. General Terms of Reference

I. The Chairman may co-opt other Experts/Member and constitute Resource Groups for specific tasks if required

II. The expenditure on TA/DA of official members of the sub-Group 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 SR 190 (a)

III. The Sub-Group will submit its report to the Planning Commission by the 12th August, 2011.

IV. The Sub-Group will make a presentation on the report prepared on 17th August, 2011 at 11 A.M. in the second meeting of the Working Group

V. Subhash Chandra, DIGF (FP), Ministry of Environment & Forest, will be the Member-Convenor. The members may also communicate with Smt. Archana Singh Katiyar, Director (SP), Planning Commission in this regard.

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Annexure 7

Minutes of First Meeting of the Working Group

Summary record of the first meeting of the Working Group on Forestry and Sustainable Natural Resources Management held on 25.7.11 in Room No. 403, Paryavaran Bhavan, CGO Complex at 11.AM.

7.1. The first meeting of the Working Group on "Forestry and Sustainable Natural Resources Management" was held on 25.7.11 in Room No. 403, Paryavaran Bhavan, and CGO Complex at 11.AM. The Meeting was chaired by Shri A.K.Bansal, Additional Director General of Forests, Ministry of Environment and Forests. Shri Ranjan Chattarjee, Consultant (E&F), Planning Commission participated in the meeting as special invitee. The list of participants is at Annexure-7.1.

7.2. Shri A.K. Bansal welcomed all the participants and requested Shri Ranjan Chatterjee to speak a few words. Shri Ranjan Chatterjee stated that the Working Group on "Forestry and Sustainable Natural Resources Management" has been constituted as a part of formulation of the 12th Five Year Plan. As the report of the Working Group has to be submitted to the Steering Committee on Environment and Forest by 31st August, 2011 a stringent timeline has to be observed. The Steering Committee will prepare a report based on the inputs received from various working Groups for consideration of the NDC. He therefore requested all the members to submit the report within the stipulated period.

7.3. The Chairman, Mr.A.K. Bansal further informed the members that the steering committee on Environment and Forest has constituted four working groups. The terms of reference for these working groups may overlap. The task of this working group on Forestry and sustainable Natural Resources Management is to prepare a road map for forest and natural resources management. The concerted efforts of the Ministry have successfully reversed the trend of decline in forest cover. But it is not sufficient and the forest cover is required to be increased. Now, the time has come when we need to concentrate more on qualitative improvement of the forests and green cover, matching with the needs of the people and ecosystem-resilience. 67% of the forest area falls in the tribal areas of the country. People's participation and balanced usufruct sharing in our NRM is a very important issue the Group has to recognize Focus should be on value addition, green marketing, eco labelling and product patenting. 13th Finance Commission has allocated funds, which are tied to preparation of working plans from third year onwards. Compilation of working plans of good quality needs attention. Preparation of maps from 1:25000 scale to a scale which is commensurate with revenue maps is required. Monitoring and evaluation with a strong IT base already exists in some states. It is required to be up scaled in other states. R&D support is very important for our sector. Greening activity should be placed on a landscape approach. The Ministry also need to take a lead in seeking convergence with similar schemes of other departments and Ministries. In changing socio economic scenario, eco services have assumed a prime role and the role of forester has become the role of the facilitator and technical adviser. Climate change, disaster management, mangroves, grassland and pasture management are the new dimensions and have brought a paradigm shift in the role of foresters, planners and programme implementers. Sensitizing and capacity building of different stakeholders requires a focused strategy.

7.4. Dr. Indrani Chandrasekhar stated that use of Technology, Information Management and new program may also be suggested.

7.5. This was followed by a brief presentation by Sh. Biswajeet Banerjee, Director (Forestry), Planning Commission. The Members then gave following inputs:

Dr. S.K.Nanda, Pr. Sec. (E&F), Gujarat

- Commercial Timber Plantation in areas outside Forests has to be made into a big movement. Successful experiments carried out in few districts can be up scaled. Such plantations will form income growing assets and GDP from forest will increase. A statistical model on the commercial timber plantation is also required.
- Under MGNREGA, each village should plan for one hectare of fuel wood plantation to cater to the local needs. This would reduce the biotic pressure on the forests.
- The degraded forests in fringe areas should be rejuvenated under JFM. 100% usufruct from these forests should go to the people.
- We should have an advanced green banking scheme under which some areas should be earmarked for developing forests in advance in lieu of diversions which may be required in future. Such areas should be statutorily declared as forests.

Dr. U. Sankar, Honorary Professor, Madras School of Economics

- Strengthening the forest information system for policy making
- Innovative methods of raising resources
- Access and Benefit Sharing.
- Identify weak links in supply chains
- Higher investment in natural capital

Dr. V.K. Bahuguna, DG, ICFRE

- We must look at the achievements of the 11th plan. The suggestions made by the group should be accepted within the broad framework of policy.
- Farm management should be linked to investment.
- Melting of glaciers is a matter of concern.
- Two important national concerns are food and water security and forests play an important role. A huge rural population is dependent on forests for sustenance. We have to see whether forests can be considered as an infrastructure just like telecommunication and can be given due importance for its development.
- The Agricultural productivity from the irrigated land has now reached a stagnant stage. We must therefore focus on rain fed areas and the fringe forests. We must have livelihood based forest management involving local Panchayats and JFM committees.
- The funding support provided to ICFRE is very poor and it is only 90 crores per annum (80% as salary) as compared with the ICAR with fund support of Rs.3000 crore per annum.
- The forest management policies are required to be developed and research is very important.

Mr. A.K.Mukeerjee, Former DG & Spl. Secy of Forests

- In the draft approach paper there is no mention of forestry implying thereby that this sector has been seriously neglected.
- The tribal population has increased four times and pressure on forests has increased many folds due to developmental activities.
- Energy and water has been emphasized in the draft approach paper as important issues. But there is no mention of rural energy, which is mainly derived from fuel wood.
- The allocation to forestry sector has been very poor and it is less than one percent of National plan.
- Considerable land is lying with railways and defence, which should be utilized for raising plantations.

Dr. B.R. Subramanian, Advisor, ICMAM Project Directorate

- MOEF has performed well in coastal areas management especially mangroves management.
- However, the silting is increasing in river mouths and these areas are shrinking. Salinity is also increasing in mangrove areas and water quality in these areas is deteriorating. Hence we should think of a special programme for coastal forestry.

Mr. Dhyani, Director, ICAR

- We must have climate resilient forestry.
- More emphasis should be laid on forestry education, R&D, and Agro forestry education.

Shri. Bhagvan Singh, Representative of PCCF, Tamilnadu

- In order to increase tree cover, we must plant trees on areas outside forests. In Tamilnadu saplings are planted by forest department on private land. The maintenance of these trees is done by the owners who are free to choose the species and the entire ownership of trees vests with owners. An incentive of Rs. 2500 per hectare is also given to the farmers for maintaining these plantations on their lands. Under JICA assisted afforestation project, 2 crore seedlings are planted every year on this pattern. This experiment has been very successful and can be replicated in other states.
- The state has also successfully achieved convergence between forests and other schemes. The state has constituted State Level JFM Committee and District Level JFM Committees for this purpose.

Mr.R.K.Dave, PCCF, MP

- Fragmentation of forests is having an adverse impact on its sustainability. Due to diversions for non forestry activities, many forest areas have been fragmented. Acquisition of lands for compensatory afforestation has also resulted in scattered patches of forests. Consolidation of forest areas for better management may be considered.
- There is a need for a comprehensive planning for sustainable regeneration, harvesting and management of NTFPs in forests.

Dr.R.B.S. Rawat, PCCF, Uttarakhand

- We must emphasize the mountain perspective in our report.
- Farm forestry has to be incentivized. About 30 to 40 percent of agricultural land belongs to absentee landlords who do not wish to sublet it. Some arrangement can be thought of about raising plantations on this land.
- Experiment in the past has shown that involvement of women in raising saplings has had a tremendous impact on mainstreaming the rural women. Women nurseries should be promoted.
- A successful plantation would mean multi layer trees, shrubs, herbs and grasses. It may be at an enhanced cost but will yield more growing stock with better quality.
- We must develop 15 to 16 Agro Eco Zone models, which are replicable under diverse climatic factors.
- We should have an integrated forest management system based on water shed approach.
- The forest officials have to be reoriented in view of new emerging areas of development as distinct from core forestry. Attitudinal change in the foresters at all levels and their capacity building is required.
- We must make optimum use of all available resources. We have adequate funds under CAMPA, 13th Finance Commission, MGNREGA and state sector schemes. Additional funding however is required in R&D and forestry education.
- States which have a forest cover of more than 50% should be compensated adequately with development funds.

Mr. V.M. Arora, Director, DoLR

- The Department of Land Resource has recently brought out a Wastelands Atlas 2010 in which wastelands area has been reflected as 47.22 million hectares as compared to 55.27 million hectares reflected in Wasteland Atlas 2005. The Department has taken up treatment of 22.65 million hectare of degraded / rainfed areas under the 11th Plan and has a target of treating 25 million hectare in 12th Plan. Recently there has been an amendment in the Common Guidelines for Watershed Development Projects, 2008 and the forest areas forming integral part of the selected watershed projects under IWMP, will be treated with IWMP funds at the rate of Rs. 12000 per hectare in plain areas and Rs. 15000 per hectare in difficult and hilly areas. A provision of 19% of the project cost is earmarked for micro-enterprises and livelihoods. The Department has issued convergence guidelines with MGNREGA. The scheme has potential for convergence with NAP scheme of MOEF.

Mr.D.N.S.Suman, PCCF, UP

- Eco services from forest areas need to be given publicity.
- CAMPA should be additionality and not a substitute.
- The policy of increasing the forest cover 33% is not realistic and this target should be revisited.
- States having more population, both human and cattle and are suffering from higher biotic pressure should be given more funds for management of forests.
- Delivery system of plan allocation should be improved.

Dr. R.B.Lal, Director, IIFM

- The National accounting system must take care of the returns from forestry sector and eco services should be taken into account while calculating GDP.
- The livelihood issues should be dovetailed in the working plans
- The Economics of Ecosystems and Biodiversity (TEEB) – India which MoEF has assigned to IIFM needs additional financial allocation during 12th Plan.

Mr.P.C.Tyagi, Representative of Director, WII

- There has been a degradation of wild life habitats due to various reasons. There has been an increase in weeds. Extent of such areas should be mapped. Areas where man- animal conflict is there should be mapped. Integrity of these corridors should be maintained.
- Micro financing facilities to the rural population in fringe villages for rural based livelihoods and setting up small enterprises should be made available from VFMC funds.
- In the 12th plan there should be separate allocation of funds for Research and Development.

Mr.Sudipto Roy, Additional Chief Secretary, HP

- Himachal Pradesh has got 6.5 lakh cattle population. Hence, grassland management is very important. In the 12th plan a special component of grassland management should be included.
- CAMPA should be utilized to treat each and every catchment. The working plans preparation can be outsourced.
- Water shed projects are very important and in many states water sheds should be a part of planning in each department.

Mr. Ramesh, Professor of Law, National Law School of India, Bangalore

- Suggestion are annexed.

Mr. R.K.Goel, IGF, MoEF

- The target of increasing the green cover by 5 percent was not accompanied by matching availability of funds. There was a lack of financial resources to carry out the task.
- Ecological security for goods and services.
- In R&D huge programme is needed
- Awareness raising programme is required for creating green cover outside forest. Afforestation needs to be promoted in schools and colleges.
- Green India mission is important and should form a part of 12th plan approach paper.
- Rejuvenation of MFP, R&D should be strengthened.

Mr. B.M.S. Rathore, Jt. Secy, MoEF

- Green India mission formed after lengthy consultations and reflects a change in the focus from quantity to quality, Polycentric approach, revamping of existing institutions, climate resilient societies, biodiversity, ecological services, and trees outside forest, grassland, pasture, mangroves management, landscape approach, agro ecological mapping and convergence with IWMP.
- The funds required are Rs. 4600 crore every year out of which 50% from convergence and 50% from Planning Commission.

Mr. R.M. Misra, DIGF, DoLR

- Clear land titling of forest lands and mechanism required for providing it
- The Department of Land Resources has already prepared a draft land titling bill. The MoEF can take similar action for forest lands.
- The forest act is still lagging behind... Changes are required in the forest act and guidelines.

Mr. Subhash Chandra, DIGF, MoEF

- National Forestry Seed Bank may be created.
- We need an institute for formulation of forest policy. The forest policy has not been revised since 1988.

Mr. D.K.Sharma, DIGF (NAEB), MoEF

- Methodology for measuring the plantation has to be delinked from the target of increasing forest cover. The increase in forest cover is estimated by FSI on the basis of satellite imaginary which captures a plantation which is minimum five years old. Therefore the plantation target achieved in the current year will be reflected in the FSI report after a period of five years.
- Ten percent area should be separately earmarked for production forestry.

H.D. Kulkarni, Chief of Plantation and Farm Forestry, ITC Limited

- Recycling is very important.
- Industries have to be given a role in productivity improvement.
- The forestry plantation should address the issue of tolerating elevated levels of Carbon dioxide.

7.6. After detailed discussion, following 5 subgroups were formed for a focussed approach on the important issues, including the issues raised by the members.

1. Subgroup I on Forestry
2. Subgroup II on Non Timber Forest Produce
3. Subgroup III on Fodder and Pasture Management
4. Subgroup IV on Institutional and Technology Management
5. Subgroup V on International Cooperation and Law

7.7. The Constitution and Terms of Reference of the Subgroups is annexed at Annexure 2 to 6. The Chairman further requested the Subgroups to submit the reports to Planning Commission by 12th August and present the reports in the second meeting of the Working Group on 17th Aug 2011. The Chairman also requested the members to exchange their views for inclusion in the reports via e- mail also.

The meeting then ended with vote of thanks to the chair.

Annexure 7.1.

First meeting of the Working Group on Forestry and Sustainable Natural Resources Management held on 25-07-2011 in Room No. 403, Paryavaran Bhawan.

List of Participants

Sl. No.	Name	Designation & Name of the organization
1	Shri A.K. Bansal,	Addl. DGF, (FC), MoEF
2	Sh. Ranjan Chatterjee	Consultant (E&F), Planning Commission
3	Sh. A.K. Mukherjee	Former DG & Spl. Secy of Forests
4	Sh. R.B. Lal	Director, IIFM
5	Sh. S. Roy	Additional Chief Secretary (Forests), HP
6	Sh. S.K. Nanda	Principal Secretary, Forests and Environment, Gujarat
7	Sh. Ramesh K. Dave	P.C.C.F. MP
8	Sh. R.K. Goel	IGF, MoEF
9	Sh. D.N.S. Suman	PCCF- UP
10	Dr. R.B.S. Rawat	PCCF, Uttarakhand
11	Dr. V.K. Bahuguna	D.G., ICFRE
12	Sh. B.M.S. Rathore	Jt. Secy, MoEF
13	Sh. R,.M. Misra	DIGF, DoLR
14	Dr. D.K. Sharma	DIGF (NAEB), MoEF
15	Sh. A. M. Singh	DIGF (SU), MoEF
16	Sh. Subhash Chandra	DIGF (FP), MoEF
17	Dr. U. Shankar	Hon. Professor, Madras Sch. of Economics
18	Dr. M.K. Ramesh	Prof. of Law, National Law School of India
19	Dr. H.D. Kulkarni	Chief of Plantation and Farm Forestry, ITC Ltd.
20	Dr. B.R. Subramanian	Advisor, MOES, Chennai
21	Sh. Premjit Lal	Director (Works), M/o Urban Dev.
22	Dr. S.K. Dhyani	Director, ICAR
23	Dr. V.M. Arora	Director, D/o Land Resources
24	Sh. Pratul Saxena	Scientist, MOWR
25	Sh. P.C. Tyagi	Rep. Director, Wild Life Institute
26	Sh. Bhagwan Singh	Representative of PCCF, Tamil Nadu
27	Sh. Priya Ranjan	AIGF (RT), MoEF
28	Sh. Mohan Lal	AIGF(FP), MoEF
29	Dr. Indrani Chandrasekharan	Adviser (E&F), Planning Commission
30	Sh. Biswajit Banerjee	Director (E&F), Planning Commission
31	Smt. Archana Singh Katiyar	Director (SP), Planning Commission

Annexure 7.2.

Suggestions given by Dr. M.K. Ramesh

STRENGTHENING GREEN GOVERNANCE: A FEW SUGGESTIONS

Mr. A.K.Mukerji's paper entitled, " Neglect of the Forestry and Wildlife Sector in India's Development Planning under the Five-Year Plans", circulated among the members of the Working Group, is a brilliant and incisive analysis of policies, Plans and programmes of action of the Government. It underscores the immediate need for a review and reform of them to make them people-centric and eco-friendly, that would blend the fruits of TK(-traditional knowledge), local skills, equity and the latest technological innovations in the field of forestry and wildlife management. Coming as it does from a Forster with a wealth of experience and expertise, the ideas expressed deserve and demand serious attention and accommodation in the Plan Document.

My effort, as an academic and researcher in Law, in this note, is to build on the vision and direction suggested by Mr.Mukerjee, by reflecting on Policies , Laws and their implementation and to suggest ways and means of strengthening Green Governance, during the next plan period.

The following suggestions are attempts in further strengthening Governance in Forest, Wildlife and Biodiversity sectors and are based on the experiences of the operationalization of the XI Plan and the engagements of MoEF in Policy and Law-making, skill building and execution of a variety of programmes of action. Quite a few of the observations here are drawn from and elaborations of my submissions to the XII Plan Steering Committee on Environment &Forests. The suggestions relate to :-

(i) Legal and Institutional Reforms;
(ii) Capacity-Building;
(iii) International Commitments and Compliance and
(iv) New Initiatives, both as a demonstration of conforming to the obligations undertaken and to serve as a template for better governance for the lead to other legal systems.

(- Nos. 1,3,4 and 6 of Terms of Reference)

1. The Ministry to undertake , on a priority basis, a comprehensiveReview, Revision and Reform of the legal regime concerning Forest, Wildlife and Biodiversity.

The principal law, concerning Forests was made in 1927. The same law continues to operate even now. While appreciating the durability and longevity of relevance of this law, for this long, one has to take cognizance of the fact that it needs to be made more flexible, to acknowledge, accommodate and absorb a host of legal developments, that have occurred since then, both in the statute book and in the decisional law. The same can be said about the Wildlife Law made in 1972 (- with major amendments till 2002) and the Forest Conservation Law that is of 1980 vintage.The object of review and Reform is primarily, to centre-stage the green concerns and to mesh and synergise the designs and working of a wide variety of laws and the authorities under them, that impact biodiversity, forests and wildlife conservation, protection and management:

- In the light of legislative developments , in related areas, initiated by other ministries: PPVFRA, Forest Rights Act, Seeds Amendment Bill, Biotechnology Regulatory Authority Bill etc.;
- in the wake of a series of orders passed by the Supreme Court in T.N.Godaverman and by the higher judiciary, in a clutch of cases, and institutional arrangements worked out for the implementation of them, that have a far reaching impact on Forest governance;

- to evolve an effective and robust legal safeguards for addressing the issue of "biosafety" (-Cartegena Protocol);
- to internalize the international commitment concerning the Access and Benefit sharing regime (-Nagoya Protocol) ;
- to provide sufficient and effective safeguards for the protection of TK & Folk Art concerning Biodiversity;
- to fulfill our commitments and comply with the obligations undertaken under the Wetlands and Desertification Conventions and (-as was revealed in the Steering Committee Meeting of May, 2011, the CoP of CBD will be hosted by India in 2012, and India's reign over CBD would last 4 years of the XII PIan Period -2 years as President and 2 years as Past President-)
- to give a good account of India, in the community of nations, on compliance with its international obligations over Biodiversity issues (- primarily over Biosafety,

Conservation of TK, Equity, Access and benefit-sharing etc.) and effect reforms in Forestry, Wildlife and Biodiversity regime.

2. Strengthening Governance :-

- COORDINATION and ensuring HARMONY:- One of the major problems in Environmental Governance in India is that of lack of coordination and harmony in the functioning among different agencies of State. This has invariably led to the Environmental Imperatives neither informing and influencing policies nor their translation into the programmes of action and working of other sectors associated with Natural Resource Management (- like Water, Land and the like) and those that deal with economic development(- Industry and Commerce). Even within the Ministry, there is an imperative need for coordination (- right from the stage of policy and law-making to their implementation. It is very necessary to evolve a two pronged strategy to achieve this- one that is internal and another that is Inter-ministerial as below:-
  (i) Intra-Ministerial Coordination Committee/Council: that would bring in the much needed synergy and harmony in the working of different aspects of environmental governance like, forestry, Wildlife, Biodiversity, Pollution Control and Waste Management, Environment Impact Assessment, CDM, Ozone Layer Protection etc.
  (ii) Set up the Inter-Ministrial Coordination Committee/Council- revive the early nineteen eighties' effort- a forum having policy oversight, to facilitate harmony and alignment of working of different agencies at the Central level to realize the

  core object of environmental governance : secure environmental integrity and promote SD.

3. Justice Dispensation: -

- Revisit the new system currently being put in place, through the Green Tribunal Act, to explore the scope, space and role for –
  (i) the local self-govt. institutions ,
  (ii) the primary judiciary and the High Courts and
  (iii) the implications of the new Regulatory Regime , being brought in place for the management of natural resources, for access to and securing justice through the normal Constitutional processes.

  This is also needed, in the light of what emerged out of the orders of the Supreme Court in T.N.Godaverman Cases.

  This is the need of the hour as, the regulatory systems, put in place in other sectors, are also being proposed for Forestry, Wildlife and Biodiversity Sectors . It is time, the implications of such proposed measures are considered, in depth and suitable strategies and safeguards are evolved in ensuring decisions and conflict resolution as to forest, wildlife and Biodiversity management remains a function of the State, in the extended sense of the term. The extent, adequacy, desirability and appropriateness of participation and partnership of a number of players (- different layers of governance, communities of people and the private enterprise) in exercising control over and management of Natural Resources,

requires a thorough examination as to ensure that the Constitutionally ordained role of the State as the "Public Trustee" of all the resources remain unaffected and get strengthened.

4. Strengthening the Capacity in the Green Laws: This has two dimensions:
   - Strengthening Ability in putting across Indian position in an effective manner, bargaining for a better deal in International Negotiations and in International law-making processes and
   - Strengthening the Capacity in understanding and in effectively implementing the domestic law.

The Strategies for this could be :

(i) Legal Capacity-building venture- an initiative of MoEF between 1997-2003- requires revival and expansion, to help and enable the domestic "managers" of environment and the policy-makers and international negotiators, to catch up with the developments in the law and to acquire better tools and techniques of its application to problem situations- to be entrusted to Centres of Excellence in Law, in Ecological Sciences, Economics, Natural Resources Management and the like.

(ii) Creating "Centres of Excellence" and instituting "Chairs"- in legal academic and research institutions(- like, the National Law School of India University , Bangalore), to build the much needed capacity in law and enforcement, besides reforming it for better governance.It would be a worthwhile effort to pursue and investment made for future, to transform the existing legal academic institutions into institutions of excellence – to serve as "brain-trusts" and " laboratory and training ground" to help in building competence and to professionalise Environmental governance.

This need for investment in strengthening Capacity and in R & D is very much in practice with the MoEF, in Ecological Sciences, Engineering, Economics and Management etc. Need remains for the extension of the same in the field of Law, as well. A proposal to this effect was under the active consideration of MoEF, when the World-Bank aided Environmental Law Capacity-Building Project was undertaken by MoEF, in 1997. This requires revival and actualization.

Dr. M.K.Ramesh
Professor of Law
NLSIU

Annexure 8

Minutes of Second Meeting of the Working Group

Summary record of the second meeting of the Working Group on Forestry and Sustainable Natural Resources Management held on 23.08.2011 in Room No. 122, Yojna Bhavan, at 2:30 PM.

8.1. The second meeting of the Working Group on "Forestry and Sustainable Natural Resources Management" was held on 23.08.2011 in Room No. 122, Yojna Bhavan, at 2:30 PM. The Meeting was chaired by Shri Dilip Kumar, Director General of Forests, Ministry of Environment and Forests. Shri Ranjan Chattarjee, Consultant (E&F), Planning Commission participated in the meeting as special invitee. The list of participants is at Annexure-I.

8.2. The Chairman welcomed the participants and minutes of the first meeting were confirmed by the members. The Chairman then invited the Sub Groups to present their reports. The Five Subgroups presented the reports. Comments were then invited from the members. The following suggestions were made by the members.

1. Timely availability of funds are critical to the forestry operations which are strictly seasonal in nature. Often the funds are released by Central Govt and State Govt. much after the planting season is over. The funds available under EAP and grants of 13th Finance Commission are also considered as part of state budget defeating the very purpose of such additional allocations. A strategy and mechanism has to be worked out to overcome these impediments.
2. Every village should have an energy plantation and should have fodder plot ranging from 2 to 5 Ha depending on population. Trees on private lands should be considered like other assets by banks for facilitating microfinance.
3. Parameters of monitoring are required to be changed. A theme based monitoring on parameters of sustainability index, ecosystem services, Forest fires, encroachments, biodiversity index etc should be introduced. At present the density and growing stock as a measure of quality of forests is being monitored.
4. Community foresters from Tribals is a welcome idea. However, these community foresters may be organized into groups rather than working as individuals.
5. Wild life management should bring out an annual report on the lines of forestry report. FSI should also give annual reports on certain features which are of annual nature. FSI should have a central porter in DG office which should be linked with a portal at each PCCF in the State. FSI has about 2000 sample plots. Which are being used for calculation of forest produced removed from forests by IIFM. The last report from these plots was produced in 1996. The FSI should update the report.
6. It appears that a sectoral approach has been adopted while framing the working groups. Forest, wild life and biodiversity should be aligned and conservation should be centre stage. Coordination and alignment with other departments has been sought adequately but two important Ministries which have been left out are Science and Technology, and Commerce. The Department of Biotechnology has brought out a paper on Biotechnology Regulatory Bill which has an impact on forestry and biodiversity. Section 28 of the Indian Forest Act on village forest needs attention in the context of community forestry.

7. Although we have a forest policy and agriculture policy, we do not have agro-forestry policy. That is the reason that agro-forestry is not picking up in India. ICAR has developed agro-forestry models for all the agro climatic zones of the country. These models can be used for promoting Agroforestry.

8. The benefits of payments for ecological services should also be extended to farmers so that they are encouraged to take up tree plantation on their lands. We must incentivise trees outside forest so that overall forest cover increases. The invasive weeds like Lantana, Eupatorium and Parthenium etc. have to be tackled and ways have to be thought for converting them into resources.

9. In North East the per capita forest is about 3-4 ha. as compared to 0.064 ha. as average for the whole country. This suggests that we need to have a disaggregated approach. We need to develop a strategy so that community has a stake in conservation of forest. Forest corporation should enter into partnership with Private Companies to introduce innovative management paradigm. There has to be a certification mechanism in forest department to certify quality seeds.

10. We must think of areas in International Cooperation where we can have Bi-lateral agreements like Trans boundary PAs like Manas Sanctuary in India and Nepal. We should identify some institution which can prepare countries position and stand in various international conventions.

11. The deputations for the international conventions should draw experts from ZSI, BSI, ICFRE etc.

12. In the report of Sub Group-II, very little allocation has been kept for R&D which needs to be enhanced. In the report of Sub Group-III, certain areas should be identified for silvi-pastoral system.

13. FRI should take up silvicultural system for important NTFP as so far FRI has been focussing only on tree species. Volume tables should be developed for newly emerging species. Research on 5-10 NTFP species including sustainable harvesting, sorting, grading and processing (region wise) should be taken up. In 1995, a grazing policy was formulated by NAEB Board. Planning Commission should sponsor a joint study by Agriculture, Animal Husbandry and Forests to prepare a report on this subject.

14. There is a lack of the tree breeding specialists even in ICAR. Agro-forestry models are required to be developed for North East to replace shifting cultivation. There is a need to expedite sustainability certification, developing standards and supporting the States in meeting those standards.

15. There is a need to pay attention to strengthen the State Forest Research Divisions. The posts are most neglected and there is no coordination with ICFRE and other research institutes. The budget is low. There are many species in NTFP which are being used by the forest developers for their own use. These species also need to be conserved and promoted.

16. Almost all the sub-group reports are either preventive or meeting the current challenges. What is required most is Capacity Building to meet the challenges specially the bio-diversity safety issues. The Nanotechnology mission under C.N. Rao has communicated to make a quick study on impact of Nanotechnology on pollution control and waste management. We must better prepared for international discussion and convention.

17. There is a lot of duplication in R&D over certain areas like NTFP. Hence, there should be a portal on which the information can be shared to avoid duplication. The base line data once it is formulated on NTFP should be put on this portal.

8.3. The Chairman requested the Sub Groups to consider the suggestions made by members while finalising the recommendations. It was decided that based on the recommendations of the Sub Groups, a drafting Committee under the Chairmanship of Sh R.K.Goel, IGF will compile the Working Group Report. Sh. A.M.Singh DIGF, Smt Archana Singh Katiyar, Director, Planning Commission, Shri D.K.Sharma, DIGF and Sh. Biswajit Banerjee, Director, Planning Commission will assist Sh. R.K.Goel as members of the Drafting Committee.

The meeting then concluded with vote of thanks to the chair.

Annexure 8.1.

Second meeting of the Working Group on Forestry and Sustainable Natural Resources Management held on 23-08-2011 in Room No. 122, Yojana Bhawan.

List of participants

Sl. No.	Name	Designation
1	Sh. Ranjan Chatterjee	Consultant, SP, Planning Commission
2	Smt. Indrani Chandrashekhran	Adviser, E&F, Planning Commission
3	Dr. J.C. Dagar	ADG (Agro forestry) ICAR, New Delhi
4	Dr. C.N. Pandey	Director, IPIRTI, Bangalore
5	Sh. Pankaj Agarwal	ADG (RP), ICFRE
6	Sh. P.C. Tyagi	Professor, WII, Dehradoon.
7	Sh. M.M. Joshi	CCFP-II, Gurgaon
8	Sh. Rampati	CCF(Protection & Vigilance)
9	Dr. S.K. Dhyani	Director, NRC for Agro forestry, Jhansi
10	Dr. G.S. Goraya	CCF (NTFP, H.P.)
11	Sh. R.B. Lal	Director, IIFM, Bhopal
12	Sh. C.R. Babu	University of Delhi
13	Sh. B.S. Sajwan	PCEF, Arunachal Pradesh
14	Sh. Jagdish Kishwan	ADGF(WL), Moef
15	Sh. A.K. Mukerji	Former D.G. forest
16	Sh. Subhash Chandra	DIG, F, FP, FIC
17	Sh. A.M. Singh	DIGF, SU
18	Sh. Kinsuk Mitra	President, Ninrock, Institute
19	Sh. Pratul Saxena	Sr, H., Ministry of Water Resources
20	Smt. Rekha Singhal	Prof. & Dean, IIFFM, Bhopal
21	Sh. Dr. M.K. Ramesh	Prof. National Law Sch. Of India, Bangalore
22	Sh. Dr. Biswajeet Banerjee	Director, E&F, Planning Commission
23	Smt. Archana Singh Katiyar	Director, SP,Planning Commission
24	Sh. P.J. Dilip Kumar	DG, Forest
25	Sh. R.K. Goel	IG (F) Moef
26	Sh. A.K. Bansal	ADG Moef
27	Sh. DNS Suman	PCCF, UP
28	Sh. Ramesh K. Dave	PCCF MP
29	Dr. RBS Rawat	PCCF-UK
30	Sh. Vinay Luthra	Addl. PCCF Karnataka
31	Sh. Utkarsh Ghate	Director, CCD
32	Sh. Priya Ranjan	AIGF (RT), Moef
33	Sh. Birakh Rath	Sr. Pr. Mgr. RCDC
34	Sh. Premjit Lat	Dir(Works) M/o Urban Dev.
35	Sh. S.P. Vashishtha	Director, (MGNREGa), MORD
36	Sh. R. M. Mishra	DIGF, DOLR
37	Dr. Sunanda	HCS
38	Sh. Bala Prasad	CEO NMPB
39	Smt. Jaya Priyadarshini	R.O. SP, Planning Commission

Annexure 9

Minutes of Third Meeting of the Working Group

Summary record of the meeting of the Chairmen and Conveners of the Sub-Groups of the Working Group on Forestry and Sustainable Natural Resources Management held on 16.9.2011 in Room No. 403, Paryavaran Bhavan, CGO Complex at 12.00 PM.

9.1. A meeting of the Chairmen and Conveners of the Sub-Groups of the Working Group on Forestry and Sustainable Natural Resources Management was held on 16.9.2011 under the chairmanship of Shri A.K.Bansal, Additional Director General of Forests, Ministry of Environment and Forests. The list of participants is at Annexure-I.

9.2. The following points were concluded in the meeting.

1. The Working Group report may inter-alia highlight the following

    1) Overall Resource Management,
    2) Removal of Invasive Weeds,
    3) Strengthening of Research,
    4) Capacity Building of Stakeholders And Institutions,
    5) Monitoring Mechanism and Evaluation for Qualitative Improvement
    6) Modernization of Forest Department.

2. Creation of corpus out of CAMPA Fund for strengthening research as well as creating infrastructure for frontline staff may be suggested.
3. In the forest fringe villages, a scheme for augmenting ground water through water harvesting and conservation measures for enhancing agricultural productivity may be included
4. The Sub-Group III may revisit the target area under the new scheme proposed and include 1.7 lakh forest fringe villages as target areas.
5. A mechanism to establish strong linkage between the ICFRE and the State Forest Departments for extension of research activities to the states may be proposed.
6. JFM Plus approach for livelihoods may be introduced in the 12th plan
7. The Sub-Group Reports of Group III, IV and V may be modified as per the format.
8. All important references may be made as footnotes. In addition references may be indicated at the end of the report.

9.3. The Chairman requested all the subgroups to submit their final reports after incorporating the above suggestions by 22.09.11. The drafting Committee under the chairmanship of Shri R.K. Goel was requested to prepare the first draft of the Working Group Report for the perusal of Working Group in its next meeting. It was also decided that Dr R.B.S Rawat may be included as a member of drafting committee.

The meeting then concluded with a vote of thanks to the chair.

Annexure 9.1.

Third meeting of Working Group on Forest and Sustainable Natural Resources Management of 12th Five Year Plan 2012-17 held on 16-09-2011 in M/o Environment and Forest

List of participants

Sl. No.	Name and Designation	Telephone No.	E- Mail
1	Sh. A. K. Bansal, Adll. DGF, MoEF	9650458111	Bansal.ak@nic.in
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3	Dr. V.K. Bahuguna, D.G. ICFR	09412057333	Bahuguna,vk@gmail.com
4	Dr. RBS Rawat, PCCF, UK	094120-51550	Pccf-ufa@yahoo.com
5	Sh. A.M. Singh, D.I.G. (SU), MoEF	9873350125	arvindmsingh@yahoo.com
6	Sh. Subhash Chandra, DIG,fp, MoEF	9818514440	subhashchandra@gmailcom
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Annexure 10

Report of Sub-Group I

Forestry

Executive Summary:

10.1. Conservation & development of forest resources including wildlife, which constitutes 23% of the country's geographical area, has assumed greater significance in the recent past due to recognition of carbon sequestration potential of the forests, ecological security it provides, implications of biodiversity conservation besides its traditional importance through supply of timber, fuel-wood, fodder and range of NTFPs and also livelihood security to the people. However, contributions of forestry and wildlife sector to the GDP of the country continue to be underestimated as GDP calculations recognizes the contribution of tangible products provided by the forests and the ecological services provided by the forests are not considered in the calculations. Though, the Planning Commission in the XIth Plan Mid Term Evaluation has recommended increasing the allocation to atleast 5% of annual, state and central sector outlay to the forestry sector preferably by 12th Plan, the allocation for Forest and wildlife sector was only 0.4% to 0.5% of overall 11th FYP allocation despite the recognition by the planners of the importance of the forestry sector in our agrarian economy, and in growing scenario of urbanization and industrialization in the country.

10.2. With 17% of the world population and 18% livestock over 2.4 % of world total geographical area, India's forests are facing severe biotic pressures, which have resulted into deterioration in the quality of forest cover and in the productivity of the forest areas in the country. Review of the afforestation programmes of the country suggests that there is decline in the afforestation targets of even major scheme -National Afforestation Programme of the central government due to declining allocation to the forestry and wildlife sector.

10.3. To meet the dynamic challenges the forestry and wildlife sector is facing and the need to ensure ecological security of the country and the livelihood needs of the people, strategies have been outlined in the report. To take care of changing paradigm and developing needs of the forest and wildlife conservation and meeting the democratic aspirations and livelihood needs of the people, the strategies and recommendations include augmentation of flow of financial resources, involvement of JFMCs and other local level institutions of Gram Sabha in participatory management of forests, emphasis on urban forestry and agro-forestry, afforestation of under-utilized lands, enhanced linkage with allied sector, forest conservation and management issues, capacity building of JFM Committees and forest officials, appropriate regulatory regime including liberalized provisions for transport of timber and NTFPs, forest certification issues in sustainable forest management, enhancing forestry research and appropriate M & E regime involving technology and social audits.

10.4. Five major schemes with an overall outlay of Rs. 42000 crores have been recommended to take care of afforestation, sustainable livelihoods, capacity building of JFMCs/ Gram Sabha and other stakeholders, Green India Mission, Community foresters from among tribal youths/ people residing in forests, monitoring and evaluation. The implementation of the forestry sector schemes recommended in the report would result in increase in Forest and Tree Cover (FTC) by about 3.5 million ha and improvement in quality of forests over another 3.5 million ha. This will take India's forest & tree cover to around 82 million ha, which will be about 25% of geographical area of the country. Improvement in quality and area of FTC would enhance range of ecological benefits like carbon sequestration, higher ground water table, improved agriculture productivity and increased livelihood of the people as a result of these interventions.

Background:

10.5. India, with a wide range of climate, geography & culture, is unique among biodiversity- rich nations. The panorama of Indian Forests ranges from evergreen tropical rain forests in Andaman & Nicobar Islands, the Western Ghats and north- eastern states to dry alpine areas in Himalayas in the north and between these two extremes, the country has semi-evergreen, deciduous, subtropical and thorn forests.

10.1. India - A Mega Diverse Country

- India accounts for 7-8% of recorded plant & animal species of the world.
- India has four global biodiversity hotspots - Eastern Himalayas, North East region, Sunderbans and Western Ghat.
- Out of India's land area of 328.7 million hectare, 76.95 million hectare (23.41%) is recorded forest area. Total Forest and Tree cover of the country is 78.37 million hectare which is 23.84 percent of geographical area of the country (SFR, 2009).
- Total numbers of Protected Areas (PAs) in India is 661 consisting of 100 National Parks, 514 Wildlife Sanctuaries, 43 Conservation Reserve, 4 Community Reserves, encompassing 4.8% of the total geographic area of the country.
- 15 biodiversity rich areas of the country covering an area of approximately 74000 sq kms have been designated as Bio-sphere reserve and four Biosphere reserve viz Nilgiri, Nandadevi, Sundarbans & Gulf of Mannar have been recognize by UNESCO under world network of Biospheres.
- Presently 25 Indian Wetlands have been designated as Ramsar sites in the country and six new sites are under consideration.
- Carbon stocks in our forests stood at 6662 m MT in the year 2005.
- Nearly 27% of the total population of the country, comprising about 275 million rural people, depend on forests for its livelihood.

10.6. The integrated management of natural resources has assumed greater significance in the light of emerging challenges in the field of climate change, ecological security, biodiversity conservation and livelihood issues especially the food and water security of the country. The sound and efficient management of the natural resources is essential for a healthy environment. The mandate of the Ministry of Environment & Forests is to ensure conservation of forests for land and water development in the country, which are keys to meet the demands of rising population especially for the poverty reduction apart from providing a pollution free environment. Therefore, for sound management of the natural resources, it is essential to accord sufficient importance to the conservation & development of forest resources including wildlife, which constitutes 23% of the country's geographical area.

10.7. There is gross underestimation of the contribution of Forestry sector in the GDP of the country because prevailing GDP calculation does not appropriately capture the contribution of forests in national economy. Contribution of forests to the economy is traditionally recognized through tangible products of calculated value like timber and other forest products but a range of non-priced as well as highly subsidized products such as fuel-wood, fodder and a range of Non-timber Forest Products (NTFPs) including medicinal plants that are exchanged in an informal manner are not measured.

10.8. The limited market exchange of forest products results in gross undervaluation of the contribution of the forests, which has led to in-adequate allocation of funds to the forestry sector. The economic development also results in to depletion of natural resources, deforestation, and pollution but such negative effects are left out in current system of GDP calculation. The present system of GDP estimation may be good at measuring the size of the economy but it's a poor measure of social welfare and sustainable development as well as of environmental services and ecological security of the nation.

10.9. Ecological Services of forests like regulation of hydrological cycle, soil & water conservation, flood control, carbon sequestration, fresh air generation, climate stabilization, bio-diversity conservation and amelioration of overall environment, urban and semi-urban amenity, eco-tourism etc. are being increasingly recognized and planners have started thinking in the direction of developing green budgeting of the economy in the country. Apex Court has interpreted that Fundamental Right to Life is not mere survival right but also include

right to good environment, and forests ensure this uninterruptedly. National Environmental Policy (2006) has set out concrete recommendations to develop such system as following:

- Strengthen the initiatives taken by the Central Statistical Organisation in the area of natural resource accounting
- Develop and promote standardized environmental accounting practices and norms in the preparation of statutory financial statements for large industrial enterprises, in order to encourage greater environmental responsibility in investment decision making, management practices, and public scrutiny.
- Facilitate the integration of environmental values into cost-benefit analysis, to encourage more efficient allocation of resources when making public investment decisions

10.10. Forest Survey of India is working in tandem with Survey of India (SoI) for the purpose of forest and tree cover mapping. At present Survey of India (SoI) reference maps are available in the scale of 1:50000 for whole country and for few areas in the scale of 1:15000. Forest Survey of India assesses forest cover in India on biennial basis on a 1: 50000 scale. Though there is need to go for mapping in the scale of 1:15000 / 1:4000 and for annual cycle of assessment of forest cover in place of present biennial system of reporting in the country, it will be possible only when all SoI reference maps and geo-referenced revenue maps are available at these scales besides enhancing the infrastructure, manpower and budgetary support to FSI by atleast 5-6 times of present level. However, in urban areas, forest and tree cover mapping on a scale of 1:4000 may be possible with the availability of enhanced human and financial resources to FSI.

10.11. With the existing manpower and infrastructure, FSI has been able to mainly assess the forest cover on biennial basis. The change in the type of forest cover in India from 2001 to 2007 (State of Forests Reports by the Forest Survey of India) can be seen from the table given below:

Table10.1. Forest Cover Change in India from 2001 to 2007 (area in Sq Km)

Year	VDF*	MDF*	OF*	Total Forest Cover	Forest Cover %
2001	51,285	3,39,279	2,87,769	6,78,333	20.64
2003	54,518	3.34,056	2,89,242	6,77,816	20.62
2005	83,472	3,19,948	2,86,751	6,90,171	21.00
2007	83,510	3,19,012	2,88,377	6,90,899	21.02 (In addition, Tree cover is 2.82%)
Total Geographical Area of India in Sq. KM				32,87,263	

**Very Dense Forest (VDF) with more than 70% canopy density, Moderately Dense Forests (MDF) with canopy density between 40% and 70%, Open Forests (OF) with canopy density between 10% and 40%. Scrub areas (below 10% canopy density) are excluded from mapping of the forest cover.*

10.12. With the existing level of technology, it is possible to improve the scale of mapping as indicated above, periodicity of reporting assessment of forest cover besides other parameters such as inventory of bio-diversity and NTFP, as and when sufficient manpower, infrastructure, budgetary support are available in the 12th five year plan.

10.13. Though the above data shows an apparent increase in the forest cover, an in-depth analysis reveals that such increase has been attributed mostly due to plantations, limited harvesting of timber, protection and management accorded by forest department as well as Vana Samrakhshana Samities or Village Forest Protection Committees (VSSs or VFPCs). However, the quality of forest cover and the productivity from the forest areas have generally declined, owing mostly to biotic pressure like grazing, human interference, habitat fragmentation, forest fires etc.

10.14. To overcome the problems faced by forests, National Forest Commission has recommended allocation of 2.5% of national budget to the forestry sector. The Planning Commission in the XIth Plan Mid Term Evaluation also recommended increasing the allocation of atleast 5% of annual, state and central sector outlay to

the forestry sector preferably by 12th Plan. However, the allocation for the environment, forests & wildlife has remained below 1% of which Forest and wildlife sector received only 0.4% to 0.5% of overall 11th FYP allocation.

10.15. The following table indicates the allocation/ expenditure of financial resources in the 11th five year plan under various schemes/ programmes.

Table 10.1. Allocation/ expenditure of financial resources in the 11th five year plan

(Rs. In crores)

S. No.	Name of Scheme	Approved Outlay of XI Plan	2007-08 (Actual Exp.)	2008-09 (Actual Exp.)	2009-10 (Actual Exp.)	2010-11 (Actual Exp.)	2011-12 (BE)	Total Allocation
1.	Grants to Institutions	450	85	118	142	139	122	606
2.	Capacity Building	110	10	11	22	52	84	179
3.	Gregarious Flowering of Bamboo	37	21	15	-	-	-	36
4.	Intensification of Forest Management	600	68	75	69	58	65	335
5.	Strengthening of Forest divisions	100	11	21	20	16	18	86
6.	Strengthening of Wildlife Division	150	22	22	23	29	29	124
7.	Integrated Development of WL Habitats	800	64	79	73	74	70	360
8.	Project Tiger	615	65	158	204	193	163	783
9.	Project Elephant	82	17	21	21	22	22	103
10.	NAEB Scheme	250	29	25	37	44	27	163
11.	NAP	2000	393	345	318	310	303	1669
12.	Animal Welfare	120	21	25	24	24	24	118
	Total Forest & WL	**6214**	**805**	**916**	**951**	**961**	**927**	**4560**
	Total Environment & Forests	**10000**	**1350**	**1483**	**1631**	**2180**	**2300**	**8941**

Thus, the plan funds for the development of forest resources are inadequate to ensure the integrated management of the land and water resources in the country in a sustainable manner.

