Report of Sub- Group - I on Forestry

(Constituted by the Planning Commission of India on 25/07/11)

Executive Summary:

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.

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 flagship scheme -National Afforestation Programme of the central government due to declining allocation to the forestry and wildlife sector.

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.

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.

1. Background:

1.1 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.

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.

1.2 The **integrated management of natural resources** has assumed great 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.

1.3 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.

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.

1.4 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

1.5 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.

1.6 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:

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.*

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.

1.7 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.

1.8 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.**

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

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.	NAP	2000	393	345	318	310	303	1669
11.	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.

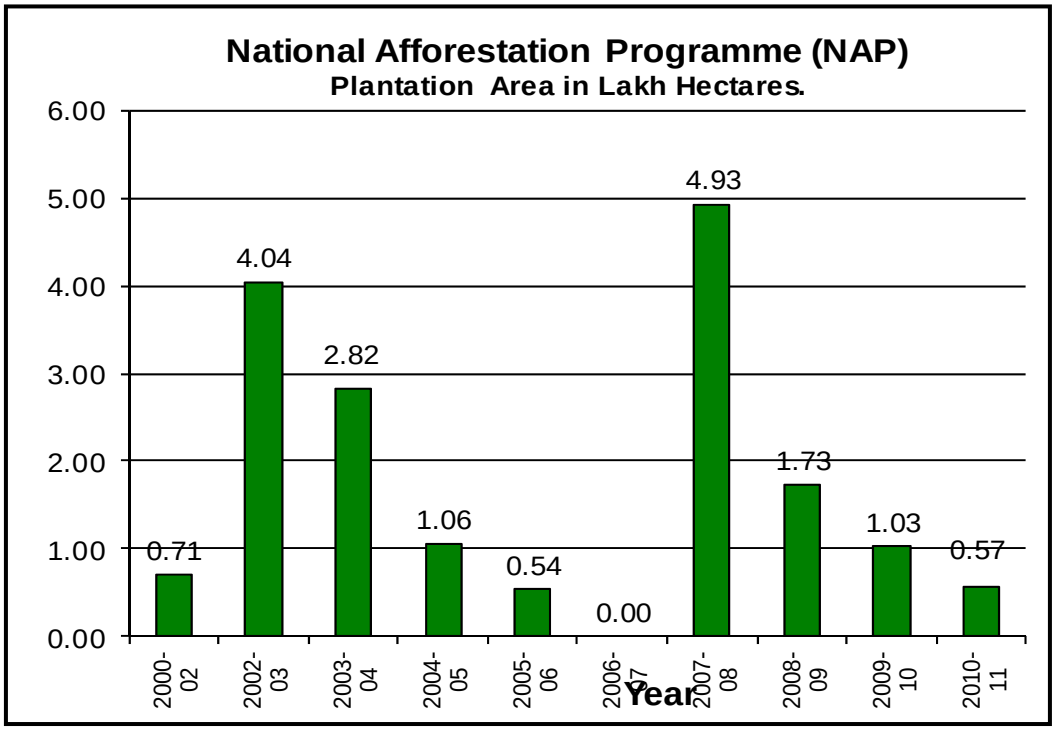
2 Review of Forestry Programs: Regional, National and International dynamics and concerns:

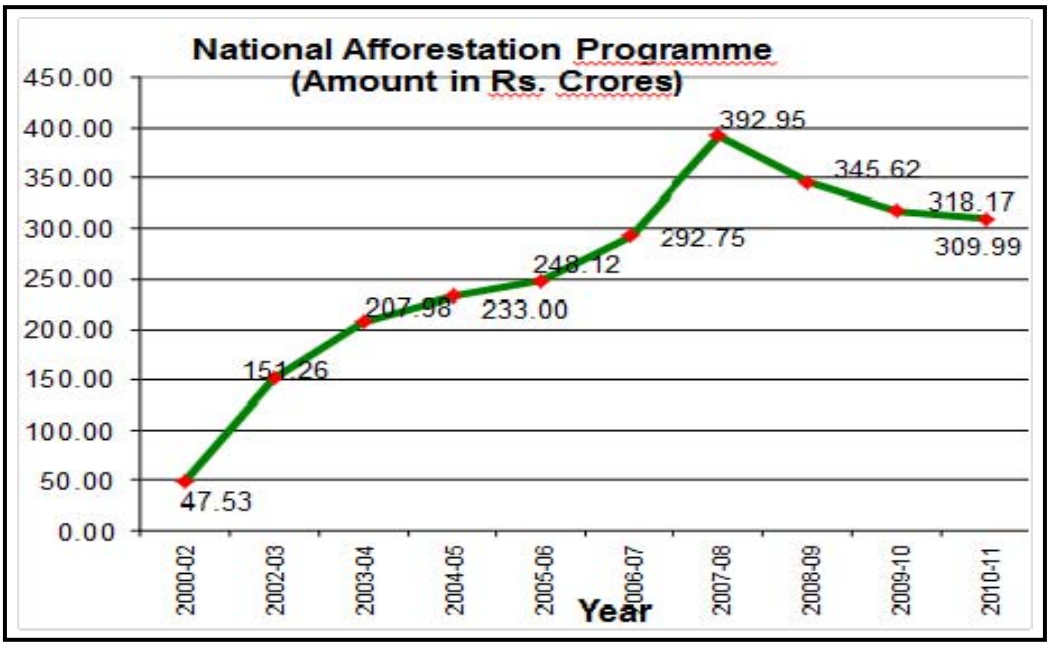
2.1 Funds for the forestry sector flows through Central budget, State budget and through externally aided projects. Central sector scheme for afforestation are National Afforestation Program (About Rs. 310 Crore/year), Integrated Forest Management scheme (for forest infrastructure, boundary demarcation, 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.

2.2 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 12^{th} and 13^{th} 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.

2.3 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-





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, an emphasis on making them as permanent technical committees under the guidance and supervision of Gram Sabha during 12th five year plan period.

2.4 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.

2.5 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.**

3. Gap Analysis of Programmes of Forestry Sector:

3.1 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 10^{th} and 11^{th} plan respectively. **This required large plan allocation to forestry sector, which did not happen in 10^{th}/11^{th} Five Year plan rather funding to forestry & wildlife sector has come down to 0.4% - 0.5% of overall size of 11^{th} Plan.** This has affected the afforestation drive aimed to achieve the targeted growth in forest cover.

3.2 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**.

3.3 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.

3.4 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.

3.5 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.

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

i. 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.
ii. 1.2 million ha of forest areas are subjected to shifting cultivation.
iii. Annual diversion of forests under FCA 1980 is about 25000 ha per annum.
iv. Honey-combing of forests due to encroachments and recognition of forest dwellers' rights on the principle of 'As is where is basis'.

3.7 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.**

4. Key Challenges to the Forestry Sector in India:

4.1 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.

4.2 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.**

4.3 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.

4.4 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.

4.5 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 wildilfe by taking multi-sectoral and multi-stakeholder approach to the forest management.

5. Strategies for the Forestry Sector:

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.**

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:-

A. Innovative ways for augmenting flow of Financial Resources:

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 organisations 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.

1. 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.

2. 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**.

3. 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.

4. 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.

5. **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.

6. 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.

B. Participatory Management:

7. **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.

8. **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.

9. 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.**

C. Urban Forestry:

10. 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.

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.

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

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.

D. Afforestation of Under-utilized Lands:

11. 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.

12. 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.

E. Agro-forestry and Optimizing Productivity:

13. 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.

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

15. 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.

F. Linkages with Allied Sector:

16. 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**.

17. 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.
18. 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 ethinicity 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.
19. 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.

G. Forest Conservation & Management:

20. **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**.
21. **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.
22. **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.

23. **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.
24. 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.
25. **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.
26. 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.

H. Capacity building of Forest Officials & JFM Committees:

27. 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.
28. 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.
29. 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.
30. 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.

I. Regulatory regime:

31. 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.
32. 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.

33. 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.

34. 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.

J. Sustainable Forest Management and Forest Certification:

35. 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.

36. 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.

37. 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.

K. Forestry Research

38. 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.

39. 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.

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

41. 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.
42. 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.
43. 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.

L. Miscellaneous:

44. 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.
45. Bio-diversity, Mangroves, wetlands, coral reefs etc. are the natural parts of forests and wildlife and require convergence with different departments for meaningful outcome.
46. **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.
47. **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.
48. There is need to remove annual uncertainties about time and quantum of funds in allocation so that regular funds flow in time-bound manner.
49. 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.
50. 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.
51. 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.

6. Recommendations and Proposed Targets:

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.

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. Involvement of 50000 Community Foresters for activities\ programmes \ schemes of forest conservation and management including NTFP's.
2.	Capacity Development of the JFMCs, Gram Sabha 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
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. 2.5 lakh Ha. Bamboo & NTFP Plantation, chain of value addition, Marketing Support etc in overall management of NTFP areas drawn from another sub-group		

7. Monitoring and Evaluation:

7.1. 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.

7.2. 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.

7.3 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.

7.4 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.

7.5 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.

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.

7.6 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.

8. Expected Outcome:

8.1 The implementation of the forestry sector schemes recommended in previous para would result in increase in forest and tree cover by about 5 million ha and improvement in quality of forests over another 4.5 million ha. This will take India's forest & tree cover to around 83 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.

8.2 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 12^{th} plan which will increase with the maturity till it attains mean annual increment & rotation period.

8.3 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.

8.4 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.

Annexures (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.

References:

State of Forest Report, 2003, 2005, 2009 published by Forest Survey of India

National Forest Policy, 1988

National Environmental Policy, 2006

Green India Mission Document (Draft) 2010.

Operational Guidelines of National Afforestation Programme, 2009

Mid-term Review of 11th Plan by Planning Commission

Forestry Statistics of India published by ICFRE, Dehradun

Discussion with Working Group on Forestry and Sustainable Natural Resource Management constituted by Planning Commission.

Annexure (Break-up of Schemes)

1. Components of National Afforestation Programme (NAP)

Sl. No.	Component	Model Cost
1.	**Eco-restoration and Afforestation** (ANR, AR, Silvi-pasture, Mixed Plantation, Regeneration of perennial herbs etc.)	**Rs. 8000 crores**
2.	**Ancillary activities (**Given below**)**	**Rs. 4000 crores**
(i)	Strengthening of JFM	Rs 10000 per new 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% of the Plantation Cost
(vi)	Soil & Moisture Conservation	15% of the Plantation Cost
(vii)	Entry Point Activities (per Hectare)	Rs. 4,000/-
(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. 2000 crores**
	Total	**Rs. 14000 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)
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 HH	**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

i. Forest Fire Management: Action as per Fire Vulnerability Map/ Fire Hazard Map/ other parameters etc.: Rs. 600 crores
ii. Mapping and Boundary demarcation: Rs. 500 crores
iii. Forest Infrastructure: Rs. 300 crores
iv. Control of Invasive Alien Species: Rs. 300 crores
v. Strengthening of Working Plan Divisions/ Research Wing: Rs. 300 crores

5. Satellite based Forest Resource Assessment and Technological based monitoring

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: Rs. 350 crores
iv. Field Station maintenance for monitoring of outcome parameters: Rs. 100 crores

Annexure (ToR)

Sub Group I on Forestry under Working Group on Forestry and Sustainable Natural Resource Management

In the first meeting of the Working Group on Forestry and Sustainable Natural Resource Management held on 25/07/11, five Sub- Groups under the Working Group were constituted. The Sub-group –I on forestry was constituted vide Office Memo M-13033/1/11-E&F Part-III dated 25/07/11 of Planning Commission of India with composition and Terms of Reference 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	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

Technical terms of reference and relevant para dealing with each issue of the ToR in the Report of the Sub-group are outlined below-

Sl. No.	**Technical Terms of Reference for Sub-Group I on Forestry**	**Observation of Sub-group –I on Forestry (Relevant Para of the Report)**
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; a. 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. b. 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. c. Assess technological and manpower requirements for forest protection including forest fires and illegal activities such as encroachments and poaching etc. d. 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.	**Para 2, Para 3, Para 5 and Para 6**
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.	**Para 4 and Para 5**
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	**Para 1.5**

	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.	**Para 5 and Para 7**
V.	Suggest mechanisms for capacity building for Management and Planning for conservation and development of Forests	**Para 5**
VI.	Recommend Innovative ways for augmenting flow of resources into the sector through integrated investment framework.	**Para 5**