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Roadmap for Institutional and Policy Mainstreaming of Sustainable Land and Ecosystem Management in India


Summary for Policy Makers



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Indian Council of Forestry Research and Education



The report on "Roadmap for Institutional and Policy Mainstreaming of Sustainable Land and Ecosystem Management in India - Summary for Policy Makers" is prepared under the World Bank funded Ecosystem Services Improvement Project (ESIP) being implemented by the Indian Council of Forestry Research and Education, Dehradun.

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Foreword

Land is a vital resource for producing food and providing livelihood to a large number of local communities, especially in the rural and forest fringe areas. Large number of floral and faunal species are extinct in the past decades due to land degradation and overexploitation of natural resources. Desertification and land degradation along with climate change and biodiversity loss were identified as the greatest challenges to sustainable development. Sustainable land and ecosystem management can help and facilitate conservation of forests, biodiversity, natural resources, and restoration of degraded lands thus improving carbon sinks.

India is the seventh largest country in the world having total geographic area of 328.73 mha, which occupies only 2.4% of the world's geographical area, however it supports about 18% of the world's human and cattle population. Dry lands areas in India are about 228.3 mha which is 69.6% of the total geographical area, and comprises of arid lands, semi-arid land and dry sub-humid areas. The extent of land degradation is estimated to be 97.85 mha covering 29.77% of the geographical area of the country. There are numerous factors contributing to land degradation in India. An ever increasing human and cattle population have enormous demands on land which has led to drastic changes in the proportion of land utilized for agricultural activities, urbanization and industrial development. Issues such as human and animal pressure on land, over-exploitation of soil and water resources, unscientific land use, climate change resulting in natural calamities like drought and floods are major factors responsible for land degradation in India. The Hon'ble Prime Minister of India while addressing the High-Level Segment of Fourteenth Conference of Parties to United Nations Convention to Combat Desertification in 2019 made an announcement to set up a Centre of Excellence on Sustainable Land Management at Indian Council of Forestry Research and Education in order to further develop scientific approach and facilitate induction of technology on land degradation issues.

It is required to know the current state of institutional and policy arrangements in India, identify key gaps and how these may be required to be realigned to mainstream sustainable land and ecosystem management (SLEM) practices in making investments choices etc. ICFRE has developed a road map for institutional and policy mainstreaming of SLEM in India under the World Bank funded Ecosystem Services Improvement Project. This roadmap has provided specific guidelines to different Ministries/ Departments/ Research Organizations/ Civil Society Originations involved in restoration of degraded lands and to combat land degradation and desertification. The roadmap also provided the guidelines and action plans for achieving Land Degradation Neutrality, Sustainable Development Goals and Nationally Determined Contribution targets of India.

I congratulate Project Director and entire team of Ecosystem Services Improvement Project and team of M/s Ernst & Young LLP for their efforts in bringing out a roadmap for institutional and policy mainstreaming of SLEM in India - summary for policy makers. I am certain that guidelines and action plans given in this roadmap will be useful in mainstreaming of SLEM in India and in combating desertification and land degradation in India.

Dated: 03 October 2022

(Arun Singh Rawat)





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Preface

The Government of India is implementing the World Bank/ GEF funded Ecosystem Services Improvement Project (ESIP). ICFRE is one of the project implementing agencies and implementing one of the components of the project, i.e., scaling up sustainable land and ecosystem management (SLEM). The main objectives of this component are to prevent land degradation and desertification and increase above-ground forest carbon stock through a combination of investments to scale-up tried-and-tested SLEM best practices, to increase national capacity for monitoring land degradation and track associated indicators, and to generate knowledge exchange on SLEM approaches. The goal is to develop a national knowledge platform for supporting a community of practice on SLEM. These activities are designed to overcome the twin challenges of arresting land degradation and meeting the national targets and international commitments. As a part of the ESIP, ICFRE has engaged M/s Ernst & Young LLP as a consultant to prepare a 'Roadmap for Institutional and Policy Mainstreaming of Sustainable Land and Ecosystem Management in India'. The SLEM road map provided specific guideline to different Ministries/ Departments/ Research Organizations/ Civil Society Originations involved in restoration of degraded lands and to combat desertification. The road map also provides the guidelines and plans for achieving the targets of land degradation neutrality, sustainable development goals and NDC targets of India.

Financial support provided by the World Bank for Ecosystem Services Improvement Project is gratefully acknowledged. Necessary direction and guidance provided by Sh. Arun Singh Rawat, Director General, ICFRE and Dr. Anupam Joshi, Team Task Leader, ESIP, the World Bank for conducting this study under ESIP are gratefully acknowledged.

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Contribution made by Dr. R.S. Rawat, Project Manager, ESIP for conducting this study and editing & finalizing the SLEM roadmap - summary for policy makers is also gratefully acknowledged.

I am thankful to all the team members led by Sh. Amit Kumar, Associate Partner, Ernst & Young LLP in conducting this study and preparation of the final report.

I compliment the team of scientists and consultants of Ecosystem Services Improvement Project, Biodiversity and Climate Change Division of ICFRE Hqs. for editing the final report of the study submitted by M/s Ernst & Young LLP.

Dated: 03 October 2022

(Kanchan Devi)





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Abbreviations Used

AFOLU	Agriculture, Forestry and Other Land Uses
BAU	Business as Usual
BD Act	Biodiversity Act
BMC	Biodiversity Management Committee
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
CoE	Centre of Excellence
CPRs	Common Property Resources
CSSRI	Central Soil Salinity Research Institute
DAC	Development Assistance Committee
DoLR	Department of Land Resources
EMP	Environmental Management Plan
ESIP	Ecosystems Services Improvement Project
ESZ	Eco-sensitive Zone
FFV	Forest Fringe Village
FRA	Forest Rights Act
FRI	Forest Research Institute
FSI	Forest Survey of India
GEF	Global Environment Facility
GIM	Green India Mission
GIS	Geographic Information System
GP	Gram Panchayat



GPDP	Gram Panchayat Development Plan
GVA	Gross Value Added
GT	Giga Tona
ICAR	Indian Council of Agricultural Research
ICFRE	Indian Council of Forestry Research and Education
IIFM	Indian Institute of Forest Management
IIM	Indian Institute of Management
IRMA	Institute of Rural Management, Anand
IT	Information Technology
ITTO	International Tropical Timber Organization
IWMP	Integrated Watershed Management Programme
JFM	Joint Forest Management
JFMC	Joint Forest Management Committee
LULUCF	Land Use, Land-Use Change and Forestry
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
Mha	Million hectare
MoAFW	Ministry of Agriculture and Farmer Welfare
MoEFCC	Ministry of Environment, Forest and Climate Change
MoJS	Ministry of Jal Shakti
MoPR	Ministry of Panchayati Raj
MoRD	Ministry of Rural Development
MoRTH	Ministry of Road Transport and Highways



MoSPI	Ministry of Statistics and Programme Implementation
MoTA	Ministry of Tribal Affairs
NAPCC	National Action Plan on Climate Change
NBA	National Biodiversity Authority
NBAP	National Biodiversity Action Plan, 2008
NDC	Nationally Determined Contributions
NGO	Non-Government Organization
NHAI	National Highways Authority of India
NIRD	National Institute of Rural Development
NITI	National Institution for Transforming India
NRSC	National Remote Sensing Centre
PESA	Provisions of the Panchayats (Extension to Scheduled Areas) Act 1996
PMKSY	Pradhan Mantri Krishi Sinchai Yojana
PRI	Panchayati Raj Institutions
SAC	Space Applications Center
SBB	State Biodiversity Board
SDG	Sustainable Development Goals
SFD	State Forest Department
SIRD	State Institutes of Rural Development
SLEM	Sustainable Land and Ecosystems Management
SLM	Sustainable Land Management
SLUB	State Land Use Board



Sq Km	Square Kilometer
SSE	Small Scale Enterprise
SOPs	Standard Operating Procedures
TGA	Total Geographic Area
TOF	Tree Outside Forests
TSG	Technical Support Group
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
WDC	Watershed Development Component
UTs	Union Territories
WII	Wildlife Institute of India
WUA	Water User Association





1

Introduction

Land is a vital resource for producing food and providing livelihood to large segments of the population, especially in the rural and forest fringe areas. Degradation of land and ecosystems is a global concern and a critical challenge. Species diversity also bears the brunt of land degradation. An increase in land degradation causes a considerable threat of release of carbon locked in soil, contributing to global climate change. Drylands currently cover about 46% of the global land areas which are home to 3 billion people. Each year around 12 million hectares of arable and cultivable land are lost due to drought. Land degradation undermines the well-being of 3.2 billion people globally, resulting in a 5% reduction in total global net primary productivity.

Nearly 30% of India is impacted by desertification and land degradation. Water induced erosion is responsible for 37% while vegetation degradation is causing 30% of the total land degradation. Wind erosion, salinity and frost shattering contribute 19%, 4% and 3%, respectively to the cause. India has charted a strong growth story in agriculture due to expansion in the gross cropped area due to increased irrigation facilities, better seeds and other inputs and extension of farm mechanization. However, these trends have also resulted in intensive cultivation by using chemical inputs. While the overall agriculture production figures tell a positive story, the other impacts of intensive land use have also accelerated agricultural land degradation. It is projected that area affected by water erosion, water-logging and under open forests (vegetation degradation) would increase if measures to reduce degradation, restore degraded land and to achieve LDN are not undertaken. The key statistics related to the extent of degraded land is summarized in the Table 1.

Sustainable Land and Ecosystem Management (SLEM) started in India as a joint initiative of the Government of

India and Global Environment Facility (GEF) under the GEF Country Partnership Programme (CPP). The programme's objective was to promote sustainable land management and use of biodiversity and maintain the capacities of ecosystem services while considering climate change. The Desertification Cell, Ministry of Environment, Forest and Climate Change was the National Nodal Point for SLEM programmatic approach, while the Indian Council of Forestry Research and Education (ICFRE) was a Technical Facilitation Organization for the SLEM programme. As part of this programme, a SLEM baseline study was conducted by ICFRE. The baseline study highlighted that mainstreaming and upscaling of SLEM requires a Road Map and Action Plan to minimize the policy and institutional gaps and guide the harmonization of efforts by various policies, programmes and institutions at the national and sub-national level. The Government of India has received financing from the World Bank toward the cost of the Ecosystem Services Improvement Project. ICFRE is one of the implementing partners of 'Ecosystem Services Improvement Project. One of the objectives of this project is to prevent land degradation and desertification and increase above-ground forest carbon stock through a combination of investments to implement and scale-up tried-and-tested SLEM best practices, to increase national capacity for monitoring land degradation and track associated indicators, and to generate knowledge exchange on SLEM approaches. Accordingly, a comprehensive methodology, a multi-stakeholder engagement-based approach has been taken for preparation of a road map for institutional and policy mainstreaming of sustainable land and ecosystem management in India under the ESIP.



Brief of land degradation in India




 Land degradation	<h1>30%</h1>	<p>of land in India impacted by desertification and land degradation <small>Desertification & Land degradation Atlas of India published by Space Applications Centre (SAC), 2021</small></p>
 Water availability	<h1>1,544</h1>	<p>Metre cube was the per capita availability of water in India in 2011, putting India in the list of water-stressed countries in the world. Studies predict per capita water availability will become 1401 m3 and 1191 m3 by 2025 and 2050 <small>NITI Aayog, 2018</small></p>
 Ground water level	<h1>17%</h1>	<p>Blocks in India have been categorized as 'over-exploited' as per the Central Ground Water Board (CGWB) <small>Ministry of Jal Shakti (MoJS), 2020</small></p>
	<h1>61%</h1>	<p>Of the observation wells monitored by the CGWB are showing long term declining trend in ground water levels <small>Ministry of Jal Shakti (MoJS), 2020</small></p>

Table 1. Key statistics related degraded land/ wastelands in India

Report	Published Year	Estimated Area Mha	Data used	Other details
Space Applications Centre				
Desertification and Land Degradation Atlas of India	2021	<p>The area undergoing land degradation was estimated to be 97.85 Mha in 2018-19 (29.77% of TGA of the country). Area undergoing Desertification and Land Degradation during 2011-13 and 2003-05 was 96.40 Mha (29.32% of the TGA) and 94.53 Mha (28.76% of the TGA) respectively.</p> <p>The most significant process of desertification/ land degradation in the country is Water Erosion (11.01% in 2018-19, 10.98% in 2011-13 and 10.83% in 2003-05), followed by Vegetation Degradation (9.15% in 2018-19, 8.91% in 2011-13 and 8.60% in 2003-05) and Wind Erosion (5.46% in 2018-19, 5.55 % in 2011-13 and 5.58 % in 2003-05).</p>	<p>On-screen visual interpretation of IRS, Advanced Wide Field Sensor (AWiFS) data with 56 meters spatial resolution of 2018-19. Ancillary data used Desertification status maps of 2011-13 and 2003-05</p>	<p>The current atlas "Desertification and Land Degradation Atlas of India (Assessment and analysis of changes over 15 years based on remote sensing)" provides Desertification/ Land Degradation status of the country for 2018-19 timeframe. In addition to this, the atlas also provides change analysis over 15 years, from 2003-05 to 2018-19.</p>
Desertification and Land Degradation Atlas of selected districts of India	2018	<p>Mapping was carried out for 49.66 million ha, which is ~ 15.10 % of the country's total geographical area. Out of which 22.80 Mha area found to be undergoing land degradation in the assessment</p>	<p>(Based on IRS LISS III data of 2011-13 and 2003-05), 23 m spatial resolution</p>	<p>1:50,000 scale maps of desertification/ land degradation for 76 districts and two sub-basins in Leh district of Jammu & Kashmir used. Types of processes of degradation considered are – vegetation degradation, water erosion, wind erosion, salinity/ alkalinity,</p>



Desertification and Land Degradation Atlas of India	2016	<p>period of 2011-13. It compares with 22.94 million ha of the area under degradation during the time frame 2003-05. A cumulative decrease of 0.14 million ha (i.e. 0.28% of the total area mapped) occurred in the area undergoing land degradation.</p> <p>The area undergoing land degradation was estimated to be 96.4 Mha in 2011-13 (29.32% of TGA of the country) against 94.53 Mha in 2003-05.</p> <p>The area under desertification (arid, semi-arid and dry sub-humid regions of the country) was estimated during 2011-13 as 82.64 Mha; whereas, during 2003-05 as 81.48 Mha.</p> <p>Rajasthan, Maharashtra, Gujarat, Jammu & Kashmir, Karnataka, Jharkhand, Odisha, Madhya Pradesh, and Telangana contributed around 23.95% (2011-13) of desertification/ land degradation concerning TGA</p>	Based on IRS AWIFS data of 2011-13 and 2003-05 56 m spatial resolution on 1:500,000	<p>water-logging, mass movement, frost heaving, frost shattering and artificial reasons.</p> <p>This Atlas presents Desertification /Land Degradation Status Maps depicting Land Use, Process of Degradation and Severity Level, and area statistics consolidated for the entire country and state-wise for 2011-13 and 2003-05 time frame reports the changes.</p> <p>There is a cumulative increase of 1.87 Mha area undergoing desertification/land degradation in the country (constituting 0.57% of the TGA of the country) during the time frame 2003-05 and 2011-13.</p> <p>The change analysis carried out for 2011-13 and 2003-05 time frames indicates that around 1.95 Mha land has been reclaimed and 0.44 Mha land has been converted from high severity to low severity degradation class, showing improvement.</p> <p>On the other hand, around 3.63 Mha productive land has degraded, and 0.74 Mha land has converted from low severity to high severity degradation. Further, high desertification/land degradation changes are observed during this time frame in Delhi, Tripura, Nagaland, Himachal Pradesh, and Mizoram (11.03 to 4.34 %), whereas Odisha, Rajasthan, Telangana, and Uttar Pradesh have shown improvement (-0.11 to -1.27 %).</p>
National Remote Sensing Centre				
Wastelands Atlas of India	2019	The total wasteland area in the country was estimated at 55.76 Mha (16.96% of TGA). During the period, 14,536 sq. km of land was converted to the non-wasteland category	2008-09 and 2015-16	<p>23 m resolution satellite data used, mapping at 1:50,000 scale, 23 categories of wasteland identified and mapped.</p> <p>The previous report was Wasteland Atlas 2011, based on 2008-09 data</p>
National Academy of Agricultural Sciences				
Degraded and Wastelands of India Status and Spatial Distribution	2010	The harmonized area statistics of degraded and wastelands of India stand at 120.72 Mha (104.19 Mha of arable land and 16.53 Mha of forest area). The data was harmonized with NBSSLUP, CSWRTI, CAZRI, CSSRI Karnal, FSI and NRSA.	Water erosion 2007, wind erosion 2007, acid soils 2005, salt-affected soils 2004, Forest cover 1999, wasteland data 2003	Some degradation classes (not responsive to amendments or management) were excluded. For example, theoretically, any soil with a pH of less than 7 is acidic, but responses to amendments and reclamation were not observed in the soil having a pH less than 5.5. Similarly, snow-covered land or glaciers were excluded. Forest land with more than 40% canopy was not considered degraded during the harmonization process. Soil erosion below