Review of Forestry Programs: Regional, National and International dynamics and concerns:

10.16. Funds for the forestry sector flows through Central budget, State budget and through externally aided projects. Central sector scheme for afforestation are National Afforestation Program (About Rs. 310 Crore/year), Integrated Forest Management scheme (for forest infrastructure, boundary demarcation, forest fire management –about Rs. 70 crore/ year), Thirteenth Finance Commission Grant provided by Ministry of Finance (25% for forest development/ forest infrastructure and 75% for other development purposes – Rs. 625 crore for each of the first two years and Rs. 1125 crores for each of the rest three years, totaling Rs. 5000 crores for five years starting from 2010-11), CAMPA fund (Rs. 1000 -1500 crore per year for mandatory compensatory afforestation in lieu of diverted forest area for non-forestry purpose, catchment area treatment, strengthening the protection and management of forests, infrastructure development and maintenance of older plantation etc.), Integrated development of Wildlife Habitat (Rs. 75 crores per year) and 11 state sector externally aided projects under which approximately Rs. 500-600 crores per year loan taken by state governments flow for specified activities in accordance to the Project document of the state governments. Besides these programmes, State Forest Departments operate many state schemes for restoration of degraded forests and management of wildlife by taking mult-sectoral and multi-stakeholder approach.

10.17. National Mission for a Green India (GIM) has been approved by the Prime Minister's Council on Climate Change for Rs 46000 crore over 10 years coinciding with 12th and 13th FY Plan. Rs 200 crores have been allocated for the preparatory activities in the year 2011-12. The Green India Mission as it is known, aims at both increasing the forest and tree cover by 5 million ha, as well as increasing the quality of existing forest cover in another 5 million ha. The Mission proposes a holistic view of greening and focuses not only on carbon sequestration targets alone, but, on multiple ecosystem services, especially, biodiversity, water, biomass etc, along with carbon sequestration as a co-benefit. While convergence is desirable, and GIM also envisages the same, a program of this dimension should have budget support to the extent of atleast 70% so that it can attract funds for convergence with other scheme. This additionality would be required to address the need to increase the forest and tree cover and its outcome to a large extent.

10.18. National Afforestation and Eco-development Board implements the National Afforestation Program (NAP), a major afforestation drive of the Ministry through the state forest departments in the country. During the XI th Plan, the allocation of funds to the National Afforestation Programme (NAP) is Rs. 393 cr, Rs. 346 cr., Rs. 318 cr., Rs. 310 cr and Rs. 303 cr for the years 2007-08, 08-09, 09-10, 10-11, and 2011-12 respectively. The targets of planting were accordingly set as 4.93 lakh ha (including that of 2005-06 carried over to 2007-08, first year of eleventh plan), 1.73 lakh ha, 1.03 lakh ha, 0.59 lakh ha and 0.50 lakh ha. The allotment of grants for the NAP since beginning of the program is shown in the figures below-

Chart 10.1.

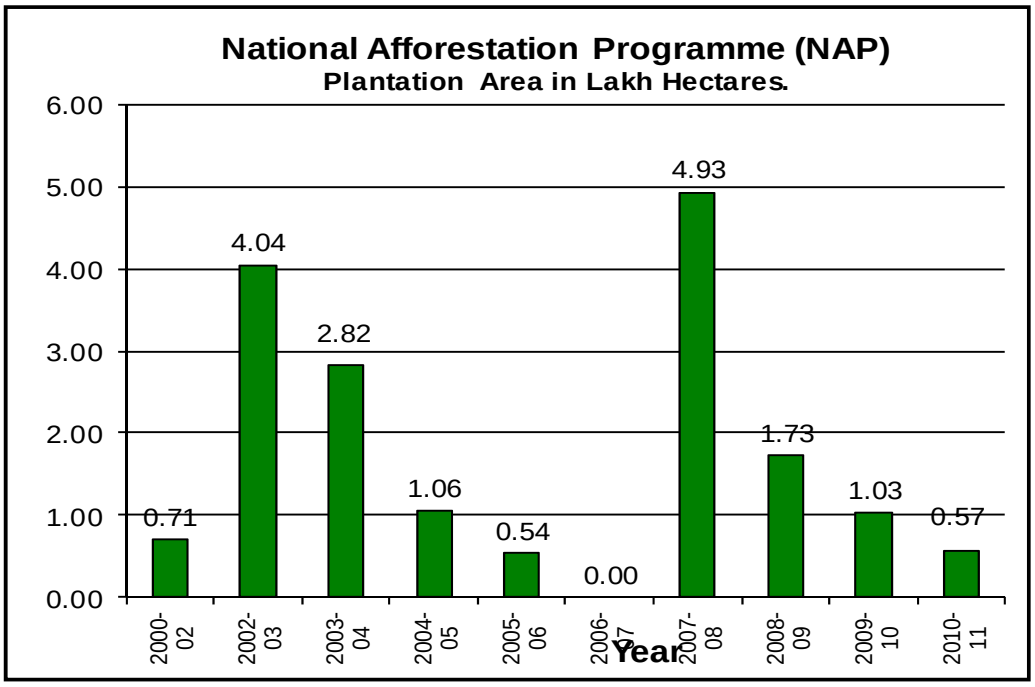
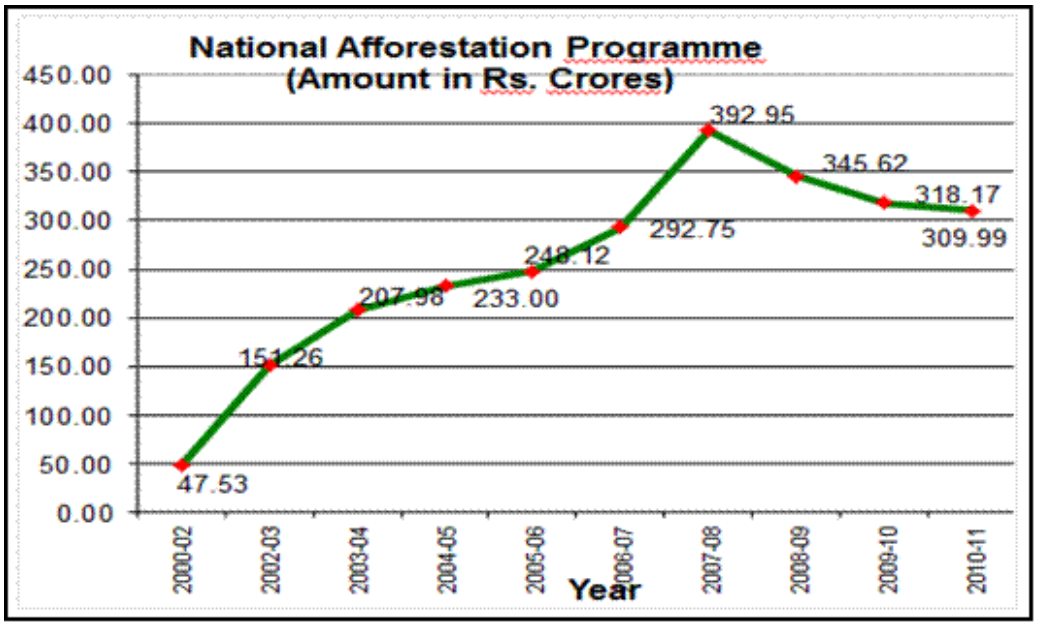


Chart 10.2.



10.19. \National Afforestation Program (NAP) is implemented through decentralized structure of Forest development Agency (FDA) and JFM Committees. From the year 2010-11, State Forest Development Agency (SFDA) has been constituted at the State level to smoothen the fund flow from the Ministry to the FDAs. This decentralized three-tier institutional structure (SFDA, FDA and JFMC) allows greater participation of the community, both in planning and implementation, to improve forests and livelihoods of the people living in and around forest areas. JFM approach of "Care & Share" draws its strength from National Forest Policy 1988 and subsequent guidelines of MoEF in 1990, 2000 and 2002, which lay emphasis on the involvement of local communities in protection, afforestation and sharing of benefits with the communities, making their gradual empowerment possible. While JFM committees in the existing system are constituted from the Gram Sabha members for management of forest resources, an emphasis on making them as permanent technical committees under the guidance and supervision of Gram Sabha during 12th five year plan period.

10.20. The Forestry sector recognizes its increasing role to provide sustained benefits to the people and strives to attain it by integrating new frontiers of knowledge & science in planning, management, research & capacity building with forest management. The professionals, who manage the forest resources, are being regularly provided with the cutting edge knowledge, technology and skills to deal with new challenges. Indira Gandhi National Forest Academy (IGNFA), Dehradun, FRI Deemed University, Dehradun, Wildlife Institute of India (WII), Indian Institute of Forest Management (IIFM) Bhopal, Indian Council & Forestry Research & Education (ICFRE), State Forest Training School and state forest institutions are making extensive efforts to fulfill the knowledge gap. Presently, one-two years long induction training, refresher courses through week long training on yearly basis and Mid-career trainings are arranged for senior forest officers and frontline staff. The state training institutions are being upgraded to provide frontline staff trainings on regular basis for updating their knowledge to take care of developing needs. However, training of members of JFM committees and other local level institutions in forestry and allied activities need to be stepped up.

10.21. While China has kept a target of increase in the forest cover by 12.5 million hectares between 2011-2015 against the increase of 40 million hectare forest cover between 2005-2020, India's target are rather modest much below the country's requirement so far unless issues of making available matching financial resources is addressed convincingly. With the drivers of degradation like forest fires, cattle grazing etc. and excessive drawl in form of fire-wood, timber etc. in the forest area, the increase in net forest cover for a Five Year plan period in India presently will be less than 1.0% and perhaps negligible. The increase in in forest cover would generally be restricted to non-forest area where there is scope for enhancing tree cover. Hence, there is urgent need to step up afforestation drives by matching availability of funds to achieve ambitious afforestation targets.

Gap Analysis of Programmes of Forestry Sector:

10.22. The Forest policy of 1988, while reiterating the "Directive Principles of State Policy" mandated the forest cover to one-third and two-third in the country and the hilly region respectively. This was further reinforced by the National Development Council by stipulating monitorable target for the forest cover at 25% and 33 % by the end of 10th and 11th plan respectively. This required large plan allocation to forestry sector, which did not happen in 10th/11th Five Year plan rather funding to forestry & wildlife sector has come down to 0.4% - 0.5% of overall size of 11th Plan. This has affected the afforestation drive aimed to achieve the targeted growth in forest cover.

10.23. The review of afforestation Programme in the previous section indicate that fund availability to the major afforestation program (National Afforestation Programme) of the Central Government has not only been stagnating but diminishing in the Xith Plan inspite of increasing costs of inputs, which gets reflected in the decreasing annual targets set for afforestation. This has resulted in the loss of focus on restoration of degraded forest lands, which has been further aggravated by increasing vacancies at the level of forest field staff affecting implementation of the afforestation and wildlife management program. In many of the states, funding from central government and externally aided projects remained the main plan resources for afforestation.

10.24. It is sometimes argued that some financial resources have also been made available for afforestation through Finance Commission grants and CAMPA funds. While the CAMPA funds are available for making the loss of forest cover due to forest lands already diverted by way of undertaking compensatory afforestation, it is a general tendency of the states that increase in central sector funds for forestry sector invariably led to reduction of state funding to the forestry, rather than treating central funding as an additional resource.

10.25. The average rate of planting is of the order of 0.15-0.20 million ha per annum under the National Afforestation Programme and State/ Forest Development Corporation add another 0.2 – 0.3 million ha. To the block planting. Thus, the annual planting in block form is 0.4-0.5 million ha. However, annual achievement of afforestation/ planting reported under Twenty Point Programme (TPP) data is about 1 – 1.2 million hectare per year, which is not solely block plantations done by forest departments but also consist of Roadside plantations, Railway line/ canal side plantations and other public land plantations by other agencies. These reported figures under TPP however do not inspire confidence due to inadequate monitoring mechanism by other agencies.

10.26. Considering that all trees in the plantations do not survive, some plantations are raised in degraded forests to improve the stocking and degrading factors still continue to operate in forests, the extent of increase of Forest & Tree cover (FTC) will be proportionately less. In this context, it is better to take into account the increase of 0.5% FTC in 2005-07 period. Taking the outcome of increase in FTC during 2005-07 period, the annual plantation rate has to be increased ten-fold to achieve 5% increase in FTC and this increase in FTC will be seen only after 6-7 years if these afforestation / plantation efforts are sustained. Thus, plantation created in 11th plan period would be captured by satellite for the purpose of FTC assessment by FSI, Dehradun in 12th plan period.

10.27. As far as the pressure on the forests is concerned, MoEF report on "Forest Cover in India" has indicated that.

- Unsustainable withdrawals of fuel wood, timber and fodder from forest areas is causing degradation of forests in India as gap in Demand & Supply of fuel wood alone is about 86 million tonnes.
- 1.2 million ha of forest areas are subjected to shifting cultivation.
- Annual diversion of forests under FCA 1980 is about 25000 ha per annum.
- Honey-combing of forests due to encroachments and recognition of forest dwellers' rights on the principle of 'As is where is basis'.

10.28. The planting in degraded or open forests would not translate into any net increase of forest cover but improve the density of forest cover. It is unlikely that any substantial extent of vacant land would be available to raise new forests and it will require extensive efforts by the states. So, the realistic measure would be to increase tree cover outside forests, which could translate into new FTC and simultaneously steps are taken to improve density of degraded & other forest areas by management interventions. Since plantations during 11th plan are not

substantial, FTC may show nil or marginal increase during 12th plan. With the current rate of withdrawal of forest resource and current level investment, it may not be surprising that FTC growth may become negative very soon.

Key Challenges to the Forestry Sector in India:

10.29. With 17% of world population and 18% livestock over 2.4 % of world total geographical area, India's forests are facing severe biotic pressure. Key challenges are-

- The forests are meeting 40% of domestic fuel-wood needs of the people and 30 % of the fodder needs of the cattle in our country.
- The demand and supply gap of timber, fuel-wood and fodder is widening in the country.
- Shifting cultivation practiced over 1.2 million ha, though associated with socio-cultural, legal and bio-physical characteristics, is also cause of degradation of forests predominately in Eastern and North-Eastern India.
- Honeycombing of forests caused by encroachments and its regularization and allotments under FRA.
- Low per-capita forest area of 0.06 hectare as against the world average of 0.64 ha.
- Allocation for the forests & wildlife sector is only 0.4% to 0.5% of the total plan outlay of the country. This coupled with late release of funds for afforestation compounds the problem.
- Slow implementation of Bio-diversity Act, 2002.

10.30. Left wing extremist groups and their variants in States of Madhya Pradesh, Chattisgarh, Uttar Pradesh, Jharkhand, Bihar, Orissa, Maharashtra, Andhra Pradesh are concentrated in large tracts of natural forests due to their isolated locations, lower allocation of financial and human resources for such forested areas, and slow implementation of government developmental schemes due to poor law and order conditions in these areas. Forest economies and tribal communities need greater protection and promotion to control extremist groups and poverty in the forest areas of the country.

10.31. Forest is foster mother of Agriculture and agriculture productivity cannot be enhanced without conserving and developing forests. Hence, continued degradation of forests will not only lead to further desertification and floods but will also affect food and water security needed for livelihood security of the people of the country. In order to maintain good agricultural growth, higher investment in forestry sector is important as forests will regulate the water flows, soil erosion & sedimentation and overall climate to maintain good agricultural growth and dependent manufacturing and service sector in the country.

10.32. Alternatives of timber consume more energy and generate more pollution and thus emphasis should be on more utilization of renewable products form forests like timber, fuel-wood, which are produced by sequestration of carbon di-oxide from the environment and thus environment friendly. Thus, emphasis should be on increasing production and sustainable utilization of forest resources. This would require higher financial and human resources for this sector.

10.33. In a scenario with heavy biotic pressure on the forests, investment of less than 0.4% to 0.5% of the 11th five year plan in the one-fourth of the land area recorded as forests and ever widening demand and supply gap of timber, fuel-wood and fodder, the degradation of forests is inevitable. This demands an urgent intervention at all levels and requires many innovative initiatives for restoration and increase in productivity of degraded forests and management of organizations by taking multi-sectoral and multi-stakeholder approach to the forest management.

Strategies for the Forestry Sector:

10.34. The expansion of forest cover to 25% and 33 % by the end of 10th and 11th plan respectively required large plan allocation to forestry sector, which did not happen in 10th/11th Five Year plan, rather funding to forestry & wildlife sector has come down to 0.4%-0.5% of the overall size of 11th Plan. It makes the plan support to Green India Mission and other forestry programmes even more important and to achieve modest targets in comparison to China under Green India Mission in Mission mode, a regular flow of fund as a plan scheme in 12th Plan need to be introduced.

10.35. It is in the perspective of the basic objectives of National Forest Policy, 1988 and National Environmental Policy, 2006 for maintenance of environmental stability through preservation and restoration of ecological balance; conserving the natural heritage of the country and natural resource accounting, the sub-group-I recommends following strategies:-

Strategy 1 : Innovative ways for augmenting flow of Financial Resources:

10.36. The midterm appraisal of 11th Five Year Plan by Planning Commission states that 5% of annual, Central, State outlay should be allocated for the environment and forestry sector separately. Since the allocation had been around 0.4% to the forestry & wildlife sector, it has become necessary to find ways and means to generate funds for forestry and wildlife sector in the interest of the survival of the human kind and for the sake of future generation by ensuring ecological security of the country. Time and again, it has been emphasized to explore innovative funding mechanism to promote forestry activities in the past five year plans. However, this mechanism has not worked even in the profitable commercial 94rganizations like Air India, not to talk of Forestry sector, which has a long gestation period and not remunerative enough. However, following steps may take appropriate shape during 12th Plan.

- The ecosystem services of forest like hydrological benefits, soil conservation, flood control, carbon sequestration, fresh air generation, climate stabilization, biodiversity conservation etc. are now accepted worldwide. The Forestry sector need to be looked at differently especially for ecological services rather than tangible outputs and must be compensated for the ecological services it provides so that higher quantum of funds will be invested in Forestry sector. PES (Payments for Ecological Services) is an accepted concept the world over. Initially, a fee of atleast 5% on the value of the services generated from dams/ power generation, Oil/Gas/ Coal may be stipulated in Forest clearance of projects under Forest (Conservation) act 1980 to compensate for ecological services of forests. A methodology should be put in place for transferring the benefits of ecological services from those who derive these benefits to those who are directly involved in forest conservation including rural and tribal communities.
- As the funds for greening are scarce even in developed states including forest deficient states, there is an urgent need for providing the additional resources to the forest deficient districts / states on the lines of grants provided to the forest rich states by 13th Finance Commission.
- There is need for creation of “Green fund” by pooling forest development tax (About 10% of value) levied on sale of forest products, 5% forest conservation tax levied on the sale of petroleum products/ coal and similar taxes like Eco-tax in Himachal Pradesh, which may be utilized for forestry activities.
- There is need to attract funds from international institutions / bodies/ 94rganizations for carbon sequestration, REDD+, biodiversity conservation etc. to enhance the domestic investment for afforestation and to pass it on to local communities for their role in conservation and development of the forests.
- Multi-Stakeholder Partnership involving industries (requiring forest based raw material) for pooling of financial resource, Forest Corporations for implementation and local JFM Committees for participation in the afforestation of the degraded forest lands in a phased manner holds the key for optimum utilization of land capability and optimizing its productivity.
- Big business houses/ corporate houses/ Public Sector Units should provide funds for conservation and development of forest under their Corporate Social Responsibilities. This has been supported by the Permanent Parliamentary Committee on E & F and S & T.

Strategy 2 : Participatory Management:

10.37. Participatory management approach to forest management is vital for livelihood security and wider support of the people. Since there is delay in fund transfer to the state forest departments, the State Forest Development Agency (SFDA), Forest Development Agency (FDA) in the districts and the Joint Forest Management Committees (JFMCs) as Committees of the Gram Sabha at village level may implement the forestry activities. These agencies may however require revamping to take care of changing paradigm and developing needs of the forest management and meeting the democratic aspirations of the people.

10.38. Forests play a very important role in rural and tribal economy as many of the NTFPs provide sustenance to three hundred million poor people. The local people should have first claim on the forest products and local community should be encouraged to promote low key business/ economic activities on forest based raw material that not only provide jobs, income and economic base but also are environmentally restorative in nature.

10.39. Local level institutions like JFM in various styles and forms in different parts of the country should be promoted for forest management in the country and JFM Committees should be formed as standing committees of the Gram Sabha.

10.40. JFM needs to be evolved into a higher platform "JFM Plus" where the livelihood promotion of the communities gets increased importance in the conservation and development of forests.

Strategy 3 : Urban Forestry:

10.41. Urban areas especially need attention as pollution levels and radiating heat from the concrete buildings requires dissipation through vegetative means. In urban areas, local level institutions such as RWAs, Schools, Colleges, NGOs/ Vas etc. should be involved in the implementation of greening activities. A case of Delhi will be good example to provide insight in the process of greening. Delhi State had been able to increase its forest cover from 1.8 % in 1996 to 20% now despite scarce availability of land, high cost of land and heavy pressure on open areas. Other cities like Chandigarh, Ahmedabad, Hyderabad have equally done well in increasing green cover, which can be replicated by other states, cities and towns. This is very urgent as cities and towns are expanding fast and all efforts need to be made to preserve existing forests and open lands as public amenity spaces and to add new spaces within the urban plans, wherever possible.

10.42. To protect such open spaces from so-called development lobbies, users' associations should be formed to manage them jointly with the custodian (Forest, Horticulture or other departments) for safeguarding the interests of walkers, joggers and nature lovers.

10.2. Salient Features of Greening Delhi Action Plan

- Increase in Vegetation by
  - Massive plantation by all Govt. Agencies
  - Motivating people to plant atleast one tree
  - Free distribution of seedlings
  - Involve NGOs, resident welfare associations, etc.
- Enlist people's participation to make greening a people's movement
- Mass Awareness Campaign to educate people especially schools students to increase awareness for greening
- Need for coordination with other Greening Agencies
- Protection of existing Vegetation by implementation of Delhi Tree Preservation Act

10.43. Urban areas need to be tackled at source in view of low forest cover in general, high levels of pollution etc. and to improve the quality of the life of people residing in cities and small towns.

Strategy 4 : Afforestation of Under-utilized Lands:

10.44. There is need to restore degraded forests (open density forests) to its optimum production potential. Increasing the forest area under multi-purpose productive plantations to about 5- 10 % of the total forest area in a phased manner and its management through Forest Development Corporations / Agencies with well-defined targets and appropriate financial resources should be taken up. This requires huge investments in Forestry sector to create new forest resources in a phased manner. Industrial Wood products would have to be restricted to the existing areas of forest development corporations and the existing plantation felling series of the working plans of territorial forest divisions. This would involve pooling of financial resource by industries requiring forest based raw material, implementation by output oriented Forest Corporations and participation of the local JFM Committees. Till it is achieved the fuel, fodder and timber needs of the rural and urban communities may be met

from outside the forests. To restore the ecological status of forests, which were clear-felled in the past, mixed crops of services to bio-diversity and local need would be encouraged.

- There is need to give attention to meet the timber, fuel-wood and fodder demands of the country. Past working plan practices for meeting the timber, fuel-wood and fodder should be revived in forest areas that are ecologically suited to take care of these aspects. There is also a need to research various agro-forestry and mixed models and establish demonstration / pilot plots.

Strategy 5 : Agro-forestry and Optimizing Productivity:

10.45. In order the make the plantations more productive and augment the income of farmers engaged in agro-forestry, there is a need to develop high yielding varieties through tree improvement, improve nursery techniques and plantation techniques so that forestry plantations cater to the increasing demand of the people for forestry products in order to divert pressure from natural forests.

10.46. Large scale Hi-tech nurseries are to be created for Quality Planting Material required for the agroforestry activities.

10.47. Agro-forestry Development Board to guide and supervise the agro-forestry activities in the country may be constituted to facilitate the under-utilized non-forest lands. This is possible by incentivizing agro-forestry. Forestry Sector can play a very important role in the development of this sector.

Strategy 6 : Linkages with Allied Sector:

10.48. Convergence guidelines of National Afforestation Program (NAP) of MoEF and MG NREGA of MoRD have been developed but it has been observed that funding through convergence mechanism are not regular and timely and rather depends on perception of officer-in charge. To overcome these difficulties, long term understanding and commitments have to be worked out by all allied departments to ensure timely and regular funds for afforestation activities.

10.49. There should be focus on increasing forest cover outside the traditional forest areas as there is enough scope to increase tree cover outside forest area. The existing tree cover is only about 2.82 % of geographical area and the number of districts having forest cover less than 5% is one-fourth of the total districts in the country. Afforestation activities have to be focused on non-forest lands like road side avenue plantations, institutional plantations and planting on village waste lands etc. and greater thrust on forestry extension, education & others should be given.

10.50. Ecosystem based/ landscape approach should be used for making intervention in the field. Selection of the landscapes may be based on a range of criteria, including projected vulnerability to climate change, areas with significant biodiversity and other ecosystem values, critical habitats, corridors, and potential of area for carbon sink. Overlays of socio economic criteria like poverty and ethnicity may further help prioritization of project areas within the candidate landscapes. This would also require intervention of all allied departments like rural development, tribal welfare, Panchayat Raj Institutions (PRIs), watershed development departments etc. and gives an opportunity for better co-ordination and better linkages among them and with other sectors as well.

10.51. The developmental programmes in forest rich districts/ Left Wing Extremist affected districts requires convergence between different programmes of the government and the key role of co-ordination in these districts should be should be entrusted to the State forest departments, because it has the larger reach & better presence in the interior most parts of the districts.

Strategy 7 : Forest Conservation & Management:

10.52. Forest economies and tribal communities need greater protection and promotion to keep extremism away and poverty low in the forest areas of the country. The tribal youth may be involved in afforestation and forest protection by engaging them as community foresters.

10.53. Forest Fire Vulnerability Map/ Fire Hazard Index should be developed in each state to prioritize the funds for fire protection. The local communities should be extensively involved in fire management of the forest fires.

10.54. Awareness and mass media campaign in respect of forests, wildlife and environment can play an important role in spreading the message to general public. Knowledge management through digital library resources and dissemination of knowledge through Van Vigyan Kendras / local Community Radios/ FM Radios need to be explored. This could also be useful in management of Forest Fires.

10.55. Volunteers should be developed by involving people as Honorary Wildlife Warden, Honorary Forest officers, who could contribute in awareness on forest and wildlife and provide secret information on forest and wildlife crimes.

10.56. Frontline staff has to take up arduous protection duties in the forest and wildlife areas, sometimes cut off from the main land. They should be motivated by providing pay and ration on the lines of paramilitary forces/ police.

10.57. Invasive Alien Species like Lantana is creating menace in certain areas. The efforts are to be made to control it through uprooting and its further use in boards.

10.58. Utmost care should be taken to divert the already afforested lands. Role of urban authorities, PWD and other agencies is important while planning their activities near lands already planted.

Strategy 8 : Capacity building of Forest Officials & JFM Committees:

10.59. There is vacancy of 20 % at the level of frontline forest staff. As the forest duties are arduous the forestry posts should be filled on the lines of fresh army recruitment or from able bodied retired army personnels. At the same time, special efforts need to be made to develop good communication with the communities and between different levels within the forest departments and allied departments of the government.

10.60. Office staff of forest department should be selected and trained on the lines of field staff as in the police department and interchanged with each other for smooth forestry operations. This will bring better understanding and quick results in processing of projects in office and field implementation.

10.61. Extensive efforts should be made to build the capacity of the frontline staff and JFM Committee members and those involved in forestry and wildlife sector in new nursery techniques, plantation technology, monitoring through GIS/MIS, community organizing, livelihood generation activities etc. so as to fulfill the livelihood needs of the people.

10.62. Training should be regular activity for all levels rather than induction training only. Each forest official should be given chance for specializing in one or two fields. There is also need to revise training curriculum to take care of dynamic needs of forestry and wildlife sector.

Strategy 9 : Regulatory regime:

10.63. Regulatory regime like liberalized provisions for transport of timber and NTFPs need to be suitably modified and relaxed to encourage tree planting on degraded lands outside forests.

10.64. The Joint Forest Management Committees should be formalized and given legal status under the Indian Forest Act and the Panchayat / PESA Act. The state implementing agencies should be strengthened by providing funds for staff/ officials required for implementation of activities.

10.65. Bio-diversity of the country should be protected from bio-piracy. Similarly, incomes from IPRs should be shared with the communities for better protection and management of bio-resources especially medicinal plants.

10.66. There is need to modernize and adequately equip the Forest Department to control the increasing efforts of the mafia in illicit felling of trees and poaching of wild-life.

Strategy 10 : Sustainable Forest Management and Forest Certification:

10.67. Sustainable forest management and certification issues should be built in the forest management of the country. Forest Certification as voluntary procedure for management practice will pave the way for the sustainable forest management in the country. National set of criteria and indicators need to be adapted for practical applications in the state forest departments, which should be taken up as a capacity building program with the collaboration of premier institutions like Indian Institute of Management, Bangalore, BIS, NGOs and IIFM, Bhopal. This need to be supplemented by an overall effort to improve the interactions with the public, by better use of ICT and transparent processes.

10.68. The weak links in the supply chain need be identified and efforts be made to overcome the supply bottlenecks via technological, market creation/strengthening, easier access to information, capital and credit policies. There is ample scope for value addition especially in medicinal products.

10.69. The mangroves, coral reefs and wetlands are rich area of biodiversity and need to be conserved and protected from further degradation through 100% funded Centrally Sponsored Scheme. Similarly Himalayan forests, glaciers, bio-diversity hotspots, and ecologically sensitive areas require higher protection because they regulate the regional climate and are important source of fresh water for agriculture, industry and human consumption. The importance of sacred groves, endemic species like red sanders also need sufficient recognition in our conservation plans.

Strategy 11 : Forestry Research

10.70. R & D support in Forestry sector is rather poor and hence focus to meet short term applied research and long term requirements of the sector is required. Besides, policy research in changing paradigm is the necessity of the sector.

10.71. New focus should be given to multi-storey plantations to utilize the full potential of the forest lands. The present schedule of rates, species mix, plantation techniques have to be worked out through field trials.

10.72. Agro-forestry models for different agro-climatic zones should be developed and compiled by the ICFRE.

10.73. There is need to create forestry seed bank, and revival of seed orchards and identification of plus trees in all the states for better production forestry activities.

10.74. There is need for synergy and networking among ICFRE and various state research institutes so that research and extension related information could be effortlessly shared with the users.

10.75. Initiatives to develop procedures/ mechanisms in the area of Natural Resource Accounting should be taken to arrive at good measure of contribution of forests to the GDP.

Strategy 12 : Miscellaneous:

10.76. To give the impetus to the Forestry sector including wildlife, a separate Department of Forests and Wildlife may be created in the Ministry and the human resources of the department should be enhanced to deal with new fields of work.

10.77. Bio-diversity, Mangroves, wetlands, coral reefs etc. are the natural parts of forests and wildlife and require convergence with different departments for meaningful outcome.

10.78. Multiplicity of the land based committees like Bio-diversity Management Committees, Wetland Committees, Watershed Management Committees has to be removed and a single committee with various experts needs to be introduced for better co-ordination at the local and district level.

10.79. For the sustainable development of FRA areas, map with geo-referenced boundaries should be developed by Tribal Welfare Department so that options for livelihood including agro-forestry could be provided to the people and Forest Department could develop plan for sustainable livelihood options of these areas.

10.80. There is need to remove annual uncertainties about time and quantum of funds in allocation so that regular funds flow in time-bound manner.

10.81. Preparation of Working Plan for scientific management of the forests in the forest divisions is very important for its sustainability and therefore central assistance for this aspect is necessary.

10.82. There are large numbers of small rivulets in addition to major rivers in the country. Bio-engineering models should be applied in watershed areas of these rivulets also to control floods and draughts in the command areas.

10.83. The forest department should review their plantation schedule and incorporate the essential need to take care of adequate cost of tall planting, scarcity of plantation manpower, seasonability of afforestation work coinciding with agriculture activities, poor output of unskilled persons due to low wage rate, welfare needs of these people so as to achieve the good afforestation results rather than emphasizing on qualitative targets.

Recommendations and Proposed Targets:

10.84. Considering the recommendation of Mid-term Appraisal of Forestry & Wildlife Sector schemes in Xith Plan by the Planning Commission and the country's requirements in addressing the sustainable livelihood issues of forest dependent communities through Bamboo & NTFP based programmes as well as need to main stream them in country's development, ensure ecological security by insulating the country from adverse impact of climate change by way of increasing the carbon sequestration potential apart from increasing forest cover, need to enhance scale of involvement of village level institutions besides putting in place a system of technological based monitoring & evaluation, following allocation is recommended for augmenting afforestation programmes in the 12th Plan keeping in view the ecological security of the country and livelihood support to the people.

Table 10.2. Proposed schemes during 12th Plan (Sub Group I - Forestry)

Sl. No.	Proposed Scheme/ Program during 12th Plan	Proposed Demand (Rs. Crores)	Proposed Physical Targets
1.	National Afforestation Programme	13500	2.0 million Ha. Afforestation, Soil & Moisture Conservation including water harvesting structures and Eco-development for people residing in forests. creation of cadre of Community Foresters (About 50000) for activities\ programmes \ schemes of forest conservation and management including NTFP's. The scheme would also include provisions for establishment cost of NAEB HQ, Communication strategy and Awareness component and support to regional centres of NAEB.
2.	Capacity Development of the Gram Sabha including JFMCs and other stakeholders	2500	Capacity building of members of one lakh JFM Committees and Gram Sabha through Master Trainers in each Forest Divisions for management & conservation of forests.
3.	Green India Mission	23000	Increased FTC on 2.5 million Ha. and improvement in Quality of Forest Cover over another 2.5 million Ha.
4.	Intensification of the Forest Management	2000	Forest Fire Management, Boundary Demarcation, Forest Infrastructure, Control of Invasive Alien Species, Strengthening of Working Plan Mechanism for sustainable livelihood of people and Conservation of Forest Resources. Involvement of retired defence/ paramilitary personnel in eco-restoration will also form part of the scheme.
5.	Satellite based Forest Resource Assessment and technological based M & E	1000	To put in place a system of technogical based collection of base line data,monitoring & evaluation of forestry schemes & programmes
	Total:	**42000**	
	Note: Break-up of the above schemes is given in annexures. 6 lakh Ha. Bamboo & NTFP Plantation, chain of value addition, Marketing Support etc in overall management of NTFP areas drawn from another sub-group		

Monitoring and Evaluation:

10.85. Monitoring and Evaluation is an integral part of any program for assessment of the works underway and effectiveness of investments made. Continuous monitoring and periodic evaluation of the selected parameters, performance efficiency and impact of the projects / programs will have to be undertaken for proper implementation of afforestation program. With this objective in view, Government of India is undertaking assessment of Forest & Tree Cover (FTC) on biennial basis for assessment of its afforestation programme and future requirements of the forestry sector.

10.86. In the 11th Five Year Plan, the target for enhancing the forest and tree cover was 5%. It had two inherent problems, one that forest cover change in 11th Five Year plan will only be reflective of new plantations created in the 10th Five Year plan. Secondly the present allocation is sufficient to develop reforestation on 0.7 to 1 million ha. annually which will transform 5 million ha. during a Five Year plan which is equivalent to about 1.5 % increase in forest and tree cover. Thus, a substantial area of plantation in forest area will improve the forest density rather than increase in forest cover.

10.87. Besides, monitoring of input level activity at the level of Ministry, Forests Departments and other stakeholders, outcome level parameters should be assessed by technological based M & E system at the field level by application of modern technology like Remote sensing, GIS combined with ground truthing. For this purpose, data sets of monitor able parameters have to decided and documented from time to time for evaluation by project authorities and independent evaluators. For the reliable system of monitoring, there is a need to define indicators for scientific / technological parameters in terms of improvement in the forest cover, growing stock, improvement in ground water levels due to SMC works etc. like-wise socio-economic parameters like change in composition of agricultural crops, number of crops taken in a year and income indicators can be another set of indicators to assess improvement in water table regime etc. This should lead to the put social audit by local level communities and Gram sabha in place.

10.88. Apart from other systems in place, theme based monitoring of the following activities is required on periodical basis. Some of the parameters for monitoring the outcome of the forestry programmes are

- Pilot scale monitoring at certain locations for Ground Water Table, ecological services like carbon sequestration and Sedimentation rate of rivers/ rivulets.
- Forest sustainability index.
- Population census of major wildlife species like Tiger, elephant, Rhino etc. could be another indicator of health of the forests.
- Measurement of bio-diversity index of pilot sites on regular basis.
- Socio-economic parameters like income levels, HDI, infant mortality, sex ratio, number of BPL families, health status, cropping pattern, etc.
- Theme based annual reporting of parameters like encroachments, forest fires.

10.89. The real-time, web-based monitoring system being developed for CAMPA by National Informatics Centre (NIC), and FSI should be taken as the starting point for the interventions during XIIth Plan, and may be extended to other schemes by strengthening the Forest Survey of India (FSI) and State Remote Sensing / Geomatics Units. Density slicing could be used to gauge migration within density class.

10.90. Remote-sensing-based forest cover monitoring in close collaboration with Forest Survey of India, National Remote Sensing Agency and Indian Institute of Remote Sensing for developing a countrywide mosaic of high resolution satellite images (LISS IV, Cartosat) and overlaying polygons of areas taken up for interventions to help develop a centralized spatial data base in the GIS domain.

10.91. In order to achieve the adequate level in the monitoring and evaluation system, a dedicated forest satellite for monitoring forest cover, NTFP resource, bio-diversity on periodical basis etc. and change monitoring is required.

Expected Outcome:

10.92. The implementation of the forestry sector schemes recommended in previous para would result in increase in forest and tree cover by about 3.5 million ha and improvement in quality of forests over another 3.5 million ha. This will take India's forest & tree cover to around 82 million ha, which will be 25% of geographical area of the country. Further, the protection & conservation measures envisaged will improve the quality of forest cover in terms of density, growing stock, quantum of carbon sequestered by way of implementation of these schemes. Improvement in quality and area of FTC would enhance eco- system services like carbon sequestration, hydrological services and bio-diversity conservation in addition to increase in tangible goods like fuel-wood, fodder, timber and NTFPs from forests. The implementation of the forestry and wildlife sector schemes would benefit people living in and around forests especially tribals and forests dwellers through employment generation & low key economic activities, so vital for respectable sustenance as well as augmentation of income.

10.93. From the year 1995 to 2005, carbon stock in forests of the country were estimated to increase from 6245 million tonnes to 6662 million tonnes, registering in annual increment of 37 million tons of Carbon. With the implementation of proposed forestry sector schemes, annual carbon sequestration will enhance atleast by about 50 million tonnes at the end of the 12th plan which will increase with the maturity till it attains mean annual increment & rotation period.

10.94. Forests are also essential for maintaining favourable conditions for sustainable agriculture productivity and farmers' income is expected to increase by soil and moisture conservation works. Forests are also important for maintaining underground water table, for recharging the aquifers and for maintaining of water in rivers and rivulets. This has been established in various studies of catchments like Shimla forest catchment for securing water supply to Shimla town and Borivali National Park forests for maintaining water supply to the part of the Mumbai city.

10.95. Forests also provide a range of tangible benefits like fuelwood, fodder, timber and NTFPs which are crucial to livelihood security of the local communities. Nearly 27% of total population of the India comprising about 300 million people depend on forest for livelihood and implementation of the recommended forestry schemes would augment forest based livelihood income of the people living in and around forests.

Annexure 10.1.

Break-up of Schemes – sub group 1

1. National Afforestation Programme (NAP)

S.No.	Component	Model Cost
1.	**Eco-restoration and Afforestation** (ANR, AR, Silvi-pasture, Mixed Plantation, Regeneration of perennial herbs etc.) including Eco-development involving retired defence / paramilitary personnel	**Rs. 8000 crores**
2.	**Ancillary activities (**Given below**)**	**Rs. 4000 crores**
(i)	Strengthening of JFM	Rs 100000 per JFMC
(ii)	Awareness Generation	1% of the Plantation Cost
(iii)	Microplanning	2% of the Plantation Cost
(iv)	Planting/ Regeneration	As per models
(v)	Fencing	5 –10% of the Plantation Cost
(vi)	Soil & Moisture Conservation	15- 25% of the Plantation Cost depending on agro-climatic zones
(vii)	Entry Point Activities (per Hectare)	Rs. 10,000/-
(viii)	Training & Capacity Building	Rs.10 Lakh per FDA
(ix)	Value Addition and Marketing of Forest Produce	Rs. 20 Lakh per FDA
(x)	Concomitant Monitoring & Evaluation	2% of the Plantation Cost
(xi)	Overheads[##]	10% of the Plantation Cost
(xii)	Treatment of Problem Lands	25% of the Plantation Cost
(xiii)	Use of Improved Technology	25% of the Plantation Cost
3.	**Community Foresters** from among tribal Youths/ People residing in forests for forest conservation and management (50000)	**Rs. 1500 crores**
	Total	**Rs. 13500 crores**

2. Capacity Development of JFMCs / Gram Sabha / Other Stakeholders (Include exposure visit/ field training / livelihood issues/ record maintenance/ community organising etc.)

- Travel/ Boarding / Lodging of Experts/ Trainers
- Boarding / Lodging/ Travel of Participants
- Training Kits
- Honorarium to of JFMC / Gram Sabha/ non-officials to compensate wages lost during training.
- Contingency
- Proceedings/ Secretarial Assistance

Estimate: 1.1 lakh JFMCs (80 households (avg.) * Rs. 2.5 lakh per training (2-3 days) * 3-5 trainings/ refresher course in a five year plan = Rs. 8100 to 13500 crores for a plan. Initially, executive members/ Panch/ sarpanch/ presidents/ other functinaries of unit etc. to be trained (Demand in the plan period will be one-third to one-fourth of estimate)

3. Green India Mission

Sub Missions	Categories	Area (Million ha.)	Total Cost (Crores)
B. Eco-restoration through Sub-missions			
Sub Mission 1	Enhancing resilience of ecosystem/ landscopes high on vulnerability (increase in quality of forest cover and ecosystem services)	**2.45**	**5500**
Sub Mission 2	Restoration/ of ecologically challenged ecosystems (increase in forest cover)	**0.9**	**4200**
Sub Mission 3	Enhancing tree cover in Urban & Peri-Urban areas (including institutional lands)	**0.1**	**2000**
Sub Mission 4	Agro forestry and social Forestry (increasing biomass & creating carbon sink)	**1.5**	**4800**
Sub Mission 5	Restoration of Wetlands	**0.05**	**300**
Total Sub Missions		**5.0**	**16800**
Promoting alternative fuel energy	Biogas, solar devices, LPG, Biomass based systems, improved stoves	2.5 million households	**500**
	Total of A		**17300**

B. For Support Activities	
Activities	**Cost**
Research	**340**
Publicity/Media/outreach activities	**170**
GIS/Monitoring and Evaluation	**170**
Livelihood improvement activities,	**2900**
Strengthening local level institutions	**650**
Strengthening FDs	**650**
Overheads, Mission Directorate	**700**
Total of B	**5580**
Grand Total A+B = 22880 crores Say Rs. 23000 crores	

4. Intensification of Forest Management

Sr. No.	Components	Amount
(vii)	Forest Fire Management: Action as per Fire Vulnerability Map/ Fire Hazard Map/ other parameters etc.	Rs. 500 crores
(viii)	Mapping and Boundary demarcation	Rs. 400 crores
(ix)	Forest Infrastructure	Rs. 300 crores
(x)	Control of Invasive Alien Species	Rs. 200 crores
(xi)	Strengthening of Working Plan Divisions/ Research Wing	Rs. 250 crores
(xii)	NAEB HQ Secretariat, Communication Strategy, Awareness Campaign, Support to Regional Offices of NAEB, Other Officials	Rs. 350 Crores

5. Satellite based Forest Resource Assessment and Technological based monitoring

Sr. No.	Components	Amount
(v)	Construction and Launch of Forest Satellite	Rs. 250 crores
(vi)	Strengthening of FSI etc.	Rs. 300 crores
(vii)	Strengthening of M & E Unit of State Forest departments	Rs. 350 crores
(viii)	Field Station maintenance for monitoring of outcome parameters	Rs. 100 crores

Annexure 10.2.

Few Success Stories

Success Story of Integrated Development By JFM in Tiria village, Chhattisgarh, India

Due to 'care and share' policy of the Government, JFMC, established in 1998, comprising 368 members (74 families) managed the forest area of 340 ha. Hence the JFMC received its share of Rs.159 lakhs from harvesting of timber coupe, in the last 5 years. These funds were used by JFMC to improve socio-economic status of the village by way of providing solar electric connections, tube wells with overhead tanks for water supply, bio-gas plants to supply piped gas to every household as well as install biodiesel engines for lift irrigation to augment irrigation facilities,etc. These interventions by JFMC had the following benefits:

(1) Reducing dependence on fuelwood tremendously resulting in improvement of density of adjoining forest areas.
(2) Harvesting of two agriculture crops every year due to improved irrigation
(3) Enhancement of the income of each family by Rs.15,000 to Rs.20,000
(4) Improvement of education level of villagers due to solar powered electricity
(5) Reduction in incidences of water borne diseases due to piped water supply to every household.

While the scientific inputs for scientific and sustainable management of forests are provided by the Forest Department, the local communities help in micro planning process, for regeneration, protection and management of forests, and get the predetermined share from the forest resources managed by them.

NTFP Management & Livelihoods

Non Timber Forest Products (NTFPs) in India are known to play an important role historically in the social life of forest dependent communities. NTFPs contributes over 68% of total forest export revenue in India. Nearly 300 million people, living in and around forests in India, depend on NTFPs for sustenance and supplemental income. India has shown remarkable progress during the last decade in enhancing contribution of forests poverty alleviation through empowering people with the ownership of NTFP as well as value addition in accordance to the Millennium Declaration in 2000 to halve the number of people living in poverty by 2015. A success story leading to enhancement of incomes and poverty reduction through NTFP Management may be seen in Box III.

CASE - NTFP DEVELOPMENT & LIVELIHOODS- Case study from Orissa

Sanjog, a small NGO at Kantabanji in Balangir district, Orissa state, has promoted many enterprise based rural development activities. It has established formidable non timber forest produce based enterprises with initiatives for regeneration of resources for posterity. It has registered the enterprises in district industries centre (DIC), which helps the benefit of Govt. schemes such as subsidy. These are also registered as

cooperatives.



