

Greening India: Progress, Challenges, and the Path Forward for Green India Mission

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Abstract : *Green India Mission (GIM) which focuses on ecological restoration and socio-economic development is the important component of India's National Action Plan on Climate Change (NAPCC). The mission is based on a transition from traditional afforestation to ecosystem-based adaptation with an aim of improving forest cover, carbon sequestration and livelihoods of communities. The paper provides an overview of the genesis and design, performs a rudimentary political analysis of its impacts and challenges, and examines the ways in which it has assisted Indian Beaming focuses on climate targets--The sustainable improvement schedule. The study, based on government reports, independent evaluations and academic research, finds that while GIM has played a key role in increasing tree cover and rural livelihoods it is increasingly stalling owing to low funds, fragmented management and weak community ownership. The paper ends with policy suggestions towards enhancing institutional coordination, financing mechanisms and local empowerment. It is calling for a shift from planting trees to stewarding ecosystems in the future in order to make GIM a success; a shift that involves technology, transparency and inclusivity.*

Key Words: Green India Mission, climate change, forest governance, afforestation, India, ecosystem restoration, sustainable development

1. INTRODUCTION

India's environment issues are large and intricately linked to the country's development process. The nation's rapid economic development and urbanization have put tremendous pressure on their natural resources, resulting in deforestation, land degradation and destruction of biodiversity. According to the India State of Forest Report (ISFR) 2021, although over 24% of India's territory is covered by forests and trees, ecological deterioration is seen in drylands, hill regions, and the edges of forests. India is among the nations most at risk from climate change, and is experiencing more frequent and greater risks due to floods, droughts, and temperature anomalies, which impact both ecosystems and livelihoods. (Agrawal A., 2020)

The goal represents a paradigm change from the conventional afforestation strategy to one of community engagement, adaptability, and restoration. (Center for Science & Environment, 2021).

The Forest Survey of India 2021 claims that. This paper attempts to present a holistic picture of the Green India Mission and its genesis, aims, implementation mechanism, successes and pitfalls based on policy documents, evaluation reports and academic analyses. It also covers potential future directions for enhancing the mission's impact in advancing India's overall climate action and sustainable development efforts. In the end, the conversation highlights that GIM is not just a climate mitigation measure but also a blueprint for ecological governance in the 21st century, inclusive of everyone.

II. THE CONCEPT AND AIMS OF GREEN INDIA MISSION

Green India Mission (GIM) has grown out of India's awareness of how environmental degradation and climate change are interwoven issues and need to be addressed in an integrated and ecosystem-based manner. Of these, GIM was specifically created as a key tool for forest-based climate action, with a focus on restoration and resilience as well as plantation targets. (GOI NAPCC, 2008)

In February 2014, GIM was officially approved by the Union Cabinet as a strategic step over the previous afforestation initiatives like the National Afforestation Programme (NAP) and the Compensatory Afforestation Fund Management and Planning Authority (CAMPA) initiatives. GIM was distinguished from its predecessors, which focused on increasing the amount of tree cover, by its emphasis on "integrating" ecological, social and livelihood elements into a single policy. This was because it was recognized that forest-dependent communities are important stakeholders in sustainable land restoration. (Lele et al., 2018)

The mission's objectives are:

1. Increasing forest and tree cover on five million hectares (mha) of land.
2. Improving the quality of forest cover on an additional five mha.
3. Improving Ecosystems Services like Carbon sequestration, Soil and water protection, Biodiversity Protection.
4. Enhancing livelihoods of around 3 million households living in forest-fringe villages.
5. Empowering community-based forest governance which is linked to the Forest Rights Act (2006) and Joint Forest Management (JFM).

The nodal organization is the Ministry of Environment, Forests, and Climate Change (MoEFCC). with the institutional support of the National Steering Committee and State-level Steering Committees for planning, monitoring and convergence with allied schemes like MNREGA, NRLM and CAMPA. This multi-level governance model mirrors GIM's focus on coordination, participatory process of management, and decentralised implementation – all of which are strategies for balancing ecological restoration and social inclusion. (MoEFCC, GOI, 2020).