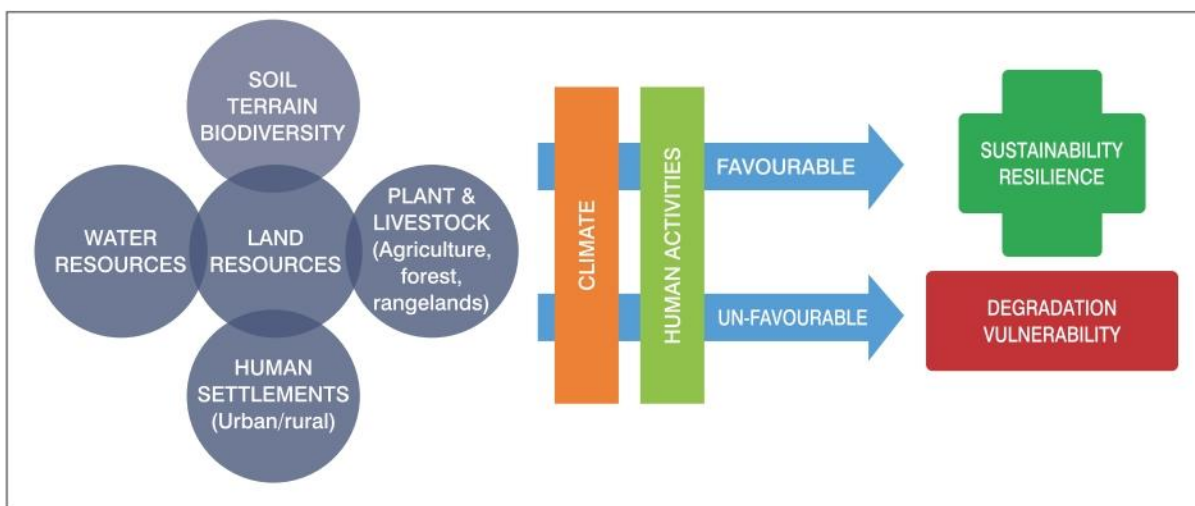
				10 tonnes per hectare generally does not significantly affect productivity and has not been counted as degraded wastelands. Therefore, the harmonized estimates have been derived from the practicalities of the reclamation, amelioration, and management for agricultural planning rather than purely academic interest.
ICAR- Central Soil Salinity Research Institute				
Mapping of salinity affected soils	1996	6.74 Mha across 17 states		Gujarat, Uttar Pradesh, Maharashtra, Rajasthan, and West Bengal have 75% of the total saline affected soils in the country.

Sustainable Land Management (SLM) defined at the Rio Earth Summit in 1992 as *"the use of land resources, including soils, water, animals and plants, for the production of goods to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions"*. SLM has the following Principles¹:

- Targeted policy and institutional support, including the development of incentive mechanisms, for SLM adoption and income generation at the local level

- Land-user-driven and participatory approaches
- Integrated use of natural resources on farms and at the ecosystem scale
- Multilevel, multi-stakeholder involvement and partnerships at all levels – land users, technical experts and policy-makers

The various factors contributing to sustainable land and ecosystem management (SLEM) can be understood as under:



Strategies Adopted for Achieving SLEM at the National Level

India has a long history of implementing programmes to tackle drought and land degradation, applying Watershed

Development Approach (since the 1970s) which aimed at the conservation, regeneration, and judicious use of

¹ <http://www.fao.org/land-water/land/sustainable-land-management/en/>



natural resources (land, water, flora, and fauna) within the watershed area. The Ecosystem Approach was adopted later at the COP 5 (CBD, 2000) of the Convention on Biological Diversity that worked as “a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way”. Ecosystem approaches are highly context-specific and flexible to address management issues in different social contexts.

Post Millennium Ecosystem Assessment 2015, a landscape approach was initiated and described as ‘dealing with large-scale processes in an integrated and

multi-disciplinary manner, combining natural resources management with environmental and livelihood considerations’. The landscape-scale allows considering several land-use systems, for example, forests, agriculture, and livestock production, concurrently and in a more integrated manner, thus reconciling the stakeholders’ various needs.

Forest landscape restoration is the ongoing process of regaining ecological functionality and enhancing human well-being across deforested or degraded forest landscapes to meet present and future needs and offer multiple benefits and land uses over time².



² <https://infoflr.org/what-flr>



2

Land Governance in India: Key Challenges in the Context of SLEM



Policy Imperatives for Actioning SLEM in India

In addition to land ownership, a number of policy instruments on natural resource management with direct or indirect implications on land are also central to SLEM.

Overall, following thirteen policies have been identified which have a bearing on SLEM in the country:

- | | |
|--|---|
| <ul style="list-style-type: none">• National Forest Policy, 1988• The National Conservation Strategy and the Policy Statement on Environment and Development, 1992• The Policy Statement for Abatement of Pollution (PSAP), 1992• National Environment Policy, 2006• The National Biodiversity Action Plan, 2008 and the Addendum to the NBAP, 2014• National Agriculture Policy, 2000• National Policy for Farmers, 2007• National Agroforestry Policy, 2014• The National Water Policy, 2012• Fertilizer Policy | <ul style="list-style-type: none">• National Biofuel Policy, 2018• National Mineral Policy, 2019• National Tourism Policy, 2002• The Environment (Protection) Act, 1986• The Provisions of the Panchayats (Extension to Scheduled Areas) Act- PESA, 1996• The Biodiversity Act, 2002• MGNREGA, 2005• The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, also known as Forest Rights Act (FRA)• CAMPA Act, 2016• Regulations for Felling of Trees |
|--|---|

Collectively, these policies attempt to advance the sustainable management of the country's natural assets and minimize the developmental and pollution impacts on resources. For example, the National Forest Policy, 1988 is a target driven policy and has a number of progressive elements, including the participation of communities for sustainable forest land management and promotion of agroforestry. Similarly, the policy statements on the environment, abatement of pollution and the National Environment Policy argue for minimizing the impact of pollution on land through strategies such as locating polluting industries in specified zones. The water policies adopted and revised many times attempts to mainstream integrated water resources management and conservation.

However, despite the existing framework of policies, achieving sustainable land management and tackling land degradation and its impact on ecosystems security has emerged as one of the key challenges in India. Many of the policies and programmes concerning the environment and sustainable resource management were initiated nearly three decades ago but they have not been able to arrest the degradation of agricultural, forest, common and government lands. The generic nature of policy imperatives with limited or no institutional mechanisms for the implementation of policy directions is realized as one of the major constraints for the non-performance of policies. The natural resource management (NRM) related policies applicable to sustainable land and ecosystem management capture the major problem areas but fall



short of addressing the socio-economic drivers that cause or explain land degradation.

In the agriculture space, the existing policies collectively too, do not address the need for rationalizing prevalent input subsidies to lands such as on fertilizer and electricity and decreasing per capita land - the two fundamental causes of agricultural land degradation in most parts of the country. For example, the extension of agriculture to low potential lands and failure of irrigation systems resulting in diminished outputs, overuse of groundwater, and diminishing soil health have not been under policy scrutiny. Similarly, using natural forest ecosystems for agricultural extension under 'shifting cultivation' in many States could not be contained through policy prescriptions.

Cost benefit analysis is often used as an effective tool while assessing various options. For SLEM related policies it is more pertinent that the analysis considers the cost of inaction or not doing enough. Even when scientific institutions and experts have come out with costs and benefits of policy actions, the translation of the knowledge into policy has been weak. For example, incentives or role of non-government institutions has not been sufficiently

explored under the current NRM related policies. In effect, the policies have focussed on proximate causes of natural resources degradation and offer a generic outline of interventions while failing to adequately address the interrelationships of various drivers.

Green accounting is another method of mainstreaming the impact of economic development on the environment and the health of people. The typical problem of accounting has been under discussion globally since the 1980s. The UN Statistical Commission had developed a Framework for Development of Environment Statistics called FDES in 1984. The natural capital accounting framework has been subsequently revised, and the System of Environmental Economic Accounting 2012 (SEEA) Central Framework (UN, 2014) was brought out in 2014. The framework prescribes the methodology to capture the increase in economic products as well as the increase or decrease of the natural capital to give an overall view of the economic, social and environmental development. However, green accounting has not become a norm due to challenges related to attributing monetary value to the stock of the ecosystem services provided by nature.



Role of Institutions in Implementing SLEM

Institutions play a pivotal role in policy formulation, programme planning and implementation. The structure of institutions, knowledge, skills, finance, human resources at their disposal, the intra-relations within an institutional structure and interrelations with other institutions, and their autonomy in decision-making determine the effectiveness to deliver.

Analysis of the institutional structures at the Centre, State, District and Sub-district, including the Gram Panchayat, suggests the absence of a dedicated and specialized nodal institution at the state level that looks at land management in totality. The District Collector/ District Magistrate (DC/ DM) has been the fulcrum of all government programmes and the focal person around whom the interdepartmental coordination and planning revolves. However, the DC/ DM being the presiding authority on the score of laws and District level committee, it is not individually possible for him to provide detailed guidance or oversight in holistic planning on all the schemes, including in areas related to land management, degradation and environment. An institution at the next

level is required to support the DC/ DM to increase the effectiveness of his office in this aspect.

At the district and block level, the staff mainly focus on implementation. This is also the most important level for inter-departmental coordination. However due to the vertical structure of the line departments, in programmes where joint implementation is required in the same landscape, coordination is difficult to achieve beyond the department where the programme is housed. Often, district level officials are not used to having a holistic view of the sector beyond the targets they need to achieve. In cases where district plans have been made, they have mainly remained of theoretical value due to the huge gap between resources demanded in the plan vis-a-vis the actual resources available, resulting in redundant plans.

Many Central sector/ Centrally-sponsored schemes have set up district-level units as part of scheme implementation with few dedicated staff, but they are inadequate or not empowered enough to effect interdepartmental or intersectoral coordination. Limitation on administrative



expenses at times becomes an important factor in programmes determining the adequacy of technical staff. Wherever programmes are suffering due to manpower limitations, the proportion of money allowed for administrative expenses might require upward revision.

Staff strength often falls short at the Gram Panchayat (GP) level, given that the responsibility and involvement of GPs are envisaged in most programmes. In addition, the planning and managerial capabilities of staff allotted to GPs is very weak. There is hardly or no reporting relationship of the line departments with GPs, so they are mostly not aware of the plans of individual departments or are made aware at a much later stage for formality

purposes. Development imperatives demand higher skills from functionaries at the Panchayat level for holistic and multi-sectoral planning, while considering demographics and socio-economic factors in mind. A dedicated technical team with the backing of technology-based tools is a requirement at the GP level. The non-separation of executive and governance functions at the GP level has reduced the GPs as an executing arm of the government machinery or a contractor, which creates impediments wherever governance functions of the GP is to be exercised, for example, in areas such as maintaining equity, distribution and access of resources, planning, building consensus and conflict resolution. Devolutions in terms of funds and functionaries continue to be a work in progress.



Social Aspects Critical to SLEM

Land is a critical resource for supporting the livelihoods of most people living in the rural areas, and the access to land and allied resources is mediated not only by the economic positions of people but also by caste, gender, ethnicity, geographies and culture. Social aspects, therefore, are of primary concern in sustainable land and ecosystem management. Reduction of poverty and inequality are also key objectives of SLEM. Understanding the contribution and role of people in SLEM is important to engage them in the conservation and management of land, water and forest resources.

Policies, legislation and programmes have included and advanced the needs and interests of the rural communities and vulnerable groups on the aspects of equity, gender mainstreaming, livelihoods, traditional and indigenous practices, development and management of common property resources, and community rights and management of forests and biodiversity in the tribal regions. Continued emphasis has been given to community engagement in planning and programme implementation as well as in building capacities for playing their role. There are several schemes that combine livelihoods with sustainable management of resources. There are also legal provisions to provide the communities ownership and management of resources they have held traditionally. Various institutions such as Joint Forest Management Committees (JFMCs), Self-Help Groups (SHGs), Watershed Committees and Water Users Associations (WUA) have been created as part of these programmes which are the primary organizations through which communities can take care of their resource and sustainability needs.

Despite the above developments over the last couple of decades, critical gaps still exist. For example, meaningful participation of the community in planning and implementation is still a challenge, and gender concerns are neither adequately articulated nor identified in sector programmes. Reporting systems do not provide gender-segregated data, and therefore it becomes difficult to understand how women benefit from the programmes. There is little attempt to meet the needs of women in different sectors, such as agriculture and forest, and women's involvement in programmatic decision-making is not sufficiently addressed.

While the poor communities often shoulder the blame for unsustainable use of natural resources, there is a lack of initiative to educate people or assist them with technology and knowledge to use resources sustainably or provide alternatives. For example, enabling marginal women farmers and landless women through collectives and federations as well as getting them tenure rights to own and cultivate land is one of the gap areas affecting poor women. The slow and inadequate implementation of the rights provided based legislations to ensure equity and ownership of resources has prolonged the timeline for the tribal communities to benefit from them. It is important to note that people's perspective changes when they see themselves as managers and contributors instead of being only users and exploiters of resources. Providing community ownership of resources, transparency in programme implementation, and active deliberation and participatory decision-making are foundations to community engagement and enhance the community's capabilities in managing natural resources.



3

Policy and Legislative Framework Related to SLEM in India: A Diagnostic Analysis

The National Forest Policy (1988) looks at forests in isolation of the needs and dependencies of the people living in the vicinity, and linkages with other sectors were not considered to address the anthropogenic pressures. The principles for valuations of land and the ecosystems services of quality natural forest during forest land diversion has been undetermined. Affirmative actions for the supply of raw material to wood-based industries are lacking. Neither it facilitates private investment for the rehabilitation of degraded land nor does it talk of conserving biodiversity outside forest areas. The climate change aspect is totally lacking and achieving the target of 33% land area under tree cover is not detailed.

The National Conservation Strategy and the Policy Statement on Environment and Development (1992), identifies the key drivers of environmental degradation as the population growth, overgrazing, conflicting uses of forest land, competing uses of agricultural land, unplanned urban development, and encroachment of wetlands and destruction of coastal features.

The Policy Statement for Abatement of Pollution (1992), identifies waste water produced from urban communities and industries, solid wastes, pollution from the run-off of agricultural inputs such as pesticides/ insecticides as drivers of land degradation. The Policy prescription of locating Small Scale Enterprises (SSEs) in rural areas has the potential to prevent further agricultural and common land degradation. The Policy envisages that the SSEs for environmental transition should be provided with planning and technological assistance.

The National Agriculture Policy (2000), aimed towards enhancing agricultural productivity and agricultural reforms like conjunctive water use and water sensitive agricultural practices, low cost electricity to farmers, land

consolidation, tenancy reforms, redistribution of surplus and wasteland among landless and unemployed youth.