LAC

Lac insect rearing on a few trees can yield even the landless tribal more than does an acre of paddy farm. This is because each Kusum (*Shleichera oleosa*) tree earns the owner about Rs. 1,650/- net in just 6 months & with just 3 trees they earn more than net income from 1 acre of paddy farm, which is Rs. 5,000/-. This is because paddy farming cost is about Rs. 5,000/- per acre while lac brood cost per tree is just Rs. 1,200/- at Rs. 80/- per kg for 15 kg of brood. The tree may yield 100 kg of lac sold at Rs. 30/- per kg & Rs. 3,000/- in total, with just 3 sprays for pest control that cost just Rs. 10.- each. The lac is sold at Ranchi, Jharkhand state or Gondia in Maharashtra or Jaipur, Rajasthan where it used in Bangles & Jewelry making. The training is provided by the Indian Lac Research Institute, Ranchi.

LEAF PLATES

Stitching leaf plates from Siali/ Mahul climber (*Bauhinia vahlii*) climber leaves earns about 200 tribal women about Rs. 3,600/- yearly (over 8 months) in Mohangiri mountains of Kalahandi-Balangir border. They earned 20% extra today than 2 years ago by collective sales through “Banashree” federation that has bank account & DIC registration. This is also partly due to access to remote & profitable markets of Tirupati temple by Sanjog through Andhra traders, rather than depending only on the local traders. Climber planting is necessary to maintain stock & avoid loss due to its bark stripping for rope making.

Lok Vaniki Program in Madhya Pradesh:

Policy and legal instruments to facilitate plantation on private lands under Lok Vaniki are in place through the Madhya Pradesh Lok Vaniki Act 2001 and the Lok Vaniki Rules 2002 for providing legal framework for preparation of scientific management plans for private & Government Revenue tree-clad holdings. This scheme

is being implemented in all the districts of Madhya Pradesh. Under the Lok Vaniki Act 2001, the management plan for the area more than 10 ha. is sanctioned by the Chief Conservator of Forests, Regional, Government of India and for areas lesser than 10 ha., Divisional Forest Officers are competent to sanction management plan. After the submission of management plan by the landowner, an action is needed by the competent authority within 30 days time limit.

Under Lokvaniki Scheme, 2901 management plans have been approved by the competent authority. In addition to this, 31 management plans have been approved by the Government of India. In about 1640 cases nearly Rs.28 crore has been distributed to the farmers against their timber mostly Teak wood. A total of 27822 farmers have been exposed to the scheme and trained by conducting 173 farmers sammelan, 52 workshops and 8 study tours.

A massive programme to survey such tree clad holdings in the entire state has been initiated, nearly 8152.98 ha. area is identified as private tree clad area. 11 Extension and Research Circles are situated in each agro-climatic zone to ensure availability of good planting stock to the people on demand.

Yepuru Vana Samrakshana Samithi, Nellore, Andhra Pradesh

Yepuru VSS was formed on 12-3-1997 in Rapur Range of Nellore Division and consists of 37 Tribal families and 64 Tribal members. An extent of 310 Ha has been allotted to the VSS in Compartment Nos. 300, 301 of Nellepalli RF in Tumaya Beat of Yepuru Section. Out of 310 Ha allotted to VSS, an extent of 198 Ha has been treated upto 2010-11. Out of 198 Ha, Eucalyptus clonal plantations were raised over an extent of 110 Ha and the balance 88 Ha was treated with NTFP species. Out of 110 Ha of Eucalyptus clonal plantations, 80 Ha has been harvested and the balance 30 Ha will be harvested during 2011-12 as per the prescriptions of the working plan.

Due to Harvesting of Eucalyptus plantations by the VSS members, net Revenue of Rs.**29,48,562**/-(Rupees twenty nine lakhs forty eight thousand five hundred and sixty two only) has been realized upto the year 2010. Out of which 50% of amount i.e., Rs.**14,74,281**/-(Rupees Fourteen lakhs seventy four thousand two hundred and eighty one only) has been distributed to VSS members among 37 families @ Rs.**39,845**/- per each family. The balance 50% amount was constituted as “Reinvestment Fund”. By using the Reinvestment fund, Post Harvest operations and Regeneration works were taken up by the VSS members. Out of Rs.**14,74,281**/-(Rupees Fourteen lakhs seventy four thousand two hundred and eighty one only), an amount of Rs.**12,75,946**/-(Rupees twelve lakhs seventy five thousand nine hundred and forty six only) has been spent towards Raising of 35 Ha Eucalyptus plantation and post harvest operations. The balance amount Rs.**1,98,335**/- (Rupees One lakh ninety eight thousand three hundred and thirty five only) will be utilized for maintenance of plantations.

The uniqueness of Yepuru’s experience is the demonstration of willingness of the community to reinvest revenues from forest management to continue sustainable forest management.

Community based Eco-tourism, Maredumilli, Andhra Pradesh

The community participation in forest management began with a focus on rejuvenation of degraded forests. Eco-tourism – the new concept emerged as an initiative to enlist people’s participation to ensure biodiversity conservation while charging for eco service payments. Eco-tourism project at Maredumilli was launched in the year 2005 and is managed by the local indigenous tribal community of Kondareddis of Valamuru, Somireddypalem, and Addaraveedhi villages.

The facilities boast of “Nandanavanam”, an Ethno Medico Awareness Centre developed with an intention to ensure awareness about the local medicinal plants, “Madankunj” developed as a picnic place amidst Pine grooves and picturesque Golden Bamboo clumps, “Amruthadhara - Swarnadhara” the twin waterfalls where water gushes down from a height of around 100 feet providing unique trecking options and the “Jungle star nature camp” adjacent to the clean waters of Pamaluru providing a unique opportunity to stay overnight in the deep woods of the unexplored Eastern Ghats. The Hill top guest house, the Bison wood suits and pre-fabricated structures provide 28 beds while the nature camp provides 20 bedded accommodation. Between 20 and 30 thousand visitors throng this place every year. People from nearby Rajahmundry and Kakinada are frequent

visitors. The place also is on the tourist circuit of the State's Tourism Department and attracts visitors from Hyderabad and Visakhapatnam.

This concept has evolved a unique arrangement of sharing the benefits of eco service payment thus ensuring sustained interest of the local community while also providing direct employment to 18 families. Till March 2011, this cluster had netted gross revenue of Rs. 42.12 lakhs out of which Rs. 30.83 lakhs was spent by the cluster on maintenance of the facility. 30% of the net revenue of Rs.11.29 lakhs is kept with the Eco Development Committees for maintenance of the biodiversity of the region, 20% is distributed a bonus to 18 families that are directly involved in managing this facility and the balance Rs. 5.64 lakhs is kept as corpus for meeting the unforeseen needs of capital expenditure is and when needed. The success of this unique initiative is only to be gauged by the growth in revenue and its popularity. Revenue and has grown from Rs. 4 lakhs during 2006-07 to Rs.18 lakhs during 2010-11. The first quarter of 2011-12 the cluster has netted a gross revenue of Rs. 6 lakhs.

The experience of community partnership in eco-tourism in Maredumilli has given a new hope for a sustainable model of participatory management of our natural resources that ensure employment and payment for eco services while maintaining biodiversity.

Harvesting of Community Plantations under Social Forestry in Goa State:

In spite of the facts that the State of Goa has got about 65% of tree cover, still the Forest Department is making all efforts to increase the greenery of the State by entering into the agreement with local Communities for taking up afforestation in the Community land for a period of about 20-25 years. Few such plantations were taken up way back in 1985-86 and they are ready for harvest at the moment. Mostly the fast growing and hardy species are taken up in such Plantations. The Department has formulated the working scheme for the harvesting of such Plantation, which has completed agreement period and harvesting of the plantations is in progress. The sale proceeds of the harvest is to be shared by the Government and the communities concerned. This will also improve the availability of forest produce in the market.

Rescue of Wild Animals in Goa State:

The Forest Department of Goa State operates 5 Nos. of Wildlife Rescue Squads in different part of the State on round the clock basis. Well trained staff/ animal attendants have been posted in the Wildlife Rescue Squad for dealing with any kind of Wildlife emergencies in the State. These squads deal with any kind of Wildlife emergencies in the State. These Squads rescue Wild animals / Snakes entering habitation / settlement areas or in distress. The general public can contact such Rescue Squads in case Wild animals / Snakes enter human habitation / dwelling houses of the nearby area and the Squad immediately attend to such call. Around 2000 reptiles including King Cobra, Leopards, Monkeys etc. are rescued every year. Rescued Wild animals / Snakes are released safely back to their natural habitat after proper health check-up.

Conservation of Sukhna Catchment of Chandigarh UT:

The Sukhna Lake was constructed in 1985 across the Sukhna Choe, a seasonal stream flowing down the Shivalik hills, to enhance the aesthetic appeal of the Chandigarh city for tourist attraction. The Shivalik hills in the Sukhna catchment are ecologically sensitive and geographically unstable and are highly prone to erosion during rains. In order to minimize soil erosion from hilly catchment area, various vegetative and engineering methods were adopted by Forest Department. The effective closure imposed over a long time and intensive soil and moisture conservation measures combined with artificially assisted natural regeneration carried out consistently over the four decades helped in reversal of degradation process and resulted in significant improvement in micro climate of the catchment area. Major achievements are:

- Siltation rate reduced from 150 Tonn/Ha/Yr(1960) to 3-5 Tonn/Ha/Yr (2010)
- Physical and Chemical properties of soil has improved in terms of
    - Lower pH
    - Increased Phosphorous and Potash

- Increased Organic matter build up
- Improved root respiration
- Formation & Accumulation of more litter on the forest floor.
- Overall improvement in Tree & Bush Density.

- Due to 190 water bodies inside the sanctuary, the underground water regime has been improved and has resulted in perennial flow of water in few seasonal nullahs / choes.
- Development of good wildlife habitat due to large no. of water holes, grazing grounds & palatable grass & shrubs.
- There is appreciable increase in the population of wild animals like - Sambhar, Chital, Peacock, Red Jungle Fowl, Porcupines, and Pangolin etc. and area has been declared as Wildlife Sanctuary.

Enhanced Agriculture Productivity Through Soil & Moisture Conservation Activities in Bundelkhand Region of Madhya Pradesh:

In project area under Bundelkhand special package of M.P., was marked by acute shortage of water, forage and nutritional sleight of cattle. The irrigation facilities were just not available in the region leading to perpetual famine type conditions resulting low productivity of land. During FY 2009-10 and 2010-11, 150 check dams, 192 contour trenches, 177 percolation tanks, 53 ponds were constructed and other SMC activities were carried out in 49678 ha forestland. The catchment areas have been regenerated by artificial seeding of Mohua, ber, *Stylosantus hamata*, *Thimida quadriwalivis*, *Cenchrus ciliaris*, guner and denanath grass. This has shown significant bearings on water levels. The water table has come up significantly in almost all villages of project area leading to rise in water table. The progress note submitted by the Add. PCCF (JFM) of M.P. based on his field observations shows that people have started shifting from rainfed maize to Soyabean crop in the project area of Chatarpur and Tikamgrah districts. Similarly, SMC works such as staggered contour trenching, gully plugs, earthen check dams, banding, etc. and plantation activities carried out in in Banda, Chitrakoot, Jhansi and Mahoba districts has resulted in recharging of ground water in adjoining non-forestland. The field inspection by the Chief Executive Officer and the Technical Expert (Water Management) of NRAA near Pahra, Katral and Bhagwanpura villages and Ratoli Block in the said districts revealed recharging of ground water in dug wells in adjoining agriculture fields, as confirmed by the farmers, as a result of water retention in the newly constructed check dams by the Forest Dept. There is a marked increase in total Kharif and Rabi Crop coverage, production and productivity in the Bundelkahnd region of M.P. and U.P. The coverage area under six districts of Bundelkhand region of M.P. has seen increasing trend from 23.39 lakh ha in 2007-08 to 27.61 ha in 2009-10, productivity from 15.51 lakh tonne to 26.7 lakh tonne and yield from 743.65 kg/ha to 996.52 kg/ha in 2009-10.

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Annexure 11

Report of Sub-Group II

NTFP and their Sustainable Management

Executive Summary

11.1. One of India's largest unorganized sectors having a dependent population of about 275 million, and with a business turnover of more than Rs.6000 crores per annum, the NTFP sector has however and unfortunately been neglected since the pre-independence period. Otherwise known as the 'minor forest produce'(MFP) particularly implying to produces of plant origin with few exceptions, its actual contribution has been so major than in many of the State Forest Departments earn the major share of their income from these NTFPs/MFPs(like tendu leaves) particularly after green felling was banned. Although NTFP accounts for about 68% of the export in the forestry sector, conventional approaches of forest management focused largely on timber with but secondary attention to NTFP development, and Working Plans remained confined at best to elaborate prescriptions for bamboo alongwith few tit bits on other NTFPs. In absence of a comprehensive national/central policy/approach, contradictory legal provisions still prevail while differential state regimes create some of the biggest limitations which constrain a healthy growth of the NTFP sector. Bamboo, for instance, is defined as a 'minor forest produce' in the Forest Rights Act, 2006 whereas the Indian Forest Act, 1927 treats it at par with timber. PESA, 1996 gives ownership rights to local communities over MFPs whereas the regime created under Wildlife Protection Act doesn't.

11.2. NTFP contributes to about 20% to 40% of the annual income of forest dwellers who are mostly disadvantageous and landless communities with a dominant population of tribals. It provides then critical subsistence during the lean seasons, particularly for primitive tribal groups such as hunter gatherers, and the landless. Most of the NTFPs are collected and used/sold by women, so it has a strong linkage to women's financial empowerment in the forest-fringe areas.

11.3. Depleting resource base either because of diversion of forest land for non-forest use, or due to unsustainable harvesting practices has been the major ecological challenge in the NTFP sector with growing & visible impacts of climate change on crop production. On the other hand, poor R&D focus, inadequate post-harvesting practices, insufficient funds & infrastructure, and unorganized nature of the trade have made it financially vulnerable particularly for the primary collectors whereas the differential and sometimes contradictory tax & transit regimes in the states have adversely affected not only the trade but even the production of NTFPs as in case of brood lac.

11.4. NTFPs have a tremendous potential to create large scale employment opportunity thereby helping in reducing poverty and increasing empowerment of particularly tribal and poor people of the poorest and backward districts of the country. The Sal seed case has demonstrated how R&D supplemented with favourable policy environment can revolutionalize the commercial fate of the NTFP collectors. Besides food security, NTFPs also provide for a big opportunity to establish eco-friendly, and small to medium enterprises at local level.

11.5. The sub-group on NTFP under the Planning Commission Working Group on Natural Resource Management discussed the issues, challenges, potential, and scope in developing the NTFP sector in the country and recommended the following strategies to be adopted for this purpose with a total budgeted amount of Rs.6590 crores for the 12th Plan:

- **Resource management** through conservation of all genotypes including of RET species; development of sustainable harvesting protocols; resource augmentation and development; zone wise inventory of NTFPs; zone wise prioritization/ selection of species for conservation, development and harvesting (CDH); pilot initiatives followed by a cluster based approach for further development of NTFPs; and SFM including revision of Working Plan Code, Certification and CBNRM. Total budgeted amount:Rs.2500 crores
- **Better opportunities in marketing** through Minimum Support Price (MSP); mechanism for market intelligence and information system; efficient Certification system for improved trade; revolving fund for primary collectors and their institutions; value chain development by aggregation; primary processing, grading, branding and certification; eco-services of NTFP such as Herbal ecotourism and local enterprise development; and encouraging corporate sector involvement- contract farming, infrastructure development, resource augmentation. Total budgeted amount:Rs.3000 crores
- **Capacity building** through formation and strengthening of local institutions; special training of front line staff and ToT; strengthening & restructuring existing institutions; modular training for primary collector, grower, entrepreneurs and traders; exposure visits of relevant stakeholders; and user friendly IEC materials. Total budgeted amount:Rs.250 crores
- **Expediting Research & Development activities** through strengthening existing potential National/State R&D institutions; undertaking state of art research on NTFPs; prime focus on developing new/alternate marketability for single market NTFPs, low value high volume NTFPs, silviculture and conservation biology of NTFPs; tapping the concept of Payment for Ecosystem Services (PES); and study on impact of non-anthropogenic factors like climate change. Total budgeted amount: Rs.290 crores
- **Ensuring an enabling policy environment** through formulation of a national level comprehensive policy; convergence of schemes implemented by different Ministries; establishment of an apex body such as NTFP Development Board and similar state level bodies; empowerment and strengthening of local institutions; ensuring better Access and Benefit sharing mechanism with legal provision; facilitating a compatible and uniform tax structure & transit rule; exemption of VAT; special compensatory support for NTFP crop failure; and introducing new schemes for NE region, mountain areas and Left Wing Extremism (LWE) affected states. Total budgeted amount:Rs.550 crores

11.6. The above efforts are expected to generate approximately 10 crore workdays in the 12th plan and about 2 crore workdays per annum thereafter in a sustainable manner, helping promote a green GDP, and contributing to the fulfillment of Millennium Development Goals .

Introduction

11.7. Traditionally Non Timber Forest Products (NTFPs) refer to all biological materials other than timber extracted from natural forests for human and animal use and have both consumptive and exchange value. Globally NTFP / NWFP are defined as “forest products consisting of goods of biological origin other than wood, derived from forest, other wood land and trees outside forests”. It is estimated that 275 million poor rural people in India—27 percent of the total population— depend on NTFPs for at least part of their subsistence and cash livelihoods (Malhotra & Bhattacharya, 2010; Bhattacharya & Hayat, 2009). This dependency is particularly intense for half of India’s 89 million tribal people, the most disadvantaged section of society, who live in forest fringe areas. According to an estimate the NTFP sector alone is able to create about 10 million workdays annually in the country.

age is below 18. Photo courtesy: RCDC.

11.8. Historically, the NTFP sector was neglected for many decades from main stream forestry, and they were considered as ‘minor’ (Minor Forest Produce), despite the fact that monopoly rights over several such

NTFPs/MFPs fetched a good income for the Forest Department. After the ban on green felling, the income from NTFPs in the total income of the Department became the major one with that from timber marginalized, in many states. Export of NTFPs and its products contributes 68% of the total export from forestry sector.

11.9. NTFPs have a tremendous potential to involve local collectors for establishing micro-, small- and medium enterprises through clear tenured rights, better collection methods, financial support, capacity development, infrastructure and institutional support in near future. With these efforts there is a potential to create large scale employment opportunity thereby, helping in reducing poverty and increasing empowerment of particularly women, tribal and poor people of the poorest and backward districts of the country.

Current, NTFP related policies and programmes

11.10. Presently there is no single NTFP policy at national level, there are several Acts , policies, or administrative orders like JFM resolutions which partially address NTFPs in reference to the ownership, benefit sharing, monopoly, transit rules, tax ,conservation need etc. at national level and at state level too (Annexure-11.2.). Some of the policy concerns and specific issues in this regard include: inadequate/insecure rights of collectors; incompatible access regulation systems; inadequate benefit sharing mechanism; incompatible tax structure, and absence of commodity specific and region specific solutions, etc.

11.1. Institutional interventions & innovations - few success stories

'Sanjog', a small NGO of Orissa not only promoted and registered small NTFP-based enterprises with the District Industries Centre thereby getting them the benefited under various schemes, but also established trade relationship with the Tirupati temple which now procures siali leaf plates produced by about 200 tribal women in the Mohangiri hills of Kalahandi-Balangir boarder area. The Tirupati deal fetches these women 20% extra income. Sanjog is also working on promoting lac cultivation since cultivation in just three trees of the Kusum (lac-host) gives a net income higher than that from 1 acre paddy cultivation.

Three women's self-help cooperatives promoted by Regional Centre for Development Cooperation(RCDC), another NGO of Orissa decided to adopt the MSP policy in 2011 and offered their version of minimum support price for hill broom and cashew drupe which worked with encouraging results. Their confidence in experimenting with this strategy and daring the traders came from RCDC and DSMS(District Supply & Marketing Society of the state government that helps with credit- and marketing support).

In Andhra Pradesh, the Girijan Cooperative Corporation(GCC), a public sector undertaking, procures NTFPs from about 5.6 million tribal primary collectors even in most inaccessible areas. It has embarked on value addition of several of these NTFPs like rock bee honey, tamarind, and amla, etc. and sells them with 'Girijan brand'. Its Girijan brand honey is processed in two centres at Rajahmundry and Chittoor. GCC has demonstrated models of business beyond welfare that makes welfare-centred business activity dynamic, challenging, and encouraging.

11.11. Review of earlier efforts in some states: A review of five state initiated NTFP based benefit sharing models are available in India which have started from 1970s-2000. These states are namely Madhya Pradesh, Chhattisgarh, Andhra Pradesh, Odisha, and Uttarakhand though some other states have also developed some mechanisms. Various activities of

Figure 2: Institution development such as collectivization of trade and establishing market linkages helped the primary collectors receive higher returns from hill broom business. Photo: RCDC.

micro-enterprise effort based on NTFPs are available in the respective selected states. Different stakeholder groups of NTFP (primary collectors, traders, processing units, and FD staff) primarily observed that institutional innovation has changed the trade situation in big way and further manifold improvement is possible. Many state governments have established separate organizations which are dedicated to the procurement, primary processing, storage and further marketing of raw products for NTFPs. There are some innovative initiatives taken by all the five states, e.g. Uttarakhand has developed "*Jarie Bootee Mandi*" under Uttarakhand Forest Development Corporation; Andhra Pradesh government has established Girijan Cooperative Society (GCC) in 1956 for socio economic up-liftment of tribal communities in the state through intervention in NTFP; Chhattisgarh state government has established very efficient organization called Chhattisgarh Minor Forest Products Federation (CGMFPF) taking leading role in NTFP trade and enterprise promotion; Odisha govermnent has two agencies OFDC and TDCC for NTFP procurement although it has transferred 69 NTFPs to panchayats, making the trade of these items free; and Madhya Pradesh with its MFP Federation has done the pioneering work on NTFP benefit sharing model in the country for the nationalized products, which has been evolved in last 40 years' time.

Regional, national, international dynamics and concerns emerged in the NTFP sector:

11.12. NTFPs have remained unorganized not only in India but in other countries like Canada too, resulting in lack of proper assessment of their actual production/collection, procurement, dependent population, and trade transactions. Although few items like bamboo have relatively organized procurement and marketing thanks to the consistency in industrial demand, the picture regarding most of the NTFPs is rather grey.

11.13. However, the potential of this sector alongwith its contribution to the livelihood of millions of poor and disadvantaged people across the world attracted international interventions, be it the NTFP-Exchange Programme in South Asia or IUFRO's exclusive sub-division on NTFP research and knowledge sharing. The Global NTFP Partnership Programme had even much broader objectives.

11.14. While globalization with economic liberalization increased the scope of accessing NTFP-based international market coinciding more or less with an increasing global demand for natural products, it also increased the competition with more emphasis on quality control and resource conservation (which is how certification became an important necessity). China could take much advantage of this global demand because of its centralized policy control and implementation mechanisms, whereas some other countries could ensure their better market share chiefly due to effective entrepreneurship. India neither had the centralized control nor the required extent of effective entrepreneurship. If it still secured its position in the global NTFP market then that is partly because of the fact that like China it has a rich tradition of indigenous knowledge of NTFP-based health care products, and partly because many valuable NTFPs are produced here. Otherwise it lags behind when it comes to bamboo-based entrepreneurship of Taiwan or product standardization of the US. Fortunately, for natural reasons, India still remains No.1 in case of few items like lac because it is only here that the best quality lac is produced that too in substantial quantities. According to a study the Indian share of global medicinal plants trade is increasing at an annual growth rate of 23%, and India stood 3rd among the biggest exporters of medicinal plants during 2009 after China and Canada respectively (Annexure-11.1.)

Figure 3: Lac. India has not been able to meet the current international demand of this NTFP because of under-harnessed potential. Photo courtesy: RCDC.

Chart 11.1.

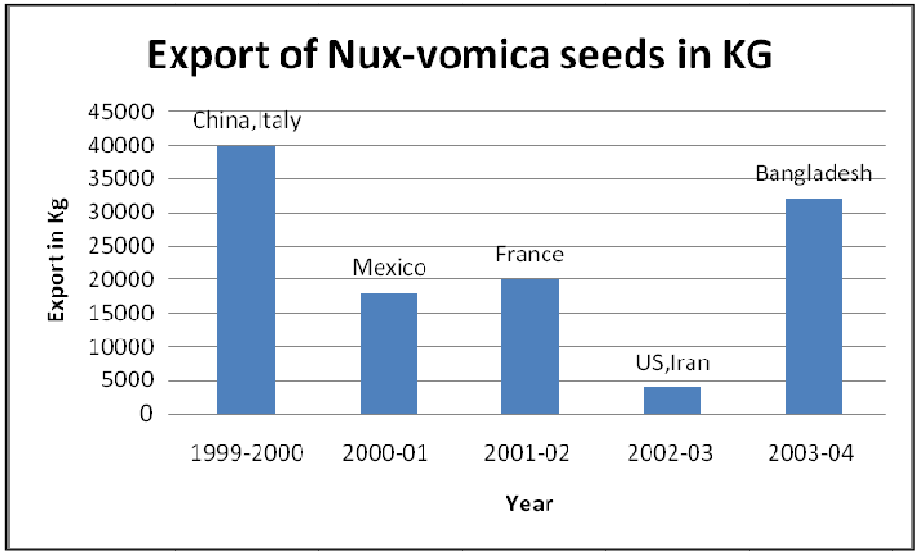


Chart-1: An interesting projection of complexities in NTFP export. In case of nux-vomica seeds the importing countries kept on changing during 1999-2004 (based on DGCIS data quoted in Rath, 2005).Export ensures a substantially higher gain for the same quantity of an item than domestic trade, but is more vulnerable to collapse.

11.15. Not only consumer demand but also political relations/situations sometimes affect the NTFP export. For instance, export of tendu leaf to two major importing countries, Pakistan and Sri Lanka, were adversely affected during the civil war in Sri Lanka and bad political relations with Pakistan(Rath, 2010).

11.16. Most of the raw drugs being sourced from wild, global demand further accelerated the unsustainable exploitation of some species like *Taxus baccata*, and *Swertia chirayita.* At the same time the CITES treaty restricted the export of highly procured by endangered species like *Rauvolfia serpentina*. On the other hand, it has also happened that synthetic substitutes adversely affected the domestic and export trade of many NTFPs like lac. Hence, it is a kind of mixed affair so far NTFPs are concerned.

11.17. Herbal raw materials from NTFP source contribute to 90% of the supply for the industry, which are practically sourced from natural forests. Of the 7000 plants used in Indian System of Medicine, 960 have been recorded in trade and 178 are traded in high volumes in quantities exceeding 100 MT per year. According to a study, a total annual demand of botanical raw drugs in the country for the year 2005-06 has been estimated as 3,19,500 MT with cross ponding trade value of Rs.1069 crores.

Chart 11.2.

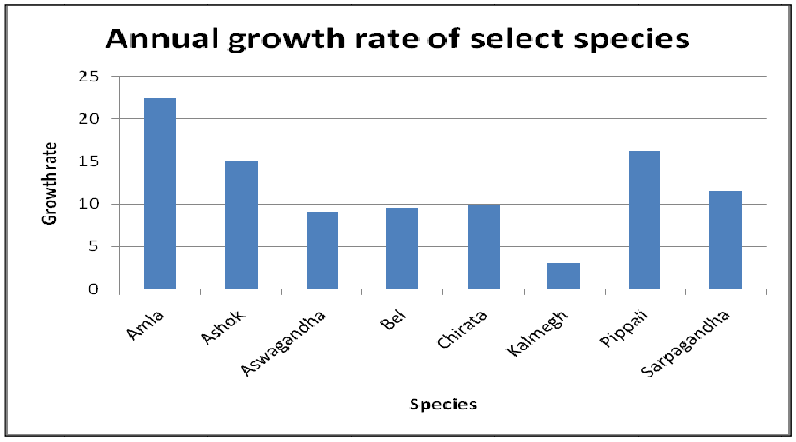


Chart-2: Annual growth rate(demand) between 2001-05 of select NTFP species many of which are also cultivated commercially(based on TFRI 2011, table-4). Atleast four of them are endangered in wild due to unsustainable harvesting and inadequate regeneration focus.

11.18. At regional level NTFP production and trade is largely concentrated in Central India with Odisha and Andhra Pradesh. Bamboo dominates in north-east while rare and valuable medicinal herbs are sourced in the Himalayan states. The south is focused on few items like tamarind and pongamia seeds, etc. though Kerala's herbal tourism consumes a lot of and diverse medicinal plants. The states have their own policy on NTFPs though it is informal in most states. Many of them have procurement agencies for NTFP, but performance of these agencies have not been satisfactory due to a number of reasons like lack of professionalism, incompatible structural arrangement, etc.. The central-level procurement agency TRIFED's performance has also been no better. Abolition of monopoly and deregulation of many items as per the mandate of PESA has been another important factor responsible for such poor performances.

11.19. Both government and non-government agencies have attempted to promote collectives of primary collectors in the form of SHGs, self-help cooperatives , and producer companies which, despite its little net achievement on the financial front, has given the NTFP collectors(who are mostly women) a new identity and self-confidence alongwith growth of an intellectual capital in them. They need more support and enabling mechanism to grow financially.

Gap analysis:

11.20. The NTFP sector has remained underdeveloped in comparison to its vast potential chiefly because of some of the serious gaps that have been existing since long, as under:

- **Gaps at policy level:** There is no national clarity at policy level on NTFP management. Stake in NTFP sector has been a major issue of confrontation between the Forest Department and the local communities, particularly after PESA and FRA. Grey areas exist even in legal provisions, and access/transit regime is incompatible across the country. For example, bamboo as per FRA is a minor forest produce; but Indian Forest Act, 1927 treats it at par with timber and the Forest Department is not ready to lose its stake in bamboo. The then Minister for Environment & Forest Mr.Ramesh wrote letters to state chief ministers to recognize bamboo as an MFP and transfer ownership of the same to local communities accordingly in deserving areas; but the state forest departments are hardly willing to accept that. Monopoly rights of states are legally questionable though they still continue with that.

Figure 1: Critical dependency on Mahua. Many state Forest Departments deregulated mahua collection & trade, but the Excise policy curtailed this freedom. Photo courtesy: RCDC.

- **Gaps at production level:** While conservation and regeneration of NTFP species did not receive adequate attention in the timber-centric forest management system, unsustainable harvesting practices alongwith diversion of forest land for non-forest use caused substantial degradation of the resource base. Of late medicinal plants received some special attention which helped in promoting their commercial cultivation, but not the NTFPs as a whole.

- **Gaps at institutional level:** There is no central organization to coordinate NTFP-related matters, so there is an overlapping of concerned schemes/programmes and institutional activities. Further, procurement agencies at state- and central level lack adequate capacity and skill to successfully manage the trade affairs like private traders; and local institutions of primary collectors are often confronted with limited capacity versus uncertain market.

- **Gaps at management level:** NTFP management protocols are hardly available/developed. Making working schemes for bamboo is easy but not for other NTFPs because they are not so widespread/contiguous. Orissa and Kerala adopted some NTFP management guidelines, but overall achievement of the same seems to be poor. Moreover, there is a dilemma regarding ownership of communities, and even community forestry hasn't yet evolved to take up this challenge independently and effectively.

- **Gaps at market level:** The NTFP market is mostly unorganized in nature(except for few items like tendu patta or bamboo), and uncertainty in market demand makes it difficult to survive with one or two items only. Lack of value addition (like, cleaning and grading) at primary level causes the primary supplier lose a substantial part of the possible income. Few items are almost exclusively dependent on export market due to unfavourable domestic policy(as in case of sal seed butter which can be used in Europe in chocolate making but not in India). Procurement agencies lack market intelligence to trade successfully. Monopoly rights save them, but such rights are legally contradictory in PESA and FRA areas whereas there is also an understanding that a kind of centralized and government procurement & marketing system is at present more preferable than total deregulation because the latter might ultimately go against the interest of the primary collectors(like, in case of tendu patta).

Issues and Challenges

11.21. High exploitation and poor regeneration-Due to unrestricted collection, over use of products and unscientific collection, and also rapid deforestation for non-forest use, the natural availability of NTFP producing trees are less in number, and their regeneration in many forest areas has gone down. Number of productive trees is less in the forest which is how the overall production of NTFP has decreased whereas the demands have gone very high.

11.22. Inadequate NTFP baseline data and mapping, unclear demand supply scenario-For national level planning and management a reliable data base on NTFP is required which however is not available properly to determine the quantity available, collected, self- consumed, value added and traded, mature trees available and their production potential, per hector number of trees, etc.. Since NTFP collections are seasonal and may vary from year to year (though the average size of the dependent population may remain more or less the same for quite some time) it is difficult to provide demand and supply data until a dedicated system prevails. In different agro-ecological zones and specific forest types, mapping/inventorization through GIS system is to be developed.

11.23. Poor attention to NTFP conservation- In situ and ex situ conservation, identification of genotype and gene bank, application of biotechnology and genetic engineering are either paid less attention or totally absent in NTFP sector.

11.24. Absence of sustainable harvesting protocols- Sustainable harvest means ,*"the level of harvest at which a species can maintain its population at natural or near-natural levels and the harvest will not change the species composition of the community'.* Understanding of sustainable harvesting is not an easy task, and suitable robust thumb rules are to be followed for different plant parts – roots, leaf, bark, flowers, gums & resin, whole plant etc. Sustainable harvesting protocols have not been developed for most NTFPs and whatever protocols are available remain unpracticed in many cases. Participatory ecological monitoring is required, so that local people may understand how much resource is available and how much is to be harvested sustainably.

11.25. Unorganized sector- Traditionally the whole NTFP sector, particularly its collection, trade and local value addition are managed in an unsystematic and unorganized manner. Gram sabhas and Panchayats were given some responsibilities for NTFP management but are still not in a position to independently & successfully handle the overall management of NTFP. Ownership has not been defined in the concerned law. What the Haque Committee (MoPR) quoted can't be applicable to common property resources where the right to disposal has to be exercised in a manner justifiable to the society. State regimes widely vary. Same item may be free in one state and restricted in the other.

11.26. Policy-level inconsistencies*:* As stated earlier various states have got different management processes, procedures and control mechanisms for NTFPs, and that's because forest is a concurrent subject; but the concurrency has resulted in a kind of highly incompatible regime across the country thereby hampering the development of the NTFP sector. It is high time to develop a national policy, which can address the need of 275 million people related with this sector. There are many grey areas like ownership of Gram sabha in PESA areas over produce cultivated privately on trees on private land or community land, or rights of the Forest Department over NTFPs that are not traditionally collected by communities entitled under FRA outside PESA areas, which are to be addressed for clarity in a national policy.

11.27. Inadequate infrastructure, and post-harvesting facilities/skills- In most places in India neither the Forest Department nor the procurement agencies nor the Gram sabha/Panchayat nor the institutions of primary collectors have proper storage facilities. Most NTFPs are biological

Figure 4: Machine stitching of siali leaf plates not only fetched better income but also gave a better self-confidence & identity to the women primary collectors. Photo: RCDC.

and seasonal products; and several products being perishable require immediate disposal in absence of appropriate storage facility. This means that the primary collector is vulnerable to distress sale or sale at a low price due to lack of adequate storage facility. Further, lack of value addition deprives the gatherer of better gain. Some products like lac, tassar, medicinal plant, several gums and fruits require cold storage while some like char seeds and kalmegh fail to provide the potential return without value addition.

11.28. Volatile market- NTFP market is highly diverse, and fluctuates quite frequently; hence interventions based on assumptions of market stability or expectations of stable/growing market often become non-viable commercially. This discourages private entrepreneurship in the sector so far commercial farming is concerned. Primary collectors and producers get the least share from their hard earned product, so there is a need of Minimum Support Price (MSP) from the government side.

11.29. Adapting to Climate change- Climate change is a global phenomenon that is affecting the phenology and the reproductive biology of various trees, shrubs and herbaceous plant species. Various research data suggest change in temperature and rainfall pattern affecting the NTFP production-both qualitatively and quantitatively (for example, lac), and which will in turn affect the dependent economy of the local people. Suitable strategies require understanding the level of vulnerability and adaptation measure in future. Mapping of vulnerability to NTFP management and livelihood – change monitoring, bio-geographic region specific adaptation model require further understanding.

11.30. Incompatible tax structure - The present tax structure for many NTFP (tendu patta, lac, gum, mahua, medicinal plants, sal seeds, etc,) is incompatible across the country which needs to be restructured. VAT has been a matter of major concern for public sector procurement & trading agencies in NTFP who advocate for exemption of the same. In some cases imposition of both central sales tax and state sales tax even led to litigations.

11.31. Inadequate capacity and knowledge in NTFP management- Previously forestry trainings were mostly oriented towards timber, even community forestry was also timber-centric. As a result these conventional forest management systems are unable to meet the requirement of much broader, finer, integrated and complex challenges of the present era like biodiversity conservation and climate adaptation.

11.32. Poor progress in research & development: R&D is very much required to develop the NTFP sector, but there is very inadequate investment on the same. Some commercially important NTFPs like mahua and tendu leaf have only one market use which is why they are very much vulnerable to fluctuations in demand. There are many high volume NTFPs that either remain unsold or sold at a meager price due to absence of better marketability options. Unfortunately the research institutions have not been able to address these issues satisfactorily. Project-based approach along with bureaucratic attitude has made the scientists deviate from the spirit and vision of research. On the other hand NTFP silviculture has not developed much. Poor R&D focus has been partly responsible for under harnessing of the actual potential of the NTFP sector.

11.33. Minimum Support Price (MSP) for NTFPs:- Procurement of collected products providing an uniform minimum assured price will immensely help the gatherers who are often exploited by the local level trader. Although NTFPs are not same as agricultural products, some of them (particularly medicinal plants) are cultivated too while others are vital to the poor forest dwellers, which is why MSP for NTFPs has been advocated for since long. It is also true that similar attempt has been made in the past in few cases/areas often with drastic financial results, but the experiences have also suggested that without the government guarantee for compensation for the losses to be accrued (if any) and without a compatible policy regime (including tax structure) in the country MSP can's be successful or sustainable in the long run. The Ministry of Panchayati Raj had constituted a Committee on ownership, price fixing, value addition and marketing of minor forest produce under the Chairmanship of Dr. T. Haque, Member, Planning Commission. The Committee has submitted its report in May, 2011. Just to start, the Committee has recommended for MSP for 14 (actually 16 to include all three myrobalans,

vide note under Annexure-11.3.) minor forest produce initially. However, the mechanism for successfully implementing this recommendation is yet to be developed, while on the other hand the huge money required to pay the MSP on 16 items is yet to be assessed and ensured properly.

11.34. Absence of complimentary mechanism for NTFP crop failures: MSP can't help the primary collector in case there is a crop failure. Periodic crop failure is a natural phenomenon for many NTFPs, but climate change has increased the frequency. NTFP crop failure or bad crop severely affects primitive tribal groups and hunter gatherers, but there is no policy or mechanism to provide some support in such cases to the critically dependents.

11.35. Underperformance of public sector procurement & trade agencies: TRIFED and state-level procurement & trade agencies have often underperformed in meeting their objectives partly because their structure is not much professionally and/or commercially viable, partly because they suffer from policy level set backs, and partly because they have to face unwanted and informal political and other interventions.

11.36. Primary collectors losing interest in NTFP collection: Uncertain market and reduced production followed by availability of more secured options like MGNREGS has reduced the interest of primary collectors (particularly males) in NTFP collection in many areas. This is similar to the labour crisis in agriculture, and is one of the reasons of underharnessing of the vast potential of the sector.

11.37. Priority should be given to the following challenges in the 12th plan:

1. **Depleting resource base and its conservation/regeneration**
2. **Unassessed resources and their inventorization**
3. **Differential policy and its solution**
4. **Inadequate skill & capacity at various levels on value chain development, and interventions for its solution**
5. **Weak institutionalization, and its solution**
6. **Poor R&D focus and its remedy**
7. **Lack of special attention for critically dependent communities and areas**
8. **Effective marketing linkages**

11.38. These are the broad areas where challenges are major, and interventions are necessary for the overall development of the NTFP sector in order to properly utilize its vast potential in socio-economic development of the disadvantaged people and areas. Volatile market is one of the major challenges but the government is not supposed to totally control the market as that would be unsustainable in many ways. However, the government can create enabling mechanisms that reduce this volatility atleast for some species, and enhance the resilience of the primary collectors and their institutions to withstand the adverse impacts of market dynamics.

Strategy

11.39. The NTFP management on sustainable basis has remained a complex process for the last several decades but in the present scenario, there is a need to adopt multipronged strategy, as under, to build up an environment to strengthen community based management and trade of NTFPs which in turn would strengthen the livelihood of poor forest dependant population:

- **Resource Augmentation Plan / incentives for growing NTFP crops in private land**: Due to unrestricted & unscientific collection and over-use of products the NTFP resources have greatly been depleted in past years while their regeneration in many forest areas has gone down. Special effort is required for reducing the pressure on forest by cultivating selected species outside forest areas and undertaking intensive conservation of existing forests supported by ANR and other conservation

activities. The increased production thereby would not only reduce the gaps between demand and supply but also shall become the ground for sustainable NTFP development.

- **Detailed inventory and prioritization of zone-wise species**: India has got very rich biodiversity. Hundreds of NTFP species are of medicinal value, and are in active trade. While the knowledge and data base on all species are needed, a gradual process of understanding and developing management programme would be appropriate and therefore, there would be a high need of zone wise inventory and prioritization of the various NTFPs.

- **Forward and backward linkages / Organisation of existing trade**: There is a need to involve financial institutions to promote community based micro-enterprises with clear benefit sharing mechanisms. Involve financial institutions like NABARD and other public sector banks in NTFP enterprise development. Just as they have a target for Small and Medium Enterprises in the industry sector, similarly, this approach can be customized towards Small Forestry Enterprises. In such effort PPP model must be developed which may help achieve the objectives of private sector involvement for bringing technology and capacity in the remote areas.

Figure 6 : Weaving Himalayan Nettle (*Girardinia diversifolia*), a natural fiber species found in the upper reaches of Himalaya. Hands weaving the potential fibers in district Chamoli of Uttarakhand. Photo-UBFDB

- **Capacity development training, awareness building, exposure:** Skill/capacity development is very important for the foresters (particularly the sub-ordinate field staff) to successfully face the emerging challenges of accommodating community rights in forest conservation, ensuring biodiversity conservation, and managing climate change. At the same time, complimentary facilitation should be made for forest protecting /forest managing communities too in the form of NTFP management protocols. Trainings to primary collectors, processors, and traders, and also to the front line staff require basic and advance training to build their confidence.

- **Food security and income generation for poverty alleviation**: For empowerment of community and sustainable forests a symbiotic relationship between forests and forest dwellers must be maintained in order to provide food security for forest dwellers and income generation for the poor population. Women are mostly dependent on NTFPs due to the nature of its production, quantity, collection procedure, processing and local selling. Therefore, in order to improve upon the subsistence level, programmes supporting to ensure food security would be required with specific concern for the landless, hunter gatherers and primitive tribes.

- **Research and Development**: More revolutions in the NTFP sector are possible through successful R&D initiatives like that of Sal seed in 1950s. Special R&D drive is required to develop marketability for low value and high volume items, and also for alternate marketability for presently single market items. R&D focus is also necessary to develop NTFP silviculture, sustainable harvesting protocols, low-cost and user-friendly (preferably women-friendly) value addition techniques and processing machines, eco-friendly and safe storage methods, and methods for using otherwise waste biomass in forest.

- **Establishment of an apex body for NTFP development:** The overall development of NTFP sector, despite its vast potential, has not been a priority in the past. To develop the NTFP sector in a holistic way by coordinating/guiding various government sponsored activities/programmes on the same alongwith managing the knowledge, developing package and practice, ensuring capacity development of stakeholders and providing overall guidance over the NTFP sector, an apex & autonomous agency

like the Rubber Board or Spice Board would be very much required. This agency may be called the NTFP Development Board, and can have its state offices/branches.

Recommendations

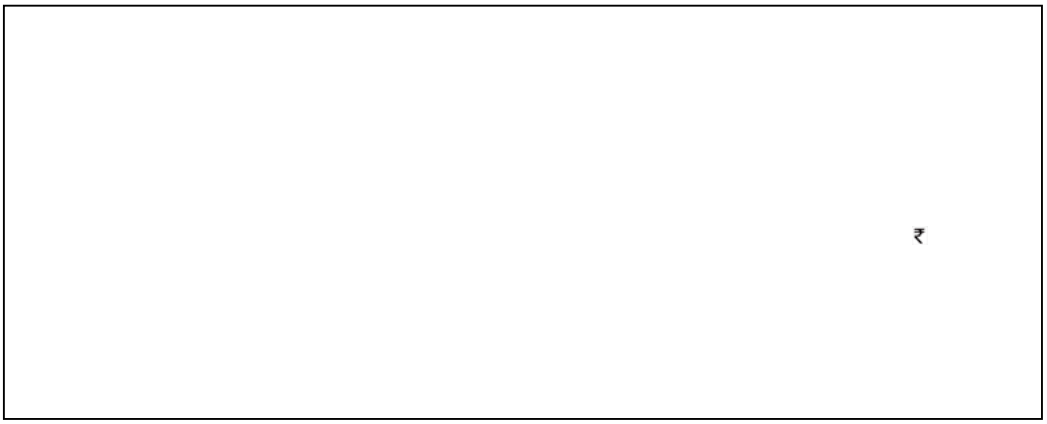
The recommendations for overall development of NTFP sector are based on the following approaches:

Resource augmentation through *in-situ* plantation and ANR / *ex-situ* cultivation (ha)

11.40. One of the important strategies for resource generation is conservation, development and harvesting (CDH) methods which is an integrated approach from conservation and production to the end use. Undertaking in-situ conservation measures for NTFPs including protection and Assisted Natural Regeneration (ANR) to reduce resource depletion and reviving endangered NTFPs is urgently required. Special attention would be paid on providing food security to forest dwellers and people living in the forest fringe areas, apart from income generation of these communities from NTFPs. Additionally cultivation/propagation/plantations of NTFP would be promoted on different land types including Reserve forests, Protected forests, village forests/ Van Panchayats, gram panchayats, Jhum sites in north east India, absentee's land and even in the private land types, to reduce the gap in demand and supply. Further, plantations for industrial purpose will be encouraged for industries provided that doesn't create ecological concerns and also doesn't divert productive land for non-food crops. To promote cultivation of NTFPs in private land types, absentee/fallow land types, and degraded land types etc., incentives / support would be provisioned in the ratio of 75:25. Similar incentives would also be given in naxal affected and mountain **areas of the country. For all activities of** ANR, nursery raising, plantations, and tissue culture etc. an amount of Rs. 2500 Crore has been envisaged for the conservation and augmentation of NTFP resources over (6.35 lakh ha at the average rate of Rs. 40,000/ha) under 12th five year plan. However, the target area can be substantially increased with the same investment through reduced per hectare cost with community involvement and improved silvicultural practices.

Identification, Prioritization, Standards, Certification and Value Chain Development, Infrastructure / Enterprises/ Marketing/Minimum Support Price

11.41. NTFP sector is still unorganized. There are no comprehensive studies available on most of the NTFPs. Only few species are recognized and traded on regional basis while no or a little centralized data is available for them. With action oriented research, their value can be increased manifold as in case of chir-pine needle, lantana and other underutilized NTFPs, etc. Underutilized or unutilized biomass can be converted to commercial products without harming the ecosystem. Several examples are there like- *Nyctanthus (Harshringer)* from forest twigs used for basket making in Sheopur district of M.P.; Lantana based furniture; karanj and neem seed waste used as commercial organic manure; etc. A first-hand knowledge towards the identification of species should be available at a centralized place. Then prioritization of these species has to be done on a zonal basis for the country following which in a much more focused way the states can have their own choice of zonal specifications within the state depending on local market trends. The knowledge and data base on all species, however, are needed but a gradual process of understanding and developing management programme would be practical. Importance would also be given to those species which come under RET (rare, endangered and threatened) categories. For each prioritized species value chain analysis and development would be carried out followed by need based infrastructure development, processing facilities, standardization, certification, enterprise development, arrangements for working capital / loans etc. The subject of Certification is emerging very fast and promotion of certification of NTFPs including medicinal and aromatic plants has many direct and indirect benefits. Works initiated by some of the national institutes such as IIFM in this regard can be taken as a bench mark and the Ministry of Environment & Forests can take forward the initiative to have a proper mechanism in place for NTFP product certification which, unlike timber certification, has been a difficult and complex matter till date. An amount of Rs. 1000 crores has been proposed for this purpose.



11.42. While Minimum Support Price is a need of the hour, a preliminary estimate suggests that MSP on all the items suggested by Dr. Haque committee may cost Rs.4000 crores to Rs.5000 crores annually. However, since it is expected that in case of some of these NTFPs (like, honey, tendu patta, and lac) the traders are likely to offer higher prices than the MSP and hence are likely to procure those items instead of the government, and also that initially MSP may be considered on a priority basis for those items that do not have an assured market price at present (like, chebulic and belliric myrobalans); a minimum amount of Rs.2000 crores has been proposed for this purpose in the 12th Plan though a substantially higher allocation may definitely be required to fully implement the recommendations of the Haque committee. .

11.43. Thus, total Rs. 3000 crores has been proposed for marketing support and related activities.

Awareness, Social Mobilization and Capacity Development

11.44. Farmers, community institutions, line departments, project staff and other stakeholders shall have to be trained. For a wider social mobilization intensive awareness campaign would be required along with National and International exposure visits, exhibitions and other capacity development measures. The capacity of the rural communities in the NTFP sector is very weak. Concentrated efforts are required to build capacity of primary forest produce gatherers, officials of forest department, and executives of government procurement agencies on different aspects NTFP management, processing and marketing. Similarly, knowledge of the available models of sustainable harvesting like Tej pat (*Cinnamomum tamala*) collection in Uttarakhand, honey collection in Tamil Nadu, lac collection in Chhattisgarh, satabar collection in Madhya Pradesh and broom grass collection in Meghalaya are to be well disseminated through exposures and/or on spot training by experts and user-friendly IEC materials. An amount of Rs. 250 crores has been proposed for this purpose.

Research and Development

11.45. Research and Development activities in the past were more or less timber centric. Except for few NTFPs like lac, resin, tendu patta, etc. most have been ignored even though they are highly exploited. There is a need of action oriented R & D in areas of developing new/alternate marketability particularly for low value & high volume NTFPs on the basis of a special drive, post harvesting, semi processing, genetics, management, nursery, plantation, collection, storage, chemical analysis for useful contents, etc. Research is required on biological, social, trade and market, and economic dimensions. Special emphasis can be given on research over natural fibers, aromatic plants, unutilized/underutilized biomass, and weeds, etc. An amount of Rs. 290 crores has been kept for the same.

Enabling policy & institutionalization

11.46. An autonomous organization on NTFP development, similar to Coir Board or Rubber Board, is proposed to be created under the Ministry of Environment & Forests with state level units, and with various goals and responsibilities **(Annexure 11.4.**). However, its basic function would be to look at the overall development of the NTFP sector at the national level and take care of the research needs, capacity building needs, publications,

documentation, package of practice, etc. Apart from this, there is a need for compensatory provisions in case of NTFP crop failure, favourable taxation regime including exemptions, and special schemes for left-wing extremism affected areas, mountain areas, and NE regions. For such purposes an amount of Rs. 550 crores has been proposed under the programme.

11.47. Accordingly, the recommendations have been categorized and outlined in the following way:

- **Resource Management**
  1. Conservation of all genotypes including RET species, Development and Sustainable Harvesting with locally feasible models of community participation like People's Protected Areas in Chhattisgarh in deserving areas.
  2. Resource augmentation and development
  3. A zone wise GIS-based inventory of availability, cultivation status, demand and supply for NTFPs
  4. Zone wise species prioritization and selection for conservation, development and harvesting (CDH) of important NTFP species
  5. A cluster based approach after few successful pilot initiatives, for further development of NTFPs
  6. SFM including revision of Working Plan Code, Certification and CBNRM.

- **Marketing**
  1. Minimum support price (MSP) for NTFPs.
  2. Mechanism for market intelligence and information system.
  3. Efficient Certification system for improved trade .
  4. Revolving Fund or similar financial support to primary collectors and their institutions.
  5. Value chain development by aggregation, primary processing, grading, branding and certification.
  6. Eco- services of NTFP such as herbal ecotourism and local enterprise development.
  7. Encourage corporate sector involvement- contract farming, infrastructure development, resource augmentation.

- **Capacity Building and IEC**
  1. Formation and strengthening of local institutions-SHGs, FPCs, VPs etc.
  2. Special training of front line staff and ToT.
  3. Strengthen & restructure existing institutions, particularly public sector procurement & marketing agencies.
  4. Modular training for primary collector, grower, entrepreneurs and traders.
  5. National and International exposure visits of relevant stakeholders.
  6. User friendly IEC material.

- **Research and Development**
  1. Strengthening existing potential National/State R&D institutions.
  2. Undertaking state of art research on NTFPs, including nationally coordinated projects, collaborative projects.
  3. Prime focus on developing new/alternate marketability for single market NTFPs, low value high volume NTFPs, silviculture and conservation biology of NTFPs.
  4. The concept of Payment for Ecosystem Services (PES) needs to be tapped in future.
  5. Study on impact of non-anthropogenic factors like climate change.

- **Enabling Policy and Institutionalization**
  1. Adopt a national level comprehensive policy on NTFPs
  2. Convergence of schemes implemented by different Ministries.
  3. Establish an apex body such as NTFP Development Board like Rubber Board or Spice Board.
  4. Empowerment and strengthening of local institutions such as Gram Sabha, JFMC, Van Panchayat, primary cooperative societies, LAMPs and other procurement agencies.
  5. Ensure better Access and Benefit sharing mechanism with necessary legal provisions.

6. Introduce compatible and uniform tax structure & transit rule, exempt VAT and introduce cess system in deserving cases.
7. Provide special compensatory support like additional quota in PDS, for NTFP crop failure, particularly for primitive tribals, hunter gatherers, etc..
8. Introduce new schemes for NE region, mountain areas and Left Wing Extremism (LWE) affected states.
9. Ensure integrated and compatible policy environment for NTFP development(like, to promote eco-friendly sal- and siali plates, ban or heavily tax the market competitors of the same like thermocool and polythene coated plates which are not eco-friendly; mandate consumption of natural tan stuff like harra particularly along the bank of Ganga as a part of the Clean Ganga Project; allow cocoa butter equivalent from NTFPs in chocolate making; etc.)
10. Make scientific names of species mandatory in all official communications and reports so as to avoid confusion, overlapping, and repetition.

Table 11.1. Proposed Budget for 12th Plan- (Subgroup II – NTFP)

(Rs. in Crore)

Sl. No.	Proposed Activity	Total Budget	Year Wise Budget*				
			Year 1	Year 2	Year 3	Year 4	Year 5
1	**Resource Management** (Resource augmentation through *in-situ* conservation and ANR / *ex-situ* cultivation [ha])	2500	250	750	750	500	250
2(a)	**Marketing** (Value Chain Development, Infrastructure / Enterprises)	1000	100	300	300	200	100
2(b)	**Minimum Support Price [MSP]**	2000	400	400	400	400	400
3	**Capacity Building & IEC** (Awareness building, Social Mobilization, National / international exposures and Capacity Development)	250	25	75	75	50	25
4	**Research & Development**	290	35	80	80	60	35
5	**Enabling Policy & Institutionalization** (Setting up of National NTFP Development Board with state centres, M&E Documentation, Manuals, Networking, Outreach, Administrative, compensation for NTFP crop failure, etc.)	550	100	100	150	100	100
	TOTAL	**6590**	**910**	**1705**	**1755**	**1310**	**910**

* A 10% escalation in base rates would be applicable from year 2013-14 onwards.

Monitoring & Evaluation mechanism:

11.48. M&E can be and has to be done in the following ways:

a. **Technical monitoring:** Technical monitoring is necessary to compare the baseline information with special efforts during the 5 year plan so that on the basis of quantifiable monitoring indicators the technical outputs are ensured. Ecological Monitoring at regular and required intervals can help monitor the status of NTFP species and production potential. Technical monitoring can be undertaken by potential Government and non Government institutions of the country.

b. **Commercial monitoring:** The main purpose of such monitoring could be to qualify the domestic as well as exports figures in comparison to the 1st year of the plan.

c. **Social monitoring:** This can be ensured with proper training to stakeholders along with imparting the training to communities and their institutions like Gram sabha so that the socio-economic aspect of the NTFP sector flourishes properly.

d. **Institutional monitoring:** The potential institutions can be involved in the monitoring system that can help in monitoring the status and trend of the NTFP sector.

e. **Financial Monitoring:** In order to have effective financial discipline it is necessary to ensure internal and external auditing system. Keeping in view the quantum of budget special audit by CAG is also recommended.

11.49. On the basis of all above monitoring mechanisms, evaluation of the whole sector can be assessed on yearly basis with reference to the targets set and achieved of the year and subsequently for 5 year plan. Midterm review is also proposed for critical analysis and if necessary, modify the future strategy for the remaining period of the plan. Ultimately in the final year of the programme it is strongly recommended to prepare an exit plan for sustenance of the sector that could ultimately lead to learn lesson during the plan period and further improvement in the next five year plan.

Expected Outcome

11.50. NTFPs support poverty alleviation due to their collection & sales by the poorest of the population who lack land, skills & even education. Most of these communities are forest dwellers and the ones who live around forests. The sector is mostly unorganized and lack basic infrastructure for storage, processing and transportation. There is no exclusive body to control and develop the NTFP sector in the country though there are few agencies taking care of only a part of the responsibility (like, procurement and trading). With the creation of an apex body new avenues of international cooperation can also be explored such as linkage to the Global Partnership Programme on NTFPs (NTFP-GPP). With implementation of the suggested efforts and an investment of Rs. 6590 crores in 12th five year plan, approximately 10 crore workdays are expected to be generated for the rural community during their implementation in the 12th plan and about 2 crore workdays thereafter in a sustainable manner. Augmentation in production areas would ensure availability of material for promoting green industries and leading to an increased economical growth and ultimately green Gross Domestic Product (GDP) for the nation that ultimately fulfills the Millennium Development Goals (MDGs).

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Annexure 11.1.

Exporter countries of Medicinal Herbs of the world (in million US$)

Table 11.1.1. Exporter countries of Medicinal Herbs of the world (in million US$)

Rank (2009)	Country	2007	2008	2009	CAGR (2005-2009)	% Share (2009)	Cumulative % Share
1	Canada	142.51	58.72	224.73	25.58%	14.14%	14.14%
2	China	334.62	219.07	193.33	23.99%	12.17%	23.31%
3	India	73.44	50.44	105.91	20.09%	6.67%	32.98%
4	Singapore	117.63	33.61	94.82	-10.22%	5.97%	38.94%
5	China, Hong Kong SAR	212.37	95.47	86.65	.-36.12%	5.45%	44.40%
6	USA	152.24	168.02	79.44	-27.76%	5.00%	49.40%
7	France	50.01	77.22	71.51	149.58%	4.50%	53.90%
8	Germany	72.65	93.76	68.07	-3.20%	4.28%	58.18%
9	Japan	77.81	139.83	66.74	-7.39%	4.20%	62.38%
10	Spain	39.76	35.84	47.04	8.77%	2.96%	65.34%
	Grand Total	**1791.92**	**1653.00**	**1588.93**	**-5.83%**		

Source: UN Trade Statistics Database 'Comtrade'

Annexure 11.2.

Provisions on NTFPs in different laws and schemes

- *Ownership of NTFP, Rights and Concession* –PESA, 1996; Forest Rights Act, 2006;Wildlife Protection Act, 1972 with amendments; Supply of Bamboos to Artisans Including Co-operative Societies (Orissa) Rules, 1980; JFM resolutions/directives
- Benefit Sharing Arrangement/Mechanism – Biological Diversity Act, 2002; JFM directives/resolutions; Tendu Patta Adhiniyam, 1964; Sal Seed Vyapar Vidhiniyam, 1969 for trading of Sal Seeds, Nistar policy in MP.
- *Nationalization and Deregulation* – Orissa Forest Produce (Control of Trade) Act 1981; NTFP Procurement and Trade Policy, 2000; FRA, 2006; GCC, 1956 in A.P.
- *Conservation and Production***-** NCA, 1976; NFP, 1988; JFM directives/resolutions; NAP, 2000; NMPB, 2001; BCA, 2002
- *Role of Panchayat*–PESA, 1996, JFM, 2002, FRA, 2006, Orissa Minor Forest Produce Administration Rules, 2002, NTFP Procurement and Trade Policy, 2000; JFM resolutions/directives
- *Sustainable Harvest and Non-Destructive Harvest* – NFP, 1988; JFM, 2002; MP State Forest Department spl. order for non-destructive collection, 2005.
- *Restriction on Negative Trade List* – Biodiversity Act, 2002; Indian Forest Act, 1927; Forest Conservation Act, 1980; Wildlife Protection (Amendment) Bill, 2010
- *Institutional Framework Strengthening* – NCA, 1976; NFP, 1998; JFM, 2002
- *Marketing Linkages* – NCA, 1976; Formation of MP MFP Federation, 1984 ; JFM, 2000; JFM, 2002; NTFP Procurement and Trade Policy, 2000; GCC 1956
- *Transit Policies* – The Orissa Timber and Other Forest Produce Transit Rules 1980; NTFP Procurement and Trade Policy, 2000
- *Capacity Building* - JFM, 2002; NAP, 2001
- *Pricing and Taxation*– Sales Tax; VAT; Forest Development Tax; Education Cess; Royalty; Commercial Tax, NTFP Procurement and Trade Policy, 2000, Bihar Orissa Excise Act, 1915, Schedule of Rate of Forest Produce In Orissa Rules 1977,
- *Domestication and Commercialization* – MGNREGA, 2005; SGSY, 2002; FCA, 1980; NAP, 2001; NMPB, 2002
- *Processing and Value Addition* – Available under various schemes of NMPB, Bamboo Mission, Horticulture Mission, FDA

Annexure 11.3.

Potential NTFPs (for Enterprise Development)

Table 11.3.1. Identified list of potential NTFPs (for Enterprise Development)

Sl. No	North Himalayan zone	North-Eastern Zone	Central Indian Zone	Southern Indian Zone	Western Indian Zone
1	Tejpatta	Broom grass (*Thysanolyna maxima*)	Tendu leaf*	Cinnamon bark	Tendu leaf
2	Jatamanshi	Bamboo*	Sal leaves	Mahagli *(Decalepsis spp.)*	Bael
3	Tulsi	Phrynium leaf	Chironji*	Karanj seeds*	*Buchanania lanzan* (Chronji**)**
4	Jhula (Lichens)	Tejpatta	Lac*	Tamarind*	*Boswellia serrata* gum
5	Kutki	Orchids	Tamarind	*Bauhinia vahlii* (Siali leaf or Mahul patta)	Guggal *gum (Commiphora wightii.)*
6		*Acqularia sp.* (Agar*)*	Sabai grass	Sandal oil *(Santalum album)*	Bahera*
7	Chirata	Ashoka bark	Kalmegh	*Garcinia indica* (Kokam)	Harra*
8	Reetha	Cinchona	Mahua seed* and flower*	*Asparagus racemosus* (satawar)	Chrota seed* *(Cassia tora)*
9	Moss ghash	*Taxus baccata*	Sal seeds*		*Mahua flower, seed oil*
10	Pine resin	*Swertia chirata*	*Siali leaves*		
11	*Picrorhiza kurrooa (*Kutki*)*	*Litsea glutinosa*	Anola*		
12		*Andrographis paniculata* (Kalmeg)	Kullu gum*		
13		Cane *(Calamus spp.)*			
14		*Parkia speciosa* (tree bean)	Hill broom grass		
15			Salai gum		
16			*Litsea glutinosa* (Maida bark)		
17			Arrowroot *(Curcuma angustifolia)*		
18			*Rauvolfia serpentina*		
19			Honey*		
20			Tassar		
21			Bamboo		

*Items suggested by the Haque committee for MSP, alongwith neem seed

Annexure 11.4.

Role of NTFP Development Board at Central and State level

Role of NTFP Development Board at Central and State level

1. Development, coordination and control of the NTFP policy & programme at the national level and/or state level.
2. Maintaining a thorough data base of NTFPs and related activities.
3. Implementing use of NTFP based GIS and MIS systems for planning and monitoring.
4. Implementation of sustainable NTFP harvesting practices including domestication/cultivation for regular supply of products and improved livelihoods of forest-dependent communities through establishment of NTFP based model nurseries and large scale plantations.
5. Publications of various forms in local and other languages to support trainings, awareness campaigns, exhibitions etc.
6. Trainings, capacity development, handholding, design and development.
7. Providing expertise of different levels and guidance to the central/state government on NTFPs.
8. Lobbying and visibility enhancing outreach measures including organizing international seminars, participation in relevant events, dedicated website, network development and policy advocacy.
9. Providing directions on conservation, collection, cultivation and production of different NTFPs.
10. NTFP based value addition, pricing and marketing.
11. Set up growers and industrial consumer tie ups, market research and development.
12. Facilitating research through relevant research institutions under ICFRE, CSIR, and Universities etc.
13. Formulating a trade channel with consensus, and ensuringa level ground for sale/purchase so that primary producers and gatherers get their share of much higher returns.
14. Carrying out in collaboration with other agencies like BSI etc. periodic survey, categorization and preparation of state of state of NTFP report.
15. Adopting M&E system including an online monitoring system CPM & MIS (Computerised Project Monitoring & Management Information System).
16. Documentation of processes, techniques and information.
17. Strengthening legal capacity, legal reforms and institutional arrangements.

Annexure 11.5.

Scope of convergence of Schemes

Scope of convergence of Schemes

State Programmes	Central Programme and Schemes	International Programme
Externally Funded Forestry Projects (WB, JBIC, DFID)	NAEB/FDA/ JFM CAMPA Fund Greening India/ NAP	CCF II, UNDP and GoI-Country cooperation fund II
State Forestry Plan	National Biodiversity Agency MoTA sponsored projects	Biosphere and livelihood programme (near National Parks and sanctuaries)
Rural Livelihood Programme	National Medicinal Plant Board-Commercial and Promotional scheme	Other Such Schemes DPIP, WFP–National and International Funding Agencies Assisted
Rural Development and Panchayat	TRIFED scheme in Tribal areas	UNFCC, SFP, UNDP, GEF
Tribal Development Corporation	MNREGA: Employment related to forestry activity can be linked	JICA sponsored Projects in 19 states of India
NGOs involvement	Bamboo Mission, Bio fuel Mission	DFID, DIDA, FAO, EU
Working Plans	Desert Development Programme, DPAP	GTZ / GIZ

Annexure 12

Report of Sub-Group III

Fodder and Pasture Management

Executive Summary

Context

12.1. Livestock rearing is one of the major occupations in India and is making significant contribution to the country's GDP. The livestock population, over the years, has shown a steady growth on broadly two counts i.e. (i) increase in the number of stall feeding based bovine livestock viz. buffaloes and hybrid cattle, and (ii) increase in the number of free grazing based livestock like goats and sheep that can survive on the fast degrading pasturage. The first category of livestock growth pertains to the people with arable land and resources to grow or procure fodder, and forms a good source of additional income for them. The second category of livestock growth on the other hand pertains to millions of resource-starved households - landless pastoralists and marginal farmers - for whom livestock rearing often forms the only one and most critical source of food and cash income.

12.2. The animal husbandry sector has a good growth potential. However, further growth of the sector will be as much dependent upon the availability of fodder as it will be dependent upon the breed improvement programs. Whereas Animal Husbandry departments and various research institutes in the country are engaged in improving the breeds of livestock, it is the issues related to fodder that are a cause of concern. The available data reveals that the present fodder availability in the country is well below requirement. The data also reveals that only about half of the annual fodder requirement is met from the cultivated fodder and crop residues, whereas open grazing and fodder availability from common property resources like forests, pastures, village commons, etc. fulfils the remaining half of the annual fodder requirement. The issue to be taken note of is that it is the open grazing and fodder availability from the common property resources that provides sustenance to a vast majority of households with animal husbandry as the only vocation.

12.3. In view of the large number of resource-poor households dependent upon open grazing for their livestock, it is neither desirable nor possible to simply wish away open grazing. Similarly, with increasing demands of food grains on the available arable land resources, the opportunity cost to divert cultivable land for fodder production in a big way might be very high. The only plausible option, therefore, is to revitalize the degrading common fodder and pasture resources in the country and improve their productivity.

Issues

12.4. The grazing lands, considered to be one of the most productive ecosystems in the Indian Subcontinent, have been at the receiving end for long. As per estimates, the country's pastures have reduced from about 70 million ha in 1947 to just about 38 million ha in 1997. The remaining grazing lands have either already degraded or are in the process of degradation with average carrying capacity of less than 1 ACU (adult cattle unit). These grazing lands, often looked at as 'wastelands' on which tree plantations have to be done or which can be easily diverted for other uses, are suffering due to management neglect. Many of the grazing lands have been invaded by non-palatable invasive alien species like *Lantana*, *Eupatorium*, *Parthenium*, *Prosopis juliflora*, *Leucaena*, etc. severely impacting their productivity. The once robust viullage level traditional institutions ensuring their sustainable management have broken down and there is no other agency to look after their management issues. Many of the ecologically sensitive pasture lands viz. Shola grasslands of Nilgiris; Sewan grasslands of Bikaner,

Jodhpur and Jaisalmer; semi-arid grasslands of Deccan; Rollapadu grasslands in the semi-arid tracts of Andhra Pradesh; Banni grasslands of Gujarat and Alpine grasslands of Sikkim and Western Himalaya are already on the verge of no return.

12.5. It is felt that the lack of comprehensive grazing-cum-fodder and pasture management policies at national and state levels is the major cause of degradation and diversion of grazing lands. Similarly, the sector has suffered due to the absence of any nodal agency to coordinate and steer grassland and fodder development program in the country.

12.6. Then there are issues viz. gradual erosion of the traditional agro-forestry/ silvi-pastoral systems; lack of fodder banks and value addition facilities to handle and store surplus fodder during monsoons; lack of field level research on management protocols in respect of ecologically sensitive grasslands; un-organised use of grazing lands; etc. that contribute to further degradation of grazing lands and depletion of fodder resources.

Past Efforts

12.7. The major focus of the departments of animal husbandry and agriculture has been to promote stall feeding based mainly on cultivated fodder and feed meals viz. Accelerated Fodder Development Programme (AFDP) a part of the Rashtriya Krishi Vikas Yojana (RKVY) under which fodder resources in 25,000 villages were to be improved over the 11th Plan. However, there does not seem to be any program by these departments to develop fodder resources on CPRs.

12.8. The forest departments have been, over the past Plans, engaged in managing grazing lands that have been legally classified as forests. A centrally sponsored scheme titled “Area Oriented Fuel and Fodder Project Scheme” under National Afforestation & Eco-development Board (NAEB) has also been implemented over the 11th Plan period. However, most of these efforts have been to close the areas and plant up these with trees, resulting in further depletion of areas for free grazing. The MoEF also set up a team of experts to draft a grazing policy. However, report of the team is awaiting implementation since 1994. These efforts have been too small and too widespread to show any significant results. Also there has been negligible inter-sectoral dialogue between the key departments dealing with the subject. Suffice is to say that development of the grazing lands has not received any concerted focus over the past Plans.

The Proposal

12.9. In view of the context and issues brought out above, development of fodder resources and rehabilitation of grazing lands on forests and in forest fringe areas is of paramount importance in view of the total dependence of a large number of people on this resource for their livelihood needs.

12.10. This proposal is based on the hypothesis that the development of fodder resources will be best achieved through allocation of clear and mutually exclusive but closely inter-linked roles and responsibilities to the various line departments, viz.

- the department of animal husbandry, in collaboration with research institutes, will be responsible for development of better livestock breeds; and fodder storage, feed development, value addition protocols.
- the department of agriculture, in collaboration with agricultural universities and research institutes, will be responsible for developing, promoting and extending nutritious and high yielding varieties of fodder species for cultivation on agricultural lands.
- the department of forests, in collaboration with Panchayati Raj Institutions, Joint Forest Management Committees, Centre of Excellence, and research institutes will be responsible for rehabilitating the degraded grazing lands through promotion of fodder species – grasses, legumes and trees - and creating fodder banks in the Forest Fringe Villages.

12.11. Such an approach will allow the various line departments to concentrate on their defined roles, especially in view of the anticipated changes in the livestock growth patterns in the country. It is presumed that the departments of animal husbandry and department of agriculture will be making independent proposals in respect of their mandates.

12.12. The current proposal is, therefore, aimed at developing fodder resources and pasture development on forests and other CPRs under the aegis of Ministry of Environment & Forests.

12.13. Salient features of this proposal include –

- Formulation of a national policy on grazing-cum-fodder and pasture development in consultation with civil society organizations and domain experts.
- Designation of a suitable agency, like ICFRE, as Centre of Excellence on fodder and pasture development on CPRs to coordinate and steer various research, educational and extension programs under the proposed scheme.
- Mapping of ecologically sensitive grasslands across different agro-climatic zones and development of appropriate rehabilitation models.
- Rehabilitation and productivity enhancement of degraded forests through silvi-pastoral practices of integrating grasses and fodder trees under the instruments of Joint Forest Management.
- Develop fodder blocks in Forest Fringe Villages through revival and development of pastures on CPRs in collaboration with Panchayati Raj Institutions.
- Creation of fodder banks/ storage facilities in partnership with user groups.
- Development of seed/ germplasm banks and nurseries in every state for pasture development program in collaboration with research institutes.
- Promote incorporation of fodder trees with agricultural practices towards agro-forestry initiatives.

12.14. The scheme envisages (a) putting in place community based mechanisms towards sustainable management of fodder resources and grazing lands, (b) enhancing the productivity/ carrying capacity of the grazing lands tackled under the scheme, and (c) adoption of a comprehensive grazing-cum-fodder and pasture development policy at national level.

12.15. Total scale of the scheme is proposed to be Rs. 910 crores.

Implementation and Monitoring:

12.16. The scheme will be implemented under the aegis of National Afforestation and Eco-development Board/ Green India Mission, MoEF, GoI. At the State level, the scheme will be implemented through the State Forest Departments. The ICFRE and its regional institutes, to be developed as Centre of Excellence on the subject will coordinate and steer research, education and extension activities related to the scheme.

12.17. Monitoring of the project progress will be through specially appointed Steering Committees at the National and State levels. These Steering Committees will have members drawn from across various line departments, research institutes and user groups for effective inter-sectoral coordination, implementation and mid-course corrections if any needed.

Introduction

12.18. Livestock rearing is one of the major occupations in India that provides manure, draught power for agriculture and local transportation and forms important source of food and cash income to millions of households spread across various parts of the country. Significance of the livestock sector can be appreciated from the fact that it contributes about 8.5 - 9% to the country's GDP[8]. The sector assumes still higher significance as it forms the most critical means of supporting the earning capacity of landless pastoralists and those of marginal and small farmers, especially those living in drought-prone, hilly, tribal and such other areas where crop production, dependent mainly upon vagaries of nature, is not certain.

[8] Anon (2006). Report of the Task Force on Grasslands and Deserts. Planning Commission. GoI.

12.19. Closer scrutiny of the sector, however, reveals that the contribution to the GDP by livestock sector is far too low for such a large size of livestock population. This low productivity of the sector is as much attributable to underfeeding of the livestock as it is attributable to the poor livestock breeds. An idea of the meager fodder availability can be had from the fact that about 50% of the cattle population, depending largely upon free rangeland grazing in forests, pastures, village commons and the like, end up getting only about 1.5 kg of dry fodder/ day/ ACU (Adult Cattle Unit) as against the healthy fodder requirement norm of 3% body weight. In absolute terms, the country is, by 2020, facing an estimated shortage of 728 million tons of green fodder and 157 million tones of dry fodder. Obviously, this low forage availability impacts the productivity. The increasing cattle population, due partly to the animal husbandry policies, without corresponding attention towards enhancing the forage production, is likely to put further pressure on the already scarce fodder resources in the country causing further depletion in productivity of the sector.

Review of the Past Efforts on the Subject

12.20. The subject pertaining to fodder and pasture management has been dealt over the last Plans by the departments of Animal Husbandry, Agriculture and Forests, with little inter-sectoral dialogue between these departments.

12.21. The major focus of the departments of animal husbandry and agriculture has been to promote stall feeding based mainly on cultivated fodder and feed meals viz. Accelerated Fodder Development Programme (AFDP) a part of the Rashtriya Krishi Vikas Yojana (RKVY) under which fodder resources in 25,000 villages were to be improved over the 11th Plan. This scheme, focused largely on promoting fodder cultivation and post harvest handling in the selected villages, does not have any component to develop fodder resources on Common Property Resources for the benefit of forest side and landless communities. The Department of Animal Husbandry, Dairy and Fisheries has spent about Rs. 141.4 crores over the 11th Plan on feed and fodder development. The department is now mulling the creation of a National Fodder Mission under the 12th Plan.

12.22. The issue has also been engaging the attention of the Ministry of Environment and Forests, GoI that has been trying to formulate a special National Grazing Policy. However, the proposed policy, for which an expert group was constituted under the aegis of NAEB (MoEF) during 1994-95, has remained at the draft level only. A Centrally Sponsored Scheme under NAEB titled 'Area Oriented Fuel Wood and Fodder Project Scheme', started during 9th Plan, was continued over the 11th Plan period also. However, the budgetary outlay has been too meager to have any significant impact. One of the recommendations under the Forestry sector's mid-term review of 11th Plan was that 'grassland and other ecologically important eco-systems need to be conserved (para 22.65)'[9].

12.23. The government also set up expert committees/ task forces to address this issue viz. MoEF's Committee on Fodder and Grasses (1988) and Planning Commission of India's Task Force on Grasslands and Deserts (2006). However, the reports of these committees are yet to be comprehensively integrated into grassland management strategies and implemented on ground.

Ecological and Social Significance of Pastures:

12.24. The grasslands and pastures not only form major source of forage for the livestock, these also provide habitat to a large variety of wild animals and birds and are home to a myriad species of plants, many of which are 'threatened'. Any further degradation of these habitats is likely to put many more species under threat. In addition, the fodder and pasture development program has great significance towards fulfilling Millennium Development Goals in the form of reducing 'poverty and hunger' and bringing in 'gender equality' and 'maternal health'.

Dynamics and Issues Concerned with the Sector

12.25. Animal husbandry has traditionally been a critically important sub-sector of the agriculture, being the source of manure and draught power for various agricultural activities. It has also been the only source of cash

[9] Anon. Mid term review of 11th Plan. Chapter 22 'Forests and Environment'. Planning Commission. GoI.

income to a vast majority of landless people who maintain small stocks of cattle on the fodder resources available on common/ forest lands. However, the dynamics of animal husbandry practices have undergone a marked change over the years making India the leading milk producer in the world. The sector provides an excellent potential for further growth. However, there are various issues and corresponding developments have impact the sector directly and indirectly.

Change in Livestock Population & Population Patterns:

12.26. Livestock population in the country, recorded at 280 million in 1947, has shown significant increase over the years. Estimates of present livestock population in the country vary from 480 million (table below) to 520 million[10].

Table 12.1. Change in Livestock Population (in Millions)

Particulars	1961	1971	1981	1991	2001	2008
Buffaloes	51.21	56.88	67.50	82.16	95.25	98.60
Camels	0.90	1.12	1.05	1.02	0.71	0.63
Cattle	175.60	177.81	188.70	203.50	189.66	174.51
Goats	60.86	67.03	91.00	114.20	123.81	125.73
Horses	1.33	0.98	0.90	0.81	0.78	0.75
Mules/Asses	1.15	1.06	1.12	1.15	0.89	0.83
Pigs	5.18	6.53	9.60	12.50	13.44	14.00
Sheep	40.22	40.10	46.42	49.74	60.11	64.99
TOTAL	**336.45**	**351.50**	**406.29**	**465.09**	**484.67**	**480.04**

12.27. A quick analysis of the table-1 reveals an almost twofold increase in the buffalo and goat populations over the last 50 years. Similarly, sheep population has also recorded an increase by more than 50%. On the other hand, the cattle population is on a gradual decline. This decline in cattle population is on account of greater inclination towards rearing less number of high-yielding hybrid cattle varieties against the earlier practice of keeping large number of local varieties by the people who have access to cultivated fodder.

12.28. One of the fallouts of the changing livestock dynamics is drastic increase in the numbers of scrub cattle. As more and more people are going in for improved breeds, they are turning the inferior cattle away adding to the already huge population of scrub cattle. Uncontrolled grazing by such cattle adds to the problems of pasture land management.

12.29. Obviously, this changing livestock rearing pattern has implications on the type of fodder resources needed to meet the fodder requirements.

Major Fodder Sources and their Status in the Country:

12.30. Fodder in the country is sourced from either the agricultural fields or the natural pasture lands (see box below).

[10] Anon (2006). Report of the Task Force on Grasslands and Deserts. Planning Commission. GoI.

12.1. Major Fodder Sources in India and their Status

A. Tropical and Sub-tropical Grasslands: These mid-successional/ sub-climax type of grasslands, found in high rainfall areas (western ghats) to arid/ semi-arid areas including terai and Gangetic plains, experience periodic burning and are subjected to heavy grazing. It has resulted in their general degradation and very low productivity. Such type of grasslands form important source of fodder for the livestock maintained by poor and landless people.

B. Shola Grasslands: Climatic climax type of grassland where climax stage is maintained by severe frost and recurrent fires. The major interference in Shola grasslands is on account of attempts to bring these under tree plantations.

C. Alpine, Sub-alpine Meadows: Climatic climax type of pastures that usually witness intensive transhumant grazing activity during summers. The climax stage is maintained by severe winters, high velocity winds and frost. The alpine and sub-alpine meadows have come to suffer from general degradation, increasing incidence of non-palatable species and erosion due to overgrazing.

D. Village Commons, Fallows & Wastelands: These lands used to form an important source of forage to the village cattle. However, most of these lands have been diverted for other uses, and whatever is remaining has become badly fragmented and degraded with no management concerns.

E. Forests: Forests of almost all crown density classifications, and the natural blanks contained within these, form an important source of forage. However, free grazing and invasion by exotic weeds has resulted in degradation of the ground cover of fodder value in the forests.

F. Tree-leaf fodder: Tree leaf fodder is a very important source of forage, especially during pinch periods. Less prone to periodic droughts, trees form an assured source of fodder year after year. The major sources of tree leaf fodder are the trees growing on forests and common lands. However, with high timber value plantations coming up on scrub forests, this resource is getting depleted from near habitations. Another source of tree leaf fodder is the trees growing on farm lands. However, with traditional cropping practices giving way to intensive agriculture, this source of tree leaf fodder is getting depleted.

- The country has seen a definite thrust over the years towards enhancement of cultivated fodder. The land area under cultivated fodder has grown to about 4% of the total cultivated land area of the country. However, the pastures over the common lands including forests, forming source of about 280 million tones of fodder annually[11], have been experiencing a corresponding fragmentation and degradation over the years. The reduction in the size of pastures and closing of some pastures for tree plantation has resulted in greater pressure on the remaining resources, especially along the forest fringes. The issue has a very significant bearing on strengthening of fodder resources in the country, especially with respect to the following:

- **Diversion of grazing lands for non-pasture uses:** Most of the pastures are neither defined nor marked on ground, and thus the total extent of such areas is a matter of guestimate. Even as only 12.15 million ha of land in the country is classified as permanent pastures/ grazing lands, grazing is estimated to occur on about 40% of the land area in the country, most of these lands being not designated as grazing lands. In the absence of such designation and accompanying land records and maps, these

[11]Anon. Report of the Working Group on Forests for the 11th Five Year Plan (2007-2012). Planning Commission. GoI.

non-designated grazing lands are gradually being put to other land uses, causing reduction in extent of already fragmented grazing lands. As per estimates, the country's pastures have reduced from about 70 million ha in 1947 to just about 38 million ha in 1997. Major proportion of this loss of pasture lands is from the village common lands. There is an immediate need to map the grazing lands in the country, demarcate these on the ground and initiate policy steps to maintain their landuse.

- **Invasion of pastures/ grazing lands by Invasive Alien species:** Invasive alien plant species (exotic weeds) viz. *Lantana*, *Parthenium*, *Eupatorium*, *Leucaena*, *Prosopis juliflora*, etc. have invaded most of the grazing lands – pastures, scrub forests, fallows, unculturable wastes, and village commons, severely affecting their productivity. Whereas some of these exotic weeds have proliferated due to long standing management negligence of these areas, some species like *Leucaena*, *Prosopis juliflora,* etc. deliberately introduced to help solve fuelwood problems have become opportunistic and have phased out native fodder species and grasses. Similarly, many exotic herbaceous components introduced in the pasture lands to enhance fodder availability, have suppressed the native fodder species. There is an immediate need to eradicate the exotic weeds and rehabilitate the affected grazing lands with native fodder species.

- **Gradual collapse of traditional agro-forestry practices:** Traditional agri-practices involved intimate integration of tree component with the crops. The tree component used to fulfill the small wood and fodder requirements, especially of the small and marginal farmers. With the (i) intensification of agriculture and cultivation of high yielding crops and (ii) policies that are non-conducive to tree farming, the tree component has almost vanished from the agri-practices, putting further pressure on the already degraded grazing lands. There is, therefore, a need to revive the age old practice of integrating multi-use tree component in the agri-practices through policy and agri-practices reforms.

Fodder Availability – Demand and Supply Status:

12.31. The increasing number of livestock and the changing dynamics of animal husbandry practices require corresponding increase in the type of fodder needed to meet the requirements of these new situations. Various studies have been carried out to assess the demand and supply of fodder resources, especially with respect to green and dry fodder. One such estimate (table-1) pegs the demand of green fodder and dry fodder in 2006 at 817.25 and 614.93 million tonnes respectively.

Table 12.2. Estimates of Annual Requirement of Green Fodder and Dry Fodder for Livestock in India (1996, 2001 and 2006) (In Million Ton)

Category	1996		2001		2006	
	Green Fodder	Dry Fodder	Green Fodder	Dry Fodder	Green Fodder	Dry Fodder
Cattle	383.27	305.08	446.28	344.28	501.79	371.58
Buffaloes	209.53	150.02	252.27	177.64	315.46	211.70
Sheep	-	7.13	-	7.40	-	7.67
Goats	-	19.43	-	21.59	-	23.98
Total	**592.8**	**481.66**	**698.55**	**550.91**	**817.25**	**614.93**

Source: Forestry Statistics India 2000. Indian Council of Forestry Research & Education

12.32. Similarly, the Planning Commission's Working Group on Animal Husbandry and Dairying looking into the demand and supply of fodder resources in India arrived at the following estimated fodder status (table-2).

Table-12.3. Demand and Supply Status of Fodder Resources in India (in Million Ton)

Demand and Supply Status of Fodder Resources in India (in Million Ton)	Supply		Demand		Shortfall	
	Green	Dry	Green	Dry	Green	Dry
2000	384.5	428	988	549	604	121
2005	389.9	443	1025	569	635	126
2010	395.2	451	1061	589	666	138
2015	400.6	466	1097	609	696	143
2020	405.9	473	1134	630	728	157

Source: Draft Report of the WG on Animal Husbandry and Dairying for 5-year Plan (2002-2007). Planning Commission of India. August 2001.

12.33. Perusal of the above table reveals that the availability of fodder, both dry and green, has not been commensurate with the requirement. Whereas the project requirement has increased by more than 50%, the fodder availability is estimated to have increased by only 14.5% in the five years between 2001 and 2006. It has resulted in a projected shortage of more than 60% in green fodder and nearly 23% in dry fodder by 2020. Converted into absolute terms, this deficit works out to 728 million tons in respect of green fodder and 157 million tons in respect of dry fodder.

Gap Analysis

12.34. The various issues that impact the strengthening of fodder and pasture resources in the country are due to various gaps that exist in the policy administrative and research frameworks. Some of the major gaps are:

12.35. Policy Level: The absence of pasture management and grazing policy at national/ state level have rendered the pasture lands, including village commons and unculturable wastes, open to developmental, societal and grazing pressures. Large chunks of such lands have experienced change in landuse due to transfer for developmental projects, land grants to landless, plantations on degraded pastures and bringing of such lands under irrigated cultivation at the expense of traditional agro-forestry practices. It is estimated that the area under permanent pastures and other grazing lands has shrunk from 70 million ha in 1947 to just about 38 million ha by 1997. The major policy related issues for the shrinkage and degradation of common grazing lands are (i) transfer of land for developmental purposes, (ii) allocation of land to landless, (iii) bringing of more and more land under irrigation and shift in crop preference, (iv) closing of land for raising plantations/ watershed management projects, non-inclusion of local bodies in management of such areas, (vi) non-sustainable use/ overgrazing, and (vii) non-finalisation of National Grazing Policy. It is estimated that the total recorded pasture land in the country has shrunk by more than 30% since independence. It is also estimated that about 78% of the forest area has degraded due to heavy grazing and other unregulated uses, adversely affecting their productivity3[12]. Similarly, the absence of such a policy has encouraged unilateral implementation of animal husbandry policy that seeks to increase the number of livestock without corresponding focus on developing fodder resources. It has resulted in further degradation of the pastures and fodder resources. A comprehensive pasture management and grazing policy would have taken care of such issues. There is, therefore, an urgent need to enunciate pasture management and grazing policy at national level over the 12th Plan period.

- **Institutional Level:** There is no single designated agency to steer the management of grazing lands and fodder resources in the country. It has resulted in the land use agencies and research organizations pursuing their own different agendas towards management of grazing lands in the country. The Forest Departments, in their endeavour to bring 33% land area under forest cover, have been busy in closing the grazing lands for raising plantations – mainly of commercial tree species like Eucalyptus, etc. The watershed departments have been closing the areas for raising tree crops in the hope of stabilizing the

[12] Anon.11th Five Year Plan. Chapter 3. 'Forests'. Planning Commission of India.

erosion prone areas. The Panchayats find it beneficial to lease out village commons for agriculture. There is no department to educate the communities about the usefulness of maintaining tree component on agricultural lands. All these have led to severely restricting the availability of fodder. A central body is, therefore, needed to steer the fodder development and grazing land management program in the country.

- **Resource Level:** There is acute deficit of fodder in the country with livestock, especially that dependent upon open grazing, getting less than 1/5th of the healthy fodder requirement per day. There are more than 4 lac villages in the country having no forests[3]. Similarly, there are about 1.7 lac forest fringe villages, located in interior areas with animal husbandry as their main vocation, that depend upon the highly degraded forest/ village grazing lands for their livestock. No wonder that productivity of the sector is low. Apparently, fodder development on grazing lands has not received due attention over the past.

- **Management Level:**

    - Since most of the fodder and grazing resources are available on forests and common lands, a perception has emerged amongst the resource users and resource managers that management of these lands is the sole responsibility of the government. The erstwhile robust village institutions towards community management of such areas have broken down and these have come to be seen as belonging to all with control by none. This has resulted in gradual deterioration of these lands as nobody's baby. The local stakeholders have been, by and large, kept outside whatever little management initiatives taken in respect of these lands. With the growing appreciation about the role of local communities in the management of natural resources, the grazing land management also needs to be undertaken in collaboration with the local communities. It is especially important to develop fodder resources around the 1,70,000 odd Forest Fringe villages, these being remote and having tremendous pressure on the forest lands.

    - Further, much of the fodder on common lands in the country becomes available during summers/ monsoons, with winters experiencing severe shortage of fodder. Most of the people during this pinch period are dependent upon dry crop residue with low nutrient value. A large part of the fodder available during monsoons is wasted due to want of appropriate storage/ value addition facilities. There is a need to carefully preserve surplus production from grasslands during rainy season to meet the forage requirements of the lean periods and to tide over unforeseen conditions like drought, etc. through efficient post harvest handling systems, including drying, bailing, storage, transportation to deficit areas, etc.

    - Another management issue is that most of the grass on common/ forest lands is removed before the seed has ripened and fallen. Similarly, most of the tree branches are lopped before seed setting. In both these scenarios the regeneration of the species is adversely affected, causing further depletion of the resource. The problem gets compounded as the community systems of management of common property resources are fast breaking down, leaving the common property resources to un-organised individuals.

- **Research Level:** There are a number of research studies pertaining to the productivity and carrying capacity of the grazing lands. However, most of these studies are fragmented and are difficult to apply on large scale towards grassland ecology. Similarly, there is a need to develop better understanding on the impacts the changing land use, animal husbandry, social and environmental conditions are having on the resource. Towards these end, strategic studies are needed.

Proposal

12.36. Inferences drawn from the issues, gaps and challenges presented above clearly bring out that -

- Fodder production in the country is well below the requirement and that the gap between demand and supply was increasing every year due to (a) increase in the livestock population and (b) degradation of existing fodder resources.

- Open grazing cannot be simply wished away due to critical dependence of millions of households on this vocation.

12.37. It, therefore, becomes clear that there is a definite need to enhance the area under fodder cultivation in the country to meet the fodder deficit. It is also clear that poor majority engaged in animal husbandry will benefit only from the better managed common grazing lands.

12.38. In view of the above, the subgroup strongly recommends launch of a special program under the 12th Plan to address the issue of dwindling fodder and grazing land resources. It is time that a comprehensive National Fodder and Pasture Management Policy is put in place. It is also time that the reports/ recommendations of the MoEF's Committee on Fodder and Grasses (1988) and Planning Commission of India's Task Force on Grasslands and Deserts (2006) be revisited, updated and developed in the form of a concrete scheme under the 12th Plan towards rehabilitation and enhancement of pastures and fodder resources in the country.

12.39. Details of the scheme along with broad implementation strategy are as under:

- **Mapping of ecologically sensitive pastures and development of rehabilitation packages:** The ecologically sensitive pastures like the alpine/ subalpine, shola, eastern ghats, arid zones (e.g. *Sewan* grasslands of Rajasthan; semi-arid grasslands of Deccan; *Rollapadu* grasslands in the semi-arid tracts of Andhra Pradesh; *Banni* grasslands of Gujarat, etc.) are facing the highest threat due to unsustainable biotic interference. These pastures, with unique floristic compositions, have evolved to climax/ sub-climax stages over hundreds of years of ecological succession and it may not be possible to bring these back once these are destroyed. These ecologically sensitive pastures will, therefore, be comprehensively mapped using GIS / remote sensing and their extent worked out for each phyto-geographical zone. Natural floristic composition of these pastures will be studied and keystone species/ formations identified. Appropriate rehabilitation packages towards conservation of these grasslands4[13] will be worked out under the 12th Plan.

- **Rehabilitation and productivity enhancement of degraded grazing lands:** Many of the grazing lands, including scrub forests, unculturable wastes, village commons, etc. have become degraded on account of –

    - heavy biotic pressure, especially over grazing over the years.

    - attempts at tree plantations – mainly of commercially important exotic trees like Eucalyptus, Teak, Gmelina, Leucaena, etc. and bamboos, with many of such plantations having failed to establish. Whereas tree planting does improve the soil and helps check erosion, these intensive plantations have caused reduction of grazing lands and further alienation of local communities from management of CPRs. Many of the tree species used for these plantations have run wild and assumed weedy proportions, further affecting grass and fodder availability.

    - occupation of large extent of grazing lands by invasive alien species – invasive alien plant species - severely affecting their productivity.

    Appropriate provisions at comprehensive rehabilitation of these degraded grasslands will be made under the 12th Plan -

[13]Anon. Mid term review of the 11th Plan. Chapter 22 'Forests and Environment'. Planning Commission. GoI.

- The existing Working Plan prescriptions to convert grazing lands classified as forests into woodlands will be reviewed and such practices discouraged.

- Research shows that judicious integration of woody perennials into grass lands actually results in increase in fodder grass yield and it has been possible to increase land productivity from 0.5-1.5 t/ha/yr to about 10 t/ha/yr on a rotation of 10 years through such interventions. It is, therefore, a matter of choosing the correct species mixture and correct planting density. Viable models of judicious species mix and plantation density to improve productivity of grass lands will be worked out for major phyto-geographical zones and implemented during the 12th Plan.

- The grasslands infested with alien weed species will be taken up for priority rehabilitation action. This would need physical removal of weeds followed by rehabilitation of the areas with a mixture of native species – woody perennials and grasses - of multiple use value. Such rehabilitation will not involve the use of (i) any chemical methods of weed control, and (ii) non-native species for productivity enhancement.

12.2. The Chandigarh Forest Department initiated a specific program to clear the Sukna Catchment of exotic weeds, mainly Lantana. The program has, over the past ten years, resulted in near elimination of exotic weeds and springing back of native vegetation, including grasses and fodder shrubs and trees. The moisture regime of the area has also improved and silt load has substantially reduced due to these interventions.

- Special focus will be laid on developing/ rehabilitating pasture lands around 1 lac of the 1.7 lac Forest Fringe villages in association with village communities.

- **Promoting fodder species under agro-forestry initiatives:** Animal husbandry in the country is intimately woven with the agricultural practices. However, the traditional practice of growing and maintaining fodder trees/ bamboos/ grasses on farm bunds, to meet fodder requirements during winters, has slowly given way to intensive agriculture severely affecting this traditional practice. Leaf fodder is a very useful resource, especially during winter months when all other fodder sources have been exhausted. Suitable models towards integration of fodder species with the intensive agricultural practices will be developed in collaboration with research institutes and promoted on large scale.

- **Developing seed/ germplasm banks/ nurseries of native species for rehabilitation of grazing lands:** It is widely believed that the native species have a higher chance of surviving the harsh natural conditions, especially in open conditions such as grasslands. There is, however, an acute shortage of seeds/ germplasm of native species – grass, forbs, woody perennials, and trees - for use in rehabilitation program of grazing lands. At least one such germplasm bank with associated nursery network would be established in each state. Institutes like Indian Grassland and Fodder Research Institute and state agricultural universities would be involved in establishment of such germplasm banks and nursery networks.

- **Developing fodder storage/ value addition facilities:** As has been brought out above, there is surplus fodder during monsoons, much of which goes waste. There is a need to handle this surplus fodder in a way so that it could be appropriately stored/ pickled for use in the pinch periods. Towards this end fodder storage banks under the aegis of state animal husbandry departments will be established in each state in close collaboration with Indian Grassland and Fodder Research Institute and state agricultural universities. PPP model of producing, storing green and dry fodder, and supply, especially value added feed blocks, leaf meals will be worked out on pilot basis under the 12th Plan.

- **Capacity building of Managers/ Community Groups:** Rehabilitation and management of the resource that has witnessed neglect for such a long period would need appropriate orientation of the mind sets of the managers and the user communities alike. It would involve development of training material and its delivery. In view of the enormity of the work, it would need steering by a central agency and collaboration with Civil Society Organisations.

- **National Grazing-cum-Fodder and Pasture Management Policy:** That the country needs a National Policy to address the subject needs no highlighting. The Expert Committee to review the National Forest Policy 1988, and its implementation under the chairmanship of Mr. C. D. Pandya, IGF (Retd.), also recommended that "A National Grazing Policy should come into effect at the earliest." The draft Grazing Policy will be revisited, put up for public debate and finalized as comprehensive policy in the first 2 years of the 12th Plan. The Policy would address issues pertaining to diversion of grazing lands for other purposes, conversion of critical grassland habitats into plantations, research on grassland ecology and pasture management, capacity building of managers and resource users, rehabilitation of degraded grazing lands, collaborative management of grazing lands and fodder resources with local communities. The Policy would also look into the issues related to transport of fodder from one area to another without first fulfilling local needs, migration of livestock from one area/ state to another, rotational grazing, stall feeding, regulating the number of livestock, and the problems of stray and feral cattle.

- **National Centre of Excellence (CoE) for Fodder and Pasture Land Management:** The issues cutting across various departments and stakeholder groups are best addressed if these are steered under one nodal agency. A Centre of Excellence on Fodder and Pasture Land Management would be established under the 12th Plan. Even the Chairman, Steering Committee on Environment, Forests, Wildlife & Animal Welfare in its meeting of 19 May 2011 for 12th Plan recommended setting up of more Centres of Excellence to address specific issues in a focused manner. A suitable nodal agency for hosting the Centre of Excellence would be identified and strengthened to undertake research, coordinate with stakeholders, prepare effective implementation plan and propose policy framework. This CoE will work in a Mission Mode – maybe under Green India Mission.

- **Encourage establishment of Cooperatives for Fodder and Pasture Management:** The present approach to utilize the common grazing lands is to maximize the benefits on individual level without any concern for its management. Since the major user of the resource is community, the best bet to ensure the sustenance of the resource is organize the community into user groups with responsibility to manage the resource also entrusted to the group. It would need to settle the tenural issues. Such groups could be formed on the lines of highly successful Milk-Cooperatives. An appropriate incentive scheme to user groups for effective management of grazing lands would also be worked out.

12.40. In view of the above discussion, the Sub-Group recommends initiating a separate long term scheme (at least 15 years) to comprehensively address this issue of great ecological and socio-economic significance. Proposed title of the scheme is "Central Sector Scheme for Fodder and Grazing Land Management". The scheme would be developed into different programs, each program defined with its measurable outputs.

Scheme Details – Central Objectives and Measurable Outputs:

12.41. The proposed scheme titled "Central Sector Scheme for Fodder and Grazing Land Management" - a fully funded scheme - is envisaged to be implemented in the form of well defined programs so as to provide due focus on all crucial issues. The proposed programs also provide opportunity for implementation through specialized/ expert agencies.

12.42. Central objectives and measurable outputs in respect of various programs under the scheme will be as under:

Table 12.4. Central Objectives and Measurable Outputs

S. No	Title of scheme (S)/ program (P)	Central objectives of S/P	Measurable outputs for 12th plan (in bullets)
P-1.1	Development of National Grazing-cum-Fodder and	o To ensure optimum productivity of fodder on sustainable basis. o To guide focused and effective	o A National Grazing-cum-Fodder and Pasture Management Policy in place

	Pasture Management Policy	implementation of pasture management action plans. o To create wider awareness and build consensus through participation by all stake-holder groups. o To define roles of different departments and build strong inter-sectoral linkages.	by the end of 2nd year of the Plan and adopted by the State governments. o The Scheme Implementation Plan suitably modified in view of Policy recommendations.
P-1.2	Mapping of ecologically sensitive grasslands and developing rehabilitation packages	o To map total extent of ecologically sensitive grasslands across different phyto-geographical zones for undertaking comprehensive management action. o To develop field scale rehabilitation models for such grasslands located in different areas for eventual replication.	o Extent of area under each such grassland type documented and mapped with respect to their conservation status. o Field scale rehabilitation models for major ecologically sensitive grasslands developed.
P-1.3	Rehabilitation and productivity enhancement of pasture lands in forests	o To enhance productivity of grazing lands through improving density of desirable forage species by way of - removal of exotic weeds - encouraging natural regeneration of native tree/ herbaceous species of fodder value - augmentation with native species of fodder value o To create local stake in such rehabilitation under JFM instruments.	o 2 lac ha area in different regions of the country completely rehabilitated with enhancement in productivity by >25% and proportional reduction in fodder deficit. o Local communities/ user groups actively managing the rehabilitated pasture lands.
P-1.4	Revive/ develop pastures on common/ revenue lands around forest fringe villages	o To create fodder availability in the vicinity of 1 lac forest fringe villages o To create sense of ownership amongst stakeholders	o Pastures of an average size of 1 ha developed around 1 lac forest fringe villages in association with local communities, resulting in enhancing fodder availability by >100 million tons/ year.
P-1.5	Develop seed/ germplasm banks & nurseries of fodder species	o To develop adequate germplasm of fodder species for grassland rehabilitation program. o To develop standardized storage/ nursery and rehabilitation protocols in respect of various species.	o At least one functioning seed/ germplasm bank with attached nursery network in place in 20 states.
P-1.6	Develop fodder storage/ value addition facilities	o To develop protocols and facilities for storage of fodder to meet lean period requirements. o To develop and operationalise PPP models of fodder storage/ value addition. o To link fodder storage/ value addition initiatives with user groups	o Functioning fodder storage/ value addition facilities in 20 states.
P-1.7	Promote incorporation of	o To enhance the fodder availability from private fodder banks to make	o Fodder availability enhanced

	fodder trees on agricultural lands	people self-sustained.	for winter months.
P-1.8	Establish National Centre of Excellence (CoE) on Fodder and Pasture management	o To act as nodal agency to steer the Policy formulation work. o To establish and ensure inter-sectoral participation in scheme implementation. o To guide and undertake strategic research/ surveys on various fodder and grassland management issues. o To guide and undertake capacity building programs for user groups/ resource managers in respect of good management practices. o To bring out literature, monographs, and other extension material on the subject. o To set up effective monitoring mechanisms for effective implementation of the scheme	o The CoE established and functioning. o Research findings in key grassland management areas available. o Organised cadres of user groups established in project states.

12.43. The magnitude of the problem being stupendous, the sub-group strongly recommends that the scheme be rolled over to the next at least two plans to create significant impact of the programs. It is especially so as the subject matter of the scheme is biological resource that is very slow growing besides being exposed to the vagaries of Nature.

Budgetary Outlay
(Centre Sector Scheme for Fodder and Grazing Land Management)

12.44. Program-wise proposed budgetary outlay in respect of the scheme for the 12th plan period is given as under:

Table 12.5. Proposed budgetary outlay Centre Sector Scheme for Fodder and Grazing Land Management

(Rs. in Crores)

S. No.	Title of scheme (S)/ program (P)	Basis of Budget Calculation	Proposed Outlay
P-1.1	Development of National Grazing-cum-Fodder and Pasture Management Policy	LS (surveys/ studies/ consultations/drafting/ etc.)	1.00
P-1.2	Mapping of ecologically sensitive grasslands and developing rehabilitation packages	LS (maps/ landsat imageries/ analysis/ ground truthing/ development of rehabilitation models	10.00
P-1.3	Rehabilitation and productivity enhancement of pasture lands in forests	@ 2 lac ha x Rs. 0.25 lac per ha[14]	500.00
P-1.4	Revive/ develop pastures around forest fringe villages	@1 lac ha x Rs. 0.20 lac per ha	200.00
P-1.5	Develop seed/ germplasm banks & nurseries of fodder species	@2.5 crore/ state x 20 states)	50.00
P-1.6	Develop fodder storage/ value addition facilities	@2.5 crore/ state x 20 states)	50.00

[14] Based on Model Expenditure Norms in use by the Gujarat Forest Department

P-1.7	Promote incorporation of fodder trees on agricultural lands	@500 lac trees @ Rs.10/- per plant)	50.00
P-1.8	National Centre of Excellence on Fodder and Pasture Management	LS (@Rs. 800 lac/year to support strategic research, education, capacity building, extension activities)	40.00
		Sub-total:	**901.00**
	Management Support/ Contingencies	(@1%)	9.00
		Grand Total	**910.00**

Implementation and Monitoring Mechanism

12.45. The proposed strategy for effective implementation, monitoring and appraisal of the scheme involves creation of a National level Task Force to steer the Scheme and effective involvement of CSOs/ domain experts in implementing the various programs:

Table 12.6. Strategy for effective implementation, monitoring and appraisal of the scheme

1.	Over all Steering and monitoring of the proposed "Central Sector Scheme for Fodder and Grazing Land Management" at National Level.	This scheme, with all approved programs, will be implemented as an all India coordinated scheme. MoEF will act as a national nodal agency for this scheme. This scheme will be steered by an inter-sectoral National Steering Committee under the Chairpersonship of Secretary (Forests & Environment), with members from Department of Animal Husbandry; DG (Forest); representatives of CSIR and ICAR; Director, IGFRI, Jhansi; PCCFs (from 2 states – to be coopted); representative of eminent CSO; and with DG, ICFRE as Member Secretary. This National Steering Committee, to be serviced by ICFRE as Centre of Excellence, would be responsible for approval and review of annual action plans. It will also be responsible for independent monitoring of the scheme through a panel of experts.
2.	Steering of the programs under the scheme at State Level.	At the State level, the scheme would be steered, reviewed and monitored by a State level Steering Committee under the Chairpersonship of Pr. Secretary (Forests), with members from Departments of Animal Husbandry, Agriculture and Rural Development; Vice Chancellors of State Agricultural/ Forestry Universities; Directors, local Research Institutes; representative of eminent CSO; with PCCF as Member Secretary. This State level Steering Committee would be responsible for approval and review of the State's annual action plans.
3.	Coordination	Effective coordination amongst various stakeholders is the key to successful implementation of the scheme. It is proposed to develop the Indian Council of Forestry Research & Extension (ICFRE), as a dedicated node in the form of a National Centre of Excellence (CoE) on Fodder and Pasture Management for this purpose.

		The CoE will be responsible for – - Coordinating the Policy development action - Coordinating and steering strategic research - Coordinating and steering capacity building and extension activities - Monitoring of the progress of various programs under the scheme The action plan of the CoE and its activities will be monitored by a Committee under the Chairpersonship of Jt. Secretary, MoEF, with members from the concerned departments, research institutes, CSOs and nominated representatives from states The Planning Commission will coordinate Policy formulation through a specifically constituted Core Group with ICFRE as the convener of the Core Group.
4.	Monitoring & Evaluation	Monitoring of the scheme will be at the following levels: • Implementation level - Continuous monitoring at the State levels - Steering Committee monitoring at national level twice a year - Third Party monitoring on sample basis on annual basis • Impact assessment level - By Third Party from 3rd year onwards

Expected Outcomes

12.46. Inadequate availability of good quality fodder is the major limitation in further development of the animal husbandry sector in the country. India has vast tracts of grazing land, most of which has fragmented or become degraded due to lack of appropriate policy interventions and management inputs.

12.47. The proposed scheme is envisaged to result in putting in place community based mechanisms aimed at sustainable management of grazing lands, especially around the forest fringe villages. The scheme also aims at arresting the degradation and fragmentation of grazing lands and reversing the degradation process through active management interventions towards developing fodder species on these lands. It is estimated that the scheme would result in enhancing the fodder availability from the present 280 million tons per year to >400 million tons per year from 3rd year onwards under the 12th Plan. This will have a very significant impact on the subsistence rural economy, particularly in respect of rural poor/ landless people depending upon open grazing for livestock rearing.

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Annexure 13

Report of Sub-Group IV

Forestry Institutional & Technology Management

Executive Summary

13.1. The contribution of forests to economic activity and livelihoods is not reflected in the GDP. During XII Five year Plan, Institutional & Technology Management support in Forestry is required for enhancing the productivity of forests, increasing the economic contribution of forests and enhancing the GDP growth rate during XII Five year Plan.

13.2. GDP growth for the 11th Plan is likely to be 8.2%, which is although less than the target of 9%, but is a remarkable achievement given the worst drought in 30 years and the global recession. One of the booming areas contributing to this growth is Information Technology Sector. Encouraged by the growth rate achieved during the XI Plan, the Government of India has proposed a target range of GDP growth of 9 to 9.5% for the XII Plan. Under this scenario, the forest sector is going to face a greater pressure as this sector has not only to keep itself embraced with the pace of technology development but also has to prepare itself for providing requisite support to the industrial sector. Access to livelihood, clean environment and development equity are going to be the major challenges of the XII Plan. Keeping this in view, the Steering Committee on Environment, Forests and Wildlife and Animal Welfare for the Twelfth Five Year Plan has constituted a Working Group on Forestry and Sustainable Natural Resource Management and an important sub group under this working group is constituted on 'Forestry Institutional & Technology Management', with the mandate to identify thrust areas for an enabling environment for forestry sector and to make recommendations for policy initiatives and programmes.

13.3. This sub group is of the view that the role of the forests is going to increase manifold during the XII Plan and the forestry sector should get adequate focus in order to meet the new challenges. The need of the hour is for convergence and synergy among different stakeholders working in the field of environment and forests. The Environmental Wing, Forestry Wing and State Forest Departments, need to work together to meet the emerging challenges in the field of forest and environmental conservation, forest based livelihood, water and bio-diversity conservation and climate change. The Central Board of forestry should be revived under the chairmanship of the Prime Minister. Furthermore, ICFRE and its institutes have been leading the forestry research in the nation over more than a century. They should be given greater functional and financial autonomy and ICFRE should be declared as the 'Centre of Excellence' through an act of parliament. If forestry research suffers, it will have adverse implication on ecology, food and water security of the country.

13.4. The forestry research in the states should also be strengthened and coordinated with appropriate technical support from ICFRE to address the global challenges that the world is facing today. The tropical and subtropical countries of the developing world have to play a major role in the mitigation of climate. The ICFRE is the first DOE from India to be accredited by UNFCCC and can undertake functions of validation, verification and certification of CDM projects for climate change mitigation under the sectoral scope of 'Afforestation and Reforestation'. This would help forge further such linkages. A REDD-plus Bureau should be established under ICFRE to allow a phased approach to address the drivers of deforestation across different States of India.

13.5. The professionalism in the forestry sector also needs to be more focused as the foresters will have to bear multifunctional responsibilities in future. The post of Director IGNFA should be re-designated as Director General (Forestry Training) in order to have focused approach for the training of forestry professionals. Also, the

DFE and the Central Forest Academy Principal are in the same rank causing a problem of command and control. This should be sorted out by up grading the post of DFE. The IIFM is one of the leading institutes in the field of Management Education in Forest and Allied Sectors which aims to provides leadership in professional forestry management aimed at environmental conservation and sustainable development of Ecosystems. The ongoing study on 'The Economics of Ecosystems and Biodiversity in India (TEEB-I)' under the overall coordination of the IIFM needs to be further strengthened which will further support implementation of GIM at the national level. Research and training on all aspects related to production of plywood and other panel products from wood would be covered by IPIRTI.

13.6. During the last few decades, the village level institutions have gained strength and they should play a greater role in forest management. The efforts of JFM committees should be synergised with those of other village level institutions by suitable amendment in the Panchayat Raj Act.

13.7. Today, we are living in the age of technology and the forestry sector should also capitalise on the gains of technology revolution. Forest Survey of India is the leading and nodal agency at national level dedicated to forest resources assessment of country for more than last 40 years. Now, there is an urgent requirement of real time monitoring of forest fires and forest cover in eco-sensitive zones. The forest resource assessment activities need to be strengthened at the national as well as at the States level under a coordinated programme. The Forest Survey of India can be adequately strengthened to play a nodal role in this regard. A robust mechanism for forest resource assessment needs to be established wherein data nodes can be created at the state levels, coordinated by a central node at FSI. This would also require creation of adequate infrastructure and capacity building of forestry professionals. Similarly, Wildlife Institute of India should strengthen itself through institutional and technological advancement to remain in the forefront as a professional leader to provide capacity to '*Lead Change*' and address emerging challenges of wildlife conservation or '*Conservation in Transition'*. The technological advancement has now made it possible to identify species from their parts and products used in illegal trade of wildlife. The modern RS/GIS tools could effectively be used for both routine management and monitoring of the protected areas resources and thereby assisting in wildlife conservation. Remote monitoring of the wildlife is also possible through *'Sensor Network Technology'.* The network should also be strengthened for continuous wildlife disease surveillance and monitoring in and around protected areas for checking emerging infectious diseases which are transmitted through wild animals and birds.

13.8. The Sub Group is also of the opinion that there is a tremendous pressure on the forests due to conflicts among various stakeholders and utter shortage of Forestry personnel due to non filling up of the posts. There is also an urgent need to enhance the motivation level of the forest personnel. They should be given parity with the other uniformed staff as the police personnel. The beats should be reorganised to reduce over burden and there should also be other motivational schemes such as subsidised ration, scholarships to their children, forest housing corporations, special incentives for anti poaching activities, adequate equipments and capacity building and medi-claim and group insurance facilities.

13.9. The population pressure, scarcity of essential resources and a rapid pace of change in environment has thrown open new global challenges. With its strong forest legacy and forest professionalism, India can play a leading role by suitably adopting the institutional and technological advancements.

Introduction

13.10. The primary task of this Sub-Group is to identify thrust areas for an enabling environment for forestry sector and make recommendations for policy initiatives/ programmes for Forest Information Management, strengthening of forest research, capacity building, technological Upgradation, infrastructural development, forest resource assessment, augmenting flow of funds in the forestry sector, and motivation and morale of forest personnel.

Background

13.11. GDP growth for the 11th Plan is likely to be 8.2%, which is although less than the target of 9%, but is considered to be a remarkable achievement given the worst drought in 30 years and the global recession. Based on this, the Planning Commission has proposed a target range of GDP growth of 9 to 9.5% during the XII Plan. The basic objective for the Twelfth Plan must be faster, more inclusive and sustainable growth.

13.12. A meeting of the steering committee was organized by Planning Commission of India on Environment, Forest, Wildlife and Animal welfare, under the chairmanship of Dr. K. Kasturirangan, Member Planning Commission on 19th May 2011. The members discussed the strategies for XII Plan highlighting several challenges to the sector with respect to implementation of schemes, target versus finance match and governance issues. The Chairman indicated that the access to livelihood, clean environment and development equity is a major challenge of the XII Plan. He also appreciated the efforts recently been made for modern data management put in by the sector and expressed the need augmentation of effort for efficient monitoring of implementation effectiveness and building up of a strong decision support tool consistent with the best practices in the world. It was also emphasized that more number of Centres of Excellence should be created in the XII Plan. Thus the sector specific sub group was formed on Institutional and Technology Management with the experts to address all challenges and recommend effective coordination and convergence.

Schemes and Status during XI Plan

13.13. The XI Plan emphasized that ongoing paradigm change in the forestry sector necessitated fundamental orientation and attitudinal changes of the personnel in line with multifarious roles of forests, corresponding variety of externalities, and for coping with traditional forestry management practices. This includes social sensitivities along with the scientific basis of the processes of nature. It was envisaged to design an integrated capacity building programme for forestry personnel including training of trainers for State frontline staff training institutions and to enable stakeholders to understand the perspective of conservation in human well being by providing them state-of-the-art information and knowledge base. Specific mandates were given to different forestry institutions:

Indian Council of Forestry Research and Education (ICFRE)

13.14. The management of research and education needs to be supported by enabling decision making through consultation and in a professional capacity.

- The Council should have specific separate mandates regarding the administration of its institutes and co-ordination of research.
- For the plan period, 50% of the total grants-in-aid to ICFRE will be earmarked exclusively for research and education. The Council will encourage its institutes to collaborate with other institutions of repute in relevant fields including State Forest Research Institutes.
- Research programmes will be oriented towards meeting the priority areas of productivity, genetic improvements, ecosystem research, and updating growth and yield parameters required for analysis in management planning. Management of natural forests for improvement of their profile will be the main focus.
- Nation-wide long-term genetic improvement programmes for indigenous species, screening of Indian species for fast growing, short rotation alternatives for traditional species for industry and protocols for survey, inventory, and management planning for NTFP, medicinal, and aromatic plants in forests will be launched.
- Specific thrust will be given for developing technologies and processes for agro-forestry and social forestry. Quality seed and planting material programmes in public or private sector will be supported by credible testing and certification regimes.
- A forest biodiversity network will be established for integrating the available information on one platform and for studies in the left out areas. It will be compatible with the management planning systems of forest administration and the other existing/evolving information resources.
- Inter-sectoral impacts, trade, and market aspects of forest economics, ecosystem research, policy research, and concerns of climate change including carbon trade methodologies, will be taken up.

Wildlife Institute of India (WII)

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

Forest Survey of India (FSI)

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

13.17. Scope of interpretation of satellite data for tree cover will include separate canopy status in forest lands, Forest 71 patterns of degradation, and state of commercial plantations. With redefined green cover, appropriate indicators compatible with the technologies used by FSI need to be developed. Monitoring of ecological status of landscapes/habitats in terms of the dynamics of vegetation and early warning systems, productivity, consumption, and supply from forest and non-forest resources will be taken up. On the basis of these priorities, rationalization of the present network of regional units and manpower will be taken up. The scope, definition, and components of FSI inventories will be decided at an expert group level, in order to render them compatible with various national and international formats, definitions, and organizations for collaboration.

Indian Institute of Forest Management (IIFM)

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

Indian Plywood Industries Research and Technology Institute (IPIRTI)

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

13.20. Many of the issues envisaged in the XI Plan, as shown above, could not be addressed due to paucity of funds or due to non-availability of funds. These are again included in the proposed XII Plan proposal.

Challenges

13.21. Today, the biggest challenge in front of forest and wildlife sector is to ensure long-term survival and betterment of forest and wildlife of India and at the same time the safeguarding of the interests of the forest dependent populace.

13.22. In an era of globalization and rapid economic integration in a fast changing world and consequent pressure on the natural resources, the role of forests too has become very crucial for maintaining the hydrological cycle; sustaining the food and water security; conservation of biodiversity; mitigating the effects of climate change and providing livelihood support to millions of poor people living in India. This has increased the

mandate of institutes; those are involved in forestry research, manifold. The tropical climate and fragile ecological situation prevailing in many parts of the country necessitate that, if India has to sustain 9% plus rate of growth in our economy, massive investment will have to be made in the forestry sector, on the lines of roads, power and other infrastructure projects. The role of the forests in providing food and ecological security becomes all the more important. In this regards the setup for Forestry Institutions, Institutional Changes and Forest Technology need to be deliberated seriously for delivering outputs at a faster pace.

Strategies

13.23. In order to meet the challenges as enumerated above, the foremost requirement is to strengthen the forest research infrastructure in the states and to build scientific ecological thinking among masses through continuous extension strategies. Guidance, direction and appropriate liaison at national level is required to steer and if need be, reorient the forestry research to be in consonance with the national developmental priorities. The ICFRE has the appropriate scientific strength and forest legacy to take the lead role. The manpower, equipments and other infrastructure of research of ICFRE should be strengthened so that it could cater to the research needs of all the states and UTs through its institutions/centres or through MoUs with the research institutions of the states. Ideally speaking, the research in the states should be confined to applied research such as production of seedlings through tissue culture/micro-propagation, seed development, maintenance of sample plots and preservation plots, taking stock of soil carbon and biomass, etc. and they have a better role in the extension of research findings to the field. Although CAMPA funds are outside the consolidated funds of Government of India and hence are outside the purview of the Planning Commission, however, the guidelines of CAMPA provide the scope for utilization of this fund for Research, training and capacity building. Therefore, a corpus of Rs 1000 crores, through CAMPA Fund is proposed to be created under MoEF to meet the needs of infrastructure for the field staff in all the states/UTs. In addition, a corpus of Rs 1000 crores, through CAMPA Fund, is proposed to be created under ICFRE for strengthening research strength of eight institutes and four centres of ICFRE and to provide sustained extension programmes through them and also to cater to the research/ extension/education infrastructure needs of the states and UTs.

13.24. The FSI will be the nodal agency to develop a robust mechanism for forest resource assessment, through state of the art technologies, and integrating all the states for developing real time monitoring system. The WII will be the nodal agency to '*Build Capacity for Wildlife Conservation*' in the country and to provide capacity to address emerging challenges of wildlife conservation. The IIFM will provide the leadership in professional forestry management aimed at environmental conservation and sustainable development of Ecosystems. The research and training support on all aspects related to production of plywood and other panel products from wood and other lignocellulosic materials will be provided by the IRIRTI. The knowledge and skills to the professional foresters, at all levels, and help them to develop competence for managing the country's forest and wildlife resources on a sustainable basis, will be provided through the IGNFA and the DFE.

13.25. The integrated efforts of all these institutions, coupled with appropriate technological bolster, would lead to create the appropriate scientific thinking that is essential for upgrading and utilising the invaluable natural resources on a sustained basis.

Recommendations

Recommendation 1

13.26. Institutional Changes *(Ref. Para 13.1.1 to 13.1.14 of Annexure 13.1)*[15]

- Revival of '**Central Board of Forestry'** as an instrument for wider consultations and convergence of ideas on forest resources management,
- ICFRE to be recognized as an Institution of Excellence by an Act of Parliament which would enable it to gain the freedom and flexibility to work as an Institution of Excellence and would also lead to better coordination, planning and networking with other national/international organizations,

[15] *Main Report is the '**Report of the Sub Group IV on Forestry Institutional & Technology Management', enclosed with this Summary Report as Annexure.***

- Re-designation of the post of Director IGNFA to DG (Forestry Training) for grooming future forest professionals/managers in an integrated manner,
- Up grading the post of DFE,
- Establishment on National Non-Timber Forest Products Board for developing the NTFP sector in a focused manner,
- Better utilization of the CAMPA funds to meet the goals of its creation for compensating loss of the environmental and ecosystem services,
- Creation of interface between different village-level institutions such as JFMs and Gram sabha, and
- Convergence in the functioning of officers at the District and State level to check Left Wing Extremism.

Recommendation 2

13.27. Forest Resource Assessment and Information Management *(Ref Para 13.1.15 to 13.1.58 of Annexure 13.1)*

- Forest Resource assessment provides the basis for long term planning of forestry activities both at national and state levels and the forest resources of a country cannot be managed sustainably unless well thought strategy for their overall development is prepared based on the their assessment. In order to suitably integrate the development of IT sector in the field of forest management, following new activities are proposed in the XII five year plan:
    - i) Creation of spatial database/NFIS (including forest area as layer) and adequate networking with the State/UT Forest Departments,
    - ii) Near real time Monitoring of forest fires,
    - iii) Near real time monitoring of Forest Cover in Eco-Sensitive zone to keep a close watch on the ecologically sensitive areas,
    - iv) Monitoring of incremental carbon stock by intensifying the current inventory work and involving States Forest Departments as partner in this endeavor,
    - v) Monitoring of plantation & other activities under centrally sponsored schemes for applying course correction whenever and wherever necessary,
    - vi) Integrated information system for monitoring of Centrally Sponsored Schemes,
    - vii) Creation of R&D Unit at FSI HQ,
    - viii) Creation of new zonal offices of FSI and strengthening of existing ones,
    - ix) Establishing Robust mechanism for Forest Resource Assessment using Forestry Geomatics Centres with state of art equipments and trained manpower,
    - x) Establishment of centralized data node and Information Nodes in State Forest Departments,
    - xi) Strengthening Knowledge Capability of WII to deal with emerging challenges
        - a) National Wildlife Forensic Research Facility to develop web-enabled wildlife forensic database
        - b) Protected Areas Geodatabase at Enterprise Level using modern RS/GIS tools
        - c) Wildlife Health and Disease Research and Monitoring Facility
        - d) Remote Monitoring of Wildlife Populations in case of terrestrial as well as aquatic species

xii) Establishment of WII's Regional Centres to create gateway to wildlife information and hub of regional expertise, cooperation and collaboration for improved strategies for 'conservation' amidst 'all round development' and human security.

Recommendation 3

Strengthening Forestry Research *(Ref. Para 13.1.59 to 13.1.107 of Annexure 13.1)*

13.28. Indian Council of Forestry Research and Education

i) Strengthening research infrastructure of ICFRE for better scientific performance (Laboratories, scientific equipments, library, manpower, capacity building, etc.),

ii) Scientific strength of ICFRE should be increased as research is needed in emerging fields like forest hydrology, climate change, forest economics, forest management, productivity enhancement, frontier areas of research in genetics and genetic engineering, Biodiversity, wood science and technology etc. Erstwhile abolished 53 posts of scientists should be revived and around 75 new posts of scientists and 25 posts of foresters should be created,

iii) Synergy among different stakeholders to meet the emerging challenges in the field of forest and environmental conservation, forest based livelihood, water and bio-diversity conservation and climate change,

iv) Creation of Corpus fund of Rs 1000 crore through CAMPA Fund,

v) Strengthening of forestry extension programme through Van Vigyan Kendras,

vi) Creation of a Directorate of Environmental Management and Accounting

vii) Upgrading of the post of Secretary ICFRE

viii) Strengthening forestry research in states, and

ix) Establishment of REDD (plus) Bureau,

Recommendation 4

Wildlife Institute of India

- Research development is required to properly understand the dynamics of ecosystem and wildlife resources. Despite sincere efforts by various institutions, quality wildlife research is just confined to about 20% protected areas, while majority PAs, and other conservation reserves face the deficiency of basic research inputs such as desired baseline information, ecological understanding, reliable data on biology, ecology, management and socio-economic aspects.
- The organization is expected to provide capacity to 'Lead Change' and address emerging challenges of wildlife conservation or 'Conservation in Transition'. WII is required to augment ongoing wildlife research manifold in order to overcome the current deficiency. Further, it is proposed to adopt 'adaptive management approach' through experimental research and All India Coordinated projects on priority conservation themes (habitat and invasive species management, wildlife population and animal damage control, long term ecological monitoring, and buffer zone management).
- To achieve these goals, in addition to 'Strengthening Knowledge Capability of WII' as mentioned in point 2 above, advanced technologies such as Remote Sensing and GIS, GPS, Radio/Satellite Telemetry, Camera Traps, Molecular and DNA Based analysis, etc. will also be integrated with field conservation efforts.

Recommendation 5

13.29. Indian Institute of Forest Management, Bhopal

i) Creation of Advance Centre for Policy Analysis at IIFM,

ii) Establishment of National Portal on JFM covering impact of JFM on livelihood, ecosystem and Forestry & Environment,

iii) Intensive study in 5 states (Andhra Pradesh, West Bengal, Himachal Pradesh, Sikkim, Maharashtra and Andaman and Nicobar Islands) under "The Economics of Ecosystem & Biodiversity" (TEEB) Project,

iv) In depth studies in various functional areas of management in relation to Forestry & Environment such climate change, Human Resource Management, Institutional mechanism for inter-departmental coordination, Marketing and Supply Chain, Ecotourism, Certification, Sustainable Forest Management, Gender-Equity in Natural Resource Management, Micro-finance and Rural Enterprises etc., and

v) Documentation of best practices in forestry management related to value addition of NTFP, Micro-enterprise setting, Forest Management, Natural Resource Management, People's Participation, Biodiversity Conservation, Community Forestry etc. through audio-visual documentary.

Recommendation 6

13.30. Indian Plywood Industries Research & Training Institute, Bangalore

- Guided by the shortage of prime timbers from forests, the Institute is pursuing two pronged strategy for bridging the gap between demand and supply for industrial round wood, namely:

  i) Development of appropriate processing technologies for efficient utilization of plantation grown tree species for manufacturing quality wood and panel products including plywood of different grades, block boards, flush door shutters, particle board and medium density fibre board, and

  ii) Evolving technologies for using non-wood renewable fibers to manufacture alternates to wood, including development of environment and people friendly products from bamboo.

Recommendation 7

Capacity Building *(Ref. Para 13.1.108 to 13.1.123 of Annexure 13.1)*

13.31. Indira Gandhi National Forest Academy

a) Training of trainers, i.e. skill upgrading of faculty of IGNFA,

b) Exposure (Foreign) visit to IFS Probationers,

c) School forest (Model forest/Training forest), i.e. to have a patch of forest adjoining Dehradun for the competence based learning in the field condition,

d) Mid-career training of IFS Officers to be continued in the XII Plan, and

e) Centre for Forest Policy Research for updating training inputs to budding foresters in contemporary and futuristic management regimes.

13.32. Directorate of Forest Education (DFE)

a) Augmenting the capacity of DFE to bridge the gap between existing and required training need for SFS, FROs and Frontline Staff

b) Induction Training of State Forest Service Officers (2-yr Diploma Course),

c) Induction Training of Forest Range Officers (18 month Certificate Course),

d) Mid-career training of SFS officers

e) General Refresher Courses for in-service State Forest Service Officers/ Forest Range Officers(FROs)

f) Creation of Database Cell at Directorate for establishing linkages with State FDs

13.33. Technological Upgradation *(Ref. Para 13.1.124 to 13.1.133 of Annexure 13.1)*

a) Upgrading Office and Field Management Tools,

b) Human Resource Development,

c) Enhancing Productivity of Forests,

d) State-of-art technology for conservation of wildlife,

e) Information Technology Upgrading and Integration Scheme to address the shortcomings and upgrade requirements of all state forest departments and forestry institutions.

Recommendation 8

13.34. Infrastructure Development *(Ref. Para 13.1.134 to 13.1.139 of Annexure 13.1)*

- The research infrastructure and also the supporting infrastructure of various forestry organizations and state forest departments have become grossly inadequate and out-dated to cope up with the emerging research requirements. For upgrading the level of forestry research to the international standard, modernization of labs, replacement of age old out-dated equipment with modern state of art scientific equipment for carrying out research in frontline areas, up-gradation of libraries and human resource development are essentially required.

Recommendation 9

13.35. Motivation and Morale of Forest Personnel *(Ref. Para 13.1.140 to 13.1.153 of Annexure 13.1)*

- Structure of forest organization should gear up to have a delivery mechanism for interface with the public which can inspire the confidence of the people.

a) Subsidized Ration to Forest Personnel,

b) Scholarships to the children of forest personnel,

c) Formation of Forest Housing Corporations in the states,

d) Beat system reforms to reduce the over-burden on forest guards,

e) Parity of forest subordinate staff with the police personnel, and

f) Incentives for anti-poaching operations.

Recommendation 10

13.36. Monitoring and Evaluation mechanism

- There will be three-way monitoring and evaluation mechanism for the schemes and programmes that would be undertaken by different institutions during XII Plan:

a) Concurrent evaluation through external agencies to be nominated/selected by MoEF/the Institution,

b) Internal monitoring committees in all institutions headed by the head of the concerned organization and having members from the MoEF and the Planning Commission, and

c) Mid-term evaluation of each scheme/programme by an independent evaluator.

Expected Outcomes

13.37. In general, if the fund flow as proposed is assured, we will be able to effectively address the major issues such as resource management, professional forestry trainings, biodiversity and wildlife conservation, maintaining the hydrological cycle, sustaining the food and water security, mitigating the effects of climate change and providing livelihood support to millions of poor people living in India. Also the fund flow in tribal/forest fringe areas will help in addressing the forest conservation and livelihood issues in the tribal areas which will further help in checking left-wing extremism. The synergy between JFM and Panchayat will lead to better participation of the gram sabha in natural resource management. The specific outcomes expected through the proposed interventions are as follows:

- Revival of Central Board of Forestry will lead to a focused approach on policy development and implementation issues in the forestry sector in the country,
- Research in forestry would be strengthened by providing autonomy to ICFRE through an Act of Parliament which in turn will help in better management of forests and biodiversity of the country,
- All forestry institutions and SFDs would get assured research and infrastructure support through corpus created out of CAMPA fund,
- The professional trainings capacity building of the forest managers at all levels would be more focused and integrated,
- The NTFP sector will be more developed through National NTFP Board and will help in sustainable development of our natural resources,
- Technological upgradation would be done at all institutional and SFDs level and all states/UTs would be interlinked to achieve real-time assessment and monitoring of forest resources,
- Motivation and morale of the forest staff would be boosted through staff-based schemes such as subsidized ration, scholarships, housing, beat reform, parity with police personnel and incentives for anti poaching activities, and
- Interface would be created among different village level institutions and that would bring a convergence at district and state levels to check left wing extremism.

13.38. Financial Requirements

Table 13.1. Financial Requirements-Institutional and Technology management

Sl No.	Activity	Amount (Rs crore)
1	FSI New activities	280
2	Establishing Robust mechanism for Forest Resource Assessment	220
3	Establishment of centralized data node and Information Nodes in State Forest Departments	32
4	WII – Institutional and Technology Advancement	175
5	Research Support to ICFRE and the States	1000*
6	Research Support to IIFM	230
7	Research Support to IPIRTI	40
8	WII – Augmentation of Wildlife Research	30

9	Capacity Building – IGNFA	183
10	Capacity Building – DFE	85
11	Capacity Building – IPIRTI	24
12	Capacity Building – IIFM	229
13	WII - Wildlife Training	20
12	Capacity Building – ICFRE	6
13	Technological Upgradation	105
14	Infrastructure Development	2575*
15	Motivation and Morale of Forest Personnel	1265
	TOTAL	**6499**

**Note: Through CAMPA fund*

- *a corpus of Rs 1000 crore is proposed for research support to ICFRE and the States, and*
- *a corpus of Rs 1000 crore is proposed for infrastructure development in the States*

Annexure 13.1

Main Report: "Report of the Sub Group IV on Forestry Institutional & Technology Management", under the Working Group on Forestry and Sustainable Natural Resource Management; *by* Dr. V. K. Bahuguna, Director General, Indian Council of Forestry Research and Education, Dehradun.

Chapter - 1

Institutional Changes

13.1.1. The Institutional changes which can provide enabling environment were discussed by the sub group with the vision for recommending policy initiatives/programmes for better overall management of forests. This sub-group suggests following institutional changes to be incorporated in the XII Plan.

Recommendations of National Forest Commission

13.1.2. The National Forest Commission (NFC) was created to review the functioning of Centre and State level institutions concerning forestry and come up with recommendations for the long-term survival and betterment of forest and wildlife of India and at the same time the safeguarding of the interests of the forest dependent populace. The Commission has proposed that the forest personnel on their part need to radically change their mindset, vision and their professional approach. These recommendations are still relevant and have been considered by this sub group while proposing the institutional changes to be incorporated to meet the challenges of future forest management and involvement of all stakeholders.

Revival of 'Central Board of Forestry (CBF)'

13.1.3. In order to evolve national consensus on forestry matters to meet the new challenges the '**Central Board of Forestry'** should be revived. This was an instrument for wider consultations and convergence of ideas on forest resources management and was done away with after the creation of Forest Policy Division in the Ministry. There has been a demand of its revival from various quarters. It is therefore, proposed that the '**Central Board of Forestry (CBF)'** be revived to be headed by the Prime Minister as Chairperson and Minister of Environment & Forest as Vice Chairperson, on the lines of National Wildlife Board. It should have membership from key Ministries, State Ministers, PCCFs/senior professionals and Forest Secretaries, civil society representatives, JFM committee representatives, tribal representatives, and forest based industries, and R&D institutions. This should be the apex body for policy development and consultation in the country.

ICFRE to be recognized as an Institution of Excellence by an Act of Parliament

13.1.4. ICFRE and its institutes have been leading the forestry research in the nation over more than a century. During this journey ICFRE and its institutes have laid the foundation of scientific forestry not only in India but also in other parts of British Empire and elsewhere. It is also a fact that the efforts of ICFRE are recognized much more outside India. Now, the time has come that research in the field of forestry in our country is further strengthened and global leadership is attained by recognizing ICFRE and its institutes as an Institution of Excellence by an Act of Parliament.

13.1.5. In fact, it had also been recommended by the National Forest Commission in its report that the functional autonomy should be granted to ICFRE, as provided to other institutes of excellence. This would enable the ICFRE to gain the freedom and flexibility to work as an Institution of Excellence and would also lead to better coordination, planning and networking with other national/international organizations. This could be achieved with the enabled support of an Act of the Parliament.

13.1.6. If Forestry Research suffers, 23% of the land mass of the country lacks inputs for forest management which will have adverse implication on ecology, food and water security of the country. Forest research annual budget is only around Rs. 90 crores, as compared with Rs. 3000 crores for ICAR, and moreover, most of the budget of forestry research is spent on salaries. Furthermore, enough staff should be provided among Institutes of ICFRE to cover subjects like Forest Mesuration, Silviculture. Forest Economics, Forest Accounting, Forest harvesting, Environmental management, NPV, Forest hydrology, Biodiversity and Fringe Forest Land Use to bring about synergy in research pursuits of ICFRE. Research on Forestry can only be sustained and

strengthened if ICFRE and its institutes are granted autonomy by an act of Parliament. Furthermore, there is also an immediate need to create Institute of Sustainable Forest Management at New Delhi and Institute of Forest based Livelihood at Hyderabad by upgrading the Hyderabad centre to bring about synergy in research pursuits of ICFRE. A National Academy of forest sciences should also be established on the pattern of National Academy of Agricultural Sciences and Indian National Science Academy to provide a forum for policy debate.

Re-designation of the post of Director IGNFA to DG (Forestry Training)

13.1.7. The training of forestry professionalism needs to be more focused in the larger context of grooming future managers in an integrated manner. The Director IGNFA is now in the apex scale equivalent to Secretary to Govt. of India and should be made in charge of coordinating and supervising the training of all categories of forestry personnel including IFS/SFS officers in the country. However, as detailed in Chapter 4, more discussion is needed to take a decision on this issue.

Up grading the post of DFE

13.1.8. Presently the DFE and the Central Forest Academy Principal are in the same rank causing a problem of command and control. This should be sorted out by up grading the post of DFE.

Establishment on National Non-Timber Forest Products Board

13.1.9. The forest based livelihood is largely maintained by the NTFPs and around 350 million people are dependent on the NTFPs. However, there is no focus on their management especially on their regeneration, non-destructive harvesting, marketing, value addition, MSP for remunerative prices for the gatherer etc. For smooth implementation of the Forest Rights Act we need to improve the livelihood from the vested lands to ensure that the conservation of the forests is continued by the Right holder. In order to ensure this it is proposed that a **National Non-Timber Forest Product Board** be established in the Ministry of Environment & Forests on the lines of (National Medicinal Plant Board) with the responsibility of developing the NTFP sector in a focused manner.

Better Management and Utilisation of CAMPA Fund

13.1.10. There is need to plan for the better utilization of the CAMPA funds to meet the goals of its creation for compensating loss of the environmental and ecosystem services on account of the diversion of the forestlands. Forest has to play a crucial role in securing the food, water and ecological security of the country. A part of the fund at the disposal of CAMPA need to be converted into a corpus for meeting the forest management infrastructure, livelihood of forest dependent communities (like supply of LPG connection to rural poor), R&D, training, capacity building and protection needs of the States and to reduce dependency on the Budget.

Creation of interface between different village-level institutions

13.1.11. The village level institutions and stakeholders must play a role in the management of forest. At the village level, as decided by the Ministry of Environment & Forests, the JFM Committees be constituted by the Gram Sabhas and this should be recognized by an amendment in the Panchyat Raj Act. For better synergy and convergence, the executive committee of the Village Panchayat shall also concurrently be the members of JFM committees and vice versa.

13.1.12. With the recognition of individual and community rights under FRA 2006, there is need for establishing an institutional mechanism for the management and conservation of these resources. In many of these forest areas JFM committees have already been functioning. For better implementation of the provisions of the act, the Gram Sabha may constitute Community Forest Management Committees and all the JFM members may be made part of the committee to ensure synergy and better sharing of benefits and accountability. The forest Department shall provide technical backup, build up the capacities of the communities and shall also be responsible for regulatory provisions as enshrined in the relevant acts.

13.1.13. In areas other than FRA the Gram Sabha shall constitute JFM committees. The Gram sabha may appoint a facilitator from among the educated village youth to act as an interface between the forest department, Gram Sabha and the JFM Members. His salary should be met from the State Budget by the forest department for which a scheme may be launched during the 12th five year plan. At the same time there should be capacity building of JFM committees to scientifically manage the forest resources and at least two JFM members (one of them women) should be declared as Forest Officers under the Indian Forest act 1927. The village Panchayat will have the responsibility to converge the land based activities like MNEREGA with forestry and watershed programmes in the fringe forests. However, the regulatory functions under the various Acts must remain with the

forest department and JFM members who have been declared as forest officers. This is essential to ensure that sustainability of the resources is not threatened in the long run as forest must be maintained in the long run to ensure food and water security and to ensure inter-generational equity in the midst of climate change scenario, increasing population pressure, increased economic development and pressure on the scare resources in a tropical country like India.

Convergence at State and District level to combat naxalism

13.1.14. To combat the menace of Naxalism in the country there should be more and more convergence in the functioning of AIS officers at the District and State level. A mechanism may be established for this to ensure proper convergence of development of naxal affected forest areas by instutionalising more and more interdepartmental cooperation through joint training programmes and giving a key role to the team consisting of District Collectors, DFOs and SPs.

Chapter 2
Forest Resource Assessment and Information Management

Introduction:

13.1.15. Forest Resources of a country can not be managed sustainably unless well thought strategy for their over all development followed and put firmly in place. A rational forest policy and strategy would require detailed information about location and extent of forests, their composition, growing stock, increment or in other words the information of forest resources in qualitative/quantitative terms is known. Forest Resource assessment also provides the basis for long term planning of forestry activities both at national and state levels.

13.1.16. We are today living in the age of technology. The internet provides a global path way for information exchange, and literally any information is available at the click of a button. Forestry sector has yet not made adequate and effective use of the computers and other modern tools and techniques in their day to day working and thus has not totally capitalized on the IT revolution. It would not be wrong to state that forestry, for the most part, still relies upon age old dependence on manual procedures and the human resource available. Forest inventory, growth and yield statistics, forest extent, species diversity and the like continue to be executed and documented manually, as a result of which the activities are not only effort and time consuming but also subject to human error. Use of available and developing technology can help to a large extent in rapid assessment of forest resources as well as generating and updating the information and data that is the very basis for good planning. Geographic Information System (GIS) is an effective technology for storage, analysis and retrieval of spatial, temporal and tabular data for natural resources. A lot needs to be done by the State Forest Departments (SFD) in this area.

13.1.17. Long history of scientific forestry in India has generated a wealth of data on forest resource particularly extent and types of forests, their legal and ecological status, tree growth, nursery and regeneration practices. These data are dispersed at various places in the state Forest Departments, MoEF and research institutions/ universities. Use of this huge reservoir of knowledge needs a system of easy access for planning, management, research, extension and other needs. Today with the importance being given to Citizens' Right to Information, it has become imperative for the forestry sector to create a central repository of data and use IT capabilities to link various existing sources of data.

Present status of Forest Resource Assessment In the States:

13.1.18. Planning for the management of forests has been the keystone for the development of the forests, and a reflection of this are the working plans which are the basis for forestry management. Over the years various forest departments in the country have gained expertise in the formulation of such working plans. In State Forest Departments, the forest resource assessment is generally done while preparing working plan of a Forest Division. Working plan document contains exhaustive information of forest resources available in a division.

- Previously forest working plans were timber centric and do not contain adequate information on multiple forest resources including the much valued NTFPs which provide essential livelihood support for a vast population of tribals and forest fringe communities primarily subsisting upon them.
- Information is mainly collected based on terrestrial survey methods.
- Classical methods and field based forest inventory are used. Tabulation / computation of data using GPS/ computers etc.

- Integration of data collected at divisional level into data bases at state level is not facilitated
- Proper mechanism for monitoring and evaluation schemes/programmes not available due to very poor progress in development of MIS as an effective tool for monitoring. Slow adoption of modern technology & lack of training of personnel at field levels and of computerization up to range level etc.

At National level:

13.1.19. Forest Survey of India is a nodal agency at national level which has been given the responsibility to carry out forest survey and monitoring at national level. Forest Survey of India, an organisation under Ministry of Environment and Forests, Government of India, is dedicated to forest resources assessment of country for more than last 40 years. FSI succeeded the Pre-Investment Survey of Forest Resources (PIS), a project initiated in 1965 by government of India with sponsorship of FAO and UNDP to ascertain the availability of raw materials for wood based industries in selected area of the country. PIS was organised into FSI in June 1981.

13.1.20. The Forest Survey of India is headed by a Director General. The organisation has its headquarters at Dehradun where major number of professional staff are based and responsible for planning, designing, quality control and administration as well as direction. There are four zonal offices located at Shimla, Kolkata, Nagpur and Bangalore, each headed by a Regional Director. The National Forest Data Management Centre (NFDMC) and the Training & Forest Inventory (TFI) units at Dehradun are headed by Joint Directors. The Headquarters as well as the Zonal offices work in close coordination at carry out various activities of FSI. There are about 25 Professionals, 100 Technicians and about 200 field and supporting staff. In addition, about 50 technical associates (TA) recruited for short term projects and special studies work in the organisation.

The main objectives of FSI are as follows:

13.1.21. The mandate of FSI was revised in 1986 and following objectives were set for FSI:

- To prepare a comprehensive State of Forest Report (SFR) including National Vegetation Map (NVM) once every two years. It will also prepare thematic maps through use of remote sensing data with minimum essential ground truth verification (most ground-truth verification would be done by the respective state governments) on a ten year cycle.
- To collect, store and retrieve necessary forestry and forestry-related data for national and state level planning and to create a computer based National Basic Forestry Inventory System (NBFIS).
- To design methodologies relating to forest surveys and subsequent updating. This would include methodologies for
    - (ii) Vegetation mapping including thematic maps through use of satellite imageries/aerial photographs.
    - (iii) Ground-truth verification.
    - (iv) Growing stock and volume assessment.
- To undertake work in regard to preparation of forest inventory in selected States/UTs on agency basis till the establishment of there own resources survey units.
- To impart training in modern forest survey techniques to foresters at various levels of responsibilities in the States/UTs/GOI.
- To advise the States/UTs on design and development of regional NBFIS.
- To support and oversee techniques/inventory work undertaken by State/UT Forest Departments.

2.3 Major Activities during XI Five Year Plan

13.1.22. The major and regular activities include forest cover mapping using remote sensing technology, estimation of growing stock of forests and trees outside forests through national forest inventory (NFI) and capacity building of State Forest Department officials on modern survey methods. In addition, FSI undertakes special and project level activities as requested by government institutions. The details are as follows:

2.3.1 Forest Cover Assessment

13.1.23. FSI does wall-to-wall mapping of forest cover of the country in biennial cycle. Starting in the year 1987, 10 cycles of forest cover mapping have been accomplished in the last two decades. With the advancement in the technology of remote sensing and availability of higher skill of human resource and infrastructure at FSI, the forest cover assessment of the country is currently being done at 1:50,000 scale using digital image processing (DIP) technique.

13.1.24. The interpretation of satellite data is mainly done at headquarters in the NFDMC laboratory. The NFDMC laboratory is equipped with 60 high end workstations with latest DIP and GIS software viz. ERDAS and

Arc GIS. The interpretation work is supported with extensive ground truthing and estimation of accuracy of interpretation. The findings are published in the form of State of Forest Reports (SFR).

National Forest Inventory

13.1.25. FSI has been conducting field inventory using statistically robust approach for estimating the growing stock (volume) and other parameters of the forests by laying out systematic sample plots since PIS days in 1965. About 69.2 million ha of the country's forest areas have been inventoried with some areas more than once and about 140 reports have been published until 2000.

13.1.26. Since 2002 National Forest Inventory has been launched to estimate growing stock of forests and trees outside forests at national level in which the country was divided into 14 physiographic zones. Sample of 10 percent districts (or 60 districts in the country) randomly selected and distributed over all the physiographic zones is taken for detailed inventory of forests and TOF to estimate the growing stock at zonal and national level during a cycle of two years. These estimates are to be further improved in the second and subsequent cycles as the data of first cycle will be combined with second and subsequent cycles. The random selection is without replacement; hence each time new districts are selected. Every year FSI does inventory at around 8000 randomly generated sample points.

Assessment of Trees Outside Forests

13.1.27. Extensive tree wealth outside continuous forested areas in the country termed as "Trees Outside Forests (TOF)", these are in the form of small woodlots and block plantations, trees along linear features, such as road, canals bunds, etc. and scattered trees on farmlands, homesteads, community land and urban areas. At present more than 80% of the wood produced in the country comes from TOF. Inventory of trees outside forest areas is of great importance in planning as this, together with the forest inventory, provides a complete picture of wood/forest resources. FSI has been carrying out TOF assessments since early 1990s. Its estimation at national level has started since launching of NFI in 2002.

Projects and Special Studies

13.1.28. Besides mandated activities, FSI undertakes special studies and projects from time to time on the request of government institutions. In the recent past approximately 15 such studies have been successfully completed of which the notable ones include Assessment of Trees Outside Forests in Punjab State, Assessment of Forest Cover in Tiger Reserves of India, Assessment of damage to ecology due to Tsunami, Preparation of baseline data for preparation of Working Plan – a Case Study of Kolasib Division of Mizoram, Assessment of growing stock and increment in India's Forest, Assessment of Mining area in Forests, Assessment of Forest Cover burnt by Forest Fire, Status of Forest Cover in Project Tiger Reserves, Forest Typing mapping of India etc. This rich experience of FSI in use of such technology has attracted a large number of projects on contemporary forestry areas from different Forest Departments, Ministry of Environment & Forests and other Ministries

Training

13.1.29. Training unit of FSI has been imparting training to forestry personnel since 1981 with the objective of building the capacity of officials of State Forest Departments on the modern techniques applied in forest surveys. Forestry personnel of various levels are provided training in Application of Remote Sensing (RS) and Geographical Information System (GIS) in Forest Management, Application of GIS in preparation of Working Plans, and Applications of Global Positioning Systems (GPS) in Forest Survey and Demarcation of forest boundaries and assessment of areas. The training courses are of one to two weeks duration and about 12 such courses are organised in a year having a judicious mix of theoretical and practical classes. Till date, more than 2900 forestry personnel from different State Forest Departments have been trained. FSI has organised many international training courses on forest inventory electronic data processing and remote sensing in the past. On the request of the State Forest Departments and Project Elephant of the Ministry of Environment & Forests many outreach training courses mainly on the use of GPS has been conducted by FSI in field in recent past.

Proposed New Activities

13.1.30. The following additional activities are proposed in the XII five year plan:

Creation of spatial database/NFIS (including forest area as layer)

13.1.31. To overcome the problem of inadequate spatial forestry information system, the institution of NFIS is proposed to be established. The objective of NFIS is to prepare a blueprint for effective management of programmes by development of spatial data as well as forest statistics database and adequate networking with

the State/UT Forest Departments. The NFIS will also collect, compile and disseminate information of the production and consumption patterns of forestry products including Timber, Non-wood Forestry Products, Forest Trade, Export and Import of Forestry Products etc.

Near real time forest fire Monitoring

13.1.32. FSI is monitoring forest fires of the country since 2004 using remote sensing based system develop by the University of Maryland (USA)and NASA viz MODIS Rapid Response System. After collecting coordinates of the fire spots, FSI maps the forest fires through GIS analysis. At present time lag between fire detection and reporting is about 24 hrs with modified activity it will be brought down to 3 hrs.

Near real time monitoring of Forest Cover in Eco-Sensitive zone

13.1.33. Considering the high population pressure and the developmental activities in view of the rapid economic growth of the country, it is necessary to keep a close watch on the ecologically sensitive areas. Forest ecosystems in certain parts of the country like western Himalayas, north eastern region, western and eastern ghats are unique and harbor rich biodiversity. Preservation of the ecology of these regions is of utmost importance for the environmental security of the country. Maintenance of adequate tree cover is very essential in these areas of the country and hence needs to be monitored on periodic basis.

Monitoring of incremental carbon stock

13.1.34. The Prime Minister's National Action Plan on climate change has 8 important national missions. One such mission is Green India Mission in which it is mentioned that "Forests also constitute one of the most effective carbon-sinks." Therefore, enhancement of carbon stock in forest is one of the outcome of most of the afforestation schemes. To monitor this outcome this additional activity has been included. For the proper study of climate change including requirement of REDD+, the country must have information on carbon stock in India's forest on a periodic basis at national and regional level. The growing stock constitutes the basis for calculation of carbon stored in the forests which is obtained from forest inventory done by FSI on regular basis. Presently only 60 districts are inventoried during a cycle of 2 years which means the entire country will be covered in 20 years of time. However, there is a need to reduce this time period to 10-12 years so that the reliable information can be collected for the entire country at a shorter span which will be useful in calculation of carbon stored in India's' forest both at national and sub-national level. This can be achieved by intensifying the current inventory work and involving States Forest Departments as partner in this endeavor.

Monitoring of plantation & other activities under centrally sponsored schemes

13.1.35. The MoEF is sponsoring a number of country-wide afforestation programmes/ schemes like Green India Mission, CAMPA and National Afforestation Programme, which involve sizeable financial expenditure. The funds are provided to the executing agencies at district or State level primarily for tree planting and certain supporting activities. In view of the huge financial investment and criticality of the endeavour in terms of ecology, climate change and rural livelihood support, it is prudent to monitor its success on the ground for the sake of financial accountability and even more for the purpose of applying course correction whenever and wherever necessary. The desired monitoring is now possible with the satellite imageries and well designed ground survey, an approach has been developed by the Forest Survey of India (FSI) in its core activities.

Integrated information system for monitoring of CSS

13.1.36. The monitoring of various centrally sponsored schemes will generate a wealth of spatial and non-spatial data for the whole country. The field data will have a large number of attributes such as area, latitudes & longitudes, species name, their age etc. The entry point data will contain information such as watch tower, check dams etc. All this data will accumulate into a huge volume over time as it will be required for continuous monitoring. Therefore this data will require to be archived in a well designed database for easy retrieval and analysis. This could be an important input for trend studies, research and modeling. Therefore it is proposed to constitute a separate unit.

Creation of R&D Unit at FSI HQ

13.1.37. The proposed task of country-wide afforestation monitoring is heavily dependent on modern RS/GPS/GIS/MIS and communication technology wherein new tools and techniques are emerging at a very fast pace. On the user side, there is increasing demand for instant information online, in near-real time, in more floristic specificity and higher spatial precision. Beside these demands, there are forestry specific challenges like

phenological-physiological changes in the plants in different seasons, due to weather aberrations, disease or moisture stress etc. which affect the imagery radiometry. FSI has to imbibe the relevant knowledge from various academic/research institutions and internet sources, and has to develop its own innovative solutions. All such tools, techniques need to be duly researched/tested and customised for the specific use, and to be transferred to the technical staff for application in practical work. To address all such forestry related challenges, FSI needs to build necessary human capabilities and institutional infrastructure, and therefore proposes a Research and Development unit at FSI HQ at Dehradun.

Creation of two zonal offices

13.1.38. The huge quantum of the proposed monitoring work necessitates a re-look at the jurisdiction aspect of the existing zones. At present North Eastern States are placed under East Zone at Kolkata which has 13 States/UTs under its jurisdiction. Western India is covered partly by North Zone at Shimla which has 9 States/UT; and partly by Central Zone at Nagpur which has 6 States/UTs. For effective execution of the proposed monitoring work, it is necessary to create two more Zones. Therefore it is proposed to create a North-East zone with HQ at Gauhati with jurisdiction over seven NE States and a West Zone with HQ at Gandhi Nagar with jurisdiction over the western States.

Creation of Geomatic Cell in zones

13.1.39. The monitoring work, as discussed above, necessarily requires a robust GIS infrastructure, besides the ground surveys. Due to country-wide distribution of the CSS activities, it is more convenient and cost effective to undertake the ground surveys, GIS analysis and satellite data processing at the level of FSI Zonal offices stationed at Simla, Kolkata, Nagpur and Bangalore. For this purpose, the zonal offices need to be duly strengthen in terms of RS/GIS/GPS infrastructure as well as in terms of the above described field crews for ground surveys.

Augmentation of Human Resource

13.1.40. For the proper execution and control of the additional activities additional technical and support human resource is required. It is pertinent to mention here that the few of the work can be carried out only by the permanent staff and for other works consultants/persons on contract basis will be engaged. About 214 permanent and 550 other consultants/persons on contract would be required to carry out additional activities.

Equipment

13.1.41. Depending upon the activity, number of equipment like; work stations, Differential GPS, GPS, Plotter, Scanner, Personal computer, printers, densitometer, laser distance finder, digital camera and other survey equipment would be required.

Building

13.1.42. Two new zonal offices of FSI are to be created at Guwahati in North East and at Gandhinagar in West India. Office building and residences of officers/staff will be constructed in a phased manner for which necessary allocation in budget will be required. The construction activities will be carried out by Civil Construction Unit of Ministry of Environment and forests in two years.

Budgetary Support

13.1.43. The total expenditure for proposed additional activities for the XIIth five year plan would be around 225 crore. Total requirement of funds from the Planning Commission for XII Five year plan inclusive of the present level of assistance would be about Rs 280 crore.

Establishing Robust mechanism for Forest Resource Assessment

13.1.44. Modern information technology tools for collating, analyzing, and making easy access of information should be applied, and efforts should be to link most information on forest resources with maps/spatial data with GIS capabilities. FSI may serve as the nodal agency and repository of national forestry spatial database. The web access to such databases should be facilitated for their effective use. Biennial assessment of forest cover by Forest Survey of India is one such major effort but the forest cover is just one parameter to monitor status of forests in the country. Regular monitoring of other important parameters like, growing stock, regeneration status, NTFP, production and consumption of forest products etc. are also important for proper qualitative understanding of the dynamics of the forest resources. There is an urgent need to strengthen forest resource assessment

activities at the national as well as at the States level under a coordinated programme. The Forest Survey of India can be adequately strengthened to play a nodal role in this regard.

13.1.45. The preparation of good management plans (working plans) must be accorded top priority, and Infrastructure for inventory and data processing is to be seen as the top priority. Though some states like Tamil Nadu, Andhra Pradesh, Madhya Pradesh etc have started using modern techniques for preparation of working plans but the condition in many other states are required to be improved. There is a need for preparation of these plans using more scientific ways of collection, analysis and interpretation of data for rational prescriptions synchronized with the policy objectives of forest management in the National Forest Policy like maintaining the quality of forests in context of 'ecological considerations' through scientifically selected "indicators" and provision of micro planning in JFM areas. Additional components on disease and pest surveillance, drying of trees, addressing the problem of grazing etc for maintaining the quality of forests may also need to be considered. It is also necessary to provide, on priority, the state-of -art infrastructure and capacity building for inventory, data analysis, assessment and management planning in all the states. Support may include activities like purchase of equipment, viz., computer hardware & software, GPS, equipments for survey and inventory, hiring of external specialists/services, specialized training of field staff, and also the cost of important studies which could form important inputs to the work. Similarly, basic infrastructure for survey and provision for outsourcing/hiring professional services for this purpose may also be needed on priority.

13.1.46. Keeping the above things in mind, following steps are essentially required to strengthen the existing system of forest resource assessment at national/ state level:

- FSI can serve as a nodal agency for forest resource assessment and monitoring of the CSSs at National level.
- Forestry Geomatics Centre with state of art equipments and trained manpower to be established with SFDs in all the states.
- Information of forest resources available in Divisions must be compiled in a common format, to facilitate collation and compilation at state/national level.
- Networking of all the states with FSI to establish Geospatial database for the forestry sector at national level.
- Near real time monitoring of country's forest resources for change detection.
- Monitoring of activities under flagship programmes like GIM / CAMPA and other centrally sponsored schemes.

Financial Requirement

Support to FSI (for 5 years)			Rs.100 Crores
Support to SFD (for 5 years for all States)			
a.	Infrastructure -		Rs. 20 Crores
b.	Equipments	-	Rs. 50 Crores
c.	Data	-	Rs. 20 Crores
d.	Data Collection, field Survey etc		Rs.30 Crores
	Total		**Rs 220 crores**

Establishment of centralized data node and Information Nodes in State Forest Departments

13.1.47. As a part of the National Forest Information System, a number of activities are contemplated at FSI as the central node for the NFIS. These include inter alia strengthening the SFDs and enabling them for information generation, collation, analysis and integration into the central (at the state level) database. The manpower and machines will be required to be provided to the SFDs and the other institutions accordingly.

13.1.48. Each SFD should have an information node to deal with the information being collected. The node at the SFD should be connected to the Central Node and reports should be generated from the Central Node. This will ensure uniformity in reports. The nodes would be created at following locations:

(a) 35 nodes in each SFD/UT
(b) GoI offices – MoEF, Regional offices, DGCIS, CSO, NSSO
(c) Institutions – ICFRE/FSI/WII/IIFM/IPIRTI/GBPIHED/CASFOS/IGNFA etc.
(d) NGOs, Industrial Associations, Forest based and pharmaceutical industries

13.1.49. The total nodes are expected to be approximately 80. They will be housed in the stakeholders' premises. Six Domain Experts shall be housed in the zonal offices of Forest Survey of India. One Domain Expert shall work with the Division of Statistics, ICFRE. One Project Associate will be provided to each node and two persons will be provided by the organization to work in each node. Thus, three persons will ne manning a node.

The software will be developed after assessing the information and functional requirements. The total budget requirement is of about Rs 32 crores.

Wildlife Institute of India – Institutional and Technology Advancement

13.1.50. Wildlife Institute of India (WII) has been mandated to 'Build Capacity for Wildlife Conservation' in the country. It has continued to play diverse roles relevant to professional training, higher education, research and advisory since its establishment in 1982. Soon it became an organization of repute for wildlife matters in the South and South-East Asia. Now, on completion of two and a half decades of its existence as an autonomous organization, the wildlife in India faces new challenges on account of shrinking habitat and enhanced conflict arising owing to rapid infrastructure development. Wildlife conservation efforts, therefore, need to be dynamic keeping pace with changing conditions to become more effective. Wildlife Institute of India should, therefore, remain in the forefront as a professional leader and 'think tank' so as to provide capacity to 'Lead Change' and address emerging challenges of wildlife conservation or 'Conservation in Transition'. Accordingly, it should aim to maintain scientific excellence, strive for an efficient team of committed professionals, and emphasize creative and innovative partnerships. Thus, in the first place the strengthening of knowledge capability of WII as an organization is of utmost importance. At the same time, advancement of technology and its integration with field conservation is also vital. The Twelfth Five Year Plan Period is critical for adopting broad based approaches required for enhancement of knowledge capability of people involved at WII and others, improved infrastructure, processes and best practices, and application of appropriate technology in the field.

Strengthening Knowledge Capability of WII

13.1.51. The knowledge management is essential to maintain organization's ability and capacity to deal with emerging challenges. It requires developing four dimensions: data, information, knowledge and wisdom. It has been well realized that people, process, and technology are key factors for the success of knowledge management. People are the key to the success of a knowledge management programme in an organization. Knowledge can be enhanced through learning, sharing, and culture of active experimentation. A process in place is just not enough. Cognitive, social, and organizational learning processes are essential to the success of a knowledge management strategy while measurement, benchmarking, and incentives are essential to accelerate the learning process and to drive cultural change. Technology is an enabler in a knowledge management programme. The Institute aims to continuously strengthen capabilities of its scientific staff through specialized trainings, study tours abroad, scientific exchange, networking with international experts/resource persons besides supporting capacity building of stakeholders through organized training and field oriented wildlife research agenda. Strategies for improved management of protected areas and implementation of landscape approach to conservation are some of the critical requirements.

Proposed Technological Upgradation

13.1.52. WII needs to be upgraded technologically so as to support field conservation. Following four specialized technology advancement are visualized for its development.

National Wildlife Forensic Research Facility

13.1.53. This facility will develop protocols for identification of species from parts and products used in illegal trade of wildlife using morphometric as well as molecular (Proteins & DNA) tools and techniques. The output will be in form of a web-enabled wildlife forensic database. It is proposed to collaborate both nationally - Laboratory for the Conservation of Endangered Species (LACONES), Hyderabad; Centre for Cellular & Molecular Biology (CCMB), Hyderabad; National Centre for Biological Sciences (NCBS), Bangalore etc. – and internationally with the U.S. Fish & Wildlife Service National Forensic Laboratory, U.S.A. for developing and using the next generation of DNA based species identification tools and for addressing a wide range of conservation genetics issues.

Protected Areas Geodatabase at Enterprise Level

13.1.54. WII has established a RS/GIS facility and has prepared a Protected Area (PA) Boundary database for the country and has developed spatial databases for 60 out of 663 PAs in the country. This database needs to be upscaled to an enterprise level using modern RS/GIS tools so as to enhance its use in both routine management and monitoring of the protected areas resources and also to assist in wildlife conservation policy development and particularly in addressing conservation development issues especially those relating to infrastructure development in and around the protected areas.

Wildlife Health and Disease Research and Monitoring Facility

13.1.55. In many forest and wildlife areas in the country the 'interactions' between domestic livestock and wild animals take place, which often lead to exchange and manifestation of a variety of zoonotic diseases. Besides this, there are a number of emerging infectious diseases which are mediated/ transmitted through wild animals and birds (particularly migratory). Presently, the risk preparedness and mitigation ability are very meagre compared to the potential of both economic and ecological losses that may occur, once the disease outbreak occurs. Global experience of dealing with diseases such as SARS, HINI etc. are indicative of the lack of 'information-base' as well as inadequate capacity to deal with them. Globally, the concept of 'one health' is emerging wherein human welfare in terms of disease 'from' and 'to' wild animals needs to be comprehensively understood. This will require upgrading wildlife health laboratory and collaboration with reputed veterinary institutions both nationally and internationally. It is proposed to establish a facility for nation-wide wildlife disease surveillance and monitoring in and around protected areas and for conducting research on disease transmission and for developing a framework for prophylactic interventions in accordance with the concept of 'one health'.

Remote Monitoring of Wildlife Populations

13.1.56. In recent times a number of modern tools and techniques have been applied for remote monitoring of wildlife populations both in case of terrestrial species (tiger, leopard, elephant, rhino etc.) as well as in aquatic species (turtle, dolphin, otter, etc.) However, the use is beset with a large number of technological issues that are further compounded by a range of behavioral repertoire of the wild animal species. No radio/satellite collars as well as camera-traps are manufactured in India and there is no India satellite/sensor that is capable of detecting and transmitting signals sent by the satellite collars put on wild animal species. The 'Sensor Network Technology' holds promise but it is in a very nascent stage and needs massive upscaling of R&D efforts. It is proposed to develop a consortium of institutions (WII, IITs, IIITs, NRSC, IIRS, select Universities, etc.) to develop tools, technology and capability for remote monitoring of wildlife populations.

Revolving Fund – Urgent and Time Bound Assigned Activities

13.1.57. Increasingly, WII is being asked by Government of India and the Supreme Court to undertake at short notice studies on impact assessment specific to developmental activities, facilitate/preparation of wildlife management plans/ conservation plans and also provide much desired technical information on ecosystems and endangered species for effective planning of in situ as well as ex situ conservation efforts for them. This often requires substantial manpower support from within the organization and outside resource persons, and field visits. In absence of readily available resources for such unscheduled activities, it is proposed to have a revolving fund to facilitate such urgent and time bound advisory services. This revolving fund would continuously be replenished through financial input provided by Government of India for conducting such studies.

Establishment of WII's Regional Centres

13.1.58. At the time of establishment of WII, the Government has visualized that Institute should ultimately aim to establish its Regional Centres so as to facilitate improved regional cooperation, networking, applied research, training and technical assistance in a comprehensive regional context. 'Regional Centres' are expected to be gateway to wildlife information and hub of regional expertise, cooperation and collaboration for improved strategies for 'conservation' amidst 'all round development' and human security. A policy decision for the establishment of Regional Centres in a phased manner has already been taken at the highest level i.e. by the Hon'ble Union Minister for Environment and Forests in September, 2009. The proposal seeks to initially establish three Regional Centres viz. North East India, Western Ghats, and Central India in Phase-I i.e. XII Plan Period and it involves creation of 21 Group-A Posts of Scientists, contractual engagement on 9 technical positions and 24 administrative positions at an investment of Rs. 79.05 crore over a five year period. Subsequently in August, 2010. the Planning Commission while according 'in principle' approval had advised that these Regional Centres will also establish a well equipped forensics lab and library to serve as centre of excellence and capacity building in the region. Further, Regional Centres will have IT enabled networking with all regional veterinary institutions, line agencies, universities, NGOs, and wildlife experts through an interactive regional web portal besides setting up a Wildlife Data Informatics Cell. The Planning Commission directed that necessary approval for creation of new posts, contractual engagement on technical and administrative staff positions and financial implications from the Ministry of Finance as per procedure be obtained.

Table 13.1.1. Fund Requirements for Strengthening Knowledge, Technology Upgrading, Corpus, and Regional centres

Item of Work	Estimated Cost (in Rs. Crore)
Strengthening Knowledge Capability of the Wildlife Institute of India: Development of WII's staff capacity - specialized trainings, study tours/ overseas visits, visits by international consultants/resource persons for providing specialized training, scientific exchange, organization of national and international conference on emerging themes of wildlife Conservation, and networking with national and international organizations and sharing experience	**15**
Technology Upgrading at WII • National Wildlife Forensic Research Facility – **40.0 Crore** • Development of PAs Geodatabase at Enterprise Level – **10.0 Crore** • Development of Wildlife Health & Disease Research and Monitoring Facility – **15 Crore** • Remote Monitoring of Wildlife Populations – **10 Crore**	**75**
Revolving Fund – Facilitation of urgent EIA/ Cumulative assessment studies, preparation of management plans/conservation plans, and provision of essentially required scientific information on fragile ecosystems, endangered species for policy/decision making	**5**
Establishment and Running of Regional Centres	**80**
Total	**175**

Table 13.1.2. Total Financial Requirement for Forest Resource Assessment and Information Management

Activity	Amount (Rs crore)
New activities of FSI	280
Establishing Robust mechanism for Forest Resource Assessment	220
Establishment of centralized data node and Information Nodes in State Forest Departments	32
Proposed Technological Upgradation (Wildlife)	175
Total	**Rs 707 crore**

Chapter 3
Strengthening Forestry Research

Introduction

13.1.59. In an era of globalization and rapid economic integration in a fast changing world and consequent pressure on the natural resources, the role of forests too has become very crucial for sustaining the of food and water security; conservation of biodiversity; mitigating the effects of climate change and providing livelihood support to millions of poor people living in India. The tropical climate and fragile ecological situation prevailing in many parts of the country necessitate that, if India has to sustain 9% plus rate of growth in our economy, massive investment will have to be made in the forestry sector, on the lines of roads, power and other infrastructure projects. The pressure on forests is increasing due to all round demand for diversion of forest land for non-forestry uses like mining; roads and other developmental projects. The role of the remaining forests in providing food and ecological security becomes all the more important. In this regards the setup for Forestry Institutions, Institutional Changes and Forest Technology need to be deliberated seriously for the success forest management.

Recommendations of National Forest Commission

13.1.60. This sub-group had wide ranging consultations with various stakeholders on the Terms of References. The group took note of the recommendations of the National Forest Commission and decided that these are very relevant for the future management of forests and need to be accepted by the Government for implementation during the 12th Five Year Plan. As stated earlier in Chapter 1, it is proposed that a cell may be created in the Forest Policy Division of MoEF to implement the recommendations of NFC.

Strengthening Requirements of ICFRE

13.1.61. The population growth, migration, urbanization, globalization, changes in technology, climate change and emergence of new forestry agenda at the national and international level are necessitating transformation of forestry research infrastructure. A large number of institutes, universities, private bodies and non-governmental organizations, both inside and outside the traditional forestry sector, are engaged in forestry research recognizing it as an important sphere of research. These drivers of change also have a significant impact on forestry education which has emerged from the portals of forestry research institutes, and is now strongly anchored in universities across the country.

Present Scenario

13.1.62. The ICFRE is an autonomous organization of MoEF, which was constituted by a Cabinet decision by Government of India in 1986 to give new thrust to forestry research. However, even after about 25 years of its formation due to various constraints and administrative bottlenecks, it has not been able to fully meet the mandate given to it when research setup in the country was reorganized in 1986. The autonomy was never granted in real sense and it lost its prestige as well as an historical government organization which was responsible for establishing the culture of scientific management of forests in India and other parts of the world. Being an autonomous body, it lost its financial support from the government as in the midst of economic reforms it was supposed to generate resources for its growth. In the national interest forestry research like agriculture research has to be public funded. The ICFRE has not yet evolved a suitable HRD policy and the numbers of scientific posts over the years have been reduced due to abolition of large number of posts of scientists, on the other hand requirement of professionally trained manpower has increased to meet the new challenges. Therefore, to meet the future needs, on the recommendations of Sixth Pay Commission of GoI, the Government had upgraded the post of the Director General, ICFRE to the Apex Scale in the rank of Secretary to Govt. of India and also upgraded the four Deputy Director Generals and Directors of six ICFRE Institutes to the Additional Secretary level. In view of the changes made by the Government, it becomes essential to adopt the pattern followed by similarly placed other R & D organizations of India.

13.1.63. Over the last century, there has been an immense change in the aims and objectives of managing forests and forestry research; both have to be mainstreamed to work and address the emerging needs of the civil society. However, the structure of the ICFRE including the scientific and technical strength at the cutting edge has not undergone adequate changes. The objectives and challenges for achieving a broad based higher growth rate in forestry is needed for a more inclusive development that includes improvement in quality and relevance of the forestry research to society.

13.1.64. In an era of globalization and rapid economic integration in a fast changing world and consequent pressure on the natural resources, the role of forests too has become very crucial for maintaining the hydrological cycle; sustaining the food and water security; conservation of biodiversity; mitigating the effects of climate change and providing livelihood support to millions of poor people living in India. This has increased the mandate of ICFRE manifold. The tropical climate and fragile ecological situation prevailing in many parts of the country necessitate that, if India has to sustain 9% plus rate of growth in our economy, massive investment will have to be made in the forestry sector, on the lines of roads, power and other infrastructure projects. The role of the forests in providing food and ecological security becomes all the more important. In this regards the setup for Forestry Institutions, Institutional Changes and Forest Technology need to be deliberated seriously for delivering outputs at a faster pace. ICFRE and its institutes have been leading the forestry research in the nation over more than a century. During this journey ICFRE and its institutes have laid the foundation of scientific forestry which is recognized and appreciated globally.

13.1.65. Guidance, direction and appropriate liaison at national level is required to steer and if need be, reorient the forestry research to be in consonance with the national developmental priorities. There is an urgent need to bring new scientific, administrative and technical infusion by establishing additional Centres and Bureaus to better address national mandate of ICFRE. The much needed functional freedom and flexibility may be attained

in the form of an Institution of Excellence with enabled support from an act of the Parliament. This will help in the growth of FRI Deemed University as well.

Synergy among different stakeholders

13.1.66. The need of the hour is for convergence and synergy among different stakeholders working in the field of forestry. There is also the need to bring more freedom and flexibility from the red tapism, professionalism and organisational fineness in the research set up of the forestry. In view of this, at one stage in the first board meeting of the autonomous ICFRE on 24th July 1991, a proposal was mooted to make the DG ICFRE as Chairman of the BoG. At that time it was decided to wait till the Director General post of ICFRE is elevated to the level of Secretary GoI. The Ministry of Environment and Forests had to take a view on this. However, for better coordination and liaison with other national/international bodies and other ministries, it is proposed that the core component of headquarter of ICFRE be shifted to New Delhi. This has already been approved by the Board of Governors in the recently held Board meeting on 24th June 2011. It is expected that this would promote, facilitate and speed up coordination to address the research issues and solve scientific problems facing forestry sector of India. It will give a better opportunity to ICFRE to orient and coordinate its research in tune with international commitments of the Government of India. This is particularly important in present times as forestry is at the centre-stage of international negotiations, conventions, action plans and green business and the need to meet the Millennium Development Goals of reducing poverty to 50% by 2014. The ICFRE has been accredited as Designated Operational Entity (DOE) for validation, verification and certification of CDM projects under the sectoral scope of 'Afforestation and Reforestation' of the United Nations Framework Convention on Climate Change (UNFCCC). This would help forge further such linkages. The financial support to ICFRE needs to be scaled up significantly to meet the new national goals. To treat ICFRE as any other autonomous organization for financial support would not be in the national interest as forest conservation need investment on the pattern of infrastructure sector so that food, water and ecological security of the country can be ensured. ICFRE, through its institutes, would also be responsible for the networking with other organizations, international bodies and private sector bodies for better utilization of research infrastructure, twinning arrangements and transfer of technologies.

Creation of Corpus funds

13.1.67. One of the options for better resource mobilizations apart from hiking the budgetary support is to adopt innovative ways to garner funds. Therefore, a corpus of Rs 1000 crores, through CAMPA Fund is proposed to be created under MoEF to meet the needs of infrastructure for the field staff in all the states/UTs. In addition, a corpus of Rs 1000 crores, through CAMPA Fund, is proposed to be created under ICFRE for strengthening research strength of eight institutes and four centres of ICFRE and to provide sustained extension programmes through them and also to cater to the research/ extension /education infrastructure needs of the states and UTs. Interests from these corpuses would be utilised for creating infrastructure for the field staff in the States and for strengthening forestry research at ICFRE institutes, other private institutions, and universities and the states/UTs. This will allow freedom and flexibility in planning new research priorities on competitive basis and in the long run will reduce the budgetary liability of the government. For this purpose the government may move the Supreme Court as it is well within the goals of creation of CAMPA.

Strengthening of Man Power in ICFRE

13.1.68. The ICFRE functions through a permanent cadre of scientists and officers on deputation from the forest departments. Over the years instead of increasing the number of researchers there has been a net attrition in number of posts. In ICFRE, the total sanctioned Group ‘A’ posts are 387, of which 280 are the scientists and rest 117 are filled on deputation, mainly with IFS officers. The strength of Scientists in ICFRE was 333, but on account of ban on recruitment 53 posts of Scientists were abolished during the period 2002-2009. On the other hand, among similarly placed research organizations like ICAR and CSIR, ban on the scientific manpower was not made applicable. Thus, immediate need is to revive 53 posts of Scientists in ICFRE. Further, to meet the future needs of the country, it is also necessary to increase the strength of scientists and practicing foresters to work on more focused research in the emerging fields. The research position should be enhanced gradually to meet the requirements of different parts of the country. In addition, during the 12th Five Year Plan, around 75 posts of scientists and 25 posts of foresters should be created as research is needed to be done in emerging fields like forest hydrology, climate change, forest economics, forest management, productivity enhancement, frontier areas of research in genetics and genetic engineering, Biodiversity, wood science and technology etc.

Strengthening research infrastructure of ICFRE for better scientific performance

Library Resources

a. **Strengthening Departmental Libraries:** Departmental and institutes libraries need to be strengthened for each institute on priority basis.

b. **Electronic Journals:** It is suggested that the ICFRE should subscribe to relevant electronic journals required by various institutes / centers of the council.

Purchase of modern equipments

13.1.69. It is emphasized that equipments and facility of ICFRE and its Institutes have become old and obsolete and need to be upgraded/replaced with modern and state of art equipments. The need of the hour is to develop centralized equipment facility for the expensive equipments (like Electron Microscopes, Automatic sequencers, various kinds of precision analytical equipments and other modern equipments for conducting research on the frontier areas of forestry sciences), which should be operated by permanent trained technicians. Facility may be made available to external organizations on payment basis to earn the revenue.

Scientific collections (museums, collections and depositories)

13.1.70. Scientific collections are widely recognized as vital part of the common infrastructure for science. ICFRE institutes hold a variety of collections, depositories and museums related to forestry and are known the world over. Basic knowledge originated from these collections has given fame to the council. These infrastructures are national heritage and need to be strengthened and modernized for the future generations.

Strengthening of forestry extension programme

13.1.71. It is known fact that R & D plays an important role in the generation of new scientific knowledge in the labs and institutions. However, the extension of such innovative techniques is always carried out by well trained and specialists of research extension workers and subject matter specialists. Though the Directorate of Extension in ICFRE have been existing since the inception of ICFRE, there is no specialist in extension and this has hampered extension activities. Similar is the situation in all most all the institutions of ICFRE. The make shift arrangements for functioning of the directorate in ICFRE and Divisions of Extension in different institutions has been causing serious problems. It is therefore required that proper extension specialists are appointed and deputed for specialists jobs. This approach would certainly benefit the ICFRE both in its higher output and better management of HRD. It is proposed that around 150 more Van Vigyan Kendras be set up for transfer of technology. To cater to the needs of tribal people under the FRA 2006, 50 Forest-Tribal capacity building centers be established.

Creation of a Directorate of Environmental Management and Accounting

13.1.72. Ecosystem services account for a large proportion of the goods and services consumed by the rural poor in developing countries. For example, ecosystem services account for 47% of goods and services consumed by almost half of the population (480 million) in India. The Ecosystem Services need to be assessed, monitored and accounted so that they could be exchanged as a commodity among different forest areas. A new Directorate of Environmental Management and Accounting should be created in ICFRE, headed by a CCF level officer.

Forestry research in states

13.1.73. Forestry research in states is being conducted through State Forest Research Institutes, Silviculture/R&D wings and universities. However, the infrastructure, manpower and funds are inadequate. It is proposed that ICFRE should also be entrusted with the work of planning infrastructure support and providing equipments for coordinating forestry research in the states. For this purpose the proposed CAMPA corpus funds may be utilized through MOUs between the states and research organizations.

Establishment of REDD (plus) Bureau

13.1.74. Following the spirit and mandate of the Kyoto Protocol the ‘Bali Action Plan’ was adopted a decade later during 13th CoP held at Bali, Indonesia, in December 2007 where parties to UNFCCC agreed upon to introduce REDD while recognizing the role of tropical and subtropical forest countries of the developing world in climate change mitigation through market based mechanisms.

13.1.75. India, which is one of the foremost tropical countries playing active role in climate negotiation since beginning, announced its first ever National Action Plan on Climate Change (NAPCC) in June 2008 to identify

measures and steps to advance climate change-related actions in the public and private domains following the Kyoto Protocol. India played a key role to broaden the scope of REDD with a comprehensive approach in the global negotiation on climate change. India's position was finally accepted in the 13th CoP at Bali when elements of conservation, sustainable management of forests and enhancement of forest carbon stocks were added to the then existing text of reducing deforestation and forest degradation as part of Bali Action Plan which turned the REDD approach into REDD plus with its added features.

13.1.1 India's approach to REDD

India advocates a comprehensive approach to REDD which has been termed as a REDD Plus approach. This approach argues for compensating countries not only for **reducing deforestation** but also for **conservation and sustainable management of forest and increase in forest cover** (ICFRE 2007). The basic principle of this approach is that unit of carbon saved is equal to one unit of carbon added. In its submission to UNFCCC in August 2009, India has elaborated REDD as 'Reducing Emissions from Deforestation in Developing countries, Sustainable Forest Management (SFM) and Afforestation and Reforestation (A&R)' which further substantiates its comprehensive approach (MoEF 2009).

India advocates a mechanism outside the purview of CDM, with a national level accounting for REDD. Indian approach on financing REDD activities has changed from strict fund based approach to a mix of market and fund based approaches; a central funding should compensate for maintenance of forest carbon stocks whereas money for compensating change in carbon stocks due to decrease in deforestation and degradation or increase in forest cover could be generated by selling carbon credits in the international market (MoEF 2009).

Institutionalizing Program and Policies for REDD (plus) Bureau under ICFRE

- REDD-plus Bureau to allow a phased approach to address the drivers of deforestation across different States of India.
- Development of REDD-plus strategies/policy to be developed at the national level.
- Demonstration of enabling policies and measures to display the implementation of REDD-plus and possibility of scaled-up investments among different physiographic zones of India.
- Demonstration of market and fund-based mechanisms facilitating performance-based payments for emission reductions and carbon stock enhancements that have potential of third-party verification.
- A community forestry system, including an effective framework for the distribution of benefits.
- The sharing of benefits from REDD-plus needs to be clarified along with the enforceable agreement within the parties.
- More user-friendly information on REDD-plus is needed at the community level across different states of India for its easier adoption.
- Broader and more integrated national land-use planning in consonance with the State Policies
- Stakeholder participation, particularly the industries, for climate change mitigation and adaptation.

Upgrading of the post of Secretary ICFRE

13.1.76. The post of DG ICFRE has been upgraded to the apex scale of Rs 80000 and the posts of DDGs and Directors of the Institutes of ICFRE have also been upgraded. Concomitantly, the post of Secretary ICFRE should also be elevated to the level of CCF in order to ensure better coordination with the senior officials of the council.

Wildlife Institute of India – Augmentation of Wildlife Research

13.1.77. Scientific information generated through rigorous research and inbuilt monitoring is vital for managing efficiently the complex and dynamic ecosystems and wildlife resources. Much of the diversity of natural living resources in India in now confined to protected areas besides managed forests and designated buffer zones of tiger reserves, elephant reserves, biosphere reserves, wetlands, and marine habitats. Despite concerted efforts by WII and some other select government and non-governmental organizations, quality wildlife research is just confined to about 20% protected areas, while majority PAs, and other conservation reserves from the deficiency of desired baseline information, ecological understanding, reliable data on biology, ecology, management and

socio-economic aspects. Increasingly, the landscape approach to conservation is being adopted for effective conservation of free ranging species viz. elephant, tiger, lion, snow leopard, rhinoceros, etc. Priority conservation landscapes require urgently much desired research information on ecological, management, and socio-economic aspects. WII is required to augment ongoing wildlife research manifold in order to overcome the current deficiency. Further, it is proposed to adopt 'adaptive management approach' through experimental research and All India Coordinated projects on priority conservation themes (habitat and invasive species management, wildlife population and animal damage control, long term ecological monitoring, and buffer zone management).

Table 13.1.3. Financial Requirement for Augmentation of Wildlife Research

Item of Work	Estimated Cost (in Rs. Crore)
Landscape level wildlife research – ecological assessments on threatened and rare species, and resource mapping	20
Adoption of adaptive management approach through experimental and All India Coordinated projects on priority conservation themes	10
Total	**30**

Indian Institute of Forest Management, Bhopal

Background

13.1.78. Established in 1982 as an Autonomous Institution under the Ministry of Environment & Forests, Govt. Of India, the IIFM was conceptualised in response to recommendations of National Commission on Agriculture (1972). Further in 1974, Govt. of India accepted the recommendations of Food and Agriculture Organization of the United Nations and Swedish International Development Agency. Besides, emphasis on renewable national resource system under Business Management was also suggested by Ford Foundation. All this necessitated the creation of Autonomous Institute to provide a formal identity in the field of Management Education in Forest & Allied Sectors.

13.1.79. Recognizing the need Govt. of India entered into agreement with Indian Institute of Management, Ahmadabad, to share the responsibility of establishing an independent and Autonomous Institute. The impetus generated by the recommendations culminated in an alliance with the Indian Institute of Management, Ahmadabad (IIMA) with the establishment of programme office at IIM Ahmadabad in1978 – 1981. The first, Ten Years Perspective Plan (1981 to 1991) of IIFM was prepared by IIM Ahmadabad. In August 1981 the programme office was shifted at Bhopal and IIFM Society was registered on 15th January 1982. The current/second perspective plan (2006-2016) of IIFM is under implementation and gives tremendous thrust on increased research, expansion of educational programmes, increased national and international linkages along with supporting infrastructure and resource base for effective implementation.

13.1.80. Since its establishment, in 1982 as an autonomous institution of the Ministry of Environment & Forests the Institute has developed as an educational, research, training and consultancy organisation at national as well as international level. The IIFM aims to provide leadership in professional forestry management aimed at environmental conservation and sustainable development of Ecosystems.

Vision of IIFM

13.1.81. To be among the leading international institutions in the area of forest and related environment development management and be respected both nationally as well as internationally, for its outstanding contributions in the field of education, training, research, consultancy, and thought leadership.

Roles and Objectives

13.1.82. The Institute, as a sectoral management institute, imparts education in forest management, which is a judicious combination of management, social, and forestry sciences. The Institute constantly endeavours to keep in touch with the problems of people, especially the forest dwellers and undertakes need-based research. The Institute tries to serve as a reservoir of knowledge in forest management and ensures proper integration of external and indigenous knowledge suitable to Indian context. The specific objectives of the Institute are:

(i) To serve different stakeholders of forestry, environment, and Development sectors and the society, in general, through development and dissemination of knowledge, human resource development through its education and training activities, and providing assistance in formulation and advocacy of relevant policies and strategies,
(ii) To be a national institution with international perspective and outreach, and
(iii) To build culture of excellence, achievement, cooperation and service within a framework of strong ethical patterns of behavior informed by universal values.

Activities of IIFM

13.1.83. To achieve the above – mentioned objectives taking further initiatives on the above, a road map has been drawn to achieve the following activities:

(i) Education and Training
(ii) Research and Consultancy
(iii) Dissemination of research based information
(iv) Development and maintenance of Database and Information Systems
(v) Policy Formulation, Analysis and Advocacy

Educational Programs

13.1.84. Presently the institute has four regular educational program viz. Post Graduate Diploma in Forestry Management (PGDFM) (1988) with the present strength of 90 students and proposed to increase 120 in the next five years. M.Phil in National Resource Management has been initiated in 2011 with the proposed strength of 20 students the program is recognized by Saurashtra University. IIFM is recognized as one of the Research Centres of ICFRE, Dehra Dun for Ph.D. Program since 1998. Till date, 29 scholars have registered for Ph.D. program and 4 Ph.D. Degrees have been awarded along with 6 thesis have been submitted. Fellow Program in Management (FPM) was initiated by IIFM in the year 2008-09 and in the year 2011 seven scholars have registered themselves for the program.

Training

13.1.85. The training workshops are two other need based activities addressed to the various stakeholders IIFM conducts short term (3 to 5 days) fee based as well as sponsored (tailor made specific to need of the sponsoring organization) training programs. These programs are organized in campus as well as off campus. So far, about 400 training programmes covering more than six thousand five hundred people have been conducted by IIFM.

Workshops & Seminars

13.1.86. IIFM keeps on regularly organizing workshops and seminars (national as well as international) on the themes of falling in its mandate for information sharing, networking, policy analysis and advocacy.

Research

13.1.87. Research is one of the another major activity of IIFM, which is performed projects funded by IIFM, as well as external funding through national and international agencies. Further, to strengthen the research three centres have been established:

- Ecological services and management
- Livelihood management,
- Sustainable Forest Management & forest certification

Besides above centres, IIFM is also having specialized research and training centre for:

a. Regional Center for NAEB, Govt. of India,
b. International Centre for Community Forestry(ICCF), and
c. Centre for International Tropical Timber Organization (ITTO).

National Facilitation Center at IIFM

13.1.88. IIFM, premier sectoral inter-disciplinary management institute, which already actively involved in strengthening forestry, environment and allied sectors through educational program, research and training since past 3 decades is well recognized for its contribution at national and international levels. Building on its expertise and experience IIFM would be one of the active partners in facilitating implementation achieving objectives and goals set in XIIth Five Year Plan.

13.1.89. Besides above activities an ongoing study on The Economics of Ecosystems and Biodiversity in India (TEEB-I), 2011-15 is under the overall coordination of the Indian Institute of Forest Management, Bhopal is being implemented. The study will further support implementation of GIM. It is in the background of a global study on "The Economics of Ecosystems and Biodiversity" (TEEB) which was initiated in 2007 by the G8 and five major developing economies with a focus on 'the global economic benefit of biological diversity, the costs of the loss of biodiversity and the failure to take protective measures versus the costs of effective conservation'. It presented an approach to help decision makers to recognize, demonstrate, and capture the values of ecosystems and biodiversity.

13.1.90. Keeping in mind the utility outcomes of TEEB-International and stakeholders consultation of TEEB in India, TEEB-India study has been commissioned by Ministry of Environment and Forests (MoEF), GoI, with Indian Institute of Forest Management (IIFM) as National Host Institution (NHI) to execute the study vide order No-12023/13/10-CS(I) dated 20th May 2011 in consultation with MoEF and further directive has been provided vide D.O. No. C-12023/13/10-Cs III dated 25th July 2011. The reason of MoEF selecting IIFM to steer this programme was to ensure that the methodologies developed, strategies adopted, consultations done etc. under TEEB –India should flow to the students and curriculum of the MBA course at IIFM. The study will, inter alia, cover the following across forest ecosystems, inland fresh water ecosystems and coastal and marine ecosystems:

13.1.91. The study shall be executed intensively in five states namely Andhra Pradesh, West Bengal, Himachal Pradesh, Sikkim, Maharashtra and Andaman and Nicobar Islands. IIFM shall consolidate the existing frittered, scant literature on the subject and subsequently build on this and prepare a tangible document for showcasing CBD-COP -11 to be held in India during October 2012. The final deliverables of TEEB Process Implementation for India will have comprising of India TEEB report, of which interim results will be delivered by November 2012 (COP-11) with a Final Report delivered by December 2013 and Capacity building for state governments to generate similar periodic evaluations in-house (2015).

The Proposal

13.1.92. In the light of its vision and mission there is urgent need to strengthen various activities of IIFM through infrastructure and resource base (qualitative & quantitative human resource) development. Against this background the proposal provides the present status of infrastructure and resource base along with need to strengthen the same in coming years in phased manner in coming five years to realize its objectives.

13.1.93. In order to cater to the academic needs of various stakeholders in the changing scenario faculty members are organized into eleven faculty areas, namely Information Technology & Quantitative Techniques, Communication & Extension Management, Eco System & Environment Management, Technical Forestry, Financial management, Environment and Developmental Economics, Marketing Management, Human Resource Management, Sociology and Community Development, Legal Environment and Strategic Management.

13.1.94. There is a need to further strengthen the research base at IIFM not only in all these four areas, but other emerging areas. In line with it's activities of the current perspective plans (Refer 3.4.4. iv & v), it is proposed to and to support implementation of GIMs strategy to achieve its objective:

Advance centers for:

(i) Policy Analysis
(ii) GIS and IT

Budget Requirement of IIFM

13.1.95. The proposed budget requirement, other than infrastructure, of IIFM for the XII Plan period is Rs 230 crores, spread over five years.

Indian Plywood Industries Research & Training Institute, Bangalore

Introduction

13.1.96. Established in 1962 as a co-operative research laboratory at the initiative of the Indian Plywood Industry with participation of the Council of Scientific and Industrial Research, IPIRTI is now an autonomous Research and Training Institute under the Ministry of Environment & Forests, Govt. of India. It is mandated for research and training on all aspects related to production of plywood and other panel products from wood and other lignocellulosic materials. Joint efforts of IPIRTI and Industry made the wood panel industry self reliant with respect to technology, mechanisms, equipment, standardization of processes and products.

Research

13.1.97. Global concern for protection of environment and conservation of bio-diversity are reflected in the research programmes. Multidisciplinary and applied research projects based on problems identified by the Institute, industries and other interested organizations are taken up. All programme are approved and supervised by the Research Advisory Committee headed by the President, Federation of Indian Plywood and Panel Industries [FIPPI] and having representatives from the Industry and other Scientific organizations.Guided by the shortage of prime timbers from forests, the Institute is pursuing two pronged strategy for bridging the gap between demand and supply for industrial round wood, namely:

(i) Development of appropriate processing technologies for efficient utilization of plantation grown tree species for manufacturing quality wood and panel products including plywood of different grades, block boards, flush door shutters, particle board and medium density fibre board, and

(ii) Evolving technologies for using non-wood renewable fibers to manufacture alternates to wood, including development of environment and people friendly products from bamboo.

13.1.98. In recent years bamboo has emerged as a important source of renewable fibre for manufacturing industrial products some of which are excellent alternate to wood. Institute has developed successful technologies for manufacturing several mat based industrial products from bamboo i.e. Bamboo Mat Board [BMB], Bamboo Mat Veneer Composites [BMVC], Bamboo Mat Moulded items [trays], Bamboo Mat Corrugated Sheet [BMCS] for roofing. Technologies for Bamboo Wood [laminates], Bamboo match sticks, Bamboo Mat Moulded Skin Door, Bamboo Mat Ridge Cap have also been developed that are ready for industrial adoption. Many of them have already been commercialized and others are ready for commercialization. Another important new area of research is utilization of agro residues like rice husks, coir, bagasse jute, wheat straw etc. for making panels or boards suitable for specific end uses in place of plywood/wood particle/fibre boards.

13.1.99. Enhancing service life of composite products made from wood and other lignocellulosic materials has gained significance in recent years. The Institute continues to work for evolving suitable treatment regimes and code of practices using environmentally safe chemicals.The result oriented approach in executing R&D projects has enhanced the confidence level of sponsors of the project. As a consequence there is a spurt in increase in the number of projects being sponsored over the years.

Institute is currently focusing on the following thrust areas:

1) Development of natural fibre reinforced bio-composites.
2) Development of bio-adhesives for panel products
3) Formaldehyde and VOC emission free binder for panel products
4) Enhancement of service life of panel products by eco-friendly preservatives
5) Fire retardant panel products
6) Energy auditing, Carbon footprint and LCA study on all next generation engineered wood products.
7) Formulation of environmental standards at par with International Standards for plywood and panel products processing units.
8) Cost effective and energy efficient bamboo based housing

Training

13.1.100. The Institute caters to HRD needs of the wood based panel industries through several training programmes including one year PG Diploma Course in Mechanical Wood Industries Technology, 1-2 week vocational training courses for industry personnel and regulatory departments and Forest officers of IFS cadre and also Assistant Conservators of Forests and Range Forest Officers. IPIRTI is also a center recognized by Forest Research Institute Deemed University for pursuing research leading to award of Ph.D.

Standardization

13.1.101. The Institute continues to play a significant role in formulating/amending Indian Standards for wood, wood products and other lignocellulosic materials through active participation in various committees of the Bureau of Indian Standards [BIS}. The Institute is a recognized center for testing and standardization in respect of all wood products and composites/panels from wood and other lignocellulosics. The facilities are availed by Central and State Public Works Departments, BIS, DGS&D, Customs, etc.

Extension

13.1.102. IPIRTI adopts a multi-pronged extension approach for quick adoption of new technologies and/or improvements/changes in technologies by the industry so that the benefits flow to the society. This includes

information dissemination through research/technical/miscellaneous reports, publication of quarterly newsletter, scientist visits to industries on request, participation in national exhibitions, technical presentation in conferences/seminars, etc., consultancy service and technology transfer to the industry. An important and unique aspect of extension approach is that lab-scale findings are up-scaled to industrial level to facilitate easy adoption by the industry which is further facilitated by many industries being members of the IPIRTI Society.

Strengthening of Scientific Manpower at IPIRTI, Bangalore

13.1.103. IPIRTI's spectrum of activities covering Technology, Process and Product Research & Development; Education & Training; Testing & Standardization, Extension of R & D activities, Industrial Consultancy Services; Information Services and Corporate functions are all centralized at its Head Quarters in Bangalore. The field station at Kolkota and the testing centre at Mohali provide services such as Testing, Training, Extension and Consulting Services. The activities are expanding in IPIRTI. Increased work load due to high volume of Research Projects. Increasing pressure for timely completion of projects and revenue generation through transfer of technology, training, testing and consultancy services are leading to a great amount of strain on the existing Scientific and Technical Manpower. On the demand of plywood manufacturers Association new testing centres are also being planned to be opened in other regions of the country. Over the last 6 years many scientists have retired from the services of the Institute adding further pressures on the existing man power. In 1991, the strength of Scientific and Technical staff was 58 with administrative staff of 56. While in 2010 the strength of scientific staff and technical staff has drastically reduced to 45 with administrative staff of 32. Thus it is imperative that there is a urgent need to have additional requirement of Scientific and Technical Manpower in the institute and overcome the existing operational problems and workload.

To Upgrade Research & Training Skills Of The Scientific Man Power In The Institute

13.1.104. In the formative years of IPIRTI in the 1980's and 1990's the Scientists and Technicians of the Institute received advanced training in reputed Institutes abroad with FAO/UNDP Assistance and served the plywood industry well. Many of these highly qualified Scientists and Technicians have retired from the services of the Institute recently leaving behind a void. The erosion in the intellectual capital base of the Institute has been very severe. Thus there is a need that the existing Scientists and Technicians get exposed to contemporary developments in the field in the leading Institutes abroad. This would help the Institute to build a strong linkage and relationship with the industries.

Strengthening of IPIRTI Centre Mohali Under Public Private Partnership

13.1.105. IPIRTI has been associated with wood based industry since its inception with a goal to access and process higher level of technological knowledge to its clients. However, it was revealed that there is a large communication gap between IPIRTI and the industry especially in North Western Region due to its Head quarters situated at Bangalore.

13.1.106. After 1996, there has been a drastic growth of plywood industry in North West India. Most of these industries were not technically sounding and they needed technical support to standardize and upgrade their products. IPIRTI Scientists have made several visits but these visits were found to remain insignificant with respect to the need of the industry. This necessitated to establish a testing centre in the vicinity of the industries which can provide technical assistance to the industry as well as maintain standard of the products through regular testing and suggesting measures for improvement. The test centre was established at Mohali with support from Punjab Government and North Indian Plywood Manufacturers Association (NIPMA). However, the facilities and the manpower existing at Mohali is inadequate to address all the issues due to the large number of factories in that particular vicinity. Hence it is proposed that the Testing Centre at Mohali may be upgraded as a IPIRTI, Field Station, which would be recognized for R&D, Testing, Training , Extension and Consultancy Services. This project would be partly supported by Punjab Government and NIPMA under public private partnership.

Budget Requirement of IPIRTI

13.1.107. The proposed budget requirement, other than infrastructure, of IPIRTI for the XII Plan period is Rs 40 crores, spread over five years.

Chapter 4
Capacity Building

Introduction

13.1.108. The role of forests in ensuring environmental security of the country, providing goods and services to society, creating livelihood option for poverty alleviation, and carbon mitigation has assumed greater importance than ever before. A number of important eco-systems lying outside the traditional boundaries of the forests also require direct or indirect interventions of foresters in association with other stakeholders. Foresters today are required to play multifarious roles to deal with a variety of externalities besides coping with traditional forestry management practices and emerging sustainable forestry issues. In India most of the forest resources are owned and managed by the government generally in association with the local communities. The capacity building of the forestry personnel, at various levels, as also of various stake holders is of great significance always and is the responsibility of the government.

13.1.109. The systemic approach towards building the capacity of forestry personnel for protection, conservation and management of good quality forest resource; using the appropriate technology for its sustainable development; helping change the attitude towards working with and for the poor, tree/forest protection and regeneration; helping build consensus for a new strategy of forest protection and management with the stakeholders, developing expertise in the field wildlife management as well as creating awareness among the personnel of other services and all other stakeholders who directly or indirectly influence the development and management of the resource is, therefore, requires sustained efforts.

Indira Gandhi National Forest Academy

13.1.110. The mandate of the Academy is to impart knowledge and skills to the professional foresters and help them to develop competence for managing the country's forest and wildlife resources on a sustainable basis, besides enabling them to act as catalysts for environmental protection, economic development and social change. Its capacity building programmes include training the new entrants to the service, skill upgradation training to officers inducted into the IFS on promotion from the State Forest Service (SFS), in-service training (Mid Career Training Programme) to contemporary batches of IFS officers belonging to three different senior levels, viz, executive, supervisory and policy development levels. Indira Gandhi National Forest Academy is headed by the Director, assisted by Additional Director, 2 Professors, 12 Associate Professors, and office staff.

Director General of Training

13.1.111. In India, the forest resource is largely owned by the government. The personnel managing these resources are also from the government sector. The training of these personnel is primarily the mandate of the government, both State and Central government. While the training of the frontline staff is generally taken care of by the State governments, that of the superior services is the mandate of the Central Government. In order to have a unified command for training of forestry personnel in the country at all levels, and also to improve and monitor the quality of inputs in a harmonious manner, it is desirable to have a central head for training.

13.1.112. It is proposed to designate the post of Director, IGNFA as Director General of Training under whom IFS training and all the training heads, including the DFE, shall be placed. This would enable a unified command for the training needs at various levels for the forestry personnel. This would also improve the combined use of resources of these institutes which would positively influence the quality of training that is being imparted to the trainees. However, the group was not unanimous in making this proposal. One school of thought was that the post of Director IGNFA was brought to the level of apex scale in order to have focused approach for the training and capacity building of IFS officers. This may be diluted by including the lower level officers and staff under the same ambit. Therefore, greater discussion is required for taking a decision on this issue.

Training of trainers

13.1.113. Indian Forest Service officers are drawn on deputation from different states of the country to IGNFA to impart training to the IFS Probationers. Though the officers drawn from the states have rich field experience and knowledge, their skill with regards to imparting training to new entrants may be limited. To over come this limitation it is proposed to get all the new faculty members appointed as trainers trained in the training skills through the Training of Trainers (ToT) programmes conducted by the Government of India.

Exposure visit to IFS Probationers

13.1.114. The IFS Probationers are taken to the different parts of the country to study the forests under various agro climatic conditions. As forestry is a fast evolving science, exposure of the probationers to best practices in the nearby foreign countries would broaden their horizon; and exposing them to international issues at the beginning of their career would make them more contemporary in their thinking and handling of issues at a later date.

School forest (Model forest/Training forest)

13.1.115. The training of IFS Probationers includes many field exercises that are conducted in the forests of the country in real life situation. Many of the techniques that are taught to them could be demonstrated in the field in a better manner provided there is a selected patch of forest designated for training purpose. It is proposed to have a patch of forest adjoining Dehradun for the competence based learning in the field condition by establishing a Model forest or School forest. This patch of forest so identified shall be managed with the resources of the Academy, but the estate shall remain the property of the State Forest Department. Appropriate methodology would be worked out in consultation with the State Forest Department of Uttarakhand.

Mid-career training of IFS Officers

13.1.116. The Ministry of Environment & Forests (MoEF) through IGNFA organizes Mid-Career Training Programmes (MCT) for Indian Forest Service officers every year. The in service training programmes were started in the year 2000, under a project funded by DFID of U.K. Subsequently, as a part of Civil Services Reforms approved by the Hon'ble Prime Minister in year 2006, the MoEF approved certain changes in the ongoing pattern of mid-career training courses of IFS officers to provide international exposure by including reputed national/international institutions as partner training institutions, similar to the pattern adopted by DoPT and MHA for IAS and IPS officers. Under the revised programme, so far more than 600 officers have been trained and the inputs provided have been well received by the participants. Workshops were conducted during the year 2010-11 to assess the effectiveness of these trainings. Based on the feedback from the participants, this pattern of the MCT Programmes for IFS shall continue in the 12th Plan also.

Infrastructure Requirement

13.1.117. While training of IFS Probationers is a continuous activity (there being 2 batches of probationers, each of about 80), the MCT courses (4-8 weeks) numbering about 4-5 in a financial year, one induction training (10 weeks) and the training for other stakeholders are typically distributed over a year, there is an urgent need to improve the infrastructure of the academy to meet the requirements of the above courses. The details are given below.

i. EXTENSION OF EXECUTIVE HOSTEL
Expected Expenditure: Rs. 4.5 crore

ii. CONFERENCE HALL WITH 6-7 SYNDICATE ROOMS
Expected Expenditure: Rs. 3.0 crore

iii. STORE INVENTORY MANAGEMENT SPACE
Expected Expenditure: Rs. 1.0 crore

iv. RECONSTRUCTION OF OLD HOSTEL COMPLEX
Expected Expenditure: Rs. 20 crore

V. RECREATIONAL FACILITY HAVING GYMNASIUM, YOGA HALL ETC.
Expected Expenditure: Rs. 1.5 crore

Total Rs 30 crores

Centre for Forest Policy Research

13.1.118. Centre for Forest Policy Research (CFPR) is conceived to provide much needed support for updating training inputs to budding foresters in contemporary and futuristic management regimes. The training needs to be improved incorporating case studies and reverse flow from the field needs to be crystallised in the form of review of forest policy. The CFPR is proposed as a registered society under the aegis of Indira Gandhi National Forest Academy (IGNFA) Dehradun with a broader goal to provide policy review/support to the forestry sector through appropriate strategic planning/policy analysis to achieve the present and future needs of forest goods and services on a sustainable basis. It is proposed that CFPR is established as a society promoted by Indira

Gandhi National Forest Academy (IGNFA), Dehradun which is premier institution for training of members of Indian Forest Service. An advisory committee for CFPR is also proposed to be set up for piloting and outlining the structure and functions of CFPR.

13.1.119. The society will have a 'governing body' as well as 'general body' to direct the broader policies of the society and it will be vested with the executive powers as per the provisions of 'Registration of Societies Act' 1860. It is also proposed to establish institutional linkages with one or more lead international centres known for policy analysis (such as FAO and IIASA) to serve as external partners of CFPR in its endeavour to carry out policy analysis and relevant research as required. CFPR would also invite other national and international experts as Honorary/visiting faculty in its research/training projects with provision of sabbatical and fellowships.

13.1.120. Ideally, CFPR would be an institution with core faculty and with provision of co-opting Honorary/visiting faculty from both national and international institutions, as and when needed. For the financial support needed for initial setup (seed money) and infrastructure development, initially the CFPR would depend on MoEF. It would be open to CFPR to receive financial support for its various activities from other agencies of national & international acclaim.

Financial Requirements

Table 13.1.4. Financial Requirements for Centre for Forest Policy Research

Name of the work	Outlay Proposed
a. Training of IFS probationers	50.0 crores
b. MCT	81.0 crores
c. Training of other stake holders	1.0 crore
d. Infrastructure	30.00 crores
e. CFPR (Seed Money)	20.00 crores
f. Dr. Hari Singh Fellowship	1.0 crore
TOTAL	**183.00 crores**

Directorate of Forest Education (DFE)

13.1.121. The Directorate of Forest Education, a subordinate office directly under the Ministry of Environment and Forests has been involved in capacity building of forestry personnel of the states and union territories in the country other than IFS since 1991. The forestry training institutes under the direct administrative control of the Directorate of Forest Education are:

- Central Academy for State Forest Service, Dehradun (Uttarakhand)
- Central Academy for State Forest Service, Coimbatore (Tamil Nadu)
- Central Academy for State Forest Service, Burnihat (Assam)
- Eastern Forest Rangers College, Kurseong (West Bengal)

Mandate

- To ensure 'Standard and quality' of training being imparted to the forestry personnel of all levels other than Indian Forest Service personnel.
- To assist develop appropriate and relevant training modules/ content/evaluation formats for forestry training of various levels of personnel.
- To sensitize the stakeholders about forestry and forest conservation through conducting custom made training modules.

Proposed Activities

Table 13.1.5. Activities proposed for Directorate of Forest Education (DFE)

Infrastructure and Maintenance

Sl. No	Details	Amount required for New Infrastructure	Amount Required for Renovation & Maintenance	Total
1	Directorate	-	2 crores	2.0 Crores
2	CASFOS, Dehradun	2 crores	3.8 crores	5.8 Crores
3	CASFOS Coimbatore	2.7 crores	2.3 crores	5.0 Crores
4	CASFOS Burnihaat	2.7 crores	3 crores	5.7 Crores
5	EFRC, Kurseong	0.7 crores	3 crores	3.7 Crores
	Total	**8.1 crores**	**14.1 crores**	**22.2 Crores**

Indian Plywood Industries Research and Training Institute (IPIRTI)

The Institute was established in 1961-62 as a Central Research Laboratory of the Indian Plywood Manufacturers' Research Association under the Cooperative Research Scheme of the Government of India from out of the funds provided by CSIR and voluntary contribution from the Plywood Industries Consequent to the reorganization of the CSIR during 1977-78 IPIRTI was one of the several Cooperative Research Laboratories, Subsequently,

the Institute was transferred to the administrative control of Ministry of Environment and Forests from 1.5.1990. The name of the Institute was changed to Indian Plywood Industries Research and Training Institute (IPIRTI) in the year 1992.

Mandate

- Research on all aspects of production of sawn timber, manufacturing plywood and other allied engineered and reconstituted wood or lignocellulosic products, including improvement of materials, manufacturing processes, improvement of machines and appliances, conditions of work, time and motion studies, standardization of methods of work, conditioning of factories, inspection, certification and marking of all forest products *viz*. plywood, wood, timber, hardboard, particleboard, chipboard, furniture, gluelams, compreg, doors, panel doors, block board, flush doors, veneered panels, veneers, laminated panels, composite boards, and the products of allied trade and industry.
- Training in connection with forest product utilization for plywood industries and trade and for allied industries

Budget Requirement at IPIRTI

➢ Research & Development	6.00 crores
➢ Infrastructure Development	14.25 crores
➢ Strengthening of scientific manpower	3.75 crores
Total	**24.00 crores**

Indian Institute of Forest Management, Bhopal

13.1.122. The Indian Institute of Forest Management (IIFM) is a premier autonomous Institute under the Ministry of Environment and Forest (MoEF), Govt. of India. The Institute has four main activities, namely; research, teaching, training and consulting in the forestry and allied sectors. It was established in 1982 in response to the growing need for application of business methods in the management of forest and natural resources to ensure efficiency in resource use and conservation. The Institute conducts the following major programmes:

- Two Year Post Graduate Programme in Forestry Management (PEM, Equivalent to MBA)
- One Year Post Masters Programme in Natural Resource Management (MRM, Equivalent to M.Phil.)
- Management Development Programmes for Industry, Development Sector, government sector, Non Government sectors, covering Forestry Policy and Institutional Aspects, Rural Livelihoods, Community Participation, Micro Finance etc.

Budget Requirement for IIFM

Table 13.1.6. Budget Requirement for IIFM

Category	Year 1	Year 2	Year 3	Year 4	Year 5
Resource	8.5	10.2	11.5	13.5	14.4
Infrastructure	23.25	39.40	6.75	9.25	5.5
TEEB	5.0	5.0	4.0	4.0	2.0
Research	10.00	15.00	17.0	20.0	5.0

Total Rs 229.25 crores

WII - Wildlife Training

13.1.123. Building capacity to manage wilderness resources through effective training programmes for various target groups and developing human resources through Master's degree programme in Wildlife Science are major mandates of the Wildlife Institute of India. In order to rapidly build capacity it is proposed to conduct customized training programmes for various target groups (forest and wildlife managers; paramilitary and law enforcement agencies; custom and revenue officials etc.) of varying duration at headquarters as well as in field locations. It is also necessary to sensitize the judiciary, politicians, senior administrators, armed forces about various facets of wildlife conservation through short-term interactive programmes.

Item of Work	Estimated Cost (in Rs. Crore)
Planning and conduct of refresher, orientation and short duration specialized theme based training courses/workshops for field managers and other stakeholders	20
Total	**20**

The Indian Council of Forestry Research and Education (ICFRE)

iii)	HRD of ICFRE - Domestic Training	Rs. 1.0 crores
iv)	HRD of ICFRE - International trainings/ exposure/seminars visits	Rs. 5.0 crores
	Total	**Rs. 6.0 crores**

Chapter 5
Technological Upgradation

5.1 Introduction

13.1.124. Information Technology (IT) upgrading is dealt with in two parts in this chapter. The first part deals with the current status of IT usage across the forestry and wildlife organizations in the country and the second proposes a new Scheme "Information Technology Upgrading and Integration Scheme" during the XII Five Year Plan for harnessing the IT for drastically improving the way we prepare policies, strategies, coordinate, work and monitor.

Current Status and Upgrading Requirements

13.1.125. A brief description of some issues with Information Technology is given below

Office and Field Management Tools

13.1.126. Computerization is ubiquitous now in offices across the country. It is, however, a mixed package. Officials who work in offices are mostly comfortable in the usage of Microsoft created software like the operating systems, word processors and to some extent, the spread sheets too. This has relegated the typewriter of yore to the background and has made the work of typing and producing a document faster and easier. It saves on time and increases efficiency.

13.1.127. The first technology upgrade required today is to have access to databases through applications sitting on the front end. Linked to this is the necessity of having Servers and Networked environments through which the data is entered, stored, analyzed and retrieved as and when required. Most of the offices are quite weak in this department. Databases, if these exist, are single PC based single user systems. These would not serve the purpose of the modern, aspiring and fast developing global powerhouse called India. We do need systems which run on applications drawing data from Enterprise Relational Database Management Systems (RDBMS) like Oracle and offer access to the data across the offices, across the states and across the country. This would help in maintaining data integrity, querying and analysis, generation of reports-both routine and otherwise. The data entry needs to be made where data actually is. For example, collecting data from State Forest Departments and then entering it in the database in some GoI Institute is unwarranted as it will waste time and also compromise data integrity.

13.1.128. Forestry and wildlife are managed in the field. This is where technology upgrading is required on an urgent basis. Plantations and nurseries are mostly not marked digitally with Global Positioning Systems (GPS). GPS can allow the departments to map the plantations and nurseries, store this data for keeping a tab on plantations created and their growth. This data also needs to be put on the enterprise RDBMS mentioned earlier. Forest and Wildlife related crimes too need to be mapped using GPS data so that spatial patterns could be analyzed for devising more sophisticated strategies for combating these threats to our forests.

13.1.129. Use of Geographic Information System (GIS) is in its infancy in most of the States. GIS data, when available, could be used for analysis of spatial patterns on population density, cattle density, firewood and fodder

requirements of rural population etc. for enabling allocation of financial resources in a more rational manner. For this to happen, the GIS data will have to be stored in enterprise level RDBMS with data entry made in different states and access to all GoI organizations working on Forestry, Wildlife and Environment fields. User organization specific versioning may also be necessary. Management of wildlife too will benefit from better usage of GPS and GIS.

Human Resource Development

13.1.130. Indira Gandhi National Forest Academy (IGNFA) and Central Academy of State Forest Services (CASFOS) are the main agencies providing Human Resource Development through training. Under the proposed "Information Technology Upgrading and Integration Scheme", trainings will need to be imparted not only in these training organizations but in those too which are under the control of State Forest Departments. Technology upgrading would also include providing best internet connectivity to these and providing access to resources available in other organizations like ICFRE, IIFM, WII etc. through web-enable application software.

Enhancing productivity of forests

13.1.131. ICFRE is the premier research organization in the field of forestry in the country. A lot of research work has been done in ICFRE which would positively impact the productivity of the forests. Integration of ICFRE through the new scheme proposed would allow better research and better dissemination of the same to State Forest Departments etc. To enhance co-ordination between the State Forest Department and forest produce based industries on one hand the ICFRE on the other, a Scheme called "Direct To Consumers" is proposed to be implemented during the XII Five Year Plan. In this scheme, ICFRE would take technologies developed by it to the States & Industries and get these accepted and implemented there for enhancing productivity and serving the interests of conservation of our resources.

Conservation of wildlife

13.1.132. As detailed in Chapter 2, an enterprise wide network that provides data on forestry and wildlife across the country can be used for conservation of wildlife and Wildlife Institute of India (WII) needs to upgrade technologically in the following areas:

- National Wildlife Forensic Research Facility
- Protected Areas Geodatabase at Enterprise Level
- Wildlife Health and Disease Research and Monitoring Facility
- Remote Monitoring of Wildlife Populations

Information Technology Upgrading and Integration Scheme

13.1.133. IT usage impacts upon almost all the fields where technology upgrading is required. The most fundamental change that is required for improving policy formulation, decision making and implementation of work in any particular area in forestry sector is to integrate and provide access to knowledge and data that can be stored, updated, analyzed and retrieved by different organizations in the sector. If this is not done, we have pieces of knowledge and data spread across the country that are there but not accessible to all organizations. Integration of Forestry & Wildlife organizations in terms of data sharing is the essential ingredient to better management of forest resources.

Current Inadequacies in IT Implementations in Forest Departments and Forestry and Wildlife Organizations

- Presently, the data related to forestry sector is compartmentalized within various organizations. Dissemination of the data/information is largely in hard-copy formats and there is always considerable delay in such dissemination from the time the data is digitized to the time when it is distributed. This is more or less true for digital data also.
- The data is not normally kept in standard Relational Database Management Systems (RDBMS) but is spread around in the form of hard copies, softcopies in Microsoft Word, Microsoft Excel etc. This results in bad storage, analysis and retrieval arrangements.
- Wherever the data is kept in RDBMS, it is generally kept in Microsoft Access or similar non-enterprise systems. Problem with such systems is that these allow for limited storage abilities and very small number of simultaneous users. The security implementations are also quite poor.
- Databases kept in different organizations are frequently incompatible with each other in terms of architecture and are often poorly designed.

- ❖ GIS has to be an important ingredient of the scheme as most of the data related to forestry management is spatial in nature. This, like the non-spatial system that would be part of the scheme, should keep Forest Departments of the State in a central position and should be accessible across forestry organizations. Whatever Geographic Information Systems exist at present in different State Forest Departments and forestry and wildlife organizations, these may not have been built to the same standards and on similar platforms. Data inter-operatability may therefore be an issue affecting seamless usage of data across these organizations.

Brief outline of the "Information Technology Upgrading and Integration Scheme"

- ➢ The **"Information Technology Upgrading and Integration Scheme"** is expected to address the shortcomings and upgrade requirements listed above. It needs to aim high as ambition deficit results in achievement deficit.
- ➢ The scheme needs to keep the State Forest Departments in central position as they would key in the data in the GIS and in systems with non-spatial data. The upgrade IT proposals of different organizations in the forestry and wildlife sector should be included in the scheme itself.
- ➢ The data needs to be owned collectively and on a virtual basis across the nationwide network. This is a much needed shift from the current practice of ownership in terms of possession of software and data by individual organizations within four walls, so to speak. The GIS data needs to be used by including versioning technology & time-stamping.
- ➢ Computing power could be enhanced by using grid computing. This kind of approach will allow faster access and sharing of data by multiple users across the country. The data disseminated/accessed will be current and will therefore be more meaningful for policy and strategy formulations**.**
- ➢ The Scheme could be implemented by following the general action sequence given below. Finer and deeper details would emerge only after the initial studies are completed.
  - An Enterprise Architecture study including study of sectoral legal frameworks, policies, goals and strategies. It should also include Business Process Reengineering study (as is, to be and the transition methodology).
  - Preparation of Technology Architecture
  - Preparation of phase-wise implementation schedule
  - Setting up of hardware and networking components
  - Web-enabled Software development and its implementation including acquisition of RDBMS and GIS software with adequate licensing.
- ➢ For the implementation of IT Integration Scheme, server farm in the ISO 27001 certified Data Centre at ICFRE HQ may be used for hosting applications and databases. This may need some upgrading in terms of hardware and software.
- ➢ The Data Centre of ICFRE at Dehradun has to have a mirror site at Bangaluru as a Disaster Recovery measure as Dehradun and Bangaluru are substantially separated in space and belong to different seismic zones.

Fund Requirements for Technology Upgrading:

Table 13.1.7. Fund Requirements for Technology Upgrading

	Area	**Item of Work**	**Estimated Cost (In Rs. Crores)**
1	**"Information Technology Upgrading and Integration Scheme" :**	**"Information Technology Upgrading and Integration Scheme" :** Enterprise Architecture Study; Preparation of Technology Architecture; Preparation of phase-wise implementation schedule for	25
		"Information Technology Upgrading and Integration	600

	Across all State Forest Departments, MoEF and its forestry and wildlife organizations	**Scheme" :** Setting up of hardware and networking components including upgrading computers wherever required, acquisition of GPS for field level staff for geo tagging field data like plantations etc., upgrading the Data Centre at ICFRE, Dehadun, Creation of mirror Data Centre for ICFRE as a Disaster revovery measure	
		"Information Technology Upgrading and Integration Scheme" : Web-enabled software development and its implementation including acquisition of enterprise level RDBMS and GIS software to which RDBMS can funnel spatial data with adequate licenses for countrywide usage.	300
2	WII	National Wildlife Forensic Research Facility	40
		Development of Wildlife Health and Disease Research and Monitoring Facility	15
		Remote Monitoring of Wildlife Populations	10
3	ICFRE	"Direct to Consumers" Scheme	15
	TOTAL		**1005**

Chapter 6
Infrastructure Development

Introduction

13.1.134. The institutional structure of forestry setup in the states has not changed much over past hundred years ever since inception of scientific forestry in India; where as the social structure of the country has under gone lot of changes. Very little attention has been paid to the basic requirement of the frontline staff. They are still living with their families in the remote areas, where education and health facilities are hardly available. They have to tackle organized crime of illegal felling, illegal trade of timber and other forest produce, poaching and encroachment on forest land. To give their children better facilities of education and health care and also to enhance operational efficiency, construction of residential accommodation for their families at Block and Division level through Forest Housing Boards, construction of bridges, causeways, culverts, purchase of Jeeps, trucks at Range level, solar powered wireless system are being proposed in the XII Plan. Incidence of forest fires and their impact on the forest has not been given much importance; however, the studies carried out indicate that the challenge needs to be tackled to improve the forest wealth as well as to minimize its disastrous impact. Therefore, forest fire tracking and surveillance system is being proposed. To improve the decision making process, the application of GIS is proposed to be expanded in all the states. For regular updating of knowledge of the front line staff, strengthening of forestry training school is also being proposed. There is hardly any linkage between the research wing of forest department and the forestry research organizations and the universities in the country. It is, therefore, proposed to upgrade the research facilities of the State Forest Department and its net working. Man animal conflict is a major issue these days which is sapping lot of energy and time of the forestry personnel. It is resulting into damaged to the Wildlife and its habitat. Fencing of the areas which are vulnerable to crop raiding, damage to the property and critical Wildlife habitat are being proposed to be fenced.

13.1.135. Forestry research in the country under the aegis of Indian Council of Forestry Research and Education needs to be upgraded to the International level. It has to meet the emerging challenges in the areas of biodiversity conservation, Climate change mitigation, effect of climate change on the vegetation, enhancing the productivity of the forest, meeting requirement of the forest based industries, livelihood issues of the people depending of the forests.

13.1.136. For upgrading the level of forestry research to the international standard, modernization of labs, replacement of age old out-dated equipment with modern state of art scientific equipment for carrying out research in frontline areas, up-gradation of libraries and human resource development are essentially required. The research infrastructure and also the supporting infrastructure of forestry research organization have become grossly inadequate and out-dated to cope up with the emerging research requirements. The heritage FRI building which was badly damaged in the last earthquakes requires retrofitting to save it from irreparable

damage. Most of the buildings which are more than 80 years old and have lift their life require immediate restoration.

13.1.137. ICFRE is the fountain head of forestry education in the country, it maintains the standard of forestry syllabus at UG&PG level as well as gives grant to the 28 universities all over the country imparting forestry education. FRI has the status of deemed university and it is the leading institute for forestry education in South-East Asia. To further upgrade the level of forestry education in the country, proposals have been made to modernize the infrastructure required for this purpose.

13.1.138. Research and training facilities of IPIRITI are also being proposed for expansion under the XII Five Year Plan. Indian institute of Forest Management is in urgent need of infrastructure for housing students, imparting quality education. Forest survey of India has proposed for expansion and purchase of modern scientific equipment to enhance its operational capability. Directorate of Forestry Education which takes care of training of feeder cadres of forest services requires to be equipped with modern tool of management like GIS etc. for imparting quality training in the colleges under its jurisdiction. The existing facilities in IGNFA which is imparting initial and in service training to IFS officers and also training to officers of other services are inadequate and require up-gradation and expansion.

Financial Requirement

13.1.139. Following are the proposal under XII Five Year Plan:

Table 13.1.8. Financial Requirement for Infrastructure Development of Institutions

(Rs. in Crores)

Sl.No.	Particulars	Amount
1	State Forest Departments- Construction of residential quarters field staff, improvement of communication, mobility, protection of forests from fires and decision making : modernization, training and research facility	2000*
2	Research Organization - ICFRE Modernization of lab facilities and purchase of equipment, renovation of infrastructure, construction of ICFRE Head Quarter at Delhi, Establishment of field research facilities.	400
3	Forestry Education- FRI Deemed University and Other Universities - Modernization of teaching and grant of forestry universities.	5
4	Forestry Education- Grants to Universities Forestry Education- Infrastructural Development in 28 Universities Imparting Forestry Education	50
5	IPIRITI Bangalore- Expansion and up gradation of research and training facilities	15
6	IIFM Bhopal- Upgradation of teaching facilities, strengthening of existing infrastructure and expansion of FSI in the other parts of country.	85
7	Forest Survey of India- Expansion and Modernization	20
	Total	**2575**

*Note: * out of this budget, a corpus of Rs 1000 crore is proposed through CAMPA fund for infrastructure development in the states*

Chapter 7
Motivation and Morale of Forest Personnel

13.1.140. The Group was of the view that there is a tremendous pressure on the forests due to conflicts among various stakeholders and utter shortage of Forestry personnel due to non filling up of the posts. Whereas forestry personnel are under tremendous threat from smugglers, encroachers and leftwing extremist (LWE) groups, on the other hand the area of the forest beat varies from 25 to 75 sq km among different states to be manned by single Forest Guard who is neither intellectually equipped with the skills for emerging technical issues nor is young enough to traverse the entire area of the forest beat, in fact that average age is over 55 years. The group therefore feels that structure of forest organization should gear up to have a delivery mechanism for interface

with the public which can inspire the confidence of the people, yet another problem relates to the threats from the well equipped mafia as the uniform forestry personnel have to arrest them in remote and inhospitable environment. It is therefore proposed that following action may be taken in 12th Five year plan:

- To fill-up all the vacant post of the field forestry personnel in the country and for those states who meet this criteria special bonus may be given during the plan period
- A study may be undertaken through competent private sector organization to assess the requirement of forestry personnel in the country and to recommend the optimum size of the beat. Each beat should be managed by a trained forester and with at least two more forest guard and with the field facilitator to be appointed from amongst the village/villages youth falling within the jurisdiction of the beat and budgetary requirement should be met from the plan budget. The field facilitator should be the interface between villagers and the forest department. This mechanism has given excellent results in a few externally aided projects like Tripura and the same need to be replicated among other states of India.
- A Forest housing Corporation should be established on the lines of Police housing Corporation to provide family accommodation to the forestry personnel who work in interior areas, similarly other incentives which are available to the state police and paramilitary personnel may also be provided to the forestry personnel.
- President Medals may be instituted on the lines of Police department to incentivize the forestry personnel in the country.
- A special insurance scheme may be adopted for the forestry personnel in the extremist infested areas.
- The planning commission committee constituted in LWE areas is giving encouraging results. Similar kind of arrangement should be institutionalized among the field functionaries; both in the LWE infested areas and the tribal areas, for achieving the objectives of developmental works.
- The officials working in LWE areas and smuggler infested areas, including trans-border crime areas, should be provided with fast moving vehicles.
- A forest intelligence fund may also be initiated in extremist infested areas for better protection results.

Some of the policy suggestions to enhance motivation levels of the Forest personnel and encourage high moral values are outlined below.

Subsidized Ration to Forest Personnel

13.1.141. Government of Tamil Nadu had brought out innovative scheme of supply of essential commodities at subsidized rates to the field level forest personnel, from Ranger and below, including the drivers. The scheme has been in operation since 2005 and the ration was being supplied through forest department divisions, with a prorate of 5 kg rice, ½ kg sugar, ½ kg wheat, one liter palmolin oil per member of the family, subject to maximum of four, at 50 percent of public distribution rate, and 1 kg toor dal and 1 kg black gram dal per member of the family at Rs. 10 per kg. The scheme has now been further refined to switch over to the new system of supply of essential commodities through Public Distribution outlets under specifically formulated "Tamil Nadu Forest Subordinate Service-supply of Essential Commodities (under subsidized rates) Rules 2010. (Copies of relevant Government orders and rules enclosed). The scheme is also available to the Police personnel of Tamil Nadu and has been quite successful in motivating the field staff. This good practice of government of Tamil Nadu can be extended by Ministry of Environment and Forests across the country to cover all the forest personnel.

Scholarships to the children of forest personnel

13.1.142. The Government of Tamil Nadu had constituted State Forest Commission and one of the recommendations of the commission was to establish a "Forest Benevolent Fund" and introduce distribution of educational incentives to meritorious children from this fund for the wards of forest personnel from plot watchers to the rank of range officers. The government had accepted the recommendation and constituted "The Tamil Nadu Forest Sesquicentennial Scholarship fund" in commemoration of 150th year of Forest Department with the object of providing financial assistance for education of children of forest personnel upto the rank of Forest Ranger in executive cadre and upto the rank of Superintendent in the ministerial cadre. The scheme is being administered district wise and the following cash prizes are announced.

a. 10th standard:

First Prize : Rs 6500/-
Second Prize: Rs 4500/-
Third Prize : Rs 2500/-

b. 12th Standard:

First Prize : Rs 7500/-
Second Prize:Rs 5500/-
Third Prize :Rs 3500/-

13.1.143. Further, an amount of Rs 20,000/- or the annual fee paid for the higher education, whichever is less, shall be granted as fellowship for each year for the higher education for four years for deserving 20 wards of the forest personnel every year. The scheme is being administered by specifically drafted "The Tamil Nadu Forest Sesquicentennial Scholarship Fund Rules" and the government will augment resources of the fund by an annual grant of Rs 25 lakhs.

13.1.144. This scheme is again a very innovative step in motivating forest personnel, especially owing to the fact that difficult field conditions and call of the duty 24 hours, the field staff is hardly able to give attention to the personnel family matters like education of the children. It is proposed that Government of India, through Ministry of Environment and Forests announce this scheme for the forest departments throughout the country for which a policy decision is required.

Formation of Forest Housing Corporations in the states

13.1.145. The requirements of housing in the states for the field staff of forest department needs a re-look. Presently, the housing situation for field staff is abysmal. The housing is provided in isolated remote forest areas in the individual beats where very little educational, medical and other facilities exist and such places cannot be considered fit for family accommodation. Therefore much of the staff at field level doesn't stay at their headquarters. We need to introduce the concept of family station and the field hostels, as the call of duty demands forest officials to camp in interior forest areas for anti-poaching and protection operations. The community housing needs to be developed at convenient locations with all amenities and hostels, camp sites need to be provided for stay n the forest with basic amenities for effective protection. There needs to be massive emphasis on these by the government and it's not feasible to burden the protection staff with this work. There is requirement of formation of Forest Housing Corporations in the states on the lines of Police Housing Corporations to undertake this work on priority basis.

Beat system reforms to reduce the over-burden

13.1.146. The sanctioned strengths of the field staff across the country have almost been stagnant or grown at an extremely low pace across last few decades, compared to tremendous increase in the sphere of duties and responsibilities, coupled with ever-mounting societal expectations, as a result of which the staff is considerably overburdened. This is further exacerbated by the fact that almost 20 to 25 percent of the existing positions remain unfilled by unrealistic bans by the state governments, which results in further strain on the existing thin emaciated and aged foundation of the forest departments.

13.1.147. The beat is the basic administrative unit in the Forest Department and virtually every inch of the forest land is covered within the beat system. There are approximately 80,000 beats in the country. Each beat is in the charge of a Forest Guard, who is sometimes assisted by a Forest Watcher. Usually the Forest Guards are having matriculation or secondary level qualification. In actual practice in most of the states, the forest guards have come from the list of forest workers, mostly illiterate, and incapable of physical as well as mental level of working.

13.1.148. The size of each beat is yet another variable. Ideally speaking each beat should not be more than 1000 ha of forest land (which is 10 sq km), which is possible to be managed over foot. The size of the beat in the country is variable and extends to 3000 to 4000 ha in some cases. This overburdens the staff and they get used to a loose system of protection at their level.

13.1.149. The sphere of working of the field staff of the department has expanded manifolds. The field staff has not only to ensure protection, scientific data collection, application of forest laws, there is a paradigm shift in the working of the department over the years. Now the department has to work with the people eliciting their cooperation in protection of the forest. In such circumstances, the management at the level of the beat assumes greater significance.

13.1.150. It is, therefore, proposed that each beat must be in the charge of a Forester rather than a forest guard and he must be assisted by a Forest Guard and a Forest Watcher, or two forest watchers, as the case may be. This involves creation of a number of posts of Foresters in the department. It can be done in a phased manner over a period of 5 years in the ensuing plan. However, the state governments will do it only if it is supported by plan funding by the centre. At their own, the state governments have always shown reluctance to even fill up the vacant positions. Further, it can be done on 50 percent direct recruitment and 50 percent promotion basis, to

have a right mix of young blood as well as meeting the promotional requirements of the staff. The level of Deputy Ranger is available in most of the states and should be used to head the sections, comprising 3-4 beats.

Parity with the police personnel

13.1.151. The forest subordinate service in the forest departments is a uniformed service. Whereas the Government of India has given parity of the Indian Forest Service with Indian Police Service at all the levels, such parity doesn't exist for other levels of department between police and forest officials in most of states, with exceptions of few. The government of India needs to take a policy decision to ensure such parity in ranks and accouterments by states including pay parity, between Forest Watcher and Police constable, Forest Guard and Head constable, Forester and Police Sub inspector, Deputy Ranger and Selection grade SI, Forest Ranger and the Police Inspector.

Incentives for anti-poaching operations

13.1.152. A system of group insurance for the temporary anti-poaching staff from the villages to cover against the risk in the forest areas needs to be put in place. The anti-poaching staff of the forest department drawn out of the local tribal population in the enclosure and abutting villages is exposed to the same level of risk, in the operations. Whereas the government staff is having some security offered by the government job, such risk coverage is not available against the risk and medical treatment to the anti-poaching staff. The government of India may come up with the policy decision to make it mandatory to the forest departments to cover such staff under the group insurance schemes of sufficient amount and also the medi-claim insurance for the staff. The premium can be paid as a scheme by government of India by reimbursement to the state governments.

13.1.153. Another grey area is lack of transportation facilities from the respective headquarter to the place of working/camping, which many a time is too far off. Provision needs to be made in the plan for hiring vehicle to get dropped in the remote localities for efficient functioning by the field functionaries. The field staff in the forest department requires basic minimum field kit for tough jungle duties. This includes on wireless hand-set, with spare battery adequately equipped for solar charging, one PDA device or GPS unit for entering way points, survey and tracing the patrolling area, one camera to photo-document, one swiss multi-purpose knife, one torch, a binocular and essential first aid kit. As an incentive for anti-poaching operations in the interior areas, such a customized kit must be provided to each uniformed personnel in the forest department by the government, through a scheme.

Table 13.1.9. Budgetary Requirements New schemes for increasing motivation of forestry personnel

(Rupees in crores)

Sl.	Items of Work	2012-13	2013-14	2014-15	2015-16	2016-17	Total
1	Scheme of Subsidized Ration to Forest Personnel	15	15	15	15	15	75
2	Scheme of Scholarships to the children of forest personnel	8	8	8	8	8	40
3	Formation of Forest Housing Corporations in the states	120	120	120	120	120	600
4	Beat system reforms to reduce the over-burden	100	100	100	100	100	500
5	Parity with the police personnel	0	0	0	0	0	
6	Incentive for anti-poaching operations.	10	10	10	10	10	50
	Total	**253**	**253**	**253**	**253**	**253**	**1265**

Chapter 8
Summary of Financial Requirements

**Table 13.1.10. Summary of financial requirements –
(Sub Group IV on Institutions and Technology Management)**

S.No.	Activity	Amount (Rs crore)
1	FSI New activities	280
2	Establishing Robust mechanism for Forest Resource Assessment	220
3	Establishment of centralized data node and Information Nodes in State Forest Departments	32
4	WII – Institutional and Technology Advancement	175
5	Research Support to ICFRE and the States	1000*****
6	Research Support to IIFM	230
7	Research Support to IPIRTI	40
8	WII – Augmentation of Wildlife Research	30
9	Capacity Building – IGNFA	183
10	Capacity Building – DFE	85
11	Capacity Building – IPIRTI	24
12	Capacity Building – IIFM	229
13	WII - Wildlife Training	20
12	Capacity Building – ICFRE	6
13	Technological Upgradation	105
14	Infrastructure Development in Institutions and SFDs	2575*
15	Motivation and Morale of Forest Personnel	1265
	TOTAL	**6499**

Note: Through CAMPA fund

- ***a corpus of Rs 1000 crore is proposed for research support to ICFRE and the States, and***
- ***a corpus of Rs 1000 crore is proposed for infrastructure development in the States***

Annexure 14

Report of Sub-Group V

International Cooperation and Law

14.1. The present report is an attempt to focus on how our national policies and programmes can be better appreciated and reflected in the country's obligations and commitments to the various international instruments related to forestry and wildlife. This envisages that the country is better prepared to address global concerns while ensuring sustainable management of forests, conservation of wildlife and biodiversity and protecting national interests. The report recognizes the need for a more systematic, dynamic and futuristic approach to international negotiations and programmes and provides for capacity building of personnel and strengthening of institutions dealing with natural resource management in a coordinated manner. This calls for greater interaction, involvement of various institutions working in related fields through multipronged mechanism consisting of various programmes and institutional arrangements as suggested in the recommendations with appropriate financial support in the 12th Five Year Plan.

14.2. The subject was discussed by the Sub Group with a view to recommend policy initiatives and programmes for sustainable management of forests and wildlife in view of international commitments to be incorporated in the 12th Five Year Plan. The report also emphasis the development of a mechanism for implementation of international cooperation and law.

Executive Summary

14.3. Forests being an important and integral part of environment are increasingly attracting the attention at National and International Fora. Forests have an important role to play in achieving United Nation's Millennium Development Goals of environment sustainability, poverty eradication and end of hunger. Discussion at various National and International Fora have emphasized the role of forest conservation in sustainable development and climate change mitigation. REDD+ under the UNFCCC is an attempt in this direction. The concepts and norms of sustainable development have been incorporated in major environmental conventions such as the CBD, UNCCD, UNFCCC etc.

14.4. The development of international law is a dynamic process, which requires continuous examination of not only current, but also future environmental trends and challenges. There is greater need for cooperation in forestry and wildlife between developed countries and developing countries to achieve common global goals. India being a signatory to the most of the important International Conventions on forestry and wildlife, it is imperative to have proper understanding of their impacts on India's internal policies and programmes. This calls for institutionalizing the approach for taking a more systematic and proactive stand during future international negotiations. It is important to have an institutional arrangements and proper mechanism for negotiation, compliance, follow up and monitoring and reporting on International Conventions, Treaties, bilateral agreements, MoUs etc.

14.5. Implementation of domestic and international instruments to meet national needs and international obligations requires a compatible planning process. Appropriate strategies, programmes, schemes, and action plans constituting a dynamic planning process, evaluating the efficacy of present systems and instruments, and filling in the critical gaps found therein, are intended to form a prominent part of this report. The foresters being important implementers in the field need adequate exposure to latest developments at international level to

tackle forests and wildlife related important issues. There are constraints of proper capacity, financial resources and access to technology. International Co-operation may be an effective tool in overcoming these constraints.

14.6. The report suggests establishment of a Centre to work as Multi-stakeholder Forestry Forum/ (MFF) for Consultation and Evaluation to facilitate development of country's position in respect of important international conventions and agreements of interest to India. The Centre or MFF is intended to be a permanent institution serviced and funded by the MoEF to enable evaluation of the stand of the country on various international instruments in different forums, and suggest adjustment and modification in the existing country position inconsonance with the national interest. The Centre/ Forum will also help in drafting and finalizing inputs for specific meetings of the sessions of international conventions and agreements in collaboration with other institutions and stakeholders, wherein India is participating. The Centre of Forest Policy and International Cooperation Studies (MFF) is proposed to be created at MoEF which will enable participation of all concerned ministries, departments and research organizations of the Central and State Governments, reputed scientific and educational institutions in the private sector, and individual experts and subject matter specialists outside government.

14.7. Despite international importance of forests, subject of relevance 'International Cooperation and Law' has never made it to the description and treatment of forestry sector in the five year plans of the country. For the first time, an attempt is being made to include the subject of 'International Cooperation and Law' in the chapter on Forestry in the 12th Five Year Plan document of the Planning Commission. A scheme is being proposed during the 12th Five Year Plan (FYP) that will support and service the Centre of forest policy and International Cooperation Studies.

Issues of international Cooperation:

- Trans-boundary issues and PAs with Bhutan, Nepal and Bangladesh etc.
- Country's position in various International instruments and fulfillment/ implementation of obligations.

14.8. The subject 'The International Cooperation and law' has not been part of earlier Five Year Plans; therefore the sub-Group has proposed capacity building of officials and strengthen institutional framework in the 12th FYP. The new proposals are indicated below:

Institution Building: Setting up of New Institutional mechanism for:

- Setting up of new institutional mechanism like a Centre for Forest policy and international cooperation Studies for providing inputs in Forest Policy including issues relating to International Cooperation conventions / treaties at MoEF with a view to introduce synergy in policy and implementation.
- CITES Management Authority with Regional Centres.
- Creation of REDD+ Architecture (Cells in the MoEF and States).

Strengthening of Existing Institutions for dealing International Cooperation:

(i) Technical/Financial Support to various Institutions like BSI, ZSI, FSI, IGNFA, ICFRE, etc. for improving their infrastructure to take up theme based training programmes, in the field of international cooperation.

(ii) Awareness creation on matters related to International Cooperation and Law.

(iii) Project based funding to NGOs such as WWF, TERI etc. to work on specific policy issues, related to international instruments.

(iv) Providing inputs on forestry related issued on continuous basis to PMI on international treaties.

Capacity building: not only limited to present but futuristic to anticipate action for new challenges.

(i) Training/ Sensitization/ Orientation of Forest Officers as well as officers of other related Services (IAS, Indian Foreign Service, Indian Customs Services etc.) in Forestry, Wildlife and Climate Change related International Instruments and law at Joint Secretary and above level for better coordination and appreciation of roles of various concerned agencies in both domestic as well as abroad in International Conventions/ Instruments related courses.

(ii) Capacity Building and enhancing participation of Forest Officers, legal professionals, Scientists and technical staffs in International Conferences including officials of the State Forest Departments.

(iii) Building mechanism for greater interaction and cooperation among existing institutions on policy issues including exchange programme.

(iv) Inclusion of specific course curriculum in LLB Degree/ PG diploma Courses in Universities for specialization purpose in the field of emerging forestry sector issues impacting national policies.

Forging / Strengthening Cooperation/ collaboration at International/ Regional level in forestry issues:

(i) Forging partnership/ cooperation with international institutions on forestry, wildlife conservation and climate change related issues in forestry sector.

(ii) Strengthening bilateral cooperation with China and other emerging countries especially on forest productivity, farm/ agro forestry and wildlife conservation.

(iii) Strengthening regional cooperation at SAARC, ASEAN, Asia Pacific, and Central Asian and African countries with a view to take a logical stand due to similarities in socio economic conditions as well as common issues faced by these countries in international forum.

Introduction

14.9. Globally, there is a trend to view the role of forests in addressing socio economic issues and meeting UN Millennium Developmental Goals (MDGs) of eradicating poverty and elimination of hunger, employment generation and environmental sustainability. There is growing concern for strengthening practices of good governance and sustainable forest management for continuation of ecosystem services in perpetuity. Forestry sector has emerged as an important component in strategy for mitigation and adaptation of climate change at national as well as global level.

14.10. Forests play an important role in sustaining life support systems by providing ecosystem services, various essential products and also have a critical role in climate change mitigation and adaptation. Forest management in India is guided by the National Forest Policy 1988 which lays emphasis on ecological and environmental security of the country and addressing livelihood needs of people.

14.11. India, based on its vast experience in SFM, rightfully has to take proactive role in addressing these concerns. Following are International conventions to which India is signatory including both legally binding and non-legally binding instruments.

Table 14.1. Status of India vis-à-vis International Environmental Conventions

Convention / Forum	Effective	Year Signed and Enforced
Convention Relative to the Preservation of Fauna and Flora in their Natural State (1933)	1936	1939
International Plant Protection Convention (1951)	1952	1952
International Convention for the Prevention of Pollution of the Sea by Oil (1954)	1974	1974
The Antarctic Treaty (Washington, 1959)	1998	1983
Convention on Wetlands of International Importance, Especially as Waterfowl Habitat (Ramsar, 1971)	1982	1 October 1981 (ac)
Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 1972)	1978	1977
Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington, 1973)	1976	1974
Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979)	1982	1979
Convention on the Conservation of Antarctic Marine Living Resources (Canberra, 1980)	1985	--
Convention on Early Notification of a Nuclear Accident (1986)	1988	1986
United Nations Convention on the Law of the Sea (Montego Bay, 1982)	1995	1982
Protocol on Substances That Deplete the Ozone Layer (Montreal, 1987)	1992	19 June 1992 (ac)
Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (Basel, 1989)	24 June 1992	5 March 1990
Amendments to the Montreal Protocol on Substances That Deplete the Ozone Layer (London, 1990)	1992	19 June 1992 (ac)
Convention on the Prior Informed Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (PIC or Rotterdam, 1990)	Not signed	N .A.
Protocol on Environmental Protection to the Antarctica Treaty (Madrid, 1991)	1998	1992, 1996
United Nations Framework Convention on Climate Change (Rio de Janeiro, 1992)	1994	1 November 1993
Convention on Biological Diversity (Rio de Janeiro, 1992)	18 Feb. 1994	5 June 1992
Convention to Combat Desertification in Those Countries Experiencing Serious drought and/or Desertification, Particularly in Africa (Paris, 1994)	17 Dec. 1996	14 October 1994
Agreement relating to the Implementation of Part XI of the UNCLOS 1982 (1994)	1996	1995
International Tropical Timber Agreement (Geneva, 1994)	1997	17 October 1996
Protocol to the United Nations Convention on Climate Change (Kyoto, 1997)	2005	1997
Cartagena Protocol on Biosafety (Nairobi, 2000)	23 January 2001	17 January 2003

Source: Compiled from UN Treaty Register and websites on multilateral environmental agreements:

14.12. The issues relevant to the country in various International Conventions are listed as under:

- Sustainable Forest Management (SFM)
- International co-operation in forestry and wildlife Management
- Access and benefit sharing of biological diversity
- Green Economy

- Trade of timber, NTFPs and Forest Certification
- Conservation of Wetlands and Mangroves
- Conservation of Migratory Species
- Implementation of various provisions of CITES
- Conservation of Marine Biodiversity in cooperation with neighbouring countries
- Climate Change Mitigation and adaptation of climate change by REDD+ activities through forestry activities.
- Clean Development Mechanism

14.13. To further strengthen the Governance in Forestry, Wildlife and Biodiversity sectors based on the experiences of the operationalisation of the XI Plan and the engagements of MoEF in Policy and Law-making, a variety of programmes of action in following areas need to be addressed:-

(i) Legal and Institutional Reforms

(ii) Capacity Building

(iii) International Commitments and Compliance and

(iv) New Initiatives for harmonizing International obligations with national requirements and socio economic conditions

(v) Transboundary concerns of forestry and wildlife.

Existing Schemes and Status during 11th plan (targets and achievement)

14.14. This subject was not part of XI FYP or any previous Plan therefore the report is based on discussions and views of members of Sub Group and inputs from related officials/ persons. The International Cooperation matters are dealt by IC division in the MoEF, which participates in International Conferences/Workshops etc. and has budgetary allocation based on 11th Plan outlays. The Forest International Cooperation division deals with matters/ issues related to UNFF, COFO, APFC, FAO and USAID etc.

14.15. The Forest International Cooperation Division is dealing partly with forestry matters with respect to UNFF, FAO (COFO), APFC, International Conventions, etc.

Table 14.2. Division wise distribution of subjects of International Instruments

Division/ Focal Point	**Subject matter**		
Forestry Wing of MoEF	**International conventions**	**Regional**	**Bilateral**
FIC	UNFF	APFC	India China
	FAO-COFO		
FP Division			USAID/ India
SU Division	ITTO		
FPD Division	INBAR		
RT Division			Forestry Capacity Building with financial assistance from international institutions.

EAP Division			Externally Aided Forestry Projects supported by international funding agencies such as JICA, AFD, World Bank, etc.
Wildlife Division	CITES	SAWEN	India China
	Convention on Migratory Birds		
	International whaling Commission		

14.16. The budget for meeting International obligations/ commitment is presently placed with IC Division besides small provisions in the schemes implemented by various Divisions which coordinates on behalf of other Divisions.

14.17. Focal points for international conventions / institutions are nominated by MoEF. Normally, they are in the rank of DIGF / Director, and above level.

Regional, National, International dynamics and concerns which have emerged in the sector w.r.t. ToR

14.18. India has well defined framework with MoEF at the Centre and the State level. The role of the MoEF is in framing of National Policies, providing guidelines and on issues of national and global importance etc. The decisions taken at international forums are disseminated by MoEF to the States for implementation and compliance.

14.19. The depletion of forest resource base adversely impacts resilience capacity of vast majority of people (rural population around 70%) of the country to meet challenges of climate change. Recently launched Green India Mission (GIM) as one of the eight Missions under the National Action Plan on Climate Change has taken innovative and holistic approach towards qualitative and quantitative improvement of forest resources through landscape treatment. There are immense opportunities for the forestry sector in employment generation, poverty alleviation, ensuring food security, rural development and urban renewal as well as increasing resilience of forest dependent people against adverse impacts of climate change.

14.20. International Instruments on forestry, wildlife and climate change etc.

i. Forestry:

- There are international instruments like Agreement, Charter, Treaty, Convention, Protocol, Declaration, International customs and general principles of law. Of the 19 international forests related legally binding instruments, 18 deal with forests only as part of another issue, of these 16 focuses on sectoral or very specific issues and 2 deals with specific forest types. Only one is dedicated to forest namely ITTO, focusing on tropical timber.
- However, of the 21 regional forest related legally binding instruments, 3 deal exclusively with forests, while several others treat forests in a more holistic manner than many of the global instruments.
- United Nations Forum on Forests (UNFF) is the main inter governmental body that is addressing all policy and management aspects of forests in a comprehensive manner. Though its instruments are having the effect of non- legally binding but it plays an onerous duty and responsibility of all member countries to take steps to implement them.
- Acknowledging the important contribution and potential of forests as a link between climate, biodiversity, and land degradation - critical global environmental concerns - the Rio Conventions, namely, the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention on Biological Diversity (CBD) and the United Nations Convention to Combat Desertification (UNCCD), all are working together to enhance synergies in the forestry area to achieve their respective goals and objectives.]

ii. Climate Change:

- The mechanism and internal capacity to negotiate is in place but that is often ad hoc and in terms of knee jerk response. Often the official delegates to international negotiations are selected and informed at the last moments leaving little time for developing well thought out and researched national responses. This situation needs to be addressed and a more elaborate and institutionalized mechanism needs to be put in place by strengthening existing institutions and building new ones wherever felt necessary so that a well thought, coordinated response on a continuous basis is articulated at international level.

iii. Wildlife protection and management:

- India has fairly well developed network of Protected Areas with many success stories in conservation and protecting wildlife to share with other countries. Transboundary issues with Bhutan, China, Nepal, Myanmar and Bangladesh regarding migratory corridors and illegal trade/ trafficking in wildlife articles are important and need strengthening of regional and bilateral cooperation.

iv. Biodiversity Conservation, Wetlands and desertification:

- Conservation and sustainable use of biodiversity with access benefit sharing is important both from conservation as well as livelihood point of view. India should engage likeminded countries to share experience and advice on efforts to enhance biodiversity conservation including creating opportunities to capitalize on biodiversity thereby improving livelihood of local communities. Strengthening cooperation with the neighbouring countries and also at regional level in the South Asia and South East Asia in assessing and arresting forest degradation, forest fragmentation and related biodiversity loss can provide good opportunity for conservation and sustainable use of biodiversity.
- Wetlands are very important for water security, livelihood, fisheries and conservation of avian fauna. Ramsar convention and other international instruments are required to be effectively implemented with necessary policy, legal and financial support.
- CCD requires greater efforts. Combating desertification is another challenge and requires concerted efforts. Comprehensive strategy involving afforestation supported with innovative soil and water conservation measures need to be adopted. Financial and technical support from international donors may be explored in view of limited resources.

Gap analysis: mapping of potential areas & issues requiring intervention

Law:

14.21. Legal & institutional reforms: The legal regime concerning Forests, Wildlife and Biodiversity needs to be reviewed in view of recent developments both at national and international level. The Indian Forest Act, 1927, the Wild Life (Protection) Act, 1972 and the Forest (Conservation) Act, 1980 may be revisited to accommodate subsequent legal developments with respect to the country's fulfillment of international commitments without compromising the basic livelihood requirement of people apart from ecological security of the country.

14.22. Governance and Coordination issues:

- A regular mechanism to register, analyse, evaluate and monitor commitments and coordinate within or outside the Ministry with stakeholders needs to be developed. Intra and Inter-Ministerial coordination on issues/ matters having international ramifications or subject matters of international instruments needs strengthening so that stakeholders interest is not compromising while meeting international commitments.

- One of the major problems in Environmental Governance in India is that of lack of coordination and harmony in the functioning among different agencies of State. This has invariably led to the Environmental imperatives neither informing and influencing policies nor their translation into the programmes of action and working of other sectors associated with Natural Resource Management (Water, Land etc.) and those that deal with economic development (Industry and Commerce). There is an imperative need for coordination, right from the policy to law-making to their implementation.

14.23. Strengthening the Capacity in the Green Laws:

This has two dimensions:

(a) Strengthening ability in putting across Indian position in an effective manner, bargaining for a better deal in International Negotiations and in International law-making processes, and

(b) Strengthening the Capacity in implementing effectively the domestic law.

Constraints in International Cooperation:

14.24. Inadequate Capacity: There is lack of exchange of information, experience sharing, and capacity to ensure compliance, follow up, monitoring and reporting at the ground level of the obligations/ international commitments as there is limited exposure of field official/ implementing authorities at international level.

14.25. Lack of Institutional Network: There are many institutions working in many aspects of various international matters but the information sharing and convergence is sometimes missing. There is also duplicity of activity as institutions are not aware of other institutions work. The lack of collaboration between institutions dealing with law, international matters arises in view of lack of common platform or forum for sharing views exchange ideas regularly, which needs to be addressed.

14.26. Little collaboration/ partnership with international institutions: This is very important as Indian institutions will be greatly benefitted with tie ups/ collaboration with regional and international institutions in evolving coordinated action plans through exchange of information and technological capabilities.

14.27. Lack of continuity of officials/ ad-hoc approach: Most of the time experts/officials meet at short notice and are constrained to take views for the country's position. Change in official positions due to regular transfers sometimes result in inadequate preparations that consequently affect quality contributions and final outputs as well as country's settled position. Hence there is a need to ensure continuity of officials engaged in international negotiations.

14.28. Lack of specified budget to meet expenses/ contributions for international fora.

Challenges :

14.29. Identification of challenges in International cooperation:

- Each country has its own priorities. Forestry and wildlife issues are locally as well as globally important and at times do not receive the desired focus in developing countries which have different set of priorities for socio economic development.

- Lack of institutional mechanism for follow- up, implementation and monitoring of decisions taken at International negotiations. Many international arrangements on forests are dynamic and evolving. The effectiveness of these arrangements needs to be reviewed periodically. Proper understanding of their impacts on India's internal policies and programmes with a view to develop effective strategies for implementation of the commitments calls for institutionalizing our approach which somewhat appears to be lacking. Hence it results in adhoc approach and knee jerk reaction.

- International negotiation mechanism is complex and dynamic, needs permanent institutional backing, continuous dialogue and participation of stakeholders.

- Present mechanism of negotiations at International level depends heavily upon the individual initiatives. The experts/officials should be given adequate time and resources to take views for the country's position by strengthening institution and capacity. The mechanism needs to be institutionalized to that settled stand of country is not comprosed.

- Ensuring continuity of officials in dealing with a particular International Convention with back up teams to enhance quality of contributions and final outputs.

14.30. In view prioritization of challenges indicated in para 4.1, there is a justification for addressing them in the 12th Plan period as under

- There is a need to strengthen mechanism for negotiation.

- The negotiation process should be based on proper analysis of situation/ impact assessment of global policies vis- a- vis national policies on natural resources management (NRM). The institutionalization will lead to consistent, systematic and well thought of strategies to address Nation's concerns, priorities and initiatives in international conferences, and avoid pitfalls faced in negotiations as brought out in foregoing paragraphs.

Strategies:

14.31. (w.r.t. strengthening in legal domain/institutional mechanism / science & technology improvement /HRD /schemes / financing mechanism / incentives to get states on board/ people's participation in management / cross cutting issues/cross sectoral issues/areas of convergence/deliveries / awareness / employment / livelihood improvement /ecosystem services/carrying capacity / habitat improvement institutional strengthening / research and technology strengthening/ HRD /enforcement and protection/biodiversity -landscape scale on regional, national and international etc.

Strategy 1. or strengthening Inter & Intra-Ministerial coordination:

14.32. It is necessary to evolve two pronged strategy to achieve better intra-ministerial and inter-ministerial coordination as below:-

(i) Intra-Ministerial Coordination Committee/Council: to bring synergy and harmony in the working of different aspects of environmental governance like, forestry, Wildlife, Biodiversity, Pollution Control and Waste Management, Environment Impact Assessment, CDM, Ozone Layer Protection etc.

(ii) Inter-Ministerial Coordination Committee/Council- to create a forum having policy oversight, to facilitate harmony and alignment of working of different agencies at the Central level to realize the core object of environmental governance for securing environmental integrity and promote Sustainable Development.

Legal & institutional reforms:

14.33. The Strategies for strengthening legal domain are listed below:

(i) Legal Capacity-building exercise to help and enable the domestic "managers" of environment and the policy-makers and international negotiators, to catch up with the developments in the law and to acquire better tools and techniques of its application to problem situations- to be entrusted to Centres of Excellence in Law, in Ecological Sciences, Economics, Natural Resources Management and the like.

(ii) Creating "Centres of Excellence" in legal academic and research institutions to build the capacity in law and enforcement, besides to professionalize environmental governance.

International Cooperation:

(i) Developing international Strategy- for negotiation, law-making, commitments and show-casing compliance and

(ii) Evolving a more Proactive domestic strategy and action plan – of legal reforms, forward looking plans of action and a more inclusive and participatory administrative mechanisms for better governance.

Recommendations and Proposed Timeline Action Plan

14.34. The subject 'The International Cooperation and law' has not been part of previous 11th FYP or in earlier Plans, therefore the sub-Group has proposed capacity building of officials and strengthen institutional framework in the 12th FYP at an estimated budgetary support of Rs. 25 crores (Rs. Twenty Five crores annually) which is indicative. The timelines cannot be specified as the scheme is mainly for capacity building on international cooperation and law.

14.35. The new proposals are indicated below:

I. Institution Building: Establish New Institutions:

(i) Centre for Forest Policy and International Cooperation Studies at MoEF for bringing policy and implementation together for dissemination of knowledge, data through National Portal and work as a think tank.

(ii) CITES Management Authority with Regional Centres.

(iii) Strengthening of REDD+ Cells handling forestry matters in the MoEF.

II. Strengthening of Existing Institutions for dealing International Cooperation:

(i) Postings of the Forest Officers in Permanent Mission of India (PMI), Indian Embassies and Commissions.

(ii) Technical/Financial Support to various Institutions like ICFRE, BSI, ZSI, FSI, IGNFA, WII, IIFM, DFE for improving their infrastructure to take up theme based training programmes.

(iii) Financial support to Law Universities for introducing legal education and awareness creation on matters related to International Cooperation and Law.

(iv) Project based funding to institutions of excellence in the field such as TERI need to work on specific policy issues.

III. Capacity building: not only limited to present but futuristic to anticipate action for new challenges.

(i) Training/ Sensitization/ Orientation of Forest Officers as well as officers of other related Services (IAS, Indian Foreign Service, Indian Customs Services etc.) in Forestry, Wildlife and Climate Change related International Instruments and law for better coordination and appreciation of roles of various concerned agencies in both domestic as well as abroad in International Instruments related courses and

(ii) Capacity Building and Enhancing participation of more Forest Officers, legal professionals, Scientists and technical staffs in International Conferences including officials of the State Forest Departments.

(iii) Building mechanism for greater interaction and cooperation between various existing institutions on policy and implementation issues.

(iv) Sensitization and Capacity building of legal and Judicial Services Officers in forestry matters and inclusion of specific course curriculum in LLB Degree/ PG diploma Courses in Universities.

IV. Forging/ Strengthening Cooperation at International/ Regional level:

(i) Forging partnership/ cooperation with international institutions.

(ii) Strengthening regional cooperation at SAARC, ASEAN and Central Asian countries in view of resources and similarities in socio economic conditions.

(iii) Bilateral cooperation with African countries on matters of mutual interests.

(iv) Strengthening bilateral cooperation with China especially on forest productivity, farm/ agro forestry and wildlife conservation.

V. Augmenting existing schemes:

(i) Training module short, medium and long terms on International cooperation & law through institutions of excellences in the field such as TERI, IGNFA, IIFM in IC and law for forest officials/ other services officers (1 week, 2 weeks & 4 weeks).

(ii) To start on experimental basis a long term 10 months Theme based Diploma course in specific areas of international instruments with cross sectoral linkages.

(iii) National Law University to start such courses on international cooperation and law in the field of forestry and wildlife.

New schemes and financial implication:

14.36. A new scheme 'Strengthening of Forest International Cooperation' is being proposed with following Sub Head for specific components:

1. Centre of Forest Policy and International Conventions Studies
2. CITES Management Authority.
3. Strengthening of REDD Plus Cell.

Table 14.3. Financial Performance during 11th FYP – International Cooperation

S. No.	Schemes/ Programmes	Financial Performance in Eleventh Plan (Rs. in Crore)			
		Outlays	BE	RE	Actual Expenditure
	Nil	Nil	Nil	Nil	Nil

Note: IC Division of the ministry is implementing some schemes which do not cover these proposed programme areas.

Table 14.4. Proposed New Scheme on 'Strengthening of Forest International Cooperation'

Rs. In Crores

Sub Head	Name	Average Annual Provision	Total for 12 FYP
1	Centre of Forest Policy and International Cooperation Studies, Capacity Building, Strengthening of institutions etc. under Forest Policy Division	2.0	10.00
2	Strengthening of REDD+ Architecture in the Country including REDD+ Cell in the Ministry	1.20	6.00
3	Strengthening of CITES Management Authority and Wildlife Policy Group	0.40	2.00
4.	Contribution to international agencies	2	10
	Total	6.00	28.00

Financial Outlay for 12th FYP

Scheme: strengthening of International Cooperation and Law

Table 14.5. Strengthening of International Cooperation and Law

S. No.	Schemes / Programmes	Financial Projections in Twelfth FYP (Rs. in Crore) in the form of Grants						Nodal Organization
		Duration	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	
1.	Centre for Forest Policy and International Cooperation Studies/ (MFF).	Permanent 5 years	2.0	2.5	3.0	3.5	4	MoEF through the Centre with collaborating Institutions.
i.	Undertaking Policy studies including Support to Institutions / NGOs, Project based funding for specific research/ studies.							
ii.	Capacity Building of Forest Officers/ Scientists/ Officials of other services/ Law Officials/ Judiciary/ Communities through training and participation in meetings/ workshops/ conferences in International Instruments both within and abroad.							
iii.	Organizing Brainstorming Workshops/ Conferences on policy and international conventions on forestry and wildlife with SAARC, South East Asian, African Countries, etc.							
iv.	Administrative expenses							
	Total		2.0	2.5	3.0	3.5	4	
2.	Setting up REDD+ Cell in Forestry Wing & providing support to States/ UTs for initiating REDD+ activities, adaptation and mitigation.	-do-	1.0	1.0	1.5	1.5	2.0	MoEF

3.	Strengthening CITES Management Authority with Regional Centres and other wildlife Conservation Activities as follow up of international commitments.	-do-	0.3	0.3	0.4	0.5	0.5	MoEF
4.	(i) Contribution to International Bodies like INBAR, ITTO etc. under International Commitments/ Obligations		2	2	2	2	2	MoEF
	(ii) Expenditure related to committed participation in UNFF, APFC, ITTO, INBAR, CITES, COFO, etc. and bilateral commitments.							
	Total= 175 Crores for 12 FY Plan Period							

Note: 1.The budget mentioned is indicative.
2.The budget provisions for Forest International Cooperation for the proposed schemes are to be provided with FIC Division of Forestry Wing.

Table14.6. Policy Studies proposed for 12th Five Year Plan period – (Sub Group V - International Cooperation)

S. No	Studies and Reports
1	Participatory Forest Management
2	Analysis of issues and gaps in implementation of international conventions for strengthening country' position in negotiation.
3	Studies on Review of Policies/ Acts on Forests, Wildlife, and Biodiversity for improving synergies.
4	Creation and maintaining database on compliance, implementation, monitoring, and reporting on international instruments.
5	Other studies which may be considered to be taken up time to time.

Note on Centre for Forest Policy and International Cooperation Studies (MFF)

14.37. The Centre for Forest Policy and International Cooperation Studies to work as a forum/ platform Multi-stakeholder Forestry Forum/ (MFF) for Consultation and Evaluation to facilitate development of country's position in respect of important international conventions and agreements of interest to India. The Centre or MFF is intended to be a permanent institution serviced and funded by the MoEF to enable evaluation of the stand of the country on various international instruments in different forums, and suggest adjustment and modification in the existing country position in consonance with the national interest.

14.38. The Centre/ Forum will also help in drafting and finalizing inputs for specific meetings of the sessions of international conventions and agreements in collaboration with other institutions and stakeholders, wherein India is participating. The Centre of Forest Policy and International Cooperation Studies (MFF) is proposed to be created at MoEF which will enable participation of all concerned ministries, departments and research organizations of the Central and State Governments, reputed scientific and educational institutions in the private sector, and individual experts and subject matter specialists outside government.

14.39. The Centre (MFF) will be a small unit under the MoEF at Delhi which will function initially under the Forest Policy and FIC Division. The Centre initially will be headed by DGF/ Addl. DGF with DIG, Forest Policy as the Convener. Executive Members will be drawn from officials of concerned Ministries/ department and other renowned Institutions to deliberate on various issues of international as well as national importance related to forestry and wildlife on monthly basis. The theme based meetings will be organized as and when necessary and outsource the studies to experts/ institutions. The centre will bring out monthly reports / presentations on

developments and maintain the necessary database on international instruments and policy related matters. The Centre is expected to become functional in the first year of 12th FYP and will attain its full fledged capacity by the end of 3rd year of the 12th Plan. The permanent posts of its Head at the Adl. DGF, Convener at IGF/ DIGF level and posts of Social Scientist, Economist, Ecologist and Statistician are proposed to be created and will be filled through deputation or contractual basis drawn from reputed institutions working in NRM for a certain period of time.

14.40. The centre will maintain a panel of domain experts and ensure frequent interaction to work as think tank, generate ideas and build capacities. The experts will be provided sitting fee/ honourarium for attending meeting, delivering lectures or performing assigned tasks.

14.41. The minimum secretarial staff may be arranged through outsourcing which will involve insignificant expenditure.

14.42. The budget for meetings will be arranged from the new schemes. The secretariat services for running of the centre will be outsourced including the conference facilities.

Recommending innovative ways for augmenting flow of resources into the sector through integrated investment framework.

14.43. The ToR.III speaks about finding innovative ways for augmenting investment in forestry sector. The investment at present is mostly coming from the government side. However, there is a need to incentivize private participation through significant investments in afforestation especially in agro forestry, farm forestry and urban greening with special focus on coverage of area outside the forests. Appropriate policy and technical support is to be arranged by the State Forest Departments with suitable tax concessions in expenditure on afforestation/ greening. This can also be a part of Corporate Social Responsibilities.

14.44. The fund flow from CDM, UNCCD and from other international agencies from international agencies in arresting land degradation, afforestation and reforestation will also channelize and enhance investment in forestry sector. Appropriate institutional network needs to be created in this regard.

14.45. The mechanism for fund flow in REDD+ is evolving. Whereas Carbon stored in forests virtually has no market until recently, it is now traded in voluntary markets, and might soon be traded in the International Carbon Compliance markets. Including REDD+ in a post- 2012 climate agreement may spur the establishment of the global forest carbon markets even further. The inclusion of forests in carbon markets is related to the contextual revolution above, forests are valued no longer just for their goods (timber) and the land on which they stand, but also for the environmental services they provide. The fund flow may be from the Government, International sources both from Govt. and non Governmental agencies.

14.46. For the country the important issue is how the fund flow to prevent degradation of forest can be augmented. The funding support will help in addressing the drivers of forest degradation like forest fire, grazing, firewood removal and illicit felling for timber etc. Greater investment will help in diversion of pressure from forests and creation of livelihood opportunities to people beyond land/ forest based activities. There is a need to have dedicated fuel wood and fodder plantations on community land as well as fringe forest to meet local requirement and provide alternative livelihood and employment opportunities to forest dependent communities including emphasis on stall feeding to sustenance. This will substantially reduce pressure on natural forests.

14.47. Likewise the good forest management leading to Forest Conservation and improvement of forest is incentivized and rewarded. This will help in getting support of local people in improvement of forest growing stock leading to increase in forest carbon stock. Within National programmes, a part of Rural Development budget like MGNREGA, Tribal Welfare Schemes, other schemes like watershed development, NRAA can be utilized in afforestation as well as checking forest degradation.

14.48. There are models available for REDD+ like Conservation Trust Funds (CTFs also referred as Environment funds). More than 50 CTFs have been established in developing countries in last 20 years. Strengthening National REDD+ Funding architecture: As REDD+ funding is evolving, the suitable REDD+ Architecture needs to be put in place to channelize funding from national and international agencies as and when

the system matures. There are few options like Project Based funding, Separate National Fund, National Fund within the existing Government programmes.

14.49. The strength of the Project Based funding is that it resembles a market for carbon projects, thereby drawing the capacity of markets to deliver efficient outcomes. In contrast Separate National Fund is established outside the state administration and is governed by a board of representative from a broad range of stakeholders. In case of National Fund within the State Administration the fund is placed within the state administration. This could be within a ministry, or an agency under the Ministry.

14.50. A minimum specified plantation/ Green area may be fixed in case of large land based Projects like SEZs, Industrial Estates, and Residential Projects as a planned intervention to promote tree plantation. This will not only lead to carbon sequestration but also ameliorate the environment.

14.51. Specific budget support: In this option the process involved is to channel international REDD+ funding through existing budget systems in the form of general budget support, or as more or less earmarked funding. This might be an option in the early phases of REDD+, which emphasise readiness activities and specific policies and measures.

Monitoring and Evaluation Mechanism

14.52. The Monitoring of compliance, implementation, follow up and reporting on international instruments and commitment will be done by the Ministry of Environment and Forests with the help of Centre of Forest Policy and International Cooperation Studies periodically with appropriate studies on issues/ themes. The main objective is to enhance coordination and maintain continuity by putting in place a platform for dialogue/ discussion and convergence of ideas between experts and various stakeholders. Review of performance of the scheme centre will be taken up by appropriate agency/ institutional review.

Expected Outcomes
(Tangible/ intangible/ deliveries/ awareness/ employment/ livelihood improvement / ecosystem services/ carrying capacity / habitat improvement/ biodiversity)

14.53. As the number of international environmental instruments is increasing, the issue of enforcement and compliance by member countries is becoming a matter of great concern, especially for the developing countries. As a follow up to Rio, almost all the countries, especially developing countries, reviewed their national environmental regulations and reinforced these, often with the establishment of national agencies and authorities. While these institutional and regulatory changes have helped the governmental authorities in decision making on environmental issues, there is much that remains to be done. It is important for these institutions to function effectively, and at the same time, promote compliance with, and enforcement of environmental regulations.

14.54. The recommended strategies and proposals are intended to strengthen the institutional framework and build capacity to negotiate in respect of international instruments and ensure follow up of compliance, monitoring and reporting. The expected outcomes can mainly be intangibles directed for improving quality of actions and programme.

Intangibles:

1. Capacity building: trained manpower and broad basing of the internal expertise with adequate exposure in working of international institutions and mechanism. However the activities under the capacity building can be arranged in the form of tangibles like number of training courses/ programmes/ meetings or workshops organized, studies conducted and paper published.
2. Institutionalized and enhanced negotiation capacity and more systematic approach on international conventions
3. Development of a platform for regular interaction of experts and stakeholders
4. Improved inter-ministerial and inter-departmental coordination

5. Improved coordination within different wings of the Ministry and departments.
6. Improved follow up of international commitments and better implementation of our obligations
7. Futuristic orientation of our approach
8. Better enforcement and compliance of forestry, wildlife and environmental regulations.

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