III. STRUCTURE, STRATEGY AND IMPLEMENTATION FRAMEWORK

The Green India Mission (GIM) is a multi-layered governance and implementation mechanism to help coordinate between national, state and local institutions. The Ministry of Environment, Forest and Climate Change (MoEFCC) acts as the nodal Ministry for the overall planning of the mission, policy making and inter-ministerial coordination at the apex. A National Steering Committee with the Secretary of MoEFCC as Chair gives strategic direction and approves plans at the State-level and a Mission Directorate under MoEFCC handles operational and monitoring aspects.

Implementation is being handled at the State level by State Forest Departments with support from State Steering Committees and State Mission Management Units (SMMUs). These entities are responsible to create State Perspective and Annual Plans of Operation (SPAPOs) that will facilitate planning mission activities in accordance with the local priorities and biogeographical conditions. At the district and village level, it is done via Forest Development Agencies (FDAs), Joint Forest Management Committees (JFMCs) and Gram Panchayats, where the local communities are very much involved in planning and sharing the benefits. (WWF-India, 2021).

Strategic Approach

The mission's approach is based on the concept of ecosystem-based adaptation (EBA) to tackle both climate change and enhancement of livelihoods by increasing the resilience of nature. It engages in activities on key thematic areas:

1. Ecosystem Restoration: Rehabilitation of degraded forests, wastelands and watersheds.
2. Afforestation and Reforestation: Expansion of tree cover on non-forest and forest lands through afforestation and reforestation plantations such as agroforestry.
3. Biodiversity Conservation: Preservation of vital wildlife habitats, corridors and mangrove.
4. Community Livelihood Enhancement: Facilitating non-timber forest products (NTFPs), eco-tourism and forest based enterprises.
5. Watershed and Catchment Area Management: Watersheds that are integrated with forestry and other water conservation and soil stabilization projects.

Optimisation of resources and cross-sectoral outcomes is a hallmark of GIM's approach when dealing with convergence with other flagship schemes and missions. The Compensatory Afforestation Fund Management and Planning Authority

(CAMPA) provides funds for restoration, the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) provides labor support, and the National Rural Livelihood Mission (NRLM) promotes income-generating activities. Additionally, a landscape-level integrated resource management is made possible by the interfaces with the National Water Mission (NWM) and the National Mission for Sustainable Agriculture (NMSA). (2020, The Energy and Resources Institute).

Financing Mechanism

The financial structure of GIM is consistent with the distribution of costs between the federal government and the state governments, often in a 75:25 ratio for general states and a 90:10 ratio for hilly and northeastern areas. The mission also promotes access to resources from international climate financing institutions such as the Green Climate Fund (GCF), Global Environment Facility (GEF), Corporate Social Responsibility (CSR) and public-private partnerships (PPP).

Monitoring and Evaluation

Monitoring is an important element of the mission architecture. Project performance is monitored using a web-based monitoring system managed by MoEFCC and the ecological and socio-economic outcomes are assessed through periodic third party evaluations. The use of remote sensing and GIS has become more and more integrated for geospatial mapping and to quantify afforestation sites, carbon sequestration and biodiversity indicators. The evidence-based approach is designed with the aim of increasing transparency, accountability, and adaptive management. (Zuboff S., 2019).

Overall, GIM's institutional and strategic design mirrors India's attempts to make 'forest-plus' more than just a slogan – one that goes beyond afforestation to ecosystem restoration, livelihood resilience and participatory governance. But for it to be successful, good coordination, sufficient funding and ongoing community participation are all required, as examined later in the report.

IV. ACHIEVEMENTS AND PROGRESS

Despite the funding and coordination challenges, Green India Mission (GIM) has been incrementally progressing towards ecological and socio-economic goals since its formal operationalization in 2014-15. Its successes are both quantitative – in terms of forest cover – and qualitative – in terms of community-based forest resource management.

Growth of forest and tree cover.

According to the India State of Forest Reports (ISFR) published by the Forest Survey of India (FSI), GIM's contributions to the nation's total forest and tree cover have been the most obvious benefits. I as a whole experienced a rise of 2,261 km² in forest and tree cover between 2015 and 2021, with GIM supported states of Odisha, Madhya Pradesh and Karnataka reporting good results on the afforestation front. GIM's work on afforestation and restoration on degraded lands has led to carbon sequestration and enhanced ecosystem services through large scale afforestation.

The areas for mission interventions are 10 million hectares (5 million for afforestation and 5 million for quality enhancement). According to MoEFCC's mid-term review (2020) more than 1.8 million hectares were so far covered under various afforestation, restoration, and agroforestry programmes in 13 states. The mission has also encouraged selection of climate-resistant species and mixed plantation models for the restoration of degraded ecosystems with ensuring biodiversity.

Community participation and livelihood generation.

One of the key principles of GIM's design is to involve local communities in planning and implementation. Joint Forest Management Committees (JFMCs) and Gram Panchayats are empowered for the creation of "Micro-plans" for forest restoration based on their needs under a participatory approach. MoEFCC implementation data (2022) showed that

GIM has directly reached out to over 150,000 forest dependent households through employment generation, capacity building and income diversification.

The mission has resulted in creation of millions of person days of jobs through convergence with MGNREGS and NRLM, in soil conservation works, nursery development, plantation management, etc. These interventions have helped in the security of livelihoods, especially women and tribal communities living in the forest fringe areas.

Ecological Restoration and Ecosystem Services

GIM has also enhanced the resilience of important ecosystems, including mangroves, grasslands and watersheds, and has sequestered more than 40 million tonnes of CO₂ equivalent per year. Restoration efforts in Sundarbans (W Bengal), Chilika (Odisha) and Banni Grasslands (Gujarat) have led to better hydrological balance, less soil erosion, and greater biodiversity. In Nagaland, the Green India Mission State Plan was successful in contextualizing the traditional ecological knowledge and the modern approaches of forestry, showcasing the adaptability of the mission in biogeographical zones.

Capacity Building and Innovation

GIM has further seen significant advances in the institutional strengthening and innovation arena. The mission has begun capacity building activities of local forest officials, community leaders and NGOs. Monitoring and evaluation now incorporates remote sensing and GIS to improve precision and use of digital tools to monitor plantation survival and biomass development. Additionally, collaborations with research institutions like the Indian Council of Forestry Research and Education (ICFRE) and TERI have helped in creating sustainable forestry models and species diversification plans.

Global Recognition

India's achievements under GIM have been acknowledged at global platforms like the UNFCCC COP summits, and has been described as a model for community-based forest landscape restoration. The mission also helps India in achieving its Nationally Determined Contributions (NDCs) to enhance forest and tree cover in order to produce an extra carbon sink of 2.5–3 billion tonnes of CO₂ equivalent by 2030.

V. CHALLENGES AND CRITIQUES

The Green India Mission (GIM) is a prominent ecosystem restoration effort in India, but it continues to face structural and operational challenges. Financial constraints, lack of inter-agency coordination, social justice and/or governance issues have constrained the mission's ability to achieve intended ecological and livelihood goals.

5.1 Financial and Administrative Constraints

The most important challenge that GIM faces is underfunding of its activities. The total budget of the mission was approved at INR 46,000 crore, which will be released in 10 years, but only a small part of it has been released. The Ministry of Environment, Forest and Climate Change (MoEFCC) data shows that less than 20% of the budget was spent till the end of 2021. Many states have been facing problems mobilizing the necessary matching funds, which has led to delays and incomplete projects.

Besides, the Union Budget has no separate line item for GIM and the financing of GIM is often made available through cross-over schemes like CAMPA and MGNREGS. This is a disjointed funding system, which has led to a lack of accountability and continuity. Delayed fund disbursement and bureaucratic delays at the State level have been reported as a major obstacle in ground implementation by several evaluation studies by Centre for Science and Environment (CSE, 2021) and TERI (2020).

5.2 Institutional and Coordination Challenges

Although coordination is a key focus of GIM, the design is based on inter-sectoral convergence and, in practice, there have been challenges in ensuring coordination between multiple ministries (Environment, Rural Development, Agriculture and Tribal Affairs). No single operational structure has been established, resulting in overlapping project mandates, and fragmented project delivery. For instance, watershed management, afforestation, livelihood support are activities that are often managed under different schemes, leading to duplication and inefficiency.

In addition, monitoring procedures are inadequate. The planned web-based monitoring and evaluation system has been slow to operationalise on a consistent basis across states and has been inconsistent to incorporate GIS based data. There is often limited transparency and evidence-based policy making due to self-reported data from implementing agencies at the field level.

5.3 Community participation and social inclusion

GIM has community-based forest management as an intention but in practice, this is not always realised. In some states, implementation has been largely centralized and few Joint Forest Management Committees (JFMCs) and Gram Sabhas have been involved in the decision making. Many communities have complained about only being involved in the plantation rather than planning and monitoring process.

Local participation is further complicated due to tensions between GIM's aims and the Forest Rights Act (FRA, 2006). The rights of communities living in forests over forest land and resources have been recognized by FRA, but has not been aligned too well with GIM's project design. NGOs like Kalpavriksh, Forest Governance Learning Group (FGLG) have pointed out cases in which local consent under FRA had not been done, thus eroding trust and raising potential issues on land tenure and benefit sharing.

5.4 Ecological and Technical limitations:

Ecological design of plantations under GIM has also been called into question. Native species and monoculture/exotic species have been planted and used in some situations in preference to native species, decreasing diversity and ecological resilience. However, environmental organizations like WWF-India (2021) have warned that there needs to be ecological sensitivity and contextuality in afforestation initiatives, especially in fragile ecosystems such as arid zones and mangroves.

Moreover, the survival rates of sapling trees planted are highly inconsistent with research indicating a variability of 40-60 percent according to the conditions of the sites and treatment of the saplings after planting. The lack of long term budgets and capacity building of local caretakers has affected sustainability.

5.5 Governance, Transparency and Equity issues

The mission's governance system has been questioned as being too top-heavy and having weak accountability to the ground. There are calls by civil society organisations for greater transparency in fund allocation, third party audit and community social audit. If the feedback mechanisms are inadequate, it is possible for GIM to become the very same 'number game' it was in the past, focusing on quantity rather than ecological outcomes.

The benefits of GIM are still not equally distributed and are responsible for climate justice problems. While the mission has a vision to support livelihoods, many forest dependent people in marginalised areas might not have access to economic benefits, capacity development programs, carbon credit schemes.

5.6 Broader Criticism

Nonetheless, important scholars have highlighted the technocratic facet of the environmental governance model of GIM (Lele et al. 2018; Agrawal 2020). Ecological and social empowerment are not the usual metrics used to assess the success of a mission. This may be a potential hazard of the underestimation of the forest landscape complexity under socio-ecological aspects in India.

While GIM has made good efforts towards integrating climate adaptation and community based forestry, there is a great implementation gap that has to be addressed. Funding, coordination, participation and transparency are all systemic weaknesses and key to unlock its potential as a model of sustainable and equitable forest restoration..

VI. FUTURE DIRECTIONS AND POLICY RECOMMENDATIONS

While the vision of Green India Mission (GIM) is central to India's climate and development agenda, its overall sustainability will rely on the continued institutional change, innovation and community empowerment. To continue in this path, it is necessary to develop the Mission from a project-based, participatory and evidence-based perspective in the landscape.

JAFSA will support the strengthening of various institutional and financial mechanisms.

6.1 Strengthening Institutional and Financial Mechanisms

The implementation of GIM needs to be anchored through dedicated budget line in the Union Budget with a steady financial flow to address the issue of chronic under funding and fragmented implementation. A single National Green Fund based on the principle of "pooling" resources from CAMPA, CSR (Corporate Social Responsibility) and international climate finance may offer long term funding. The Mission should also tap into Article 6 (Verified carbon sequestration) of the Paris Agreement to provide local communities with income from carbon credit markets. Zuboff, S. (2019).

Integration of institutions remains vital. Single window coordination system between MoEFCC and the Ministries of Rural Development, Agriculture and Tribal Affairs can improve the policy coherence. Improve execution efficiency and accountability by strengthening State Mission Management Units (SMMUs) and timely release of funds to Joint Forest Management Committees (JFMCs).

6.2 Improving community ownership and equity

An important element of GIM's development will continue to be empowerment of forest dependent communities. This can be done by more effective mainstreaming of the Forest Rights Act (2006), creating legally empowered local governance institutions (Gram Sabha and JFMCs) in the planning, monitoring and benefit-sharing of missions.

Sustained forest restoration could promote stewardship if there were incentives for communities to do so. Moreover, improving gender representation through women associations in forest user groups and focused training under the Green Skill Development Programme (GSDP) will further improve equitability and efficiency in the management of forest resources.

6.3 Leveraging Technology and Innovation

The use of digital technologies such as remote sensing, GIS-based forest mapping and mobile-based monitoring platforms can enhance transparency, accuracy of data and adaptive management. Real-time data on plantation survival, biomass growth, carbon storage could be combined into a National Forest Information Dashboard. Working with research centers and start-ups could stimulate new ideas for sustainable agroforestry, propagation of native species, and design of resilient ecosystems.

Further, NbS and FLR can ensure that GIM is in line with the best practices worldwide that provide carbon sequestration along with biodiversity and livelihood resilience.

The CNAW has been established to align with India's Climate Goals.

GIM needs to play a vital role in India's national pledge to become a carbon sink by 2.5-3 billion tCO₂e by 2030, and to become a net zero by 2070. Having updated Nationally Determined Contributions (NDCs) and State Action Plans on Climate Change (SAPCCs) can help local actions complement global reporting requirements.

Overall, the future direction of GIM needs to be built around three key elements – transparency, inclusiveness, and innovation – to enable it to become a fully-fledged tool for sustainable forest management and climate resilience.

VII. CONCLUSION

India's policy framework for reaching climate and environmental goals has another key juncture – Green India Mission (GIM) which aims to unite ecology and social inclusion. The mission, which was born out of the wider context of the National Action Plan on Climate Change (NAPCC), reimagines afforestation policy focusing on strengthening of the ecosystem, protecting biodiversity, and involving local communities. In the last 10 years, GIM has successfully contributed towards forest cover promotion, carbon sequestration and livelihood support for forest users. The results validate its potential as a transformative tool for sustainable development and climate adaptation.

However, the mission has experienced some tree roots issues as well. It has been less effective due to funding constraints and agency silos, and low levels of community engagement. It is continually challenged in terms of social legitimacy as it faces conflicting demands for conservation and survival rights. Moreover, targets driven by quantifiable figures (e.g. planting x number of saplings, afforesting y number of hectares) can sometimes fail to take into account qualitative factors, such as the restoration of biodiversity, rehabilitation of soils and ecological purity. These jobs highlight the need for a shift in thinking from planting trees to managing ecosystems.

To achieve the success of GIM in the future, it is important to build in transparency, participatory governance, and technovation. Its potential can be fully realised with strengthened integration in doing so with the Nationally Determined Contributions (NDCs) of India, greater convergence with allied schemes like MGNREGS, CAMPA and continued interaction with local communities. The mission is not only about the environment but it's about inclusive green growth, where ecological security and human development go hand in hand.

The Green India Mission is not only a moral obligation but also a strategic move in India's journey towards becoming a net zero by 2070. Through the AMDIS pathway of environment governance, the country will not only become climate resilient, but enhance its leadership in the international arena as well.

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