The National Tourism Policy (2002), focuses on sustainability and carrying capacity of wildlife areas, underlines responsible tourism and employment generation. It supports SLEM since environmental impact assessment and social impact assessment are mandatory for new commercial construction activities in tourist hotspots.

The National Environment Policy (2006), aims to control environmental degradation due to organized economic activity but does not adequately address unsustainable land-use practices, monitoring of compliances for environment & forest clearances, framework to evaluate the effectiveness of land degradation and restoration responses like prevention, mitigation and rehabilitation. The policy is silent on institutional forms and rights required to facilitate access and ownership of natural resources to dependent people and measures required to prevent the dumping of solid waste materials and effluents in rivers. The policy neither targets nor provides any definite plan for fringe area development necessary for the conservation of ecologically sensitive areas and for the livelihood security.

The National Policy for Farmers (2007), meant to improve farmers income by bringing qualitative improvements in land resources but suffers from few drawbacks. It focusses to implement conservation farming in the Indo-Gangetic Plains to achieve food security is not substantiated. The policy does not differentiate lands as prime land and low biological value land at the implementation level. No guidelines exist regarding capacities, roles and responsibilities of climate managers. The focus on gender is minimal. Treatment and support to women farmers as a priority group is not addressed.



The National Water Policy (2012) provides directions for water resource development and water sector reforms. The groundwater is still inequitably exploited. Recognition of river corridors, maintenance of ecological flows, watershed management and are others enabling policy intentions critical for SLEM, which have to be supported in practice.

The National Agroforestry Policy (2014) is supportive of SLEM and critical for meeting India's national target and international commitments but has certain issues regarding access to markets, price fluctuations, financial support and regulations. Various agroforestry models developed by the institutions under ICFRE and ICAR needs to be taken to the field.

The Fertilizer Policy is covered by the Urea Policy (2015), Phosphatic and Potassic Policy, and City Compost Policy apart from Nutrient Based Subsidy Policy in 2010. The Urea and Phosphatic and Potassic Policies ensure sustained agricultural growth while City Compost Policy deals with waste-to-compost.

The National Biofuel Policy (2018) meant for reducing the import dependency in the Oil & Gas sector although

encourages the use of waste and degraded lands under cultivation of energy grasses and short gestation crops but would require institutional mechanisms for involving farmer cooperatives, panchayats, self-help groups and user groups.

The National Mineral Policy (2019), focuses on sustainable mining on scientific basis, fairness and transparency in allocating mineral resources, encouraging the private sector for exploration, and promoting zero waste mining. However, the policy does not mention technical aspects of afforestation and restoration separately. Permission for mining in the Scheduled Areas is assigned to an entity at the district or block level and not at the Gram Sabha or Panchayat level. The role of Panchayati Raj Institutions except in the Scheduled Areas is missing. The policy emphasizes the need to protect environment and forests, eco-fragile zones and sustainable mining, but does not dwell into methodologies to be followed to balance the social requirements. It does not propose coordination mechanisms at lower levels of governance.



Regulations Impacting SLEM in India

The Environment (Protection) Act, 1986 addresses mainly to environment pollution from industries but has been instrumental in issues of overall environmental conservation. The Environment (Protection) Act can practically be applied to all scenarios envisaged under the Environmental Policies.

The Provisions of the Panchayats (Extension to Scheduled Areas) Act-PESA, 1996 have been uneven in implementation and the areas - land acquisition, mines and minerals, forest produces have not been devolved to Panchayat/ Gram Sabha uniformly across PESA states. Due to widespread illiteracy, poverty and marginalized tribal communities, it is a challenge for people residing in the Vth Scheduled Areas to assert their claims on provisions made under PESA.

The Biodiversity Act, 2002 provides conservation of biodiversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of it, however, mainstreaming of biodiversity into developmental planning may not be realized until the State Biodiversity Boards (SBBs) and local bodies are strengthened. The SBBs have no explicit powers to formulate schemes and plans. The confidentiality clause in the Act would require more explanation as per circumstances for the ease of sharing information with the community regarding the use of bioresources. There are no incentives for sharing of benefits in commercial use of bioresources of traditional knowledge.

The Mahatma Gandhi National Rural Employment Guarantee Act, 2005 (MGNREGA) aims to eradicate rural



poverty. However, the focus is more on person-days of employment generated with a heavily target-driven approach therefore difficult in bringing synergy and convergence across sectors – agriculture, water and forest with programmes, such as the Integrated Watershed Management Programme. Technical capacity of field staff is a gap as land based natural resource management activities require technical competence for project conceptualization and implementation.

The Compensatory Afforestation Fund Act (2016) has a provision for Centre's approval for forestland diversion and

allows project proponents to pay compensation for the loss of forest land if used for non-forestry purposes.

Several states have special acts and regulations related to sustainable land and ecosystem management (e.g. Delhi Tree Preservation Act, 1994) for the protection of trees growing outside the purview of forest land which requires prior permission of the designated authority and compensation in the form of plantation of new trees.

Sectoral Action Plans Impacting SLEM

The National Action Plan on Climate Change (2008) covers sustainable development, co-benefits to society at large, focuses on adaptation, mitigation, and scientific research. It provided the framework for integrating climate change at state level and updating them periodically to be more relevant to changing circumstances, and putting it into action.

The National Biodiversity Action Plan (NBAP), 2008 and the Addendum to the NBAP, 2014 outlined the threats and constraints to biodiversity conservation, namely habitat fragmentation, degradation and loss, shrinking of genetic

diversity, declining resource base and over-exploitation of resources, invasive alien species, climate change and desertification, etc. Yet, it has not been able to strengthen the institutional mechanisms for the implementing them and suffers with gaps like specifies conservation plan of rare, endangered and threatened species, conservation of agricultural biodiversity has been weak, loss of wild biodiversity is poorly understood. The National Wildlife Action Plan 2017-2031 extensively covers all the areas of wildlife management.

Synthesis of the Policy Analysis

- There is no comprehensive policy or legislation for addressing land degradation and desertification in India.
- Land is not a major focus of policies on agriculture, farmer and water. All these are directly relevant to agricultural land use and degradation have insufficient focus. Lands must be improved by implementing land laws, particularly ceiling, leasing, tenancy and redistribution of wastelands.
- Wastelands remain undefined but are classified under various categories in land records and governed under the general framework of environment and biodiversity laws.
- The National Forest Policy, 1988, is disjointed with all other policies applicable on lands and water relevant for SLEM.
- The absence of a national policy on grasslands or grazing lands is a policy vacuum.
- Judicious use of land acquired for public or private purposes is necessary to protect its quality and not left to degrade.
- A clear policy on dealing with land conflicts needs to find a place within the national-level land use planning.
- Participatory planning remains an aspiration affecting the performance of all the programmes.



4

Social Aspects Critical to SLEM

Equity is the foundational principle of policy in a Welfare State and is concerned with fairness and social justice in resource allocations to recipients. The inclusion of people as beneficiaries of programmes is the first step towards equity. The criteria used to select beneficiaries

are based on people's social and economic conditions such as poverty, gender and other conditions, including physically challenged status, people living in forests, vulnerable communities, and those living in remote and inaccessible places.



Women and Gender Mainstreaming

Women and Forests: The National Forest Policy, 1988 and Forest Right Act, 2006 are nearly silent about women's dependence on forests and their role in conservation and sustainable management of forests. Mostly, inclusion of women in policies has remained confined to membership in village-level committees.

Women and Agriculture: Inclusion of women farmers in National Policy for Farmers, 2007 and National Agriculture Policy, 2000 to facilitate credit and institutional inputs is an appreciating step though certain challenges exist like women farmers have less access to information, technical knowledge and new technologies and equipment, poor women lack resources to invest in land development and technology.

Participation in Decision-Making: Being a major stakeholder in SLEM, women participation in decision-

making is critical for their needs, concerns, knowledge, and voices to get reflected in policies and programmes. Their inclusion by building their capacity and creating the space for them to contribute is often overlooked during programmes implementation.

Data Gap: Absence of disaggregated data on women beneficiaries of programmes as household makes it difficult to comprehend the number of women who benefit, the social groups to which they belong to, the outcome of women's access to benefits, and the trend in different regions. Secondly, household data, except in cases where women are officially registered as the head of a household, is often misleading as they occupy the unofficial position of the head of a household in situations of migration, disability or death of the male head of the household.



Tribal Communities and SLEM

- Income from non-timber forest produces has reduced dependency on the forests and provide people a sense of ownership that has led them to protect the forests.
- SLEM requires reducing dependency over forest. Three ways for doing so includes - promoting agriculture through improving land productivity and

augmentation of water availability, horticulture, and agroforestry, promoting alternative fuel by introducing alternative energy sources, such as improved cooking stoves, biogas and promoting alternative livelihoods, entrepreneurial development.



- Slow implementation of the FRA, 2006 and PESA. 1996 has limited the scope of local governance institutions and tribal communities' engagement in SLEM.

Evidence shows that granting community forest resource rights provides the communities with a sense of ownership

and leads to the sustainable use of forest resources. There are ambiguities in PESA and the subsequent interpretation by the states that have led to divesting/diluting the power of Gram Sabha and Gram Panchayat.

Challenges to Community Participation in Conservation and Management of Biodiversity

- Progress of engaging people has been slow and uneven across the states and the formation of the Biodiversity Management Committees and the preparation of the People Biodiversity Registers have lagged.
- For accountability, a monitoring mechanism at the block/district, including people's audit must exist.
- Activities to be undertaken by local communities through village committees and their mutual sharing of information as well as joint planning is missing.

Common Property Resources and Livelihood Support

- Grazing land is sometimes used for planting species that cannot be used for fodder
- Returns out of commercial trees on village commons land should benefit the rural poor
- Programmatic interventions required to meet the energy requirement of rural households
- Conflicts arise out of grazing land due to development and alternate arrangements
- Conflict resolution should not be ignored during participatory planning, integration of traditional management practices and institutionalizing procedures in the interest of communities.

Incorporation of Traditional Community-based Systems

Traditional Community-based Systems (e.g. Johad, a traditional rainwater harvesting practice in Rajasthan) is an important aspect of sustainable development. The FRA emphasizes traditional management of forests by the forest-dwelling communities. Documentation of traditional

practices and their promotion in cultures and regions where they exist can be valuable for SLEM under the constraint that they should not be treated as alternative to scientific systems and make substantial variations in them to make them suitable.





5

Key Institutions and Mechanisms to Implement SLEM

The role of institutions in implementing SLEM is very important. At Centre, there are the ministries/departments that set policies and regulations and also commit resources for the implementation of their mandate. Then, there are institutions providing support for SLEM through technical inputs in the assessment of land resources,

biodiversity, development of technologies and their know-how, training and capacity building, field testing and extension. At the State level, these institutions are Forest, Agriculture, Rural Development, and Panchayat Department which are involved in implementation.

Institutional Challenges Related to the Implementation of SLEM

Activities related to SLEM are multi-disciplinary, covering areas such as management, policy, technology, legal, governance, as well as multisectoral, covering sectors such as forestry, agriculture, skilling and livelihoods and local institutions. It calls for closer coordination with respect to planning, implementation and monitoring between various agencies. Broad observations on the institutional structure are:

- There is no institution at the state level that looks at land management in totality.
- The district collector/ magistrate has been the fulcrum of all government programmes and has to prioritize his attention. An institution at the next level is required to increase the effectiveness of his office.
- District officials miss the holistic view beyond the targets they need to achieve.
- Some schemes have district level units with dedicated staff but they lack technical handholding and supervision.
- Some functionary has to be added at the block level or below.
- Staff strength at *Gram Panchayat* needs to be enhanced.
- Involving *Gram Sabha* in the ownership of government programs is a big challenge.
- The non-separation of executive and governance functions at the *Gram Panchayat* level has reduced *Gram Panchayats* as an executing arm of the government machinery.

Challenges at Central, State and District Level

The primary role of the central institutions is laying out the policy landscape, developing relevant schemes and programmes, funding and monitoring. The bottlenecks at this level is sometimes a gap in the competence and technical expertise of senior administration and support staff, inter-departmental coordination and absence of

quality data required for evidence-based planning.

The challenges faced by the state-level institutions are similar and also include difficulty in creating and upgrading staff capacities and capacity of the institutions to enforce regulations is limited.



The district level and block level challenges include shortage of technical staff, absence of monitoring systems, conflicts between government agencies and target driven implementation leading to insufficient time to mobilize the community.

The *Gram Panchayat* faces the most critical challenges as most of the schemes vest the panchayat with the responsibility for participatory planning, implementation, monitoring and limited technical knowledge and problem-solving capabilities.

Institutions at the Implementation Level

- Since SLEM involves multi-sectoral planning, thematic integration across departments and programmes is very important. The lack of technical expertise to analytical review/evaluate the programme/ policy outcomes is a shortfall at district level.
- *Gram Panchayat* plans get consolidated and approved at Block Panchayats, and the reports are also aggregated at the Block level therefore the Block Panchayat is of considerable significance.
- The *Gram Panchayat* suffers with capacity issues like trained and experienced subject matter resources, remain the critical bottleneck. The panchayats have also not been able to raise their revenue for various reasons and therefore this limits their performance.
- A standing committee addressing the critical issues in forest/ land degradation and land management does not exist as a matter of rule in panchayats across the country.
- Self-Help Groups (Women/Men) are mostly engaged in thrift and credit operations and their engagement in natural resource management-based activities is limited.
- The sustainability of user groups often formed in villages to sustainably managing the use of a particular resource or service has been a big challenge.
- Due to project closure and reduction in support from the mainstream forestry programmes, most Joint Forest Management (JFMCs) have become now non-functional. The primary challenge faced by JFMCs in sustainability is the meagre returns from forest usufructs and operations, which has diminished their incentives to remain active.
- The Ecodevelopment Committees (EDCs) meant for villages in Protected Areas focus on protecting wildlife/ biodiversity and undertaking ecodevelopment activities. The challenges around the sustainability of the institution beyond the project period have been similar to the situations of the JFMCs.
- Biodiversity Management Committees can contribute significantly to mainstreaming SLEM in identifying and conserving economically valuable bioresources. Biodiversity Management Committees have been recently aligned with Panchayati Raj Institutions to mainstream them.
- Voluntary organizations/ Non-Governmental Organisations play a link between government institutions and the community by providing support in service delivery, capacity building and behaviour change.

Analysis of Research Institutions Pertinent to SLEM

Indian Council of Agricultural Research and Indian Council of Forestry Research and Education are the primary research institutions under the government contributing to SLEM in India and are critical as they are mandated to also take the research outcomes to the field. Apart from them universities and private funded research organizations also play their role.

Research institutions have an invaluable role in providing technical backstopping to the implementing agencies in terms of knowledge, know-how and supporting the upscaling and measurement of results and outcomes.



Dedicated Institutions for Implementation of SLEM

Within the Central and State governments, land is aspersed between various ministries and departments each having its own policies, laws, regulations, programmes, missions and targets and an institutional structure to carry these forwards. Thus, in terms of distribution of role, functions and responsibilities, the institutional presence and decision making on land can be regarded to be present in two constructs- Horizontal institutions (Central ministries and State departments); Vertical (Decentralized institutions).

The horizontal institutional ecosystem at the central level involves all the Central level ministries including industry, roadways, railways and defence but from environmental and land degradation standpoint, the five ministries MoEFCC, MoRD-DoLR, MoJS, MoAFW and MoPR have the pivotal role to play. However, there is an issue with regard to role clarity and allocations within the horizontal institutional distribution which affects the overall outcome

and ground-level implementation. All lands whether forest or outside forests have the protection of environmental laws and MoEFCC has an overarching institutional role in that context.

There are independent state-level institutions that handle land and agricultural administration but lack of integration creates uneasy administration. The horizontal distribution and spreading present an administrative and governance challenge for SLEM.

