NATIONAL MISSION FOR A GREEN INDIA

Mission Document

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
GOVERNMENT OF INDIA

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मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन
भारत सरकार

सत्यमेव जयते

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MINISTER
ENVIRONMENT, FOREST AND CLIMATE CHANGE
GOVERNMENT OF INDIA

FOREWORD

The National Mission for a Green India is a key initiative under the National Action Plan on Climate Change (NAPCC). Since its inception in 2015-16, the Mission has focused on protecting, restoring, and enhancing India's forest and tree cover while addressing climate change through both adaptation and mitigation strategies.

Adopting a holistic approach, the Mission integrates ecological restoration with livelihood generation for forest-dependent communities—an innovative model of sustainable environmental and socio-economic development. By prioritizing the restoration of degraded forests—areas with significant carbon sequestration potential—the Mission provides a cost-effective pathway for achieving India's climate commitments. Emphasizing the plantation of native, multi-purpose tree species with high carbon sequestration capacity, this strategy promotes land degradation neutrality, eco-restoration, and enhanced ecosystem resilience.

Aligned with the vision of Atma-Nirbhar Bharat (Self-Reliant India), the Mission also focuses on skill development and sustainable livelihood enhancement for forest-dependent communities. Its newly adopted Lab-to-Field approach aims to bridge scientific research with on-the-ground implementation, particularly to advance the concept of Trees Outside Forests (ToF), improve planting stock quality, and enhance land productivity and agricultural yields.

Through strategic convergence with various government schemes and multi-stakeholder collaboration, the National Mission for a Green India stands as a comprehensive platform integrating ecological restoration with inclusive development. It embodies a commitment to balancing ecological integrity with community well-being.

With continued collective efforts, we can build a greener, more resilient, and sustainable India—ensuring that our natural heritage thrives for generations to come.

(Bhupender Yadav)

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Executive Summary

The National Mission for a Green India was launched by the Ministry of Environment, Forest and Climate Change in 2011, as one of the eight Missions under the National Action Plan on Climate Change (NAPCC). It aims at protecting, restoring and enhancing India's forest and tree cover and responding to climate change through a combination of adaptation and mitigation measures aiding to enhance carbon sinks in sustainably managed forests and other ecosystems; enhancing adaptation of vulnerable species and augmenting livelihood opportunities for forest-dependent communities.

The Mission started with the objective to increase forest/tree cover on 5 million hectares (mha) of forest/non-forest land and improved quality of forest cover on another 5 mha land area, enhanced ecosystem services including biodiversity, hydrological services and carbon sequestration through the treatment of 10 mha of forest/non-forest land, enhanced annual carbon sequestration by 50 to 60 million tonnes in the year 2020, and an increased forest-based livelihood income of about 3 million households.

The Mission's interventions were started in the year 2015-16 with the collaborative effort of the Central and State governments. Various afforestation activities including tree plantation were taken up over 11.22 mha area from 2015-16 to 2020-21 under the schemes of the Central Government and State governments including the Green India Mission.

In pursuance of India's commitments under its Nationally Determined Contribution (NDC), the National Mission for a Green India aims to create an additional carbon sink of 2.5 to 3.0 billion tonnes of CO2 equivalent through additional forest and tree cover by undertaking restoration of open forests and afforestation/tree plantation on wastelands; plantations along national and state highways and railway tracks; urban landscapes, promotion of agroforestry, treatment of marginal farmlands and river catchments, etc. in conjunction with various other schemes of Central Government and State governments including Compensatory Afforestation Fund. Activity such as restoration of open forests would be taken up on priority under the Mission given its large potential to create additional carbon sink[1] and also being the most cost-effective strategy to achieve the NDCs target.

1 https://fsi.nic.in/isfr2019/isfr-fsi-vol1.pdf, Page 149, Box 4.

The Mission would adopt 'Micro-Ecosystem' approach to focus on identification of intervention pockets in the highly vulnerable landscapes like Aravallis, Western Ghats, Arid regions of North West India, Mangroves, Indian Himalayan Region (IHR) etc. and their restoration and saturation through regionally conducive best practices for holistic landscape management including planting of native multipurpose tree species with high carbon sequestration potential, and intensive soil and moisture conservation activities to achieve land degradation neutrality.

Forest Survey of India on Achieving India's NDC

The Forest Survey of India (FSI), in their India State of the Forest Report (ISFR) 2019 has indicated that the shortfall in achieving the NDC target can be achieved by undertaking activities such as restoration of open forests, and afforestation on different kinds of available lands like wastelands, agroforestry, plantation along highways, railway sidings, urban landscapes etc. The estimation further establishes that the restoration of open forests is the most cost-effective strategy to achieve the NDC target and at the same time it holds a large potential of creating additional carbon sink.

The interventions under the Green India Mission are categorized under three sub missions:

1. Enhanced quality of forest cover and improved ecosystem services
2. Increase in forest and tree cover and ecosystem restoration.
3. Enhancement of household incomes and diversification of livelihoods for forest-dependent communities

The Mission would promote the principle of 'Atma- Nirbhar Bharat- the Self-Reliant India', through developing a skilled Green India Force of trained and dedicated youth through extensive skill development and livelihood enhancement of the forest-dependent communities, besides undertaking Research & Development towards developing 'quality planting stock' of regionally conducive agroforestry species, which shall be one of its core strategies.

The Mission would also endeavor to establish:

a. Livelihood Improvement Training Centres (LITCs), to enhance the traditional and acquired skills of the communities for processing, packaging and marketing of forest produce. Farm and non-farm related income generation trainings based on their local relevance will also be provided to forest-dependent communities.

b. Sustainable Livelihood Enhancement Models for forest-dependent communities to enable them to diversify their income generation activities which will effectively reduce the pressure on the forest areas.

c. Non-Timber Forest Produce (NTFPs) Processing Centres, to function as a single window source to address skill development, procurement of locally collected raw material, its processing, and its packaging and marketing for value chain enhancement. This would further help in the increase in the importance value of the forest produce and will also ensure that the farmers, producers and local population will have enhanced incomes.

d. Integrated Nursery and Research Centres, to provide quality planting stock of forestry, NTFPs, horticulture, and agroforestry species, etc. to increase land productivity, agricultural produce and enhance farmers' income, and

e. Reducing the gap between research and field practices by strengthening the State Forest research wings with the support and coordination with research institutions through 'Lab to field' approach.[2]

The Mission would establish a comprehensive Monitoring and Evaluation Mechanism for an efficient and effective monitoring of its interventions. The M&E would be carried out at five levels, at the National Mission Directorate by the dedicated Monitoring Cell for performance tracking through web-based National Afforestation Dashboard & MIS, and GIS based monitoring through analysis of satellite imageries. The National Afforestation Dashboard would also serve as a tool for effectively capturing and reporting on the tree plantation and regeneration activities undertaken across the country under the Central Govt. schemes and State plans including the activities by the private players, NGOs, Civil societies, and individuals. The other levels of monitoring would include on-ground self-monitoring by the implementing agencies, social audit by the members of Gram Sabha and the remote-sensing based monitoring by the Forest Survey of India and other specialized agencies. Periodic monitoring of the identified intervention areas by third-party will be one of the components under the mechanism.

Establishing convergence with the various schemes would be fundamental for the implementation of the Mission's activities and achieving its objectives. The Mission would follow a 'Bottom-up' model to strengthen the decentralized governance and management of its interventions. Joint Forest Management Committees (JFMCs) would be the key implementing units, with further management and coordination vested with the Forest Development Agencies, State Forest Development Agencies and the Mission Directorate in an ascending order.

The total Mission cost is estimated as Rs 12,190 crores for implementation of afforestation activities over 1.0 million hectares during the period of 10 years (2021-30). The Mission costs will be met partly from the budget under ongoing Green India Mission CSS scheme and balance from funds available under National Fund of CAMPA. The Mission along with ongoing afforestation schemes/activities of Government of India, the line Ministries and the State Governments, will achieve the target of 24.0 million hectare to achieve the NDC goal and various national and international commitments.

2.http://www.millenniumpost.in/kolkata/state-starts-lab-to-field-initiative-to-boost-agri-sector-421689

1. Background

India is among the few countries in the world to achieve a positive trend of increase in forest cover. This has been possible because of high priority accorded under the strong framework of Policies, Acts & Rules and programmes to ensure the conservation of forests and biodiversity, enhance green cover and the participation of people in the conservation activities while protecting the rights of forest dependent communities.

NDCs have become the bedrock of India's climate actions post-2020 and are also indicative of the country's "best-efforts" while balancing the developmental imperatives, with sustainable development and poverty eradication[3]. Several proactive climate actions are being implemented to fulfil their obligations as per the principles of common but differentiated responsibilities and respective capabilities and equity. Among the various interventions; priority is being accorded to raise ambition and accelerate action to implement the Paris Agreement; Mobilizing finance, energy transition i.e. accelerating the shift away from fossil fuels and towards renewable energy, as well as making significant gains in energy efficiency; emphasis on Nature-Based Solutions (NbS), whereby to increase the sink capacity and enhancing resilience within and across forestry, agriculture, oceans and food systems, through biodiversity conservation; leveraging supply chains and technology; strengthening and motivating cities and local action and resilience, and adaptation and mitigation to manage the impacts and risks of climate change amongst the vulnerable communities.

2. Introduction and Sector Profile

The National Mission for a Green India is one of the eight Missions under the National Action Plan on Climate Change (NAPCC) with an aim to respond to climate change through a combination of adaptation and mitigation measures. The Mission recognizes the influences that the forests and other natural ecosystems have on climate adaptation/mitigation, and food, water, environmental and livelihood security of tribal and forest dwellers specifically, and of the nation at large.

The Mission acknowledges the challenges in bridging the demand and supply gap of various provisioning services from forests, particularly fuelwood, fodder and grass, timber, cane/bamboo, NTFPs etc., which are creating unsustainable pressure and contributing in degradation of forests and ecosystems. The productivity of forests is also relatively low, thereby widening the gap between demand and supply of various forest products even further.

Climate change has caused the altitudinal and latitudinal shift of the species from forest ecosystems, higher incidences of forest fire, pests and disease attack, increased proliferation of invasive species, change in species assemblage/forest type, forest die-back and loss of biodiversity, which has magnified the vulnerability of the country's forests. Consequently, the livelihoods of forest-dependent communities are also getting severely affected, especially of women who depend on fuel, fodder and food from forests, thus increasing their vulnerabilities as well.

The Mission taking into account the intensity of these vulnerabilities, will select landscapes for its interventions for ameliorating climate change, enhancing food & water security and diversification

3. https://dea.gov.in/sites/default/files/FINAL%2017%20SEPT%20VERSION%20Climate%20Summit%20for%20Enahnce%20Action%20A4%20size.pdf

of livelihoods and increased household incomes of the local communities. The Mission adopts the Micro-Ecosystem approach for undertaking landscape specific eco-restoration interventions to deliver qualitative improvement of the degraded forest areas and to quantitatively reinforce improvement of forest and tree cover on the forest and the non-forest areas. Based on the Principle of Additionality[4], the Mission will focus its interventions to enhance the reclamation and restoration process in the degraded land towards the generation of offsets[5] guided by the nature and the extent of the vulnerabilities of the identified areas. Approach towards saturation of vulnerable landscapes through tree plantation would be adopted to carry out afforestation/tree plantation activities.

The Mission under its decentralized approach focuses on efficiency in planning and implementation of its interventions. The JFMCs will have a prominent role in the identification of the landscapes, the treatment areas and the afforestation models. A comprehensive five year's perspective plan will be prepared for each JFMC detailing the benefit sharing mechanism with the Forest Departments. The State Governments will consolidate and prepare a comprehensive afforestation plan under the Mission taking reference of the targets and the funds availability of the other afforestation schemes being implemented in the respective state. The interventions under GIM will be implemented in convergence with other similar schemes and reporting will be done through the National Afforestation Dashboard.

The Mission through its interventions would emphasize upon the adoption of-

1. Reclamation/Restoration Forestry
2. Best practices of Nature Based Solutions (NbS),
3. Decentralized models of implementation for a proactive multi-stakeholder involvement and to effect synergies with the relevant ongoing afforestation schemes, and
4. Promoting self-reliance among the forest dependent communities through skill enhancement and enabling diversification of livelihoods.

This approach would in principle align the Mission with the three major United Nations Sustainable Development Goals SDG 2 (End hunger, achieve food security and improved nutrition and promote sustainable agriculture), SDG 6 (Ensure availability and sustainable management of water and sanitation for all), and SDG 15 (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss).

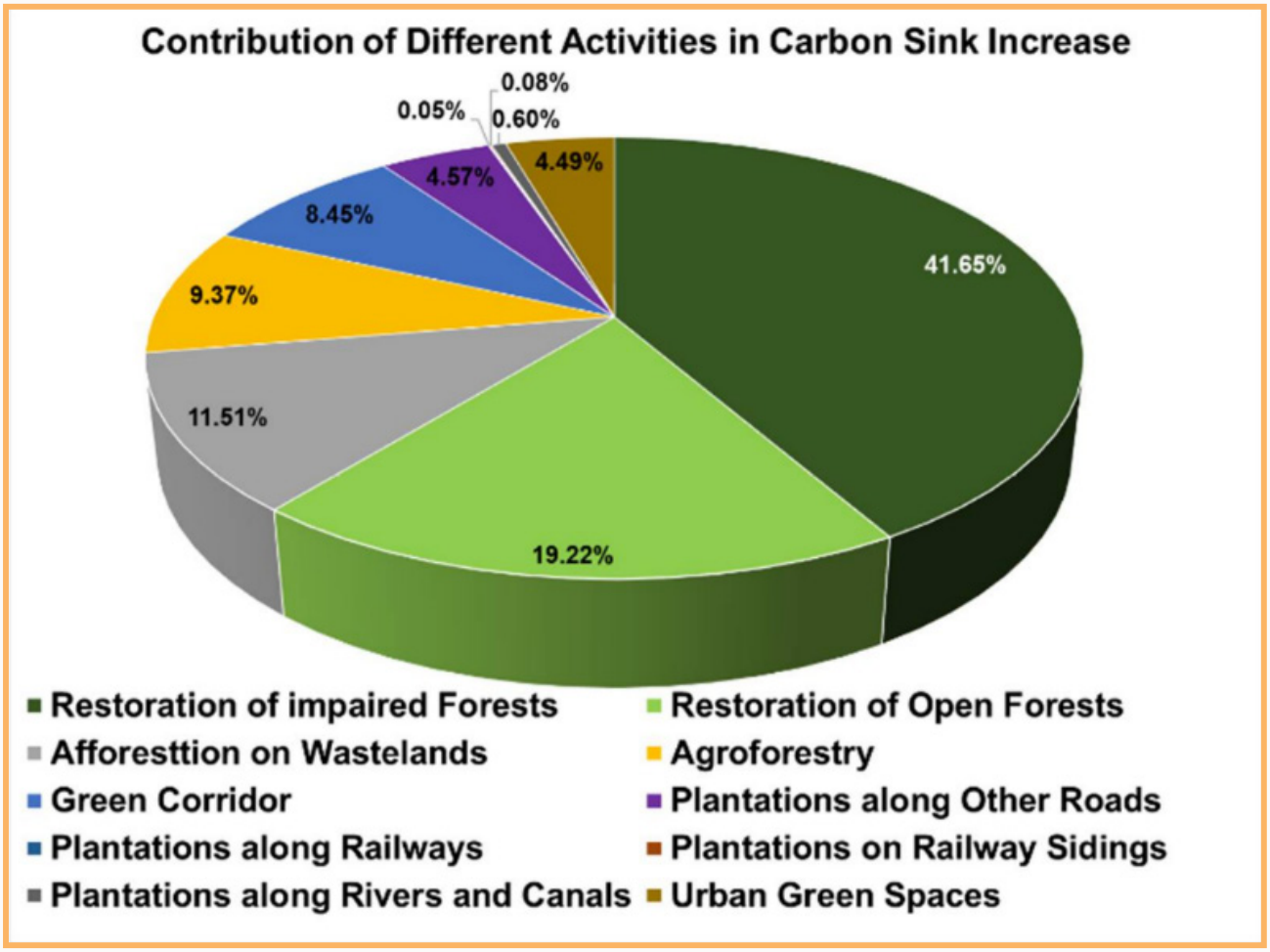
The Mission interventions are categorized under three sub-missions, aligning with the recommendations of the Forest Survey of India under the India State of Forest Report 2019. All the interventions shall be executed strictly in accordance with the Mission's mandate.

The Forest Survey of India (FSI), a premier national organization under the Ministry of Environment, Forest and Climate Change to conduct survey and assessment the forest resources of the country, has estimated that forests of the country have contributed to 29.62 billion tonnes of CO_2 equivalent carbon stock in 2015 and total forest carbon stock shall increase to 31.87 billion tonnes of CO_2 equivalent by 2030 through the increased forest and tree cover. Ten categories of activities have been considered by

4. https://www.conservationgateway.org/Documents/TNCApplyingTheMitigationHierarchy.pdf
5. counteract (something) by having an equal and opposite force or effect.

the FSI for the potential increase in carbon sink and forest cover in the country and include restoration of impaired forests, restoration of open forests, afforestation on wastelands, agroforestry, setting up of green corridors, undertaking plantations along roads and railways, undertaking plantation on railway sidings, along rivers and canals and the creation of urban green spaces.

The estimation establishes that the largest potential of creating additional carbon sinks lies in the restoration of forests which have impaired in the last 15 to 20 years, along with the activities like restoration of open forests, afforestation on wastelands and Agroforestry. These two activities of restoration of natural forests contribute up to 60% of the total carbon sink which can be achieved by 2030. It is also indicated by the FSI that to bring about an increase in carbon sink (CO_2 equivalent billion tonnes) by 2.51 and 3.39 by 2030, a corresponding increase of 18.71 and 24.69 million hectares of enhanced forest and tree cover area would be required respectively.



Potential Increase in Carbon Sink

Activities	Tentative Projections	
	CO_2 eq. (billion tonnes)	Area (ha)
Restoration of impaired forests	0.95	96,19,877
Restoration of Open forests	0.94	5669,967
Afforestation on Wastelands	0.56	37,40,844
Agroforestry	0.31	27,46,400
Green Corridor	0.23	7,00,000
Plantation along other roads	0.15	11,57,817
Plantations along Railways	0.0025	20,006
Plantations along railway sidings	0.0012	5,154
Plantations along river and canals	0.029	1,17,126
Urban Green Spaces	0.22	9,14,398
Total National Level CO_2 eq. (billion tonnes) upto 2030	**3.39**	**2,46,91,590**

India has a unique distinction to be among the few countries in the world who have achieved the increasing trend of forest cover and tree cover, despite large biotic pressure and dependency on forest. This could be made possible because of the high priority accorded to conservation and restoration of forest and enhancing biodiversity and green cover under the policies, Acts & Rules and programmes, and an efficient collaborative implementation of the afforestation efforts of both National and State Governments under various plans and schemes of the Central and the State governments.

The Mission's interventions were started in the year 2015-16 and about 11.22 mha area could be included under plantations till 2020-21 as reported under the Twenty Point Program and depicted in the table given below. The FSI study also establishes that the targets of afforestation and carbon sequestration conceived under the Mission as part of the National Action Plan on Climate Change to be achieved by 2030, can be achieved easily by sustaining the existing policies and programmes.

Area covered under various Plantation activities reported under Twenty-Point Programme		
S. No.	**Year**	**Area (in m.ha)**
1	2015-16	1.38
2	2016-17	1.99
3	2017-18	1.68
4	2018-19	1.84
5	2019-20	2.12
6	2020-21	2.21
TOTAL		**11.22**

The Mission in its new phase will continue to strive to achieve the commitment of creation of additional carbon sink by adopting efficient social, community and agro-forestry practices, in addition to reduce the vulnerabilities of the landscapes and the forest dependent communities through its interventions on the micro-ecosystem basis and effecting convergence with the other related schemes.

3. Key Vulnerabilities/Challenges due to Climate Change

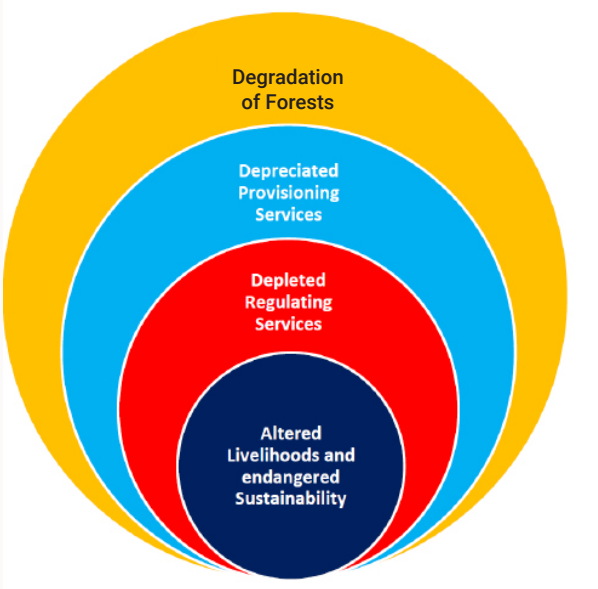
The Green India Mission recognizes the influences and potential that the forests and other natural ecosystems have on climate adaptation/mitigation, and on the food, water, environmental and livelihood security of tribal and forest dwellers specifically, and the nation at large.

The Mission acknowledges the challenges on account of the demand and supply gap of various provisioning services from forests, particularly fuelwood, fodder/grass/grazing, timber, cane/bamboo, NTFP etc., which is creating unsustainable pressure and contributing to degradation of forests and ecosystems. The productivity of Indian forests is also relatively low, thereby widening the gap between demand and supply of various forest products.

Through the scientific modelling done using RCM (Regional Climate Model) and BIOME model (BIOME 4), change is projected for 8% 18%, 56%, and 30% of the vegetation grids.[6] Use of the dynamic global response model IBIS (Integrated Biosphere Simulator) predicts the percentage of forested grids expected to undergo vegetation change range from 3.5% in the North-Eastern states to 73% in Chhattisgarh.[7] Already challenged forest eco-systems will become much more vulnerable to the adverse climatic conditions.

Climate change has caused the altitudinal and latitudinal shift of the species from forest ecosystems. Forest fire, pests and disease attack, proliferation of invasive species, change in species assemblage/ forest type, forest die-back and loss of biodiversity, have also contributed in increasing the vulnerability of the forests. Consequently, the livelihoods of forest-dependent communities are also getting severely affected, especially of women who depend on fuel, fodder and food from forests, thus enhancing vulnerability of forest-dependent communities.

The Mission will hence select landscapes taking into account the intensity of these vulnerabilities and will contribute to ameliorating climate change, provisioning food & water security and enhanced livelihood income of local communities.



6. http://moef.gov.in/wp-content/uploads/2018/04/Innca-press-release_0.pdf

7. RK Chaturvedi, Ranjit Gopal Krishnan, MathangiJayaraman, G Bala,, NV Joshi, R Sukumar and NH Ravindranath, Impacts of climate change on India's forests : a dynamic vegetation modeling approach, http://hpccc.gov.in/PDF/Forests/Impact%20of%20Climate%20Change%20on%20Indian%20Forests%20a%20Dynamic%20Vegetation%20Modelling%20Approach.pdf

4. The Goal, Objectives, and Key Priorities

Goal

The Mission aims at responding to Climate Change through a combination of adaptation and mitigation measures which will help in enhancing carbon sinks in sustainably managed forests and other ecosystems, adaptation of vulnerable ecosystems and adaptation of forest-dependent communities.

Mission Objectives

The Mission aims for-

1. Improved quality of forest cover and increased forest and tree cover on forest/non- forest lands
2. Improved ecosystem services including biodiversity, hydrological services and carbon sequestration
3. Increased forest-based livelihoods and household income of forest dependent communities living in and around the forests.
4. Creation of an additional carbon sink of 2.5 to 3.0 billion tonnes of CO_2 equivalent by 2030.

Mission's Core Priorities

1. Restoration/reclamation forestry under the Landscape Approach focusing on vulnerable habitats and degraded forest and non-forest areas through existing and regionally applicable eco-restoration models, including agroforestry and social forestry.
2. Saturation of vulnerable landscapes through tree plantations in identified gaps in consonance with the ongoing afforestation schemes of the Central and the State governments.
3. Enhancement of livelihoods and household income of the forest dependent communities living in and around forest areas through skill development and sustainable cultivation of the NTFPs.
4. Application of adaptation/mitigation measures, enhancing Ecosystem Services, Carbon Sequestration, Soil and Water Conservation, Biodiversity Conservation and Livelihood Security etc. Local communities will be motivated to play a key role in prioritizing the range of ecosystem goods and services through the process of informed decision making.

5. Mission Strategies to address Key priorities and Linkages with India's NDC Commitments for the period 2021-2030

The Mission's approach in its new phase will depend on the following strategies which are devised based on the learnings and guided by the imperatives of the country's policy commitments

Strategy 1: Saturation of Vulnerable Landscapes through Tree Plantation in the identified gaps

The Mission seeks to work in tandem and synergistically with all the ongoing afforestation schemes implemented under the Central and the State missions and plans. The Mission recognizes the efforts put in by the States in undertaking plantation activities under the various ongoing Central and State-specific schemes. The Mission seeks to complement the ongoing efforts of the States by providing itself as a tool to fill in any gaps and address the shortfalls in undertaking activities under the ongoing

schemes. Efforts would be directed to saturate the intervention landscape, working in tandem with the ongoing afforestation schemes.

Criteria for selection of project areas/ sub-landscapes/sub-watersheds under the Mission will include projected vulnerability to climatic change, the potential of areas for enhancing carbon sinks and the significance of the area from the ecosystem services dimension, such as biodiversity and hydrological services.

The efforts for saturation under the revised Mission shall focus on-

a. Inclusion of additional and new landscapes for undertaking interventions in concordance with the Mission's mandate.

b. Inclusion of additional priority intervention pockets within the selected landscape identified under its different sub-missions.

c. Inclusion of additional activities in the selected landscape not supported under the other schemes and considered as important for furthering the States' efforts (urban, peri-urban, agroforestry, eco-restoration and soil and moisture conservation activities). The identified activities must fall under the mandate of the Mission and align with the activities detailed under the Mission's different sub-missions.

This approach shall contribute to the success of the vision that all existing schemes together will contribute to fulfilling the NDC targets.

Strategy 2: Focused approach for Greening Outside Forest Areas

Forest conservation and its role in meeting subsistence needs of the forest-dependent communities are emphasized as national priorities. The Mission will promote various afforestation activities and interventions on the forest and the non-forest areas for the qualitative and quantitative improvement of the forest and tree cover on the micro-ecosystem basis. Best models of innovative afforestation practices will be adopted to increase forest and tree cover in non-forest areas, and to saturate available lands through extensive plantation in conjunction with various related schemes of central and state governments.

The protection and conservation of natural vegetation and biodiversity, removal of invasive species, soil moisture and water conservation, and promotion of sustainable livelihood and ecosystem management practices will also form an integral part of the interventions under the Mission. The Mission further seeks to introduce the concept of Geo-tagging and GIS based monitoring of trees planted under its interventions to monitor the progress of the planting activity and also to recognize the efforts of the JFMC members in the implementation of the Mission's activities. Granting a share in the usufructs to the community for tending and protection of trees planted shall also be a part of Mission's strategy.

The private sector, including individuals, local communities and industry, are seen as partners in sustainable forest management. Suitable mechanisms for motivating the role of private agencies shall be devised under the identified Mission's interventions. The Mission recognizes the concept of 'Sustainable Private Sector Forestry' which necessitates the private sector participation in sustainable

forest management and identifies measures to ensure future sustainable supplies of forest produce from outside forest areas, thereby reducing the burgeoning pressure on the forests. The National Forest Policy indicates that forest-based industry should meet its raw material needs by establishing direct relationships with farmers. As such, the concept of Farm Forestry provides ample potential for the private sector to promote industry-farmer partnerships for the supply of raw material to wood-based industries. The Mission will explore the role of private players in the Mission's interventions based on the development of appropriate policy framework and guidelines.

Strategy 3: Availability of Quality Planting Material (QPM)

The Mission would seek to ensure the sustained availability of Quality Planting Materials (QPM) for undertaking massive tree plantation in the forest and non-forest areas and including the promotion of agroforestry on farmers' lands. The Mission would support developing new nurseries and strengthening existing nurseries at appropriate sites for efficient production of good quality plants. These nurseries may be objective-driven for the production of high-quality planting material of the species depending on demand and their suitability to the landscape. Existing nurseries owned by government/ private agencies shall also be strengthened and capacitated, which will maintain the production of planting stocks of desired quantity and quality. These nurseries would function as a tool to develop, undertake research and production of certified QPM, and its further distribution at subsidized prices.

This would help in enhancing the availability of and beneficiaries' accessibility to QPM, extension of technical knowledge and marketing of the produce, and also enhancing the skills and the awareness of farmers on benefits of using QPM in farming practices through different modes of communication viz. radio, TV, pamphlets and brochures in local languages, seminars, village meetings and campaigns.

The Mission shall also strive to develop a system of accreditation for the nurseries as the certified supplier of authentic and credible planting material, and to be implemented by the Forest Department. Gene Banks shall also be established within the certified nurseries through selection of Candidate Plus Trees (CPTs) and establishment of Seed Production Areas (SPAs), with the primary objective to ensure improved productivity of plantations through identified suitable species for different agroecological zones.

Strategy 4: Establishing Repository of Vulnerable Landscapes

Vulnerable landscapes which will be a mix of degraded forest lands and non-forest lands shall be identified using the satellite imagery for undertaking comprehensive afforestation and eco-restoration measures. The details of the land resources available in each state for the Mission's interventions shall be made available on the online portal of the Green India Mission on a real-time basis. The repository shall further enable undertaking of suitable R&D to develop additional combinations of trees and agricultural crops suitable to the climatic condition, soil profile, socio-cultural acceptability and with a favourable cost-benefit analysis with regards to the available land areas.

The sole objective of this repository shall be to devise and implement replicable and conducive landscape specific afforestation and eco-restoration models and impart suitable know-how to the community, besides enhancing the productivity of the vulnerable pockets in the identified landscape.

Strategy 5: Adoption of Micro-Ecosystem Approach

The Ecosystem Approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. This approach is based on the application of appropriate scientific methodologies focused on different levels of inter-relationship between various biological factors and involving essential processes, functions and interactions among organisms and their environment. The approach recognizes that humans, with their cultural diversity, are an integral component of ecosystems. The Mission will adopt a micro-ecosystem[8] approach working in the smallest units of the landscape with their impacts being magnified and collating at the macro or the landscape level. The regionally conducive and established, identified and demonstrable models will be adopted for the holistic eco-restoration of the identified intervention areas within the larger landscapes.

The Mission's interventions including various afforestation activities shall be implemented through Joint Forest Management Committees (JFMC) at the Village level. JFMC will be involved in selecting vulnerable landscapes for tree plantations by the forest department. The Mission through the JFMCs will add "value" to ongoing programs/schemes on "greening", being implemented by multiple agencies. Such value addition will come through sharing of traditional knowledge by the local communities and comprehensive research and development activities.

Strategy 6: Ensuring Sustainability of Interventions

Restoration Ecology, where on one hand strives to undertake restoration of ecologically degraded areas, on the other seeks to establish the sustainability of the interventions through the provision of suitable livelihood opportunities for the dependent communities and also providing livelihood alternatives to enhance their household income and to reduce their dependence on forest resources.

The Mission through its interventions would adopt an enabling and an advisory role in suggesting technological solutions to address challenges in bringing about a holistic enhancement in the socio-economic conditions of the forest-dependent communities and reduction of ever-increasing pressure on the natural forests. Livelihood Improvement Training Centres (LITCs) in the key forest landscapes shall be established for the diversification of forest-based livelihoods, especially for the rural poor and women. Knowledge and skill building (KSB) of the forest-dependent communities on integrated farm-based development shall be undertaken through focused training on ancillary livelihood activities for enhancing their understanding and facilitating the adoption of those interventions.

NTFPs play a crucial role in providing a safety net for poor people who rely on forests and forest produce for their livelihood. India's tribal population forms the most disadvantaged section of society, with more than half of India's 70 million tribal population subsisting on forests[9]. In addition, an estimated 147 million villagers in India live in or around forests, and another 275 million villagers depend heavily on forests as their source for livelihoods[10]. The Mission also aims to establish NTFP as high-end products and the preferred species under community and agroforestry practices. Sustainable community-based

8. https://www.sciencedirect.com/topics/earth-and-planetary-sciences/microecosystem
9. http://www.fao.org/3/XII/0586-C1.htm
10. https://stopgetrees.org/forest-communities-struggle-traditional-customary-use-forests-india/

agroforestry models shall be promoted for the cultivation of the NTFPs outside the forest areas. NTFP processing centres shall be established to function as a single window source to enhance the skills of villagers for sustainable harvesting of NTFPs, processing of raw materials and marketing of finished products**.** These would thus be multi-purpose centers for providing avenues for the cultivation, harvest, production, processing and marketing of NTFP produce, collected locally and access to markets.

All of these initiatives shall be implemented in coordination and collaboration with the Livelihood and Skill development programmes of the government and in convergence with the Pradhan Mantri Van Dhan Yojana and National Innovations on Climate Resilient Agriculture (NICRA), a network project of ICAR.

The emphasis will be on plantations of suitable native species having a high carbon sequestration potential under the social and agroforestry models. The core strategy would thus be on raising plantations of quality seedlings and ensuring the high survival rate of plantations. This approach will provide qualitative enhancement in forest/tree cover and will establish a platform to adopt best practices under the Mission.

Strategy 7: Reducing the pressure on forests through addressing the drivers of forest degradation

Apart from restoring degraded forests through assisted natural regeneration, reforestation, removal of invasive species and soil and moisture conservation, mitigating the primary causes of forest degradation would also be taken up under the Mission.

Reduction of grazing pressure on forests and enabling the removal of other forest produce like firewood and MFPs without affecting the forest's productivity, would be the key emphasis areas.

The Mission will promote mechanisms for regulated grazing in synergy with the animal husbandry departments for development of stall feeding, improving the nutrition of cattle and thereby enhancing livestock productivity.

Pilots would be implemented for development of alternative sources of fuelwood from agri-based biomass, energy plantations, etc. Improvement of irrigation facilities, development of water sources through watershed activities, crop diversification and value addition, and access to markets would be attempted in convergence with schemes like PMKSY-watershed development and agriculture departments.

A unit at the State level established under the Mission would facilitate integration and exchange of information on various schemes of the relevant line departments which shall be dovetailed in the forest landscape in which the Mission is being implemented by preparing holistic plans in consultation with and in agreement with the various line departments.

Strategy 8: Convergence and Integration of Traditional Knowledge and Practice

Research and Development, Training and Capacity Building of the communities will be one of the key components under the support interventions of the Mission. The promotion of the Nation's call for self-reliance ***'Atma-Nirbhar Bharat'***, would be the key driving force behind the proposed interventions under this head, and include technological research and development, developing the capacities of the stakeholders and enhancing their skills towards establishing sustainable models of livelihood security.

Scientific innovations using the traditional knowledge of the communities and their applications in the field would also be promoted. Numerous initiatives portraying self-sustainable community and agroforestry models with immense potential are also being planned under this component.

Strategy 9: Adoption of Inclusive Development through Multi-stakeholder Approach

The Mission seeks to unlock people's energy and solicit their engagement with its mandate. Various stakeholders (community, farmers, Panchayat bodies, Government/Non-Government, Private institutions/agencies, academia, business houses, children especially in rural communities, media, etc.) will be encouraged to undertake and participate greening activities. This support will be provided in the form of knowledge and information dissemination, capacity building and skill enhancement, infrastructure support like planting material etc. and further engaging them in the decentralized monitoring of the Mission's interventions. The Mission acknowledges the crucial role of women in forest conservation and its sustainable use. The Mission will support women in the planning and the execution of its interventions, and also engage them in the decision-making process at various levels.

Inclusive Development Model under Green India Mission

Strategy 10: Involvement of private sector

The scale and the magnitude of the national effort required for the restoration of degraded land and an improvement of tree cover would imminently require the proactive involvement of all the stakeholders. An active association and involvement of the private sector will therefore be pursued as a strategy for funding some of the interventions under the Mission, and can be achieved through

1. Involvement of companies utilizing wood and wood-based raw material to develop their supply chain by involving the community through JFM committees and panchayat bodies.
2. Contributions from Corporate Social Responsibility (CSR) funds for restoration of vulnerable and critical areas or adoption of certain villages by supporting committed individuals or groups could act as a feather in the cap for the concerned private entity.
3. Undertaking greening of vacant institutional lands through the institution owning the land.

Garnering the commitment of institutions, both public and private, commercial and non-commercial, can be explored through existing laws and guidelines. State agencies can help these institutions by providing planting material and technical knowhow whereas the institution can provide watch and ward and inputs in addition to land. Harvesting of such plantations may be allowed at the request of the owner or user of the land as per their need and request without any liability or compensation. Dialogues with large philanthropic organizations may be initiated to request them to support the greening movement in the country.

To enable the contribution of the private sector, efforts will be undertaken at the MoEF&CC to reach out to the various corporate houses through meetings, seminars, industry road shows and dialogues, eliciting and considering their point of view and creating an enabling environment for them to contribute to the movement.

Strategy 11: Fund Mobilization through effective convergence

The Mission shall strive for enabling effective and efficient cooperative collaboration and leveraging of available funds from the ongoing schemes and programmes of various ministries and departments, including National CAMPA and State CAMPA, National Adaptation Fund for Climate Change (NAFCC), National Mission for Sustainable Agriculture (NMSA), National Bamboo Mission (NBM), Mission for Integrated Development of Horticulture (MIDH), Sub-Mission on Agroforestry (SMAF), Integrated Scheme for Agricultural Marketing (ISAM), National Skill Development Programme (NSDC), MGNREGA, NABARD, NHAI, IWMP, Namami Gange, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), National Highways Authority of India (NHAI), Ministry of Railways, Department of Mines, Ministry of New and Renewable Sources of Energy (MNRE) etc.

The Mission would further seek to facilitate channelization of philanthropic contributions and Corporate Social Responsibility (CSR) funds towards the broader and the specific objectives of contributing to the national effort of enhancing the forest and tree cover of the country through extensive afforestation and eco-restoration efforts to be undertaken both in the rural and the urban landscapes.

Strategy 12: Tapping of Carbon Market

The voluntary carbon market can be tapped for the sale of carbon of forestry origin for both forestry and agroforestry plantations. This area has not been explored so far, especially by the government agencies involved in afforestation due to various reasons including the absence of a national carbon market, but the initiative could be supported under GIM. Establishing a Carbon Registry would also function as an innovation for generating additional financial incentives. However, the involvement in international carbon markets in the post 2020 period (including voluntary markets) would depend on the rules for market mechanisms finalized under Article 6 of the Paris Agreement, and its implications for achievement of India's NDCs.

Strategy 13: Strengthening Policy and Regulatory Regime

The Mission shall also strive to evaluate the present regulatory regime impeding adoption of tree planting in the form of agroforestry and farm forestry by the farming community and suggest research-based policy reforms and their rationalization. The scope of Mission's intervention may include-

- Rationalization and easing out of felling and transit prescriptions on wood and wood products coming from agroforestry, farm forestry and tree cropping areas.
- Notifying wood, wood products and NWFP grown on non-forest lands as agricultural produce to bring them under the progressive agri-market reforms and e-NAM.
- RET species with in-country and export markets to be encouraged for cultivation on non-forest lands with strict supervision and regulations with spin-off benefits of ensuring conservation of RETs in natural habitats.

- Formulation of policy proposals for revisiting the definition of Forest Produce and Pan-India Transit Pass for agroforestry produce.
- Use of IT and digital technology for monitoring and surveillance of agroforestry and forestry products in transit by, inter alia, digital linking of check posts and barriers on national highways.
- PPP models for high yielding plantations by forging collaboration between FDC and the private sector.
- Rejuvenating agroforestry, farm forestry and social forestry in the State's deficit in wood and wood products.
- Tree Insurance for forest species and MSP coverage for agroforestry and farm forestry wood, wood products and NWFP, and
- Facilitating creation of a Carbon Registry to provide a listing, trading and tracking platform for carbon credits to stakeholders including industry with an overarching objective of meeting the NDC commitment of the country under the Paris Agreement of UNFCCC.

Strategy 14: Protection of Trees Planted through Pro-active Green India Force

Local organizations and traditional institutions due to their proximity, are increasingly taken into account as entities capable of efficiently managing natural resources. Participation itself came to be seen as a means to ensure long-term engagement by those involved in the process of solution finding and with the scope of creating accountability and ownership of eco-restoration and conservation objectives. Adaptive co-management is recently gaining momentum, permitting the local actors to share management responsibilities and learn from their actions.

The Mission focuses on community-based protection as an essential component to ensure the sustainability of its interventions. A cadre of willing, dedicated and trained youths shall form the pivot of voluntary Green India Force, which shall have the onus for the implementation of the interventions and the upkeep and maintenance of the assets generated under the Mission. These assets may be the trees planted, soil and moisture conservation structures, and community level infrastructure developed for livelihood enhancement under the Mission. The Force will be the first level trainees who will assume the role of trainers in their village.

The members of the Force shall be selected by the Joint Forest Management Committees for undergoing skill building and capacity enhancement initiatives under the Mission. A person possessing the leadership quality for protection of forests and wildlife may become a member of Green India Force.

Strategy 15: Programme Management Unit for the Mission

A Programme Management Unit would be established at the National and the state levels to focus on programme monitoring and evaluation and the coordination with other Ministries and Departments to implement activities in convergence with programmes related to agriculture, animal husbandry, agroforestry, bamboo mission, watersheds, MGNREGS, Skills, Livelihood etc. as well for reaching out to the private sector to facilitate their involvement in the Mission's activities. The Unit will also have a key role in the development of a perspective plan in coordination with different departments/ stakeholders in the states.

6. Mission's Planned Activities and Interventions

Under the National Mission for a Green India, the collaborative afforestation efforts at the National and the State level will directly or indirectly support the policy framework and the various national or international commitments including the NDC targets submitted by the Government of India to UNFCCC. The afforestation targets outlined under the different schemes will also be incorporated under the Mission's interventions to be taken up in the priority vulnerable landscapes identified under the Mission. The achievement under different schemes will be consolidated and be reported through the National Afforestation Dashboard on a real time basis.

The landscapes prioritized under the Mission shall include the Aravallis, Western Ghats, Arid Regions of North-west India and Cold Desert regions, Mangroves, River Catchments, Ravines and Wetlands, Himalayan Regions including Sea buckthorn, the areas affected by shifting cultivation, degraded bamboo forests etc. Equal importance shall also be accorded to urban, peri-urban, private, institutional and defence and public sector landscapes, for the Mission interventions.

The project areas/ sub-landscapes/ sub-watersheds under the Mission shall be selected, governed by a set of criteria which include projected vulnerabilities of these landscapes to climate change. Indian Institute of Science (IISc) has defined seven vulnerability classes by spatially combining information on forest diversity (monoculture versus natural forest), forest density (an indicator of degradation) and IBIS vegetation type change estimates for the forest grids.[11] The vulnerability maps thus prepared will provide useful criteria for the selection of areas under the Mission. The other equally important parameters for area selection would include corridors, critical biodiversity habitats and ecosystems, important groundwater/ spring recharge catchments, and potential of areas for enhancing carbon sinks etc. The India State of Forest Report provides state-wise details of forest areas that are devoid of forest cover and could be brought under green cover. This could be an added criterion for area selection. Rural poverty and scheduled areas could be taken as an additional parameter while prioritizing the areas under the Mission.

Soil and Water Conservation (SWC) is an integral component treatment of landscapes for reducing soil erosion hazards and land degradation and enhancing the conservation of water resources. The Mission under its interventions would undertake intensive SWC activities and may include terracing and reclamation, erosion control, water conservation and distribution, afforestation, cash/horticulture crops development works water harvesting works, farm ponds, conservation works in urban areas, etc.

The Mission under its decentralized approach will focus on efficiency in the planning and implementation of its interventions. The JFMCs would be involved in the identification of landscape, treatment area and site conducive afforestation models. A comprehensive five year perspective plan will be prepared for each JFMC detailing the benefit sharing mechanism with the Forest Departments. The State Governments will consolidate and prepare a comprehensive Afforestation Plan under the Mission in

11. The study by IISc on vulnerability mapping shows that nearly 39% of forested grids in India are vulnerable to climate change. The forests in the central part of India, and especially the north-western part of India, are highly vulnerable. A significant part of the Himalayan bio-diversity hotspot is projected to be highly vulnerable due to higher warming. Northern and central parts of the Western Ghats are also vulnerable to climate change. Thus, vulnerability analysis helps to identify

convergence with the other afforestation schemes being implemented in the state. The private sector, including individuals, local communities and industry, are seen as partners to identify and implement measures to ensure future sustainable supplies of forest produce from outside forest areas, thereby reducing the burgeoning pressure on the forests.

Afforestation activities under GIM will be implemented in convergence with and through leveraging funds from the related Centrally Sponsored Schemes and State plan Schemes including Compensatory Afforestation fund (CAMPA) during the period 2021-30. Guidelines of the respective schemes shall be followed in the identification and implementation of Mission activities.

The Mission will seek to establish replicable plantation models under various landscapes besides undertaking innovative technological interventions to encourage and motivate holistic eco-restoration practices to boost community-based innovations utilizing the treasure of traditional knowledge available within the communities. The Mission's interventions will be based on the comprehensive plans submitted by the State Forest Development Agencies (SFDAs) taking into account the potential vulnerabilities of the landscapes as identified by the Forest Development Agencies (FDAs). The Mission's interventions thus shall provide an Additionality to the efforts to meet country's commitments to enhance the reclamation and restoration process of the degraded land towards the generation of offsets guided by the nature and the extent of the vulnerabilities of the identified areas.

The Mission's interventions are categorized under three sub-missions for contributing towards achieving the Mission's objectives-

1. **Sub-Mission 1** will address the Mission's first objective i.e. qualitative and quantitative improvement of forest and tree cover in the existing forest areas.
2. **Sub-Mission 2** will contribute towards increasing the forest and the tree cover in the non-forest areas, and
3. **Sub-Mission 3** will focus on income enhancement and livelihood diversification of the forest dependent communities.

All the interventions will cumulatively contribute towards enhancing ecosystem services, particularly the biodiversity, carbon sequestration and hydrological services on the identified landscapes in these areas.

The sub-mission wise detailed activities to be implemented are as follows:

Sub Mission 1: Enhanced Quality of Forest cover and Improved Ecosystem Services

Ecosystems/landscapes prioritized under this sub-mission will include a mosaic of degraded and open forest areas affected by rapid ecological degradation and uninhibited exploitation. The Mission shall focus on highly vulnerable landscapes including Aravalli landscape, Western Ghats, Arid regions of North West India, Mangroves in coastal areas, Indian Himalayan Region and Degraded Bamboo forests on priority for enhancing ecosystem services and carbon sink. The Mission will take up tree plantations in identified gaps for saturation of these landscapes to have a magnified impact.

Component 1.1: Restoration of Degraded Forest ecosystems:

About 30.4 m ha of India's forest cover comes under the open forest category. The open forests are located mostly in the forest fringes adjoining the villages and are subjected to intensive biotic pressure and unsustainable removals of forest produce. These lands have an immense potential for meeting the requirements of fuelwood, fodder, small timber and NTFP for village communities. These areas also offer ample scope for increasing carbon sink by improving the growing stock and the quality of forest cover.

Under this sub-mission, best practices of restoration and reclamation forestry will be implemented on priority in these landscapes governed by the nature and extent of their vulnerabilities. The extent of degradation will guide the selection of interventions. The various key interventions that will be taken up under this component include assisted natural regeneration, soil and moisture conservation works through the ridge to valley approach, cut-back operations, removal of invasive weeds, fire prevention activities, and protection of the area through restriction of grazing followed by multiple shoots cutting, singling and thinning operations, rainwater harvesting and plantation of indigenous species. Native fast-growing species will be preferred for planting purposes in the identified landscape.

Courtesy: GIM, MP

Key Interventions:

- Assisted Natural regeneration/Artificial regeneration and affording efficient protection
- Improving quality of seedlings by using seeds of known origin
- Fire Management (both prevention and detection and control), and eradication of invasive species, pests and pathogens,
- Regulated grazing
- Improving hydrological regime through soil/moisture conservation (on ridge to valley basis)
- Coordinating with line departments like Agriculture, Animal Husbandry, Watershed, Rural development, Skill addressing drivers of degradation and improving livelihoods

Component 1.1.1: Restoration of Aravalli Hills:

The Aravalli hills are one of the oldest mountain ranges and extend for about 700 kilometres from Champaner in Gujarat to Delhi traversing through Rajasthan and Haryana. The Aravalli hills, with its vast landscape and biological diversity, have wide-ranging impacts on the sustainability of the natural resources in the region. These hills are under severe ecological threat due to extensive mining and unhindered construction activities.

The decrease in open forest cover in the Aravalli range in the last three decades has presented an increasing threat of desertification. This deforestation of the range has led to reduced moisture in the air, further causing sand storms. Consequently, the rainfall has drastically reduced in the region which has significantly depleted the groundwater availability in the region. The 2017 State of the Environment Report estimated that around 40% to 70% of the land has undergone desertification in the eight states of Rajasthan, Delhi, Goa, Maharashtra, Jharkhand, Nagaland, Tripura and Himachal Pradesh. This increasing desertification presents a substantial threat to agriculture in the region and also in the adjoining eco-geographic zones.

The efforts of the Mission would thus be to restore, conserve and enhance the ecological values of Aravallis by creating a Green Wall which will prevent extension of desertification by acting as a barrier against the sand-bearing winds from the Thar desert. This green wall will further function as a groundwater recharge zone for the long-term ecological security of the dependent cities. In addition, comprehensive eco-restoration activities including the soil and water conservation work and the plantation activities will also be taken up under the Mission. Key interventions would include plantation of indigenous tree species and shrubs, native fast-growing species, locally relevant NTFP species for agroforestry and social forestry, soil and moisture conservation works on ridge to valley approach, removal of invasive weeds and various assisted natural regeneration measures.

Key Interventions:

- Identifcation of landscape for intevention
- Afforestation of Native Species
- Intensive Soil and Moisture Conservation Activities
- planting of windbreaks in the western ecotone (towards the Thar desert)
- Reclamation of abandoned mining areas
- Promotion of Agro-forestry and Social Forest

Component 1.1.2: Restoration of Western Ghats:

The Western Ghats, is among 34 Global hotspots of biodiversity in terms of flora, fauna, landscape and ethnicity. The region harbours a rich biodiversity with about 1,741 species of plants, 403 species of birds and a variety of reptiles. The Ghats extend to a length of around 1600 kms and an approximate area of 1.6 lakh sq.kms. along the Indian West Coast from Gujarat to Tamil Nadu. As per the estimates, the Ghats neutralize about 4 million tonnes to 14 million tonnes of CO_2 annually. Due to its diverse forest ecosystems, the region neutralizes 10 percent of the total greenhouse gas emissions of India.[12]

The eco-system of Western Ghats has degraded due to extensive deforestation, felling of trees and illegal mining of minerals which causes extensive pollution, deterioration of water & air quality, depletion of ground water, scarcity of drinking water during summer, changes in agriculture practices and crops pattern etc. Siltation of tanks, drying up of rivers and springs, invasion of eupatorium, and increased human-wildlife conflicts are other major problems in the area.

The efforts of the Mission would thus be to restore, conserve and enhance the ecological values of Western Ghats through:

1. Conservation of biodiversity and enhancement of carbon sequestration potential
2. Intensive Afforestation and SMC activities to increase the groundwater recharge for the long-term ecological security of the zone.
3. Working in tandem with the Ministry of Mines for the eco-restoration of abandoned mining areas through planting of native and indigenous species so as not to disturb the eco-fragility of this zone.

12 http://peacefulsociety.org/the-western-ghats-save-the-western-ghats-movement/

Key Interventions:

- Identification of landscapes for intervention
- Afforestation of Native Species
- Intensive Soil and Moisture Conservation Activities
- Reclamation of Abandoned Mining Areas
- Eradication of Invasive Species
- Agro-forestry and Social Forestry

Other key interventions in these areas would also include plantation of indigenous tree species, shrubs, native fast-growing species, locally suitable NTFP species for agroforestry and social forestry, soil and moisture conservation through ridge to valley approach, removal of invasive weeds and various assisted natural regeneration measures. Interventions under the Mission would also complement the activities of the respective forest departments.

Component 1.1.3: Greening of Arid Regions of North-West India:

The world's arid lands cover 40% of the global land area and make up a significant yet fragile ecological system that supports a third of the world's population. The Indian hot arid zone covers an area of 31.7 m ha. (12% of the country's total geographical area) in states viz. Rajasthan, Gujarat, Punjab, Haryana, Maharashtra, Karnataka and Andhra Pradesh. The bulk of the hot Indian arid zone (62 per cent) is contained in West Rajasthan followed by about 20% in Gujarat.

The problem of soil erosion in the arid regions of North West India renders a sizable fertile area into barren wasteland every year. The main causes of erosion in this area are wind, indiscriminate exploitation of natural vegetation by the nomadic population, excessive grazing by a relatively larger population of animals as compared to the available resources, poor range management practices, increasing demand for agricultural land and destruction of vegetation for fuel and other requirements.

The Mission recognizes that degradation of India's agricultural lands, forest lands and range lands is a serious concern due to increasing population coupled with the declining agricultural productivity. In the case of forests, widespread loss of myriad ecosystem services and biodiversity have enormous social, biological and economic implications for India's more than 270 million population.[13]

Key priority interventions under the Mission will include planting of shelterbelts and windbreaks of native salt-tolerant species, regulated grazing, soil and moisture conservation works, planting of hardy, salt-tolerant grass species, and rainwater harvesting. Interventions under the Mission would also complement the activities of the state-level schemes being implemented by the forest department.

13 https://www.teriin.org/sites/default/files/2018-04/Vol%20I%20-%20Macroeconomic%20assessment%20of%20the%20costs%20of%20land%20degradation%20in%20India_0.pdf

Key Interventions:

- Identification of vulnerable areas for intervention
- Activities for prevention of desertification
- Afforestation of Native Salt tolerant Species as Shelterbelts and Windbreaks
- Intensive Soil and Moisture Conservation Activities to enhance land productivity
- Development of pastures with selected grass species to improve livestock productivity
- Regionally conducive Agro-forestry and Social Forestry practices

Component 1.2: Restoration of Mangroves:

Mangrove vegetation spreads over 4,975 sq kms and can be categorized as very dense (29.66%); moderately dense (29.73%) and open mangroves (40.61%) (ISFR, 2019). Mangrove and coastal ecosystems deserve special conservation efforts as these ecosystems are critical for protecting human lives and property from natural calamities such as cyclones, tsunami, storm surges and coastal erosion, and are the breeding, feeding and nursery grounds for many estuarine and marine organisms.

The Mission will support the restoration of mangroves in the potential areas through improving the quality of mangrove cover. The restoration activities will be taken on priority over such areas where mangroves have disappeared but were historically present. These patches of biodiversity-rich habitats will be protected through protection and restoration activities in the coastal, riverine and deltaic belts.

Key interventions would include planting of littoral species and mangrove associates and cutting channels in uplifted areas to facilitate sea-water inundation and plantation of native mangrove species as priority activities under the Mission. Pisciculture based livelihood promotion activities shall also be undertaken under the intervention.

Key Interventions:

- Identification of mangrove patches which require restoration
- Development of channels for plantation and nursery beds
- Afforestation with local species

Component 1.3 Regenerating and Revegetating Himalayan Mountains:

The Indian Himalayan Region (IHR) is the section of the Himalayas within India, spanning 11 Indian states and union territories namely UTs of Jammu and Kashmir and Ladakh, Himachal Pradesh, Sikkim, Uttarakhand, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Meghalaya, Assam and West Bengal. The region is responsible for providing water to a large part of the Indian subcontinent and contains various flora and fauna. The IHR starts from the foothills of the south (Shivaliks), and extends up to the Tibetan plateau on the north (Trans-Himalaya). Three major geographical entities, the Himadri

(greater Himalaya), Himachal (lesser Himalaya) and the Shivaliks (outer Himalaya) extending almost uninterrupted throughout its length, are separated by major geological fault lines.

The Mission will emphasize on the restoration, regeneration and revegetation of the degraded slopes through planting of native species. The objective would be to arrest soil erosion, regulate landslides and undertake slope stabilization through drainage line treatment activities including gully plugging and developing contour trenches for arresting soil run-off and rain-water harvesting. A prior land use planning exercise will also be taken up for treatment of the landscape which shall provide a basis for undertaking a range of potential interventions including natural regeneration, mixed plantations, and suitable agroforestry practices. These activities will not only help in conserving biodiversity, and enhancing carbon sequestration, but will also enhance rural livelihoods and spur the rural economy of the region. The Mission shall also seek to promote effective traditional agroforestry practices such as Hill Paddy Field Protection Plantations under this intervention.

Shifting cultivation is the predominant land use and agricultural system in north eastern states of Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. Shifting cultivation which has evolved as an ecological necessity of the terrain is deeply embedded in the cultural ethos of the local people. However, conversion of forest land for jhum cultivation is one of the causes of deforestation and land degradation in the tropical regions. Increasing population and food grain demand, shortening of fallow jhum period and non-availability of alternative land resources has made this cultural practice unproductive and unsustainable (Nath et al., 2015). The Mission recognizing the variance in the practice would seek to treat the jhum area through apt technological interventions that respect local customs. The Mission would seek to adopt an integrated application of agriculture, horticulture, herbs and medicinal species, indigenous food species, forestry, animal husbandry, soil science, water resource engineering, industrial engineering and design, financial management and banking, anthropology, and related disciplines. Solutions due to such integrated application of the above diverse disciplines are more likely to be economically pragmatic, development-oriented, locally acceptable, technologically advanced and ecologically sustainable, thereby addressing a majority of the SDG targets.

Key Interventions:

- Identification of area based on land use and watershed approach
- Drainage line treatment and SWC measures like Gully plugging and construction of check dams/contour trenches to prevent top soil runoff
- Encourage cultivation of traditional varieties of crops and horticulture by promotion of organic farming
- Regionally conducive Agro-forestry and Social Forestry practices, with due regards to traditional best practices
- Afforestation of Seabuckthorn in suitable areas as nitrogen fixing deciduous plant.
- Intregrated treatment of jhum areas.

Seabuckthorn (***Hippophae rhamnoides*** L.), popularly known as Leh berry, indigenous to the high altitudes it grows widely in the Himalayan region has immense potential in combating global warming, environmental conservation of high-altitude areas of the Indian Himalayas, in health care and poverty

alleviation. Being a nitrogen-fixing deciduous plant, it is designated a a high-priority plant for commercial purposes as well as for environmental protection, especially through afforestation. Afforestation of Seabuckthorn in suitable areas in the States of Himachal, J & K, Uttarakhand and Sikkim will be taken up under the Mission. A pilot project on development of the value chain of Seabuckthorn would be taken up for further research, extension, technology intervention under the Mission.

Component 1.4 Eco-Restoration of Bamboo forests with specific focus in the North-East and Central India:

The North-east area consists of eight states namely Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim which comprises an area of about 2,62,179 km^2 and is known for its rich biological and cultural diversity.

Bamboo forests are important forest types which can rapidly colonize and have high adaptability, nutrient enrichment and conservation ability. Due to its biological characteristics and growth habits, bamboo is not only an ideal economic investment for villagers but also has enormous potential for eco-restoration of degraded lands.

Bamboo protects steep slopes, soils, prevents soil erosion, sequesters carbon and brings many other ecosystem benefits. Its fast-growing nature and the dense foliage help to maintain the thick layer of litter and maintain the stability of microclimate specially the soil moisture content, the most important factors for the restoration of degraded lands.

The Mission would seek to adopt Bamboo and Rattans to:

1. decrease the rate of land degradation and enhance land reclamation and eco-restoration towards ensuring land degradation neutrality
2. diversify the income generation potential and provide economic incentive to the communities.
3. establish and emphasize the importance of bamboo and its impact in changing behaviour towards soil erosion control, biodiversity conservation and increasing capacities for the restoration of degraded lands.

The Mission will work in close coordination with the National Bamboo Mission to optimize outcomes at both the Centre and State level.

Sub Mission 2: Increase in Forest and Tree cover and Ecosystem Restoration

The India State of Forest Report 2019, puts specific emphasis on the importance of enhancing forest and tree cover and the growing stock in the potential forest and non-forest landscapes. Suitable eco-restoration and afforestation interventions would be specifically planned and implemented for River catchments; Ravines; Agricultural landscapes; Marginal farm-lands and fallows; Wastelands; State and National highways; and also, along the Railway track and Vacant lands in urban landscapes etc.

The Mission recognizes the due importance of this Sub-Mission and will focus specifically on the available vacant lands in the non-forest areas identified for undertaking conducive interventions.

Component 2.1: Treatment of River Catchments and Ravine Reclamation:

Landscape planning is the key approach for efficient river catchment restoration and ravine reclamation. Planning and interventions would be undertaken at the macro-watershed, sub-watershed and micro-watershed levels for the holistic restoration of the river catchment areas. The State Forest departments would be expected to align their catchment area treatment plans with the Mission to restore and enhance the ecology of the area, and socio-economic conditions of the dependent communities.

Ravine reclamation would also be one of the priority areas under the Mission's interventions. The total area under ravines in the country is 0.96 m ha (Wasteland Atlas, 2019). Effort would be taken up to check the further ingress of ravines into the non-ravine farmland by using the time-tested method of ***dorbandi*** (closing the ravine head). Shallow gullies can be tackled through the creation of earthen bunds and plantation of hardy grass species for soil stabilization, followed by planting of native species like Dalbergia, Acacia etc. Land use planning incorporating artificial regeneration, mixed plantations, and different regional suitable agroforestry practices, would further enable the reclamation of these areas and enhance the livelihoods of the dependent rural communities.

Key Interventions:

- Land Use Planning for eco-restoration and plantation activities identification of area of intervention.
- Planting of native Multi-purpose tree species like
- Acacia and Dalbergia.
- Intensive SWC Activities including Gully plugging through construction of earthen bunds
- Encourage restoration of the area by undertaking planting of native grass species to restore the productivity of the ravine areas.
- Planting of drought hardy species
- Regionally conducive Agro-forestry and Social
- Forestry practices

Component 2.2: Eco-restoration of Wetlands:

Wetlands are considered as highly productive systems in their natural forms. In India, wetland ecosystems support diverse and unique habitats and are distributed across various topographic and climatic regimes. They not only support large biological diversity but also provide a wide array of ecosystem goods and services (Wetlands Rules, 2010). They are also playing an important role in groundwater recharge, flood control, carbon sequestration and pollution abatement. However, the management of wetlands has received inadequate attention in the national water sector agenda. As a result, many of the wetlands in urban and rural areas are under anthropogenic pressures, including land use changes in the catchment; pollution from industry and households; encroachments; tourism; and over exploitation of their natural resources.

India has about 757060 wetlands with a total area of 15.3 m ha, accounting for nearly 4.7% of the total geographical area of the country. Out of this, the area under inland wetlands accounts for 69%, the coastal wetlands 27%, and other wetlands (smaller than 2.25 ha) 4% (SAC, 2011). Moreover, out of 2,414 Ramsar sites in the world, 42 Ramsar sites are in India with a surface area of 1,081,438 hectares (as of December 2020) covering 19 states.[14]

14. https://www.jagranjosh.com/general-knowledge/ramsar-sites-in-india-1605708327-1

The Mission would be working closely with the Ministry of Jal Shakti and State Wetland Authorities to ensure judicious use of these sites and their conservation. Priority will be given to those wetlands that have a high value as habitats for animal, bird and plant life to achieve biodiversity conservation along with livelihood improvement and carbon benefits. Efforts will be made to restore the drainage system and links across neighboring wetlands to recreate natural flow for recharge of the wetlands. Carefully selected aquatic species will be planted on the banks and islands. Local communities would be encouraged to continue with compatible use of wetlands and seek new opportunities for livelihood enhancement (e.g., ecotourism). Coastal wetlands will also be identified for protection. Conservation of wetlands would also go a long way in achieving the objective of 'Nal se Jal' in each household.[15]

Key interventions:

1. Comprehensive treatment of wetlands' catchment areas
2. Support to compatible land-use practices, fencing of strategic areas to protect wildlife and control encroachments
3. Control of invasive weeds and Water quality monitoring
4. Planting of carefully selected aquatic species
5. Priority will be given to those wetlands with high biodiversity value.

Component 2.3: Restoration of Abandoned Mining areas:

India has a total area of about 0.23 m ha land under the Mining Wasteland (Wasteland Atlas, 2019). The Indian Bureau of Mines (IBM) had identified 297 abandoned mine sites, out of which 106 abandoned mine sites belong to Public Sector Undertakings, major and other private sector companies. Out of the above 106 sites, 24 mine sites become operational again, thus requiring reclamation and rehabilitation in respect of 82 abandoned sites only.[16] In total 197 abandoned Coal Mines also exist in the country.[17] The major share of abandoned mining sites is found in Chhattisgarh, MP, Andhra Pradesh, Tamil Nadu, Jharkhand, Orissa in descending order.

Afforestation is an important component of the plan for reclaiming abandoned mines. The Mission will work with the Ministry of Mines and the Indian Bureau of Mines and will undertake afforestation over the abandoned mines involving local communities. Plantation of suitable native species and soil moisture conservation will also be taken up over the identified areas.

15. https://pib.nic.in/PressReleasePage.aspx?PRID=1600857
16. https://ibm.gov.in/index.php?c=pages&m=index&id=90&mid=23897
17. https://mnre.gov.in/file-manager/UserFiles/Abandoned-Coal-Mines-in-India.pdf

Component 2.4: Plantation over vacant land under the control of PSUs:

The government owned corporations are termed as Public Sector Undertakings (PSUs) in India. In a PSU majority (51% or more) of the paid share capital is held by the Central government or by any state government or partly by the central government and partly by one or more state governments.

As per the Survey 2018-19, there were 348 CPSEs as on 31st March, 2019 out of which 249 were operational and the rest 86 CPSEs were under construction.[18] Besides these there are also SPSEs under the jurisdiction of the respective State Governments. As per the Wastelands Report 2019, about 31720 hectares of wasteland exist under the jurisdiction of the CPSEs, besides the land under their functional interventions.[19] The Central and the State governments have been taking up initiatives to reclaim these wastelands and also to undertake plantation operations.[20] Vacant land with the PSUs provides an ample opportunity to increase forest/tree cover, meet the needs for forest produce and create carbon sink. The Mission would seek to complement these activities through restoration/reclamation forestry and comprehensive regionally conducive eco-restoration activities.

The Mission will encourage PSUs to take up massive afforestation over their vacant land through the participation of the local communities with the support of the Forest department. Benefits accrued out of such activities will be shared with the local communities and the PSUs. The status of land available with the PSUs would be collated at the level of MoEF&CC and shared with the states for further inclusion in their Perspective plan and Annual Plan of Operations (APO). Vacant land available with defence establishments may also be considered for undertaking afforestation interventions.

Component 2.5: Enhancing tree cover in Urban and Peri-Urban areas including institutional lands

The urban and peri-urban areas form one of the most rapidly evolving ecosystems in India and thus have an immense role to play in the ecological restoration process. Due to the increase of population, the vulnerability of the urban areas towards climate change has increased many folds. Rapid urbanization has also deteriorated air quality, increased atmospheric temperature, noise levels, water & land pollution. In the context, urban forests will provide an opportunity to help a) mitigate climate change, b) ameliorate air pollution c) improve the overall water regime, d) nurture urban biodiversity and e) provide shade and reduce ambient temperatures and the heat-island effect. The Government of India has taken several measures to increase the urban forest and its biodiversity and has launched 'Nagar Van Yojana' for developing city forests across the country by involving local communities, educational institutions, local bodies, NGOs, private players etc.

18. https://pib.gov.in/PressReleseDetailm.aspx?PRID=1602623
19.https://dolr.gov.in/sites/default/files/Wastelands%20Map%20of%20India%202015-16%2C%20State-wise%20and%20Category-wise%20distribution%20of%20Wastelands%20during%202015-16%20vis-a%20vis%2-02008-09.pdf
20. http://revenueodisha.gov.in/sites/default/files/document/Govt_Land/21261_1_7_2017.pdf

Under the Mission, a multi-pronged approach will be adopted to address the eco-preservation and improvement of ecosystem services through improved amenities for urban dwellers, soil and water conservation, biodiversity conservation and improved habitats for resident and migratory wildlife. Public–private partnerships in the management of urban forests would be explored for green space plantings and maintenance, where private companies and agencies can carry out work along with public authorities. The involvement of the private sector, NGOs, RWAs etc will be explored in the upkeep of the created green spaces.

The Mission will support urban greening through various interventions, falling under the following broad categories:

1. **Development of Biodiversity Parks**: Biodiversity Parks are nature reserves that harbor the natural heritage of the area and have conservation, educational and cultural values and enhance the environmental quality in urban centers. The underlying principle of the Biodiversity Park is to recreate self-sustaining ecosystems with native flora and fauna characteristic of the area for enhancing the quality of the urban environment. The Mission shall develop such parks with the primary aims of conserving and propagating species of rare, threatened and endangered plants of India, promote public awareness and environmental education and provide a suitable research/ education ground for the local public, students and researchers to understand the biodiversity and the local ecosystems.

2. **Creation of Green Spaces**, including the development of Biodiversity parks, around zoological gardens and hospitals, places of traditional and cultural interest, vertical gardens along the metro and flyover pillars and school nurseries and orchards, and undertaking peripheral plantations including green hedges.

3. **Tree Planting Activities** on institutional lands, consulates, landfills, sewage drainage lines and garbage dumping sites, planting along roads and on dividers etc. Green belts around the dumping yard and along natural drains would help create a natural sink for various pollutants and toxic chemicals including chemicals coming out from solid waste, and sewage, besides having a profound positive impact on the city environment and health of its inhabitants.

4. **Conservation and Reclamation Activities,** including planting of suitable tree species to serve as natural buffers along the urban water bodies, drinking water reservoirs and natural drainage lines by improving water quality by filtering potentially contaminated water before it enters a water body, besides their protection and stability.

Some of the suitable plant species that may be taken up for plantation in the urban landscape along roadsides are ***Cassia siamea*** (Cassia), ***Acacia nilotica*** (Babul), ***Azadirachta indica*** (Neem), ***Saraca indica*** (Ashoka), ***Pongamia pinnata*** (Karanj), ***Delonix regia*** (Gulmohar), ***Mangifera indica*** (Mango) etc.

The Mission will establish convergence with other Missions and other related schemes like Smart Cities, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), and Nagar Van Yojana, and greening and afforestation programmes of the respective urban local bodies etc. to promote plantation/ afforestation activities. There also exists an ample scope for involving the private sector in providing funds for urban greening, especially for developing biodiversity parks, creation of vertical gardens and creation of roadside/ avenue plantations, which shall also be explored under the Mission.

Component 2.6: Plantation along the National/ State Highways and Railway tracks:

The Ministry in consonance with the NFP, 1988, has issued an advisory to State Forest Departments for partnering with Railways and National Highways Authority of India (NHAI) for taking up plantation of trees along the highway sides and vacant areas by the side of railway tracks. Model guidelines were also circulated to all States/UTs for undertaking plantation on Railway land and plantation on sides of National Highways. The Ministry of Road Transport & Highways has promulgated Green Highways (Plantation, Transplantation, Beautification & Maintenance) Policy-2015, under which plantations have been initiated in collaboration with Forest Departments and other agencies. 1% of the total project cost of all highway's projects will be kept aside for the highway plantation and its maintenance.

The Ministry of Railways has been undertaking substantial steps to promote tree planting along the railway tracks. The Ministry of Railways has finalized a model agreement in consultation with MoEF&CC to be entered between Zonal Railways and respective State Forest Department in January 2016 for plantation of trees on Railway land along the railway track and station yards without any transfer of ownership and on cost sharing basis. The plantation work on Railway land along the railway track has already been started under this agreement in some of the States. During the year 2017-18 (up to January 2018) Rs. 85.25 lakh saplings have already been planted.[21]

Under this component the Mission shall provide technical and resource support to the National and State Highway departments and the Ministry of Railways for undertaking-

- Plantation of suitable native and multipurpose tree species along the roads and railway tracks
- Massive awareness programs, in making greening efforts a people's movement
- Identification of places of high public interest for priority-based interventions, and
- Setting up an effective monitoring mechanism at the State level to ensure the timely and efficient implementation of plantation activities.

The Mission will seek convergence with the Ministry of Road Transport and Highways' Green Highway scheme and the Ministry of Railways Green Railway Scheme, for undertaking site-specific plantations along the roads and the railway tracks under the Green India Mission. Convergence with the State Road and Highways departments shall be established towards realization of the Mission's mandate.

Agencies such as the Roads Department, NHAI and railways may allocate a certain amount for tree plantations as part of their project development cost. This could be enabled through coordination and necessary changes in guidelines initiated at the national level

Component 2.7: Enhancing tree cover through undertaking Agroforestry and Social forestry

Agro-forestry is defined as a land use system that integrates trees and shrubs on farmlands in rural landscapes to enhance productivity, profitability, diversity and ecosystem sustainability. It is envisaged as one of the important contributing sectors under the NFP, 1988 to achieve the target of increasing forest/tree cover to 33 percent. Given the fact that land-holding size is shrinking, tree farming combined with agriculture is perhaps the only way forward to optimize the farm productivity and thus, enhancing livelihood opportunities of small farmers, landless and the women. Agroforestry/Social forestry can become an important tool to build the resilience of farmers and rural people against the threats of

21. https://pib.gov.in/newsite/PrintRelease.aspx?relid=176984

climate change and natural calamities. Under this intervention, fallow lands, drylands, degraded farm and marginal lands, croplands, bunds, would be taken up under the plantation.

The Mission will support a program of nurseries for raising quality seedlings of agroforestry species for large-scale tree plantation on the farm land along with high agricultural productivity and improved soil nutrient regime. Bamboo and NTFP based models would be promoted to enhance the incomes of farmers and to enhance carbon sequestration. The Mission may also consider dovetailing institutional financial support to farmers to go in for farm-forestry on their fallow lands/unproductive lands. The use of bio-fertilizers and bio-pesticides would be encouraged.

Showcasing effective and efficient Sustainable Land and Ecosystem Management (SLEM) models will also form a part of the Mission's interventions. It is a crosscutting and multi-sectoral approach which deals with land management and biodiversity conservation which will help in adaptation to climate change and sustain ecosystem services. Soil and Water Conservation activities will also form a key component under the Mission to sustain and enhance the land and ecosystem productivity.

Agroforestry and farm forestry shall be taken up in the contiguous landscape of the areas selected for the other submissions to create a larger and synergistic impact on the interventions. These plantations shall further be explored for financing under the voluntary carbon markets to provide additional incentives to the farmers and landowners. Necessary support for enabling the same would be provided under the Mission.

The private sector, especially those companies which use wood or wood based raw materials, will be the partners in the development of agroforestry activities. Such companies may be facilitated to have a three- or two-party agreement with society depending on whether public funds are available with the local Panchayat/ JFM Committees and DCF for development of suitable plantations on village non-forest land that can be harvested for raw material and replanted. The companies may facilitate by providing high yielding planting material, tools and implements and buy back arrangement of the final produce from the local community.

Key Interventions:

- Commercial farm forestry may also be promoted by producing the raw material for industry or for urban needs.
- Planting of suitable tree species including fruit and NTFP species, and setting up of Nutrition gardens in the vilages.
- Promotion of Bamboo Based Agroforestry Models.
- Planting of native grass species to restore the productivity of the dry/fallow lands.
- Promotion of High Yielding Variety (HYV) seeds.
- Development of Quality Seedling production through research oriented Nurseries.
- Regionally conducive and adoptable practices to be promoted taking due regard to the traditional knowledge.

Sub Mission 3: Enhancement of household incomes and diversification of livelihoods for forest dependent communities

The National Mission for Green India encourages the enhancement of livelihood income, food security, health security, etc. besides promoting and supporting the community institutions towards

enhancing sustainable livelihoods of the poor. The Mission also encourages skill development and capacity building of the communities through improving their access to knowledge, skills, technology, market intelligence, risk management products and credit support through their SHGs and Federations to individual members/households, thereby contributing to enhancing their livelihoods. The Mission would also emphasize promoting and facilitating successful, small-scale projects that would enhance women's participation and productivity in agriculture and allied activities with the help of NGOs, CBOs and other government agencies across the country. It is envisaged that these projects would emerge as resource centres, with the focus on –

1. Inclusion of the poorest of poor
2. Community Managed Environmentally Sustainable practices.
3. Supporting institutions around natural resource management and allied activities to strengthen livelihoods of the poor, and
4. Developing a wide pool of community practitioners (CRPs) to ensure participatory service delivery and country-wide scaling up of best practices.

Thematic Interventions under the Sub-Mission

Component 3.1: Livelihood Diversification and Enhancement of Incomes: Setting up of Livelihood Improvement Training Centres (LITCs)

The Mission acknowledges that the promotion of a large number of livelihoods, especially for the rural poor and women has emerged as the most significant development challenge of the century. The Mission recognizes the bottlenecks of inadequacy of knowledge base on how to support/ promote large numbers of livelihoods; and inadequate availability of trained human resources who can participate in this work effectively as the major impediments in the livelihood enhancement of the communities.

The Mission seeks to establish a comprehensive network of Livelihood Improvement Training Centres (LITCs) in key forest landscapes for the diversification of a large number of livelihoods, especially for the rural poor and women. The LITCs will act as multipurpose centers to offer training on major livelihood options to enhance the skills and productivity of the rural youth. The LITCs will be equipped with suitable and relevant facilities and information which would help in ensuring that the farmers, producers, and the general local population are benefitted through the facilities

Major outcomes of Livelihood Improvement Training Centers will be

- Livelihood enhancement by enhancing and expanding existing skilling and tapping new opportunities in farm and nonfarm sectors,
- Enabling an increase in per capita income through skill generation, and
- Provision of self-employment and entrepreneurship opportunities to the rural population

This sub-mission would be implemented in coordination and collaboration with the Livelihood and Skill development programmes of the government where intervention in gaps areas would be financed under the Mission.

Component 3.2: NTFP Processing Centres

The country has rich and diverse forest resources and a significant proportion of the population is dependent on these natural resources. Non-Timber Forest Produce (NTFP) is a key output of these forest resources and plays a crucial role in providing subsistence for communities which rely on forests and forest produce for their livelihood and domestic requirements. Besides, NTFPs have a massive demand in the global medicinal market.

The Mission recognizing the importance of NTFPs seeks to support a sustainable model for the cultivation of the NTFPs outside the conventional forest areas to enhance the livelihood opportunities for the forest dependent communities and also to reduce their dependence on the forests. The Mission in convergence with the Van Dhan Centers will establish NTFP Processing Centers as a single window source to enhance the skills of the forest-dependent communities for the sustainable harvesting of NTFPs, their processing and marketing. These centers will also provide adequate infrastructure for the processing and marketing of NTFPs collected by the members of JFMCs. These centers would also help in the value addition of forest produce and ensure the incomes of farmers, producers and local population increase substantially by diversifying their livelihoods.

The NTFP processing centers shall -

- Function as multipurpose centers for providing avenues for the cultivation, harvest, production, processing and marketing of NTFP produce.
- Aim to establish NTFP as a high-end product and the preferred species under community and agroforestry practices.
- Be equipped with facilities and information for marketing, forward and backward linkages, productivity enhancement, and packaging of produce.

This sub-mission would be implemented in coordination and collaboration with the Pradhan Mantri Van Dhana Yojana.

Component 3.3: Integrated Nursery and Research Centres

The Green India Mission shall support in the establishment of Integrated Nursery and Research Centers, to provide quality planting material and support research and extension to both forestry and agroforestry interventions. The objective of this intervention is also to demonstrate model nurseries that could be adopted by the States in due course for afforestation activities.

These Centers would help in:

- Raising of “Quality Seedlings” to meet the demands of farmers and will include Agroforestry tree species, horticultural species etc.
- Providing institutional support to farmers for farm-forestry on their fallow lands/unproductive lands.
- Functioning as Knowledge and experience sharing platforms among the farmers/ tree growers.

Support would be given for upgrading the existing nurseries to the standards envisaged under the Mission. In case not suitable existing nurseries are found eligible for support, new nurseries may be developed under the Mission.

Component 3.4: Support to Research Centers for bridging the gap between research and field practices under forestry and agroforestry

Field trials of the outcome of the research in forestry and agroforestry are needed so that they are widely adopted by the farmers and tree growers. The Green India Mission envisages actively engaging with the Research Institutions for developing suitable agroforestry species for various agro-climatic zones and capacity building of farmers and forest field staff for the implementation. Eco-restoration and threat to biodiversity are the critical areas that require immediate attention. Forestry and Research institutions shall work in tandem with the implementation agencies in the field to address these problems.

The National Agroforestry Policy 2014 emphasizes on the need for undertaking and investing in the research and development, extension and capacity building and related activities based on the appropriateness and the suitability of the various agroforestry models for the different agro-climatic regions of the country. The Policy further reiterates the need to encourage agroforestry research specifically for the increased availability of the quality planting stock and also of the multi-purpose indigenous species with higher nitrogen-fixing ability to meet the local needs for fuel, fodder and timber as well as enhancing the soil health and productivity. The Research Centers so established under the Mission would

- Identify best Agroforestry Models and suitable species interlinking the traditional knowledge.
- Identify suitable agroforestry species which can be grown on farmlands for the economic and ecological benefits of the farming communities, and which can be taken up for planting on a large scale by the farmers on their land in conjunction with agriculture practices.
- Undertake field trials of suitable species for better Land Management Practices to enhance land productivity.

7. Enhancing Implementation Efficiency

The Mission adopts a decentralized model of operation and has an effective planning, implementation and monitoring of various interventions. A three-tier approach of operation is being adopted at the village level in synergy with the State and the Central Government. A Bottom-Up Model will delegate greater decision making and implementing powers to the Joint Forest Management Committee (JFMC) at village level along with giving them greater ownership and accountability for the interventions undertaken in their landscape.

Joint Forest Management Committees (JFMCs) will be a body of the Gram Sabha headed by the President elected from the members of the JFMCs. The Executive Committee of the JFMC will form the fundamental implementing unit of the Mission's interventions at the grassroots level. The JFMC will prepare site specific micro-plans for the landscapes identified for undertaking various afforestation and support activities and it will be approved by the Gram Sabha in case of village and by Urban Local bodies for urban areas. The JFMCs with the assistance of forest department officials will select the suitable species for plantation and ensure their survival.

Forest Development Agency (FDA) will be the implementation unit at the District level/ Divisional level. The Executive Committee of FDA will be chaired by the Divisional Forest Officer and the Steering Committee will be headed by the Collector, with the district level officers of line departments its members. The Divisional Forest Officer will coordinate the progress of different afforestation activities under the

Green India Mission and will report to the SFDA at regular intervals. He will follow the advisories issued by the State Forest Development Agency for the identification and the implementation of the Mission's interventions as per the approved APOs. The Divisional Forest Officer would also facilitate the involvement of the private players including the non-government organizations, civil society organizations etc. for undertaking and implementing the Mission's interventions in the identified landscape and plantations by different government departments, PSUs, civil societies etc.

State Forest Development Agency (SFDA) will act as the highest body at the state level to guide and approve the perspective Plan and Annual Plans of Operations (APOs) at the level of the State Mission Directorate. The Executive Committee of SFDA will be chaired by the Principal Chief Conservator of Forests and HoFF of the State. The officers of various line departments will be its members. The Chief Secretary of the State will be the Chairman of the Governing body of SFDA and Principal Secretaries of the line departments and PCCFs will be its members. The Member-Secretary of SFDA will be an Additional PCCF rank officer in the State. The SFDA shall be the nodal agency and will formulate the comprehensive plan for afforestation in the State encompassing all the schemes to saturate the identified vulnerable landscapes. The State level comprehensive plan shall incorporate the cumulative details of the afforestation activities for the state including under the Mission and also under other afforestation schemes being implemented in the State.

The National Governing Council of the Mission will be chaired by the Hon'ble Minister of Environment, Forest and Climate Change and the National Executive Council will be headed by the Secretary EF&CC to provide overall guidance and synergy of actions. There will be a Mission Director of Green India Mission who will be the Member-Secretary of the National Governing Council. The Mission Directorate chaired by the Mission Director will have overall accountability for the Mission deliverables at the National level and will be supported by a team of experts and secretarial staff.

The implementation structure of the Mission is depicted in the chart below-

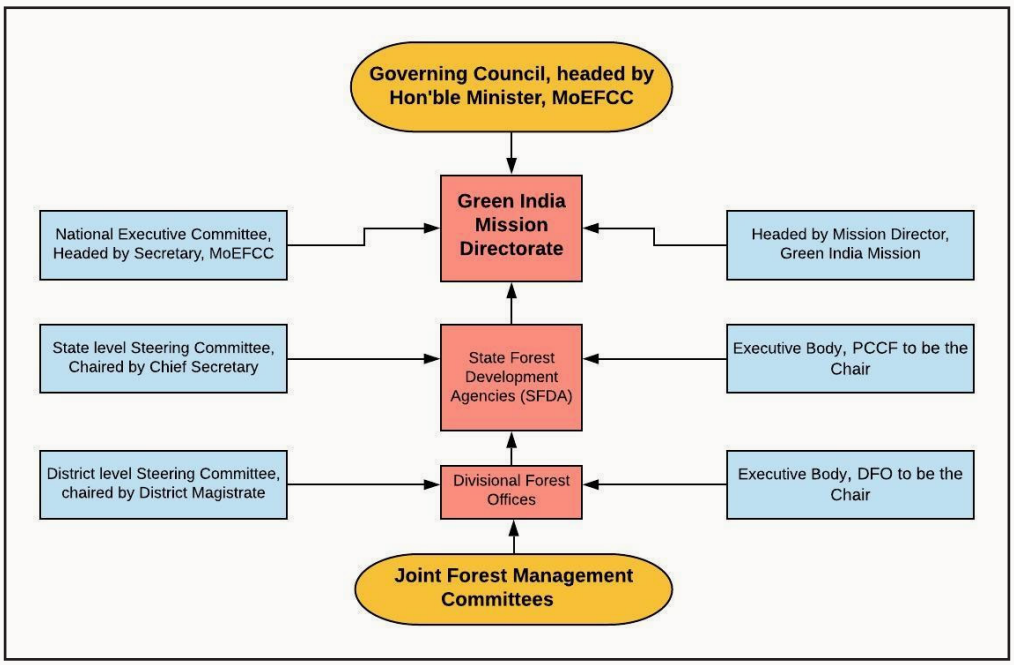
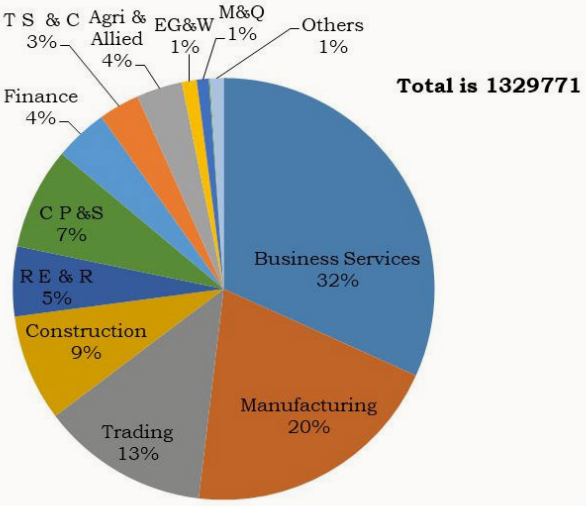


Figure 1 Operational Structure of Revised Green India Mission

7.1: Enhanced Role of Private Players and Agencies

Chart 1.1: Sector-wise Active Companies as on 28th February, 2021



Nationally Determined Contribution provides an opportunity to fast-track the much-needed momentum to move towards the goal of 33% of forest and tree cover. Rehabilitating degraded open forests and improving green cover over non- forest areas by creating additional tree cover through agroforestry, farm forestry, urban and peri-urban forests, roadside avenues, etc. would be the most effective tools. Agro-forestry activities on non-forest lands will have many "spin-off benefits including improving the income of the farmers". It will provide an "opportunity to create viable business models for farmers to get more income from tree cropping, cultivation of NTFP and its marketing, simultaneously meeting the requirements of the industry and the community."

In India, the total number of active companies as on 28th February, 2021 is about 13. 30 Lakh, out of which Maharashtra has the maximum number of active companies (259110), followed by Delhi (215266) and West Bengal (131492) as on 28th February, 2021.[22] As such there exists a huge scope to explore the concordance between the environmental and the developmental paradigms. The Mission will seek to evolve sustainable business models for agro-forestry and tree cultivation to be supported by the rationalized policy and regulatory regime, for enabling multi-stakeholder convergence and proactive participation especially with Private Sector Companies/ PSUs on the PPP model and also with the local bodies, municipal corporations, etc. These business models shall be initiated on a pilot basis to shift from the practice of project-based funding to create self-sustaining market models.[23] The activities on the private and non-forest lands may be undertaken on the co-financing basis with the responsibility of the implementation vesting with the Joint Forest Management Committees (JFMCs) and individual farmers. Support from Corporate Social and Environmental Responsibility and Corporate Environmental Liability would be envisaged from the sector.

The details of the implementation arrangement, the mechanism and its extent shall be worked out in consultation with the State Forest Departments, based and guided by the development of appropriate policy framework during the Mission's implementation period. The Mission will also add "value" to ongoing programs/schemes on "greening" taken up by multiple agencies. Such value addition will come through a) technical inputs on species mix from climate adaptation/mitigation angle, b) improved policy regime to help multiple agencies plant, protect and manage forests and tree growth, and c) advisory services for benefits under carbon funds/ bonds and would include support in outcome-level monitoring.

22. http://www.mca.gov.in/Ministry/pdf/MIBFebruary_10032021.pdf
23. https://ntps.nic.in/writereaddata/EXPERT-COMMITTEE-REPORT-ON-TOF-18112018.pdf

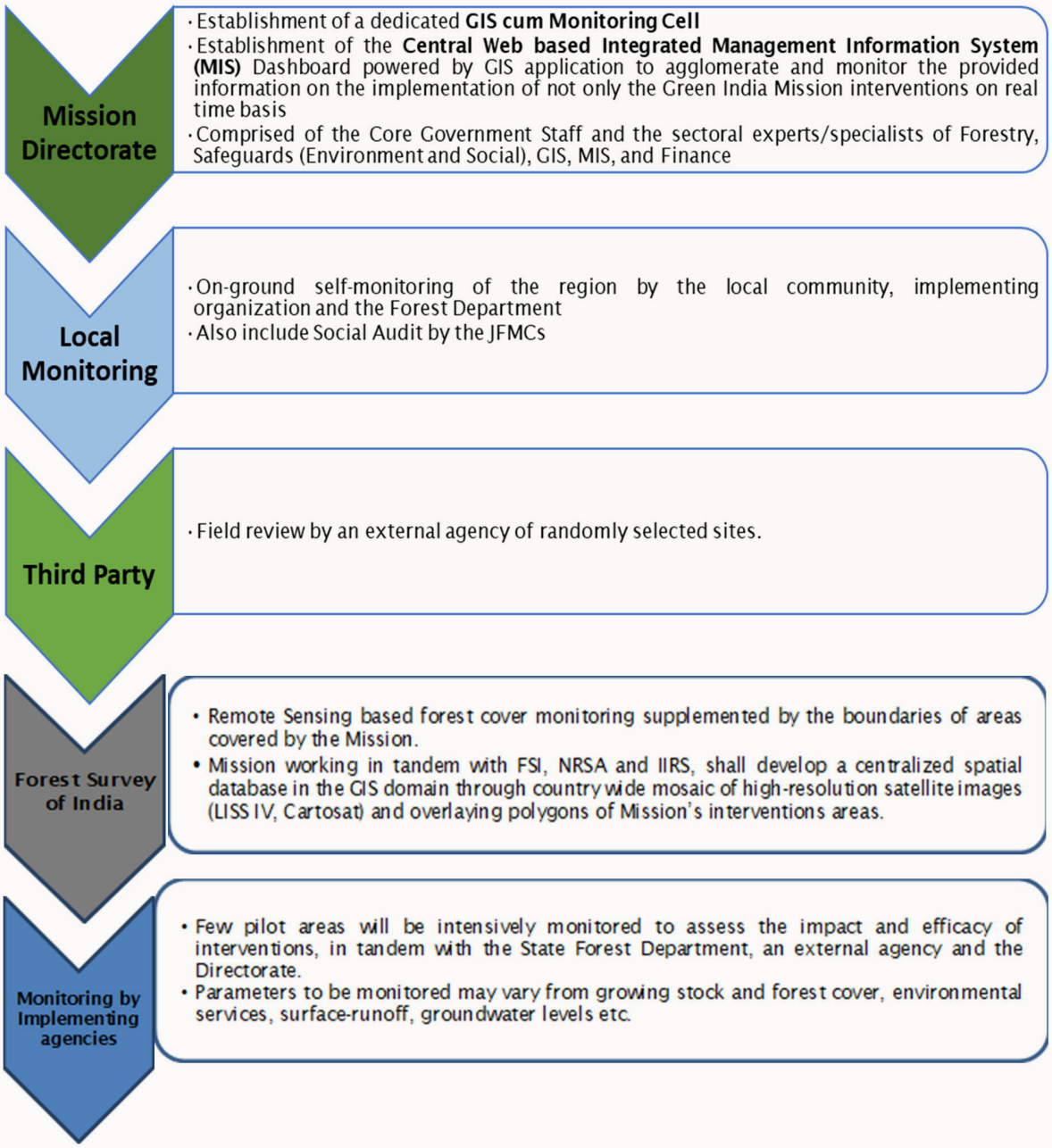
7.2 Monitoring and Auditing of the Green India Mission Interventions

A comprehensive monitoring framework at five different levels is envisaged under the Mission. In addition to on-ground self- monitoring by multiple agencies, including communities, the Mission will support the use of modern technologies like Geographic Information System based real time monitoring, Remote Sensing with GPS mapping of plot boundaries, coupled with satellite imageries for monitoring at the output/ outcome level. The Gram Sabha will carry out the social audit of the Mission activities at the village level. This information will also be disseminated in the public domain on a regular basis. Third party monitoring and long-term monitoring of certain ecosystem services at selected sites will be provided.

A Web based Integrated Management Information System platform powered by GIS application on real time basis will be developed for ensuring convergence of various afforestation schemes for robust financial planning, timely funding, mobilization of adequate resources and prudent utilization of funds. Web based portal will generate state wise progress report of numerous plantation activities undertaken under different Central and State sponsored schemes being implemented in the states and will generate information on cumulative nursery, soil and moisture conservation measures, their respective Annual plan of Operations, beneficiary details etc.

A dedicated Monitoring cum GIS cell would also be established at the Directorate level to ensure smooth functioning of the Web based Integrated Management Information System Dashboard and to monitor the progress of the Mission activities.

The various strata of Monitoring and Evaluation are depicted in the figure below:



8. Convergence with Cross-sectoral Programs; Adding value through support activities and relations with other Missions and Schemes

The Green India Mission is adopting a demonstrative approach to establish innovative afforestation/ plantation models in the identified landscape through the micro-ecosystem approach. No specific model wise-targets have been fixed so as to enable the states to leverage funds as per the need and priority of restoration. These efforts shall be further strengthened through establishing synergies and integrating the targets and leveraging funds from all the ongoing afforestation schemes of the various Ministries and also the schemes under the different State plans. The convergence with ongoing program/ schemes will be secured by getting representation of the concerned department/ministry in the organizational structure of the Mission at different levels. At district level, it will be further reinforced through linkages with the district administration. Finally, at the village/sub watershed/ sub landscape level, the process will be taken up using the convergence route adopting the gap-filling methodology.

MoEF&CC will work in tandem with the following Ministries and their respective schemes agglomerating their targets and respective fund allocations.

9. State Perspective Plans

The State Forest Development Agency (SFDA) shall prepare the comprehensive State Afforestation Perspective Plan for undertaking the Afforestation activities in the state both in the forest and the non-forest areas. The interventions under the Green India Mission shall be undertaken in accordance with the Implementation Guidelines of GIM. The State Afforestation Plan shall be prepared by the SFDA through consultations with various stakeholders including the Forest Department, line departments of the State Govt., Gram Panchayat/Gram Sabha/ Municipalities, civil society, community groups, academia (Research Organizations and Universities), etc. taking due reference to the extent of the degraded land areas in each of the State. The SFDA will prepare the Perspective Plan in consonance with the State Action Plan on Climate Change, and other Central and State Governments schemes/programs like CAMPA, MGNREGS, SMAF, NBM, etc. in the identified landscapes. Wasteland Atlas of India, 2019 and Envi Stats India 2020[24], may serve as good reference points for estimation of the degraded areas in the State for the preparation of the perspective plan of the Mission. These Perspective Plans will provide a clear roadmap for the implementation of GIM activities and measurable indicators and outcomes.

10. Implementation Guidelines

The Implementation Guidelines for GIM will facilitate the State Governments for selection of Landscape by detailing the planning process for implementation of various activities and interventions under different sub-missions and the detailed cost implications. Implementation guidelines will lay down modalities and procedures for the site-specific bottom- up planning processes at the level of Gram Sabha/Municipalities and various Committees under the Mission. It will provide the linkage between traditional knowledge and scientific forest management to ensure sustainable management of both forests and natural resources. The Ministry will update these implementation guidelines at the time of mid-term evaluation and will incorporate suggestions and feedback from Implementing Agencies.

11. Timeframe and Deliverables

The Green India Mission will be implemented over a period of 10 years (2021-2030) with the provision of mid-term review after five years of implementation. Afforestation over 24 million hectares will be taken up through convergence with ongoing Central and State Government Schemes and funds available under CAMPA. Annual Afforestation/ tree Plantation at the current trend of over 2 million hectares in the country will be taken up through convergence to achieve the target of 12 mha during 2021-25 and another 12 mha during 2025-30. Afforestation over 1.0 million hectare will be taken up under Mission specific interventions to establish regionally conducive, innovative and demonstrable models for afforestation and eco-restoration activities in identified intervention areas within the larger landscapes, as an Additionality during the period 2021-2030.

24. http://mospi.nic.in/publication/envistats-india-2020-vol-1-environment-statistics

12. Mission Costs

The financial outlay under the Mission is Rs. 12,190 crores for implementation of afforestation activities over 1.0 million hectare during the period of 10 years (2021-30). The Mission costs will be met partly from the budget (Rs. 5000 Crores) under ongoing Green India Mission CSS scheme and balance from funds available under National fund of CAMPA (Rs. 7,190 Crores). This is an indicative cost to be funded specifically under the GIM. The landscape wise cost would be specific to the state and different plantation models. The funds available under state CAMPA, Centrally Sponsored Schemes, Externally Aided Projects, CSR funds, State Plan Schemes etc. will be utilized as per the APOs towards the attainment of targets of 24.0 million hectare envisaged under the Mission.

Sl. No.	Mission Interventions	Afforestation Target (in mHa)	Total Cost (in Crores)
Sub Mission 1: Enhanced Quality of Forest Cover and Improved Ecosystem Services		0.30	3000
1	Restoration of Degraded Open Forest Ecosystems		
2	Restoration of Degraded Aravalli Range		
3	Restoration of Western Ghats		
4	Greening of Arid Regions of North-West India		
5	Restoration of Mangroves		
6	Regenerating and Revegetating Himalayan mountains		
7	Eco-Restoration of Degraded Bamboo Forest in the North-East & Central India		
Sub Mission 2: Ecosystem Restoration and Increase in Forest and Tree Cover		0.70	7000
1	Treatment of River Catchments and Ravine Reclamation		
2	Eco-Restoration of Wetlands		
3	Restoration of abandoned Mining Areas		
4	Plantation over vacant land under the control of PSUs		
5	Plantation in Urban Areas and Peri-Urban Areas		
6	Plantation along the National/State Highways and Railway tracks		
7	Agro-Forestry and Social Forestry		
TARGET AREA		**1.00 mHa**	
Sub Mission 3: Enhancement of Household Incomes and Diversification of Livelihoods for Forest Dependent Communities (in numbers)			600
1	Livelihood Improvement Training Centres and enhancement activities	50	
2	Integrated Nursery and Research Centre	50	
3	NTFP Processing Centres	100	
TARGET NUMBERS		200	
SUB-TOTAL (A)			10600
SUPPORT ACTIVITIES		Cost (in crores)	1590
1	Soil and Water Conservation Activities @ 10% of A	1060	
2	Research & Development, Innovative projects @ 2% of A	212	
3	Monitoring and Evaluation @ 1% of A	106	
4	Strengthening of JFMC, Awareness and Publicity @ 1% of A	106	
5	Mission Organization @ 1% of A	106	
SUB-TOTAL (B)			**1590**
TOTAL (A+B)			**12190**

13. Process with Sectoral Experts and Stakeholder Consultations

Stakeholders are people or organizations invested in the program, interested in the results of the evaluation, and/or with a stake in what will be done with the results of the evaluation. Representing their needs and interests throughout the process is fundamental to good program evaluation. Stakeholders provide a reality check on the appropriateness and feasibility of the interventions besides providing a detailed insight on and suggest methods to access the target populations, provide ongoing feedback and recommendations, and help make program deliverables actionable.

Mission's implementation structure involved numerous stakeholders including the State Forest Departments as the primary implementation agencies, research institutions and academia as the key advisory bodies and the community institutions as the primary beneficiaries. As such the stakeholders formed an important component of the process of the revision of Mission Document. The learnings from the experiences of the Mission's 5 years of implementation from 2015-16 to 2020, and on the basis of the feedback received from the implementing partner States, formed an important component in the revision of the Mission document to achieve efficiency and efficacy in its implementation.

Inputs and suggestions were invited from pioneer institutes like IISc, IIFM, ICFRE, WII, BSI, CEE, TERI, IIT- Delhi, FSI for inviting preliminary suggestions to undertake the stipulated revision of the Mission Document and also the PCCF's and HOFFs of all the states. The inputs were received from Indian Institute of Science, Bengaluru, IIT- Delhi, The Energy and Resources Institute (TERI), ICFRE, Forest Survey of India; Climate Change, Desertification Cell, Forest Policy Divisions of the MoEF&CC, and the 14 GIM Implementing States of Andhra Pradesh, Chhattisgarh, Himachal Pradesh, Jammu and Kashmir, Kerala, Madhya Pradesh, Maharashtra, Manipur, Mizoram, Nagaland, Odisha, Punjab, Sikkim and Uttarakhand and also including the inputs from Ernst and Young LLP ltd.

The inputs received were consolidated in alignment with the need for syncing the Mission's approaches and strategies with the commitments to Paris agreement along the following major lines-

a. **Simplicity and coherence** to impart effective comprehensibility
b. **Ease of implementation** to improve implementation efficiency
c. **Flexibility and Open-ended approach** to accommodate and include the highly vulnerable and otherwise neglected landscapes and micro-ecosystems
d. **Devolution and decentralization of implementation** responsibility to the community institutions
e. **Effective Convergence** of all the Central and State specific afforestation schemes
f. **Skill Enhancement and Capacity building** of the forest dependent communities for augmentation of livelihoods, and
g. **Inclusive Development** along with proactive multi-stakeholder involvement including emphasized role of **private players and agencies** and **corporates** etc.

Recognizing the due importance of the stakeholders, the Mission seeks to establish proactive multi-stakeholder engagement in the preparation of the State Afforestation Plans including the Forest Department, line departments of the State Govt., Gram Panchayat/Gram Sabha/ Municipalities, civil society, community groups, academia (Research Organizations and Universities). The officers

of various line departments will also be involved as members in the State Forest Development Agencies, which shall be the nodal agency in the preparation of these plans.

The Mission would also emphasize promoting and facilitating successful, small-scale projects that would enhance women's participation and productivity in agriculture and allied activities with the help of NGOs, CBOs and other government agencies across the country. The involvement of the private sector, PSUs, CPSEs, NGOs, RWAs etc will be explored in the upkeep of the created green spaces.

The Mission thus envisages to foster the spirit and establish workable models of convergence through establishment of multi-stakeholder fora for each of its interventions. Emphasis would be on effective knowledge and expertise sharing to achieve the foremost objective of the Mission.

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