The vertical (decentralized) distribution of role and responsibilities on land falls with the Panchayats at all levels where the Village Panchayats and Gram Sabha have most critical role to play and have the statutory powers over management of common property resources such as lands attached to ponds, *shamshan*, *maidan*, *khatian*, village pastures and village roads.





6

Public Investments in Land and Ecosystem Management in India

Budgetary provisions by Ministry of Environment, Forest and Climate Change (MoEFCC): Twelve major programmes and schemes of the MoEFCC had budgetary allocations towards land and ecosystem management in 2016-17 which were reduced to nine in 2020-21. Overall, the budget allocation for the MoEFCC is between Rs. 800 and Rs. 1,000 crore since 2016-17.

Budgetary Provisions by Ministry of Agriculture & Farmers' Welfare: The overall budgetary allocation for land-based schemes grew by around 38% from Rs. 54.22 billion in 2016-17 to Rs. 74.76 billion in 2020-21. Pradhan Mantri Krishi Sinchai Yojna and National Mission on Horticulture – get a significant share of around 76% in 2016-17 and around 84% in 2020-21. The Rainfed area and Climate change programme recorded a growth in the allocation of 13% from Rs. 1.9 billion to 2.03 billion during the same period.

Budgetary Provisions by Ministry of Jal Shakti: The overall budget for programmes/ schemes related to water management fell by around three per cent between 2016-17 and 2020-21 from Rs. 32.16 billion to Rs. 31.16 billion. The overall expenditure was around 100% in 2016-17 and 2018-19, it was 58% in 2017-18 due to poor utilization under the Namami Gange Scheme. The Ground Water Management and Regulation Scheme has recorded positive budgetary growth of 139% in the five years, from Rs. 1.15 billion to Rs. 2.75 billion.

Budgetary Provisions by Ministry of Rural Development: The MGNREGS and the Pradhan Mantri Krishi Sinchai Yojna - Watershed Development Component (WDC-PMKSY) are directly promoting SLEM. In 2019-20, of the total expenditure of Rs. 932.24 bn, 66.4% was spent on natural resources management under MGNREGS.

Expenditure by States in Forestry Sector: The aggregate expenditure in 2018-19 was found to be Rs. 199.84 billion. The average money spent per sq km of forest for the country is Rs. 0.285 million.

Expenditure by States on Soil and Moisture Conservation: The aggregate funding in this sector was Rs. 45.56 billion, Rs. 50.06 billion, Rs. 61.68 billion and Rs. 62.55 billion for 2015-16, 2016-17, 2017-18 and 2018-19, respectively.

Combined budgetary provisions for four Central ministries and states on SLEM related schemes: The compiled budget outlays of the four ministries for SLEM related schemes have been Rs. 448.90 billion to 547.62 billion between 2016-17 and 2018-19. Of the total, the MoRD's share has been about 80% while the MoEFCC's share is about 2%. Contribution by Central and State governments for SLEM related schemes are 68% and 32% respectively.

About Rs. 830 billion per year is being currently provided for the management of land and ecosystems.





7

Monitoring Indicators for Institutionalizing SLEM

For monitoring progress on land degradation, three biophysical indicators are used by UNCCD, i.e. land cover, land productivity and carbon stocks. These indicators also need to be supplemented by other indicators to provide coverage of ecosystem services, Sustainable

Development of Goals (SDGs), and other national indicators. The UNCCD reporting indicators as per the UNCCD Strategic Framework 2018-2030 were considered while finalizing the Monitoring Indicators and M&E Framework.



Harmonization of Monitoring and Reporting with UNCCD Progress Indicators

While the country moves towards LDN while adopting and upscaling the SLEM practices, it's desirable to harmonize the monitoring systems for various programmatic and policy interventions undertaken with the UNCCD reporting format to bring in efficiency in the reporting commitments.

The reporting format has been developed to measure the four key strategic objectives and implementation framework of the UNCCD Strategic Framework 2018-2030. These strategic objectives are:

- To improve the conditions of affected ecosystems
- To improve the living conditions of the affected population
- To mitigate, adapt to, and manage the effects of drought to enhance the resilience of vulnerable populations and ecosystems
- To generate global environmental benefits through effective implementation of the United Nations Convention to Combat Desertification
- To mobilize substantial and additional financial and non-financial resources to support the implementation of the convention by building effective partnerships at the global and national level
- Implementation framework: Financial and non-financial resources, Policy and Planning and Action on Ground.

Operationalization of the monitoring framework and reporting under the UNCCD Strategic Framework 2018-2030 would require some key considerations as:

- Identification of primary stakeholders for reporting as the indicators to be monitored as per the UNCCD Strategic

Framework 2018-2030 are being handled across various ministries namely Ministry of Environment, Forest and Climate Change, Ministry of Rural Development, Ministry of Social Justice and Ministry of Agriculture.

- Definition of hotspots/brightspots has to be decided by the nodal reporting authority, i.e., Ministry of Environment, Forest and Climate Change, in consultation with the other stakeholders for reporting in the context required by the UNCCD Strategic Framework 2018-2030 i.e. land cover area, land productivity dynamics, soil organic carbon and both above ground and below ground.
- Fixing targets at national and sub-national levels. India already has identified key areas related to SLEM under the sustainable development goals.
- Compilation of data on restoration of degraded land under various government programmes and schemes by various ministries/ departments of the Government India and state governments.

Two important aspects regarding the implementation of SLEM for achieving LDN are:

- The land units taken up for interventions under LDN should be stratified and mapped based on land types and ecosystem features. "Like for like" comparison of land types is important for assessing and managing counterbalancing between gains and losses in each class of land.
- A baseline at the identified landscape level is an essential which would cover all indicators in the monitoring framework and should be of reasonable quality to assess deviations, both negative and positive.



8

SLEM and Land Degradation Neutrality

The concept of Land Degradation Neutrality was agreed in October 2015, by the UNCCD country Parties. This idea is enshrined in the sustainable development goal (SDG) 15.3 “by 2030, combat desertification, and restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation neutral world”. Over 129 countries have committed to setting Land Degradation Neutrality targets and more than 100 countries have already set their targets.

Land Degradation Neutrality (LDN) is defined as a state whereby the amount and quality of land resources, necessary to support ecosystem functions and services and enhance food security, remains stable or increases within specified temporal and spatial scales and ecosystems.

Policies and programmes to halt and reverse land degradation have long suffered from the absence of a clear

overarching goal and quantitative time-bound targets to guide action and make measurable progress. LDN aims to balance anticipated losses in land-based natural capital and associated ecosystem services with measures that produce alternative gains through approaches such as land restoration and sustainable land management. LDN means securing enough healthy and productive natural resources by avoiding degradation whenever possible and restoring land that has already been degraded. At its core are better land use planning and land management practices that will improve economic, social and ecological sustainability for present and future generations. Thus, central to LDN is the principle of Sustainable Land and Ecosystem Management and LDN can be achieved through implementation of SLEM practices.

Land Degradation Neutrality Target Setting Building Blocks

Four building blocks form the basis of the LDN target-setting process, developed on the scientific guidance by the UNCCD. These are:

- **Leveraging LDN:** LDN target setting is not a stand-alone process but provides opportunities for coordination across ministries and sectors. By finding common answers to: Why does LDN matter? What should we leverage? Who should be engaged? Countries can succeed in leveraging LDN.
- **Assessing LDN:** Assessing the current state of land degradation and its drivers is the basis for setting LDN targets, making informed decisions on what action to take, and tracking progress.

- **Setting LDN targets and associated measures:** LDN targets define a country's ambitions in terms of combatting land degradation. LDN measures comprises of interventions to avoid, reduce or reverse land degradation.
- **Achieving LDN:** An enabling environment is a prerequisite for achieving LDN. It makes integrating the LDN concept into National policies easier and identifying transformative LDN programmes and projects possible.





Land Degradation Neutrality in India

About 29.77% of India's total land area is undergoing degradation. This has significant implications for ensuring India's food security, land resilience and climate mitigation. The costs imposed by this level of land degradation are large. Almost 82% of this cost is due to degradation while land use change accounts for only 18% of the total, underlining the need for a twin focus on restoring degraded ecosystems and preventing further deterioration. Land degradation has been reported in all the major land use classes, including agriculture, forests, wastelands and

wetlands. As part of the LDN target, India has committed to restore 26 million hectares of degraded land by 2030. This implies that there is an increase in commitment from 21 Mha to 26 Mha from India's earlier Bonn Challenge target announced in 2015 (IUCN, 2018) As per the Bonn Challenge target, India was to restore 13 Mha by 2020 and a further 8 Mha by 2030. Before we further analyse the issue, it would be important to look at the data regarding land degradation in India.



Status of Land Degradation in India

1) Extent of Wasteland in India: The Department of land resources in collaboration with National Remote Sensing Centre (NRSC), Department of Space has published Wasteland Atlas of India in 2000, 2005, 2010 and 2011 and 2019. The following emerged from the analysis:

- Spatial extent of wastelands in India is 55.76 Mha (16.96 percent of geographical area of the country i.e. 328.72 Mha) for the year 2015-16 as compared to 56.60 Mha (17.21 percent) in the year 2008-09.
- During this period 2008-09 to 2015-16, a total area of 1.45 Mha of wastelands got converted into non-wasteland categories.

2) As per the Desertification & Land degradation Atlas of India (Space Applications Centre, 2021), about 97.85 million hectares or 29.77% of total geographic area is under various stages of degradation. 23.79% (2018-19), 23.63% (2011-13) and 23.34% (2003-05) of the area undergoing desertification/land degradation with respect to total geographic area of the country is contributed by Rajasthan, Maharashtra, Gujarat, Karnataka, Ladakh UT, Jharkhand, Odisha, Madhya Pradesh and Telangana (in descending order).

The most significant process of desertification/ land degradation in the country is Water Erosion (11.01% in 2018-19, 10.98% in 2011-13 and 10.83% in 2003-05),

followed by vegetation degradation (9.15% in 2018-19, 8.91% in 2011-13 and 8.60% in 2003-05) and wind erosion (5.46% in 2018-19, 5.55% in 2011-13 and 5.58% in 2003-05).

3) Degradation of Forest Land: As per the India State of Forest Report 2021, change in density classes using the change matrix shows that 97,770 sq km of Very Dense Forest in 2019 (out of 99,158 sq km assessed in 2019) has remained Very Dense Forest in 2021 whereas net 714 sq km of Moderately Dense Forest has moved to the Very Dense Forest class, 113 sq km of Open Forest has covered to VDF. 981 sq km of Moderately Dense Forest has been lost to non-forest while 1,164 sq km and 1,712 sq km of non-forest has been added to Open Forest and Scrub respectively. Information from the change matrix does not show the degradation that might be occurring within the density classes.

4) Land Affected by Salinity in India: Five states, Gujarat, Uttar Pradesh, Maharashtra, West Bengal and Rajasthan account for 75% of the salinity affected lands. Overall, salinity affected area is expected to increase from current 6.7 Mha to 20 Mha by 2050.

Major reasons for soil salinity apart from weathering of rocks are: (i) Irrigation with saline water (ii) Excessive leaching (iii) Ingress of sea water in coastal regions (iv) Waterlogging and seepage from canals (v) Faulty irrigation practices leading to localized concentration of salts.



5) Status of Wetlands: National Wetland Atlas 2011, prepared by SAC (SAC, 2011), is the latest inventory on Indian wetlands. According to the report, a total of 201,503 wetlands were identified and mapped on 1:50,000 scale. In addition, 555,557 wetlands (of area <2.25ha, which is smaller than minimum measurable unit) were identified.

The area covered by 757,060 wetlands is 15.3 Mha (about 4.7% of the total geographical area). FSI in India State of Forest Report 2019, has reported 62,466 wetlands within forest area covering 3.83% of the geographic area of the country. Wetland survey is required to be carried out periodically to track their health.

Analysis of Factors of Land Degradation in India

Land degradation can be also be accounted for: first is the land degradation within a particular land use (degradation of forests), and second is a change in land use which is less efficient or optimal (change of forest land into agriculture). The main drivers of degradation of wasteland includes removal of vegetation for firewood, fodder, removal of soil, stones, and quarries, converting unsuitable land into subsistence agriculture, etc. which accelerates soil and nutrient loss for wastelands. The following are the factors:

1) Drivers of Forest Degradation: Forest degradation means a reduced capacity of forests to produce goods and services. The planned drivers include infrastructural development like road and railway construction, mining activities etc. while unplanned drivers include unauthorized extractions of forest resources, illegal felling of timber, firewood, small timber, and non-timber forest products extraction, livestock grazing, fodder collection, illegal mining etc. There has been no mapping of degradation within demarcated forests, however it is estimated to be 30% of the total forest area.

2) Shortage of Fodder: As per the 20th Livestock Census, the total livestock population in India is 535.78 million (increase of 4.6% over the previous Census in 2012). The deficit in green and dry fodder in the country is 21% and 26% respectively, putting immense pressure on forest and common lands.

3) Role of Forest Fringe Villages and LDN: As per the ISFR 2019, it is estimated that around 300 million people are living in forest fringe villages (villages which fall in 5 km from the periphery of recorded forest area) in India. At an aggregate scale, total 85 million tonnes of firewood, 1,053 million tonnes of fodder, 5.8 million cubic meter of small timber, and 1.8 million tonnes of bamboo is removed from forests by people residing in the forest fringe villages. The

assessment shows that more than 60 percent of fuel requirement in the forest fringe village are still being fulfilled by firewood collected from forest areas. The rural population and specially in the forest fringe villages are still not used to procuring/ growing fodder for cattle or practicing scientific animal husbandry practices and follow traditional practices.

The above data suggests that dependence on forests for forest fringe villages communities is directly connected to their income and livelihood status, thus indicating that a closer attention to the development needs of people residing in these areas is a must if degradation on forest ecosystem is to be addressed.

4) Forest Land Diversion: Overall, the forest land diverted has been on a decline trend as the area diverted has reduced from 65141 hectares in 2001 to 2689 in 2020.

5) Trees Outside Forests: The Tree Outside Forests (TOF) is 9.57 Mha and constitutes 2.91% of the area of the country as per the India State of Forest Report 2021 which was 8.14 Mha in 2001 showing about 16.5% rise in the last two decades. Wood from non-forest area supply about 90% of the timber and pulp requirement of the wood-based industry. TOF is also expected to be a major contributor in achieving the NDC forestry sector target under the Paris Agreement. Necessary policy and administrative actions would be required in the areas of wood from non-forest areas since India has a huge market with unsatisfied demand of wood and wood products which is usually imported.

6) Degradation of Wetlands and Waterbodies: Waterbodies are under extreme threat due to land use change, leaching of fertilizers and pesticides, dumping of effluents, and loss of aquatic biodiversity. Wetlands and waterbodies need proper inventorying, and multi-



disciplinary and departmental intervention for their protection and conservation.

7) Pressure on Mangrove and Coastal Ecosystems: The total area under mangroves in the country is 4,975 sq km present in 10 States and 2 Union Territories, the maximum in West Bengal (43%). Urbanization, industrialization and

discharge of sewage are other causes of threat to mangroves apart from increasing demands for development of coastal infrastructure. A dedicated agency to proactively manage/ protect mangrove seems a necessity as the role of the forest department is limited unless mangroves areas are also declared forests.



Existing Strategy for Addressing Land Degradation

Two (National Mission for a Green India & National Mission for Sustaining the Himalayan Ecosystem) of the eight missions announced under National Action Plan for Climate Change (NAPCC, 2008) directly support the efforts to tackle land degradation. The National Working Plan

Code 2014 describes the objective of a working plan is sustainable management of forests however it doesn't talk on actions required to reduce or stop stress factors causing degradation and recouping the vegetation and biodiversity of the area.



Future Strategy for Achieving LDN Target

Achieving LDN by 2030 has to be viewed from two dimensions:

a) Avoid, reduce and/or reverse land degradation in order to achieve a state of no net loss of healthy and productive land.

b) Restoration of 26 Mha of land as per the target set by the government.

Four main areas identified for much needed attention for achieving the LDN targets:



1 Gaps in Actionable Data and Technology

A standard definition and methodology for identification of degraded land, along with dedicated institutions at the State level to identify such land and prioritize them for restoration over the next 10 years is a clear gap.

- Forest land that have degraded over last 20 years (since the period from which high-quality satellite data is available) showing reduction of density by 0.2 or more should be mapped to target restoration. The true extent of degraded forest land could be estimated in a reasonable time only by using technology.

- Regular assessment of wetlands and waterbodies and survey of its health and conservation status is needed.
- It is important to develop alternate models of funding which may involves various levels of contribution by community and private sources.
- Upscaling of successful models for land restoration is also a gap.



2 Institutional and Funding Gaps

- Need to consider drivers of land-use change holistically and find a way to harmonise interventions both at State and Central levels by establishing institutional linkages.

- The Working Plan Code may be modified to give more focus on restoration of degraded forests.



- A closer coordination among Forests, Agriculture and Rural Development is required for achieving majority of the LDN targets at the Centre and States.
- Important to identify how much funding is required for achieving the LDN targets and how has it to be utilized in a sustainable manner to achieve the desired results.
- Estimates of investment for restoring or reclaiming

degraded land vary widely which is a problem for planning and committing funds.

- Varied cost structures complicate the estimation required for restoration as well as seeking commitment of public funds in the face of competing requirements. To tide over this constraint, detailed planning of land to be targeted for restoration would be important.

3 Gaps in Enabling Ecosystem

- Wastelands Treatment present an opportunity for India to achieve its LDN targets. However, treating wastelands, located outside the forest areas present numerous challenges. For example, treating wastelands through agroforestry can be a motivation for farmers if they are able to realise a good return from the sale of harvest. Changes in policies need to be made in States to make agroforestry more attractive to farmers.
- High intensity agriculture being practiced due to

current regime of subsidies and incentives. Addressing land degradation on private lands is missing in programmes and policies of the agriculture sector. Most of the farmers in India are small and marginal farmers who do not have enough capital to invest in their own farms. Changes in policies and programmes need to be made so that adequate investments can be made in the marginal land owned by small and marginal farmers.

4 Strategy for Target Setting

- Coordinated effort for target setting to cover 26 Mha of degraded land by 2030 is necessary rather than a business as usual approach. Identifying targets under individual schemes, identifying land parcel to be allocated under various scheme of the departments are important.
- The targets would also require to be broken down in the following land use classes: Degraded forest land, Culturable wasteland, Agriculture land which are not current fallows/ degraded farmland, Closed mines/ areas under mine reclamation, Rejuvenation of water

bodies, Abandoned cultivation land, Land under cultivation which can be taken under plantation/ horticulture as per land capability class or owner's agreement, Grassland and common grazing lands, Institution land/ vacant land in urban areas, Along National and State Highways, Vacant land under large industries

- Efforts in restoration of various categories of land mentioned above would also involve enabling guidelines and amendment of relevant rules to incentives the landowner and users to collaborate.





9

SLEM in the Context of Sustainable Development Goals

"Sustainable Development" was adopted and popularized in 1987 in one of the reports by the United Nations Commission on Environment and Development. The UN Conference of 2012 emphasized the three dimensions of sustainable development: economic development, social inclusion and environmental sustainability. The inception of Sustainable Development Goals (SDGs) took place at the United Nations Conference on Sustainable Development in Rio de Janeiro, 2012. All United Nations Member States adopted the 2030 Agenda for Sustainable Development in 2015 through 17 Sustainable Development Goals (SDGs), 169 Global Indicators and their targets for 2030.

India became the first nation to publish a government-led, sub-national measure of progress on SDGs under a voluntary national review submitted to the High-Level Political Forum on SDGs in 2017. The Ministry of Statistics and Programme Implementation (MoSPI) identified the nationally available datasets that align with the 17 SDGs and their 169 targets. The MoSPI thus developed the National Indicator Framework (NIF) comprising 306 indicators for measuring India's progress against the SDGs and associated targets.



SDGs in the Context of SLEM

The contribution of SLEM towards SDG 15: Life on Land is direct. As land and biodiversity are key resources to secure life and livelihoods, SLEM contributes in a supportive way to the other SDG targets as well namely SDG 1 - No Poverty SDG, SDG 2 - Zero Hunger, SDG 5 - Gender Equality, SDG 10 - Reduced Inequality, SDG 12 - Responsible Production and Consumption and SDG 13 - Climate Action.

As per NITI Aayog, it is important to assess the starting point by various states in the context of SLEM in terms of benchmark progress, identify priority areas, highlight data gaps related across SDGs. The breakdown of the indicators at the sub-national level (up to district level), along with the availability of data, will bring out the need to increase the capacity and capability of data collection.

NITI Aayog has done the higher-level work as far as institutionalizing SDGs is concerned, consisting of: (i) Creating shared understanding among the government (ii) Assigning goals and targets to the ministries (iii) Creating composite measures to advocate about the SDGs (iv) Developing the National Indicator Framework to monitor SDGs.

Some actions required are: (i) Understanding the SDGs in Local Contexts (ii) Adapting indicators and metrics (iii) Implementing the Policy Framework in states and UTs by encouraging states to undertake their visioning exercise to achieve the SDGs (iv) Organizing the implementation system.



Targets and Indicators under SDG relevant to SLEM

The SDGs are envisaged to become the de facto planning framework of the states wherein planning, budgeting,

implementation and progress tracking are aligned to respond to the gaps in the SDGs.



Targets related to SLEM under SDG 15

SLEM contributes directly to achieving targets under SDG 15, but there are other SDG targets, achieving which will positively impact SLEM such as improving water quality, affordable energy services, achieve greater equality,

reduce the adverse per capita environmental impact of cities, achieve the sustainable management and efficient use of natural resources by 2030, etc.

Future Strategy for Enhancing the Contribution of SLEM Towards Achieving SDGs

The focus needs to be shifted to the implementation of the various strategies to achieve SLEM and thus tracking the progress towards the targets.

Three actions required for enabling SDGs:

- Identify Resource Gaps and devise strategy to bridge the gaps by expenditure prioritization, revenue augmentation and efficiency improvement to ensure sufficient financing.
- Cascade state-level targets to implementation level targets for tracking performance. This will also require localization of some of the SDG targets

- Develop systems to capture performance data and for monitoring: Gaps in data required for performance evaluation to be identified, establish systems for data capture and reporting based on state level or local indicators

Cascading SDG 15 targets to States is important to maintain transparency through a clear division of responsibility. Like district-wise allocation of target, mapping and measurement to achieve 33% of total land area covered under forest and tree cover.





10

SLEM in the Context of Nationally Determined Contributions

In 2015, 196 Parties came together under the Paris Agreement to transform their development trajectories aiming to limit warming to 1.5°C to 2°C above pre-industrial levels. The Paris Agreement requests each country to outline and communicate their post-2020 climate actions, known as their Nationally Determined Contributions (NDCs).

IPCC Sixth Assessment Report notes that without "net zero" carbon emissions by 2050, a temperature rises of 1.5° C in the next 20 years and 2° C by the middle of the century is extremely likely. Globally estimated 23% of total anthropogenic emissions are derived from Agriculture, Forestry and Other Land Use (AFOLU).

About 12% of the country's emissions was offset by carbon sink action of forests, cropland and settlements. Create an additional carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent through additional forest and tree cover by 2030. Better adapt to climate change and to implement the mitigation and adaptation actions. As per the Third Biennial Updates Report (BUR) under UNFCCC submitted in 2021 (MoEFCC, 2021), India's greenhouse emission is 2.84 GTCO₂e (GT) without LULUCF (Land Use, Land-Use Change and Forestry) and 2.53 GT with LULUCF.



India's Strategy to Achieve NDC Forestry Sector Target (FSI, 2019)

- Improvement/Restoration of Natural Forests that have lost canopy density in the last few years and Improving open forests of longer vintage
- Tree planting on culturable wastelands and other available lands in villages
- Tree planting along – Roads, Railway lines, including Railway Siding and Rivers & Canals

- Greening of Urban Spaces
- Agroforestry

The above strategy will have a maximum potential of adding 75.8 Mha of green cover as per the FSI's estimates. Meeting the lower end of the NDC target of creating 2.5 GT of sink would require 4.7 Mha of additional forest cover.



Analysis of the Strategy to Achieve the NDC Forestry Sector Target

TOF will play a major role in creation of additional carbon sink. A study by IUCN suggests that India had restored around 9.8 million hectares between 2011 and 2018 at a rate of 1.4 Mha per year, but the increase in the forest and tree cover has been only 0.16 Mha over the same period. This discrepancy can be partly explained by young vegetation not getting registered in remote sensing

images. But the fact remains that degradation of forest land due to population and development pressures continues to offset the restoration efforts that have resulted in the slow net increase in the forest and tree cover.

Restoration of degraded forest land will need a special thrust i.e. the business as usual scenario needs to be strengthened with additional programmes focusing on



forest restoration, which will have to be launched without delay so as to meaningfully contribute towards the 2030 target.

Actions on the following aspects will be necessary to accelerate towards the NDC target:

- Policy interventions to facilitate the private sector for plantation and restocking of degraded forests.
- Adequate measures to increase the tree crops in non-forest areas as well as increase productivity by promoting high yielding varieties.
- Restriction on the extraction of forest produce - fuelwood and fodder, while making alternative arrangements for dependent communities, to avoid forest degradation and promote regeneration critical areas.
- Reduce the forest dependence of local people for fodder, fuelwood and timber and stop unsustainable harvesting.

- Involvement of communities through Gram panchayat-based forest governance institutions for rehabilitating degraded forest land.
- Encourage industry to intensify tree planting and use better varieties to produce more wood and sequester more carbon.
- Introduce resources and technological interventions to reduce forest fires, the spread of invasive species, pests and diseases in forest areas and improve the health of forests.
- Strengthen systems to collect high-quality data at higher periodicities and sufficiently local levels to help in local planning to monitor performance and increase the accountability of institutions for meeting National goals.

It is also clear that many of these interventions will help achieve the targets for LDN and SDGs.





11

Recommendations for the Policy and Institutional Mainstreaming of SLEM

Recommendations for the Policy and Institutional mainstreaming of SLEM - While the policy actions to tackle environmental degradation have been initiated since seventies, India's National Action Programme to Combat Desertification was the first dedicated action plan to arrest land degradation. Since then, a number of policy instruments have been adopted at the national/ state level

to deal with the depleting state of the environment and natural resources. The national circumstances and ecology-specific drivers of degradation have undergone a significant change since then due to the rise in population and changes in demographics, economic growth, rising income levels and demand for natural resources.



Harmonization of Data Related to SLEM

The multiplicity of data sets is one of the main problems with more than one institution publishing reports based on their assessment of land degradation status in the country. It stems from multiple definitions of degraded land, use of different methodologies and input data of various temporal and resolutions characteristics, and the absence of actionable information for field-level implementors. It is recommended that:

- A common understanding of degraded land must be arrived at, and a national level nodal agency must be appointed to map the degraded and degrading land in the country.
- Study of land degradation should also identify hotspots at the landscape level and categorize the degraded land based on the intensity and rate of change, vulnerability and prioritization in terms of interventions required.
- The data on forest degradation should be included as part of the State of Forest report. This would clearly identify the forest land that has undergone a substantial change of canopy and vegetation cover over the last two decades.
- Digitization of forest boundaries should be completed.

- Mapping of wetlands should be carried out and results be compared with the last assessment done in 2013, identifying the change in the on-ground status of wetlands and water bodies in the country.
- A web portal on degraded land should be developed and made publicly available including implementers, managers and researchers at the parcel level, for quality planning.
- Inconsistencies in data published by various organizations should be identified and rectified/ explained by the nodal agency.

A consistent data set of high reliability made accessible to all will go a long way in improving the planning of interventions, timely monitoring with the use of IT systems and instil accountability.

Addressing issues of soil health. Protecting soil health through better agronomy practices is one of the main prescriptions for addressing land degradation of cultivated areas. Action recommended are as follows:

- Intensifying the soil health mapping and integrating it with the application of soil amenders and fertilizers.
- Assessing and mapping areas vulnerable to degradation and developing local level plans to tackle it.



- Disseminating and adopting SLEM best practices identified by the ICFRE to a wider audience.
- Taking up innovative programmes to restore soil health, such as wider application of biochar and development of Land Resources Inventory.
- Making concerted efforts to reclaim problem lands by adopting scientific methods to prevent further degradation and increase productive or ecological value from the land.
- Studying the effect of inputs and output subsidies on soil health.
- Mapping the carbon in forest areas, including in forest soils at higher intensity, and creating a credible database for future use as a baseline.

Recommendations for Protection and Restoration of Degraded Lands are:

- Restoring the 30 Mha of degraded forest land so that they are able to provide usufructs to communities on a sustainable basis. While the state forest departments have been practising afforestation and soil and moisture conservation works in forest land, most of these areas continue to be impacted by severe biotic pressure. Thus, restoration of such areas has remained a challenge.
- Restoring grassland and grazing land; the concept of rotational grazing has in many cases not been effective, and some of the more degraded grasslands will require rest to recoup their productivity.
- Addressing the livelihoods dependency and development aspirations of communities residing in the forest fringe villages, which will alleviate some of the pressures and provide the natural space for the forests to recoup their health.
- Taking up technical interventions to improve the productivity of forest areas through better selection of planting material
- Developing and implementing a strategy for addressing the issue of invasive species, which affects regeneration of native species, yield depletion and reducing their ecological value.
- With the growing impact of temperature rise due to climate change, fires have started to emerge as a key

threat to the forest, especially in areas like the Himalayan region and Central Indian landscape. More focussed approach for addressing forest fire through the use of modern knowledge and tools is an important strategy for the future.

- Protecting the health of rivers and wetlands to maintain them as healthy ecological units.

Recommendations for strengthening of institutions for tackling sustainable land management are:

- An institutional mechanism is required for implementing projects where more than one department is jointly working with interventions on multiple sectors, such as forests and grazing lands, animal husbandry, horticulture, agriculture watershed development, soil conservation and livelihoods. Also, it is important to develop a mechanism for a common planning tool for the MGNREGA projects to enhance utility and scientific rigour in land-related works done under the programme.
- A mechanism to set department wise targets as well as conduct monitoring with the objective of achieving LDN is required, given that achieving LDN will be more than just afforestation or development of degraded forest land.
- An institution to collate and disseminate knowledge and best practices for sustainable land, biodiversity, water management and agroforestry.
- Strengthening of government institutions, such as State Biodiversity Boards, to increase their reach to handhold and support community institutions to inventorize and manage bioresources, and water user associations for participatory management of groundwater.
- Enable carbon market for the flow of funding from the private sector for SLEM and climate change-related issues.
- Revival of land use boards to act as a coordinating body in planning for land use at the state level, in balanced and judicious manner.
- A mechanism for monitoring SDGs in the context SLEM.
- Closer integration of the Panchayati Raj Institutions in SLEM.





Incentives, Disincentive and Enforcement to tackle Land Degradation

A deeper understanding of the causes and effects of the incentive regime, alternate options that are more natural resource friendly and support sustainability and empathetic change management from the current regime to a new one is required. It is recommended that:

- Pricing of water should be slowly introduced in all sectors, including agriculture to reflect both the value of the resource as well as the cost of extraction and delivery
- Disincentivizing the overuse of ground water in agriculture
- Developing an incentive mechanism to promote investment in land protection

- Activities like mining, including sand, and other building materials should be brought under stricter enforcement and compliance

Certain changes in the policy regime will be required to implement these recommendations. In addition, while moving away from the business as usual regime, the disproportionate impact on the poor and vulnerable will need to be softened through innovative mechanisms for targeting relief, which is possible now with better quality socioeconomics data available for individuals and businesses.

Addressing Community Development Needs

There is a direct relationship between deprivation and vulnerability in livelihoods with unsustainable use of natural resources. Dependence on subsistence livelihoods in and around forests has continued to be a reason for forest degradation. Small and uneconomic landholdings, tenure structure and inefficient targeting of beneficiaries have been the causes of low investment in scientific land management. Recommendations to address these issues are:

- Focused development of forest fringe villages, including areas where *pattas* have been allotted to people under the FRA. Their speedier upliftment out of subsistence will go a long way in the recovery of degraded forests.
- Strengthening of SLEM related interventions to make community participation meaningful and decisions

taken on the ground benefit a wider set of people, while also improving the legitimacy and acceptability of such decisions taken.

- Women as a group are an important stakeholder and interest group in the management of natural resources. Thus, gender mainstreaming in SLEM related programmes should be taken up.
- Most of the women categorized as women farmers are not title holders of such land. This affects the kind of decisions women can take in the protection and sustainable land use of their landholdings.
- Implementation of PESA.

Recommendations

Action Points for Environment and Forest Sector

- 1) **Integrated Policy on Land for Addressing Land Degradation:** The issues that impact land degradation and conservation of ecosystems are enshrined in several policies such as the National

Forest Policy of 1988, National Agriculture Policy of 2000, National Environment Policy of 2006, National Farmers Policy of 2007, National Water Policy of 2012, National Agroforestry Policy of 2014 and



National Mineral Policy of 2019. The need to address land degradation has been mentioned as one of the aims in the passing while the policy remains focused on their core sector agenda. In a combined manner, too, the issue of SLEM does not rise to the level of importance that it ought to. An integrated policy on land degradation is required for the holistic management of issues concerning SLEM.

- 2) **Strengthening Forest Policy:** The National Forest Policy of 1988 has remained a sectoral policy so far, though many aspects of forest conservation depend on sectors outside the forests. The forestry sector has also evolved over the past three decades due deeper understanding of the role of forests in combating climate change, provisioning of ecosystem services and addressing the vulnerability of rural communities. The international understanding on the role of forests has also changed substantially after the 1992 Earth Summit. The role of judiciary has been critical in defining the boundaries and limitations of the legislations related to forests and wildlife in the country. However, these aspects are required to be enshrined in the forest policy in due course. Strengthening of the forest policy is therefore proposed.
- 3) **Increasing Funding for Forest Programmes:** Funding at the Central government level has remained stagnant at about Rs. 8 to 9 billion, whereas that of the states combined is at about Rs. 200 billion. On the other hand, about 30.5 Mha of forest land are categorized as open forest, i.e. having a canopy density between 0.1 to 0.4. Another 4.6 Mha of land falls under the category of scrub, having a canopy density of < 0.1. Degraded forest land constitutes a significant proportion of these forest land categories. Restoration of such land has remained a long-term challenge, both from the perspective of finding resources and the local community's dependency on the resources. As the

country's GDP grows, and along with it resources collected in the form of tax and non-tax revenue also grows, the investment by the state in protecting and growing its natural capital should also increase. It is proposed that funding for the sector may be increased to tackle the challenges faced due to environmental degradation and climate change.

- 4) **Focus on Development of "Forest Fringe Villages":** The MoEFCC, in collaboration with the MoAFW, MoRD and Ministry of Skill Development, may consider initiating a special multi-sectoral scheme for the development of forest fringe villages with clear and measurable targets for improvement of various aspects of human development indices. This may be a new scheme or one that is carved out by dovetailing existing rural, agriculture and Tribal Sub Plan schemes.
- 5) **Digitization of Forest Maps:** A scheme on forest land digitization covering all states and UTs for demarcation of forest boundaries and digitization of maps may be initiated. The scheme would also support mapping units/ GIS units in the states which would be helpful for field-level planning and monitoring.
- 6) **Prioritization in Afforestation on Degraded Forest Land:** Mapping of areas within demarcated forests that have lost canopy density in the last 10-15 years would help in identifying areas for reforestation. This programme can be initiated by FSI and subsequently, the state forest departments should be able to develop their capacity to conduct such assessment at their level.
- 7) **Improving the Quality of Planting Material in Afforestation Programmes:** Using quality planting material in afforestation has been emphasized regularly. However, this area of forestry has been challenging. A project on improving the quality of planting material in forestry is proposed. The project





would also consolidate the success and research work already done by research institutes such as ICFRE's Institutes in tree improvement and help upscale the same. As part of the project, a National Database of Candidate Plus Trees (CPT) can be created for better record and access of mother trees to all stakeholders. This will also help in institutionalizing the knowledge available with local officials regarding such trees. A mechanism for seed collection from such CPTs and certification needs to be established. The registered suppliers of forest trees can be brought onto one platform to maintain the chain of custody/ certification of seeds collected and sold so that only seeds of known origin can be supplied in the market.

- 8) **Interventions to Reduce Forest Fires, Invasive Species, Pests and Diseases in Forest Areas:** Investments in technological interventions in pilot projects and in scaling up best practices may be considered for addressing problems in these areas. The use of modern predictive tools based on Artificial Intelligence (AI) coupled with RS and GIS can be used for predicting certain incidents and provide valuable lead time to take evasive actions to mitigate the threat. The MoEFCC and State Forest Departments should encourage cross-learning across the states on best practices for reducing forest fires and tackling invasive species and incidences of pests and diseases in forests.
- 9) **Forest Carbon Assessment:** There is a need to establish permanent forest carbon assessment points at the district/ forest division level for periodic measurement of forest carbon to understand changes in the carbon regime in the forests based on the management interventions. This data also will help foresters to keep a record of the changes in soil carbon over time and trend analysis. It is proposed that Forest Survey of India is already equipped with required infrastructure and National Forest Inventory database may be involved in this exercise.

- 10) **Collaboration with Research Institutions:** For improving the effectiveness of the SLEM interventions, a closer liaison with the Indian Council of Agricultural Research (ICAR) and ICFRE institutions is proposed with ongoing programmes and schemes so that research outputs related to SLEM can be mainstreamed. This will allow the implementing agencies to promote action research on SLEM and help adopt relevant technologies by including them in the plans under the existing schemes.

- 11) **Focus on Wildlife Corridor Development:** Nationwide mapping and development of wildlife corridors and establishment of Protected Area (PA) network by connecting wildlife landscapes, securing the protection of corridors in existing laws, i.e. Indian Forest Act, Wildlife Protection Act, Eco-sensitive Zone notifications and Coastal regulation zone notifications are being proposed. This initiative may be taken up by studying present and historical land use of the area and the trends in change of land use, modelling optimal land use in such corridors to serve the needs of wildlife as well as the livelihoods of people, devising schemes to incentivize landowners in the corridor areas to maintain conducive land use, putting in place unobtrusive systems to monitor wildlife use of the corridor as well trends over longer timeframe for taking ameliorative action well in time, allowing CSR contributions for activities such as compensation for wildlife depredation and developing SOPs such as the do's and don'ts to avoid encounters with wildlife.

- 12) **Strengthening State Biodiversity Boards:** The institutional arrangement within the State Biodiversity Boards (SBBs) need to be reviewed to make them stronger and effective. Intermediate level institutions and quality technical support agencies are required for SBBs to coordinate with and handhold the Biodiversity Management Committees at the Panchayat level. The State Biodiversity Boards also



need to be transformed into pro-active rather than reactive agencies.

- 13) **Mapping and Protection of Wetlands:** Mapping of wetlands along with their zone of influence and drainage may be done in a time bound manner. Mapping smaller wetlands, which are not on the list of major wetlands under any existing conservation programmes is critical. Clear responsibility may be given to concerned landowners to conserve the wetlands and ensure that they are in good health. A mechanism for periodic water quality monitoring may be set up. The demarcated wetlands may be tagged with revenue survey numbers. and diversion should not be allowed. Panchayats may be entrusted with the powers under the Panchayati Raj Act to protect the wetlands and waterbodies so identified during the mapping exercise.
- 14) **Enabling Ecosystem for Growing Trees:** Policy and institutional support is needed to make tree growing more attractive to farmers and other individuals. Simplification of harvesting and transit requirements are needed. A system for tree certification may be developed that allows voluntary registration of trees by landowners and tracking the same over its lifetime. Developing a mechanism for the certification of planting material, especially for the key species used in agroforestry, i.e. *Eucalyptus* spp., *Melia dubia*, poplar, casuarina, bamboo species is required. Policy and guidelines may be framed for bringing vacant land under private or institutional ownership under green cover with a provision that such green cover may be allowed to be removed whenever required by the owner/user of the land to incentivize the landowner and users to for bringing such an area under green cover.
- 15) **Diversion of Forest Land – Improving Monitoring and Assessing Impact Post Land Diversion:** The conditions under which individual cases of forest land diversion have been permitted need to be

properly monitored. An appropriate monitoring system may be established at the central level to enable the same. Since good quality data regarding forest land diversion is available (for land diverted since 1980), the impact of diversion on and beyond the land diverted may be studied and learnings arising out of the study should be used in defining the compensation structure for land diversion in future as many of these unintended consequences, which may be difficult to avoid, are currently not priced in the compensatory value of forest land diverted.

- 16) **Arriving at a Consensus Definition of Wasteland/ Degraded Land:** A common understanding and agreement on standard definition and methodology for identifying degraded land and its sub-classifications are required. At the same time, dedicated institutions at the Centre and state level should be recognized that can follow the methodology and identify such land and prioritize them for restoration over the next 10 years. Agencies such as the National Bureau of Soil Survey and Land Use Planning having long experience in this area may be involved in the exercise.
- 17) **Target Setting for LDN:** It is important to consolidate the coverage of area under LDN taken up under various schemes, remove duplication and subsequently use the information for planning future interventions. The consolidated information should also be compared with the land degradation status map of the country. It will also be important to divide the target under identified key monitoring areas related to SLEM with clear responsibilities to various stakeholders and cascade them to subordinate implementation units for improved outcomes and transparency. Closer coordination at the centre and state level among three key departments - Forests, Agriculture and Rural Development - responsible for achieving most of the LDN targets will be a key enabler. Detailed land planning for restoration will be





important to optimize funding requirements by removing duplications, increasing collaboration, fostering convergence and enhancing efficiency.

- 18) **Framework to Monitor LDN:** Primary stakeholders from various ministries and departments in the Government of India, namely MoEFCC, MoRD, MoJS, MoAFW and their subordinate organizations, may be identified for reporting under the UNCCD monitoring framework. Their orientation should be conducted on the reporting parameters. The definition of hotspots and brightspots across various dimensions related to land management, i.e. land cover area, land productivity dynamics, soil organic carbon and both above ground and below ground, have to be finalized by the nodal reporting authority, i.e. MoEFCC in consultation with other stakeholders for maintaining uniformity in understanding and reporting.
- 19) **Develop a Centre of Excellence on Sustainable Land Management:** A Centre of Excellence (CoE) on Sustainable Land Management can be an apt institution to facilitate and host such a forum. The proposed CoE at ICFRE can provide support at the national level for handholding implementing agencies and coordinating nationwide efforts on SLEM. The CoE will work towards harnessing knowledge, creating a knowledge repository on SLEM and widely disseminating the same for the benefit of practitioners. Besides creating a database on land degradation, training and capacity building, national-level reporting on LDN, coordinating research on SLEM with international agencies for sharing knowledge and best practices on sustainable land management are also being proposed.
- 20) **Develop Specific Project on SLEM at the National Level:** A special project may be initiated that can become a model for the future to demonstrate a multidisciplinary, multi-sector and people-centric approach in implementing LDN. Funding for such a legacy project can be arranged from international agencies committed to financing mitigation and adaptation programmes under UNFCCC and LDN under UNCCD.
- 21) **Road Sector's Contribution of LDN and NDC:** The National Highways Authority of India (NHAI) may consider a partnership with the State Forest Departments to implement "Green Highways" for improving the outcomes and quality of plantations along new and old National Highways.
- 22) **Focussed Attention on Rehabilitation of Mined-Out Areas and Abandoned Mines:** A special programme should be taken up to rehabilitate abandoned mines and other mined-out areas, which are not covered under active Environment Management Plans (EMPs). The programmes would entail interventions on forestry, reclaiming land for wildlife habitat, conservation of water, and addressing livelihoods of the local communities. Funds from the District Mineral Funds can be exploited for this purpose. The Sustainable Development Framework for the mining sector needs to be properly implemented. The quality of monitoring of the EMPs may be enhanced through respective ministries and third-party audits to achieve better outcomes.
- 23) **National Carbon Market:** Launching a national level carbon market for allowing carbon emissions trading within India will encourage flow of funds from private entities. Such funds could be made available to finance climate change mitigation and adaptation projects including LDN projects in the country.
- 24) **Enforcement of Sand Mining Guidelines, 2020:** States should adopt stricter rules in the light of Sand Mining Management Guidelines, 2020 issued by the MoEFCC. In addition to the national guidelines, all states should formulate State-level Sand Mining Regulations with strict compliance procedures and plans.



25) **Encouraging the Involvement of Students in Fighting Land Degradation:** A Graduation Legacy Policy is proposed to cover students appearing in the senior secondary board examinations or who are in the final year of graduation under any stream. Under the policy, such students in India will need to plant at least 5 trees for getting their high school leaving certificate or their graduation diploma or degree certificate. The present Van Mahotsav program implemented throughout the country can co-opt this initiative.

26) **Establishing a Mechanism for Measuring SDG Indicators Related to SLEM:** The introduction of a separate mechanism for measuring SDG indicators related to SLEM may be considered. An SDG dashboard may be developed at the MoEFCC for tracking the progress. District-wise allocation of targets may be undertaken, and relevant systems may be put in place to map and measure progress in the national level indicator with respect to land degradation, sustainable wetland management and wildlife crime.

Action Points for Agriculture Sector

27) **Policy on Development of Grassland and Grazing Lands:** A grassland policy is proposed as a strategy to arrest land degradation and to promote ecological and fodder security, better management of livestock and fodder availability, and create an enabling environment for recognizing grazing as tenurial rights under the state tenancy acts. There is a need for authentic database of grassland based on mapping as current revenue records across states have recorded grasslands under various categories of common lands. There is also a need for a ground-level assessment and corrective action by the authorities as grasslands continue to be under illegal occupation, encroachments and subjected to other pressures. National Grasslands Authority may be a solution to comprehensively address the conservation, development and sustainable use of grasslands.

29) **Disincentivizing Overuse of Water for Agriculture:** The national and state-level water policies need to identify measures that would optimize the existing irrigation facilities, including building small reservoirs locally and reducing water transportation and distribution losses through long-distance canals and distribution networks. The groundwater-energy nexus has also created perverse incentives, which have been the major driver of ground water depletion and agricultural land degradation. Policy measures for disincentivizing the overuse of water in agriculture is a need of the hour, keeping future sustainability in perspective.

28) **Special Scheme for Development of Grasslands and Grazing Lands:** A special scheme on the development of grazing and grassland may also be taken up which would focus not only on ecological rehabilitation of grasslands but also on livestock improvement, extension of the dairy value chain, diversified livelihood options and behaviour change.

30) **National Portal for Agroforestry:** A National Portal for Agroforestry may be developed as a user-friendly one-stop portal for authentic information on various agroforestry and tree species and methods of growing and maintaining plantations. The portal, in due course, will provide a large users database that can be used in agroforestry extension as well.

31) **Incentives for Investments in Land Protection:** Policy measures to incentivize investment in land protection measures on private land may be considered. This would be similar to the incentives provided for micro irrigation, horticulture development etc.





32) **Subsidy Specific Study on Agriculture:** Input and output subsidies affect the entire agriculture value chain as they are connected in a complex web with production, farmers' income, businesses of related industries, and price to consumers. Most of these subsidies are well ingrained in the agricultural economy and changing any one of them has a

cascading effect on the entire value chain and evokes drastic responses from the socio-political ecosystem. There have been various studies on the economics of subsidies in general. However, study of incentives and modelling them for impacts on land degradation which have not been taken up so far is recommended.

Action Points for Water Sector

33) **Linking National Water Policy to Land and Forests:** The National Water Policy (NWP) 2012 treats water as a hydro-geological and techno-economic entity for managing the demand and supply balance, whereas the supply side management of water is not covered with the same intensity. The quality and quantum of both surface and groundwater largely depend on land and forests, but the role of land and forest in creating water availability, an important provisioning ecosystem service, is not adequately emphasized. Thus, the linking of water with land and forests is required in the NWP which will strengthen the management of land and forests for water security.

34) **Legislation on Ecological Flows in Rivers:** A scientific assessment of ecological flows may be carried out across all major river basins in the country. Based on the assessment, an appropriate notification may be issued wherein maintaining specific basin-wide ecological flows is made mandatory. This could be made justiciable by a supporting legislation.

35) **Participatory and Decentralized Groundwater Management:** It is necessary to separate water rights from land rights to regulate the overuse of groundwater. However, the major impediment to delinking land and water rights are the Transfer of Property Act and the Indian Easement Act. A program to encourage states to discontinue perverse subsidies that exploit groundwater, accelerate soil erosion, and reduce soil health may be initiated. Electricity Regulatory Agencies need to regulate or discontinue electricity subsidies for groundwater pumps taking a cue from innovative practices in some states. The State Electricity Regulatory Commissions and the state governments need to provide adequate emphasis on strategic shift that would reduce groundwater exploitation. To aid transparency and data sharing, an integrated water balance system that indicates how water is being utilized at the local, sub-basin and basin levels may be established.

Institutional Mechanisms and Decentralized Governance to Support SLEM

36) **Common Planning Tool for MGNREGS and Watershed Projects:** A common planning tool for MGNREGS and Watershed projects at the Gram Panchayat (GP) and micro-watershed level may be developed. The effectiveness of MGNREGS can be improved by blending the net planning process. Areas

in villages can be identified and prioritized for treatments, and a list of possible works can be prepared at least one season in advance. The same can be widely shared with the beneficiaries to enable better labour deployment. The GP can undertake implementation following "a ridge to valley" approach



based on the labour demand. The technical team under the watershed programmes can provide the technical support for preparing the natural resource management plan under MGNREGA. Working Plans under forest departments may be aligned with the watershed plans and vice versa for better coordination and convergence.

- 37) **Special Provisions under MGNREGS for Tribal and Forest Fringe Villages:** For improving employment in tribal areas flexibility in MGNREGS rates and increasing the limit for maximum per household employment in forest fringe villages to up to 200 days may be considered. This intervention would be in addition to the targeted programs for livelihood development being undertaken in such areas. Increased livelihood opportunities for tribal population will reduce the dependence on forests for subsistence, provide other benefits such as addressing distress migration and improving nutrition standards.
- 38) **Revival of Land Use Boards:** While considerable attention has been given to land reforms throughout formal planning processes in India, institutional response to sustainable land use, management, and governance has been absent. State Land Use Boards were set up by 1974 in most of the states and UTs and restructured in 1985 as the apex body on land use at the state level under a Centrally-sponsored Program. It had the mandate to provide policy direction for sustainable development of land resources, ensure inter-departmental coordination

and initiate integrated planning. However, the State Land Use Boards have remained largely defunct. The boards are required to be revived to act as a unified body at the state level to mainstream sustainable land management and address the issue of land degradation.

- 39) **Integrating SLEM with Panchayat Development Plans:** SLEM may be integrated into the Gram Panchayat Development Plan, Block Development Plan and District Panchayat Development Plan. Secondary data from the line departments, especially MGNREGS, Forest, Agriculture, Watersheds, others like Bhumi Sudhar, can be fed into planning through coordination with line departments prior to the preparation of such plans. At the preparation stage of the Development Status Report, prioritization of activities and convergence strategy in the context of SLEM can be finalized for each Gram Panchayat.
- 40) **Standing Committees in Panchayat on Land Management:** State governments may be advised to incorporate the provision of constituting a Standing Committee on land and water resources in the GPs with clearly demarcated responsibilities for land conservation, addressing soil erosion, desertification, soil and moisture conservation and other problem related to lands, protection and checking encroachment in common land, forest land and village water bodies. These committees can also function as touchpoints for JFMCs, Ecodevelopment Committees (EDCs) and Watershed Management Committees at the village level.

Addressing Social Aspects for SLEM

- 41) **Strengthening Community Participation in SLEM Programmes:** Community participation in the SLEM programs may be strengthened through facilitation by NGOs and voluntary organisations. Imparting training to the project staff, particularly those at block and panchayat level in participatory planning,

implementation and monitoring is recommended. Training programs for project beneficiaries, GP and Gram Sabha, to build their understanding of SLEM and their role in sustainable management of natural resources is also recommended.





- 42) **Gender Mainstreaming in SLEM Policies and Programmes:** Although individual policies and programmes include women as stakeholders, an overarching framework of gender inclusiveness and mainstreaming gender across policies is missing. Mapping the needs of most vulnerable sections, promoting women's participation in the decision-making process at the micro-level, reporting, monitoring and reviewing to include gender-related indicators is required. Besides, gender audit may be institutionalized as part of social audit across programmes.
- 43) **Addressing the Need of Women Farmers in the Implementation of SLEM:** An overall strategy to address the needs of women farmers belonging to diverse groups, such as legal owner-cultivator, cultivators of family farms without legal ownership, tenants and sharecroppers, small and marginal farmers, and agricultural wage workers, need to be considered. Implementation of legal ownership of agricultural land, particularly of women farmers who belong to women-headed households and farmers who are now widows, single, or physically challenged, also needs attention, if SLEM to be achieved from all social dimensions.
- 44) **Management of Village Common Property Resources:** For the management of village commons, assessment of the status of Common Property Resources (CPR) and planning by synergizing programmatic interventions across various schemes such as MGNREGS, IWMP/ WDC-PMKSY, CAMPA and GIM is recommended. Further, development of a strategy for alternative fuel or fodder resources in the areas where CPRs are scarce and cannot meet the demands of rural communities is also proposed. Engagement of rural communities in the management of grazing land may also be institutionalized.
- 45) **Implementation of PESA:** Compliance of the State Panchayati Raj Act and relevant subject laws with the Provisions of the Panchayats (Extension to Scheduled Areas) Act (PESA) needs to be completed where it is pending so that the Gram Sabha/ Gram Panchayat can establish ownership and control over the community resources of land, water and forest and take decisions for their management and conservation. Rectifying ambiguities in PESA in the areas that have led to divesting/diluting the power of Gram Sabha/ Gram Panchayat is also necessary.





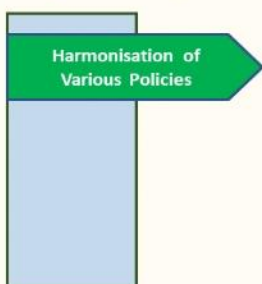
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Roadmap for the Policy and Institutional Mainstreaming of SLEM

The issues of land degradation and ecosystems conservation are enshrined in a number of policies (such as the National Forest Policy 1988, National Agriculture Policy 2000, National Environment Policy 2006, National Farmers Policy 2007, National Water Policy 2012, National

Agroforestry Policy 2014 and National Mineral Policy 2019) but they remain focused on their core sector agenda. In a combined manner, the issue of SLEM does not rise to the level of importance that it ought to. Thus, there is a need for a dedicated policy on land degradation in the country.

Integrated Policy to Address Land Degradation



- A harmonized policy on sustainable land management to bridge National Forest Policy 1988, National Agriculture Policy 2000, National Environment Policy 2006, National Farmers Policy 2007, National Water Policy 2012, National Agroforestry Policy 2014 and National Mineral Policy 2019.
- Policy to address components of ecosystem viz. land, water, vegetation and biodiversity as well as land use like agriculture, forestry, waterbodies and mining.
- Harmonization of sectoral policies should enunciate key principles for land use which would be non-negotiable and co-opted by respective sectors in view of the challenges of land degradation, arrived at based on analysis of scientific and socio-economic data.
- Strategy for implementation of the policy prescriptions should be a part of the policy.

Action: Ministry of Environment, Forest and Climate Change in coordination with Ministry of Agriculture and Farmers Welfare and Department of Land Resources

Forest policy needs to respond to future expectations particularly in the areas of climate change, sustainability of

ecosystem services, and livelihood sustenance, thus strengthening of forest policy is required.

Strengthening Forest Policy



- A more holistic valuation of forest based on the value of land, ecology and ecosystem services be given a policy backing.
- Environmental value of carbon sequestration, and sharing such benefits with communities.
- Implementation of REDD+ mechanism as mode of financing.
- Contribute to increase in tree cover outside forest area by creating an enabling environment so that target of 33% tree cover is reached in the next 2 decades.
- Play a significant role in production of wood and development of domestic wood-based industries, reduce imports and better utilization of wood through use of technology.
- Incentivise community involvement in forest conservation.
- Address dependence of communities on forest ecosystems, collaborative action with other sectors like agriculture, tribal and rural development.
- Enhance green spaces in urban areas and integrate with the long-term trends of urbanization.
- Mapping of forest degradation
- Enhancing funding for restoration of degraded forest land including through private participation.
- Strengthening forest research specially in view of the effects of global warming on forests and the need for maintaining their health so that they are able to sequester carbon optimally.

Action: Ministry of Environment, Forest and Climate Change



The budgetary allocation of the central and state governments has been inadequately low required to restore the degraded land and to address critical aspects of forestry, i.e. enhancing technical capacities for planning and monitoring, improving quality of planting material used

for afforestation, fighting forest fires and eradicating invasive species. Additional funding will also be required for meeting the NDC commitment of an additional 2.5 to 3 GTCO₂. Thus, increased funding for forestry programmes are required.

Enhancing Funding in Forestry Sector

- Revamp funding in forestry programmes, including intensification of multilateral or bilateral funding.
- Develop transformative projects in the sector, for adoption of modern technologies and methods, for increasing outcomes of afforestation.
- Funding should be directed in the gap areas in the sector, especially on enhancement of technical capacity, improved data at local level, quality of planting material, fighting forest fire, invasive species etc.
- Methods should be found to involve or attract investments from the private sector for developing the degraded forest land.
- Modalities of engagement with the private sector with necessary safeguards should be arrived at after consultation with stakeholders.
- New carbon sequestered in forest land may be monetized with benefits flowing to communities also.

Action: Ministry of Environment, Forest and Climate Change

Consciously reducing dependencies of people living Forest Fringe Villages (FFVs) is absolutely necessary to reverse forest degradation. There is a need for special

effort towards the holistic development of communities living around forests and therefore, a specific scheme for the development of FFVs is recommended.

Focus on Development of Forest Fringe Villages

- Demarcation of FFV based on criteria – distance from forests, resource dependency, SC/ST population.
- Prior study and data collection on development indices of the FFV as a baseline before initiating programme.
- Prioritization of landscapes for support under the scheme.
- Multisectoral development plan with coordinated implementation between various agencies, based on cluster of villages.
- Gap funding under scheme.
- Focused monitoring.
- Integrating solutions related to increasing agriculture production, development of agri value chain, agri-infrastructure, high value crops and credit, livelihood development, animal husbandry, and wage employment.
- Creating sustainable alternatives for firewood and fodder from outside forests.
- Integrated implementation of watershed and forestry works.
- Create mechanism for dovetailing plans under various schemes at local level.
- Repurpose existing schemes with topup as required.

Action: Ministry of Environment, Forest and Climate Change in coordination with Ministry of Rural Development, Ministry of Agriculture and Farmers Welfare, Department of Animal Husbandry and Dairying and Ministry of Skill Development



Strengthening Forest Management

Due to the non-uniform status of digitization of forest, the benefits of use of GIS in planning or monitoring as well as portals, such as those developed by Ministry of

Environment, Forest and Climate Change at the national level, cannot be fully realized.

Scheme for Forest Land Digitation



- Assess work already done by states on digitization of forest land.
- Develop quality and technical standard.
- Fund states for digitization of maps.
- Support development of GIS/ mapping units in States bases on best practices in using technology for forest management.
- Develop portal for digitized forest maps, digitize working plans.
- Invest in capacity development.

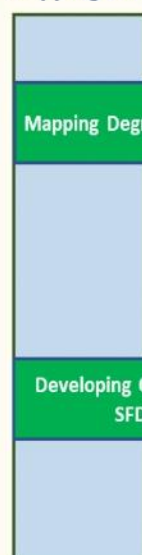
Action: Ministry of Environment, Forest and Climate Change and State Forest Departments

Prioritization in Afforestation on Degraded Forest Land

The identification of areas that were forests of higher density and have now lost forest cover can be critical for the prioritization of target areas for afforestation and assisted

natural regeneration. Targeted afforestation would be more successful.

Mapping Forest Degradation



- Mapping of patches of size 20 ha or above with demarcated forest which have lost canopy density in the last 10-15 years.
- Aim would be to map discernible changes within high density class or from a higher density class to a lower density class, along with the changes over such timeline.
- This will help in clearly identifying areas which were capable of having a higher density of trees and are now relatively open. Such areas would be ideal for carrying out afforestation.
- Assessment can be either done nationally or the State Forest Departments should be able to develop the capacity to conduct such mapping at their level.
- The data should ideally be available for the compartment-wise so that the information becomes actionable for the field teams to plan afforestation activities.
- To facilitate wider dissemination and use of information, the information may be provided on an online GIS portal with the facility to download maps in the form of vector polygons.
- Wrong site selection could be avoided and funds for afforestation could be utilized more effectively.

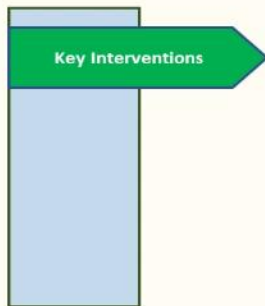
Action: Ministry of Environment, Forest and Climate Change, the Forest Survey of India and State Forests Departments



Low quality planting material enhances the threat of depletion of forest resources over time. There is a need to put special focus on the development of quality planting

material sporadically in mainstream afforestation programmes.

Campaign for Improving Quality of Planting Stock in Afforestation Programmes



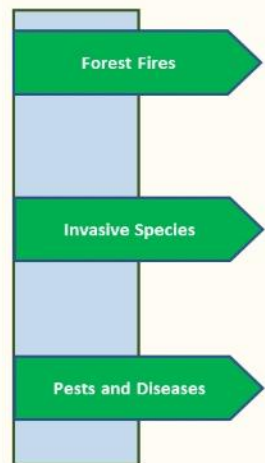
- Assess and consolidated research work already done by ICFRE institutes and others on improving quality of planting stock.
- As part of the project, create a National Database of Candidate Plus Trees (CPT) for better record and access.
- Capture institutionalized knowledge available with local officials through the portal
- Assess demand and supply gap of quality planting stock.
- Review the status of seed stands, seed production areas and seed orchards created over the last few decades and make an inventory of the same.
- Register suppliers of forest trees bring them on one platform and work with them to maintain chain of custody/ certification of seeds collected.
- Establish a mechanism for seed certification.
- Rejuvenating the research wing of forest departments after a management audit.

Action: Ministry of Environment, Forest and Climate Change and State Forest Departments

Due to global warming, there exist an increased risk of damage to forests because of forest fire, pests, invasive

species, and drought. This calls for special and enhanced attention to address these issues of forest health.

Strengthening Forest Protection from Forest Fire, Invasive Species, Pests and Diseases



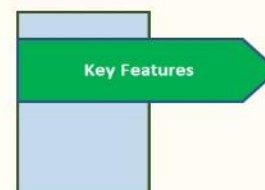
- Strengthening the forest fire management schemes.
- Conducting management audit to assess readiness of Forest Divisions in tackling forest fire and taking adequate steps to strengthen them.
- Sharing experience among states in fighting forest fire.
- Assessing the extent of area covered by invasive species and the resources needed for their eradication.
- Development of plan for removal of such invasive species by integrating with afforestation and JFM activities.
- Identification of vulnerable areas and preventing further ingress of invasive species
- Establishing a monitoring system for tracking pest and diseases.
- Establish coordination with research institutions like ICFRE with field units for technical guidance.
- Strengthening knowledge and information dissemination at local level on pest and diseases as well as controlling measures.

Action: Ministry of Environment, Forest and Climate Change and State Forest Departments

Contributions of forest carbon assessment towards climate change mitigation is an important action for NDC. Monitoring of forest carbon at the local level is increasingly becoming

important because it will not only enhance the quality of data for forest carbon accounting, but also help in monitoring forest health and its role in climate change mitigation.

Forest Carbon Assessment Programme



- To be carried out across the country.
- Localized data sets of forest carbon sink, valuable baseline for future assessments.
- Trend analysis over long term would be possible for management units in forest administration.
- Enable monitoring outcomes of forestry programmes from another dimension.
- Local agencies to be developed to carry out this exercise based on standard procedure and methodology.

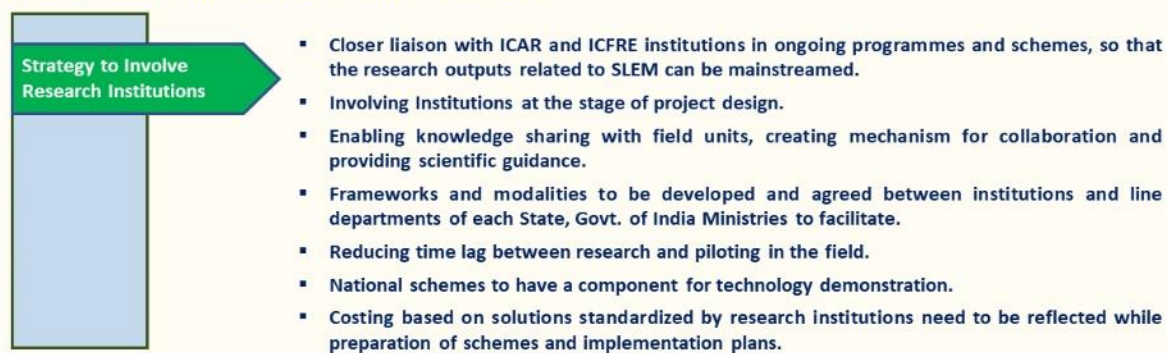
Action: Ministry of Environment, Forest and Climate Change and the State Forest Departments in collaboration with research institutions and universities



SLEM best practices being undertaken by specialized institutions need to be mainstreamed and upscaled. It can be achieved by collaboration with research institutions and involving them more closely in programmes through

design, training and advisory support. Besides, the feedback on technology, know-how and appropriate costing from research findings may be incorporated in the national and state-level programmes.

Collaboration with Research Institutions for SLEM



Action: Ministry of Environment, Forest and Climate Change and Indian Council for Forestry Research and Education



Biodiversity Conservation and SLEM

Wildlife Corridor Development in Project Tiger as well as other PAs will enhance ecological integrity of PA network. Focus needs to be on a large gap in the management

capabilities between protected areas other than Tiger Reserves vis a vis the Tiger Reserves, which affects the capabilities of the lesser-known PAs to manage corridors.

Scheme for Development of Wildlife Corridors



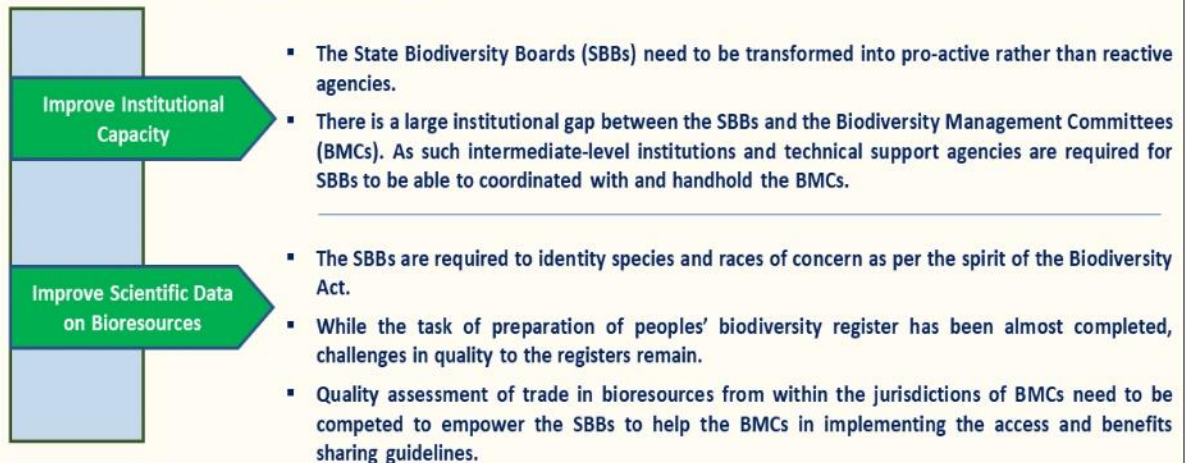
Action: Ministry of Environment, Forest and Climate Change



The Biodiversity Management Committees or gram panchayats have not been able to measure up to the responsibility of conservation of commercially valuable bioresources in their area. Institutionally, State Biodiversity Boards (SBBs) are very weak with limited scientific staff

and financial resources, therefore their strengthening is critical to enhancing biodiversity governance in the country. Benefits from bioresource should reach communities and SBBs are the main agency to make this happen.

Strengthening State Biodiversity Boards

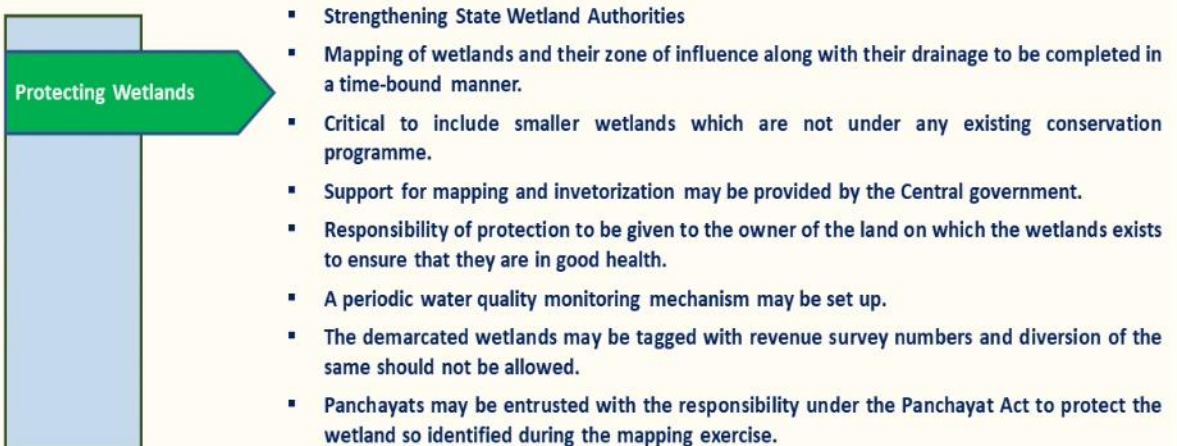


Action: Ministry of Environment, Forest and Climate Change and National Biodiversity Authority

Regular updation of wetland inventory and water bodies at the local or regional level does not exist. Multiple uses and multiple agencies have made wetland conservation a

challenge. The State Wetlands Authorities are at the initial stages of functioning and will require consistent support to be institutionally relevant.

Mapping and Protection of Wetlands



Action: Ministry of Environment Forest and Climate Change, State Wetlands Authorities and State Irrigation Departments



Enabling ecosystem for growing trees: The criticality of Trees outside forest (TOF) in India's strategy for climate change mitigation requires a boost to agroforestry. A closer

collaboration with wood-based industries is also required to open up the ecosystem and bring in private enterprise and innovation to harness the full potential of agroforestry.

Enabling Ecosystem for Growing Trees

Policy and Incentive	<ul style="list-style-type: none"> Changes in policies and institutional credit and other support to make growing trees more attractive to farmers. Development of clusters for wood-based industries.
Certification of Ownership	<ul style="list-style-type: none"> Develop a system for tree certification which allows voluntary registration of trees by landowners and tracking the same over its lifetime. Such a system would substantially reduce the requirement to prove the origin of trees at the time of harvesting and enable a record of the chain of custody of wood, thus remove hassles of any type of permit for the farmers.
Certification of Planting Materials	<ul style="list-style-type: none"> Develop a system for certification of planting material especially for the key species used in agroforestry i.e. <i>Eucalyptus</i> spp. <i>Melia dubia</i>, Poplar, <i>Casuarina</i>, Bamboo spp. An authority for certification of planting material of trees can be established under ICFRE. Private sector involvement in development of nurseries. Develop a National database on plus trees of both forests forest and agro-forestry species. The database can be linked to the planting material certification system.
Incentive Urban Greening	<ul style="list-style-type: none"> Enabling policy to cover vacant land under private or institutional ownership, especially in the urban and semi-urban areas under green cover.

Action: Ministry of Environment Forest and Climate Change, the State Forest Departments and Ministry of Housing and Urban Affairs

Since good quality data regarding forest land diversion is available since 1980, the impact of diversion beyond the forest land diverted may be studied and learnings should be used in the revised design of compensation structure as many of the unintended consequences, which may be

difficult to avoid as it may not be priced in the compensatory value of forest land diverted. Pricing of forest land is required to be backed by science to avoid moral hazard.

Monitoring and Impact Assessment of Forest Land Diversion

Monitoring	<ul style="list-style-type: none"> Monitoring the conditions of forest land diversions and plantations done under compensatory afforestation
Impact Assessment	<ul style="list-style-type: none"> Since good quality data on forest land diversion is available, commission study to assess impact of forest land diversion post 10 years after diversion in selected sites and compare with the effect that was anticipated at the time of approval. Use the output of the assessment to improve mitigation measures for future cases for forest land diversion.

Action: Ministry of Environment, Forest and Climate Change





Strategy for Achieving LDN

Multiple definitions of wasteland and degraded land and multiple agencies measuring the same have created an information system inappropriate for field work. As multiple agencies are involved, the process of target setting and monitoring requires to be made more systematic for better monitoring and impact assessment. Framework to monitor LDN involves identification of stakeholders and compilation of data related to restoration of degraded land by various departments.

Develop a Center of Excellence for Sustainable Land Management and capacity building. Achieving LDN will require interventions on multiple fronts. A large project on SLEM at the national level will serve as a model for showcasing such an approach, deploying scientific knowledge, replicating best practices, highlighting successful use of technology, and building the capacity of institutions and implementers.

Arriving at a Consensus Definition of Wasteland/ Degraded Land



- Develop and reach a consensus on the definition of wasteland/ degraded land.
- Develop database on degraded forest land based on previous forest cover assessment and ground truthing by involving State Forest Departments
- Assess status of land recorded as a wasteland in revenue records at the district level and estimate land available for restoration.
- Develop a portal to share the parcel wise details of degraded/ degrading land with further information which could be useful for its restoration
- Create sub classification of degraded land based on its potential for restoration so as to prioritize interventions and seek appropriate funds as well choose appropriate technology

Action: Ministry of Environment, Forest and Climate Change

Contributing to LDN and NDC through the greening of Highways. The country is witnessing massive road building exercises with 4000 to 10000 Km of national highways constructed in the last six years and about 10 million trees

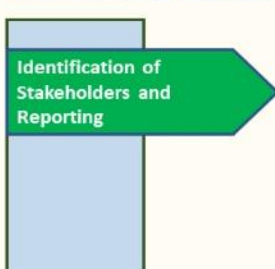
planted along the national highways. Improving the administration of greening activities under highways development can be a huge contributor in India's attempt towards reaching LDN and NDC targets.

Target Setting for Land Degradation Neutrality (LDN)



- Identifying targets under individual schemes for LDN and cascade subordinate implementation levels.
- Identification of degraded land at parcel level from the existing data bases of SAC, NRSC, SLUSI, FSI and revenue department.
- Identification of areas which could then be allocated under various schemes for combination of schemes of the departments identified.
- Target to include land categories such as degraded forest land, culturable wasteland, degraded cultivable land, unused/ closed mines, grassland or common lands, land along national highways and railways, institutional land, vacant land in urban areas and large land allottees.

Framework to Monitor LDN



- Identification of primary stakeholders for reporting as the parameters that are to be monitored in PRAIS are being handled across various Ministries and Departments in Govt. of India and States.
- Orientation of the stakeholders on the reporting parameters and alignment of mutual understanding.
- Set definition of hotspots/ brightspots and undertake identification in the context of PRAIS based on the parameters: land cover, land productivity dynamics, soil organic carbon, both above ground and below ground carbon.
- Compilation of data related to restoration of degraded land by various Departments/ Agencies under different schemes and remove duplication.



Develop a Centre of Excellence on Sustainable Land Management

Develop Knowledge and Capacity Building for SLEM

- Harnessing knowledge, creating a knowledge repository on SLEM and widely disseminating the same for benefit of practitioners.
- Creating a database on land degradation.
- Training and capacity building.
- Coordinate National level reporting and monitoring on LDN.
- Coordinate research on SLEM.
- Provide handholding to implementation agencies on SLEM.
- Identification and documentation of successful models of the LDN/ SLEM across the country.
- Create forum to share national and international experience on SLEM.

Develop a Specific Project on Sustainable Land Management at National Level

Legacy Project to Demonstrate Action on SLEM

- A large scale project to demonstrate restoration of degraded land and achieve LDN in selected landscapes.
- Develop best practices for coordinated action in the project life cycle from planning to implementation between various agencies to break the silo working approach.
- The project can become a model for addressing LDN issues across the various sectors.
- The project should aim to create a legacy for future.
- Resources can be arranged from funding agencies under international commitments for addressing climate change and LDN.

Contribution of Road Sector to LDN and NDC

Key Features

- Develop partnership with State Forest Departments in greening national highways as the SFDs have both reach and technical expertise to carry out the work.
- Plantation contractors should be facilitated to upgrade capacities so as to develop contractor based plantations market.
- Find solutions within the legal structure to restrictions on removing the plantations in case roadside amenities highway expansion is required.
- Develop green belt on unused part of ROW so that it does not interfere with highway operations.
- Find alternate methods to create plantations along highways through subsidizing or incentivising land owners on the boundary of the roads.
- Landowners may be compensated for each tree grown and protected as well as any income loss that is perceived due to diversion of land from agriculture to tree growing.
- As trees mature, landowner may be allowed to harvest and replant on the strip of land.
- For the purpose of monitoring and payment, a robust IT-based monitoring system along with DBT could be used for transferring compensation to the landowner.

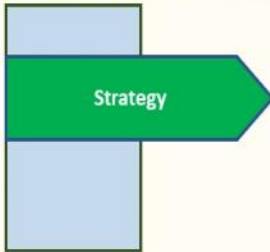
Action: Ministry of Environment, Forest and Climate Change, National Highways Authority of India and State Public Works Departments and Forest Departments



The Environmental Management Plan (EMP) is mandatory as part of the environmental clearance. The objectives are to mitigate adverse impacts on identified environmental components, protect environmental resources and enhance the value of environmental components. It also includes a monitoring plan to evaluate the success or

failure of the environmental management measures and carry out reorientation of the plan if necessary. Monitoring of EMP has remained a weak area for the mining industry. Focussed attention on rehabilitation of mined-out areas and abandoned mines is required.

Rehabilitation of Mined Out Areas



- Monitoring of EMP of the mines, through the respective Ministries and third-party audit.
- Implementation and monitoring of the Sustainable Development Framework for the mining sector
- Implementation of a special programme on rehabilitation of mined-out areas and abandoned mines not covered under active EMPs.
- The programmes would entail interventions on forestry, reclamation of land for wildlife habitat, conservation of water, addressing livelihood of the local communities, etc.

Action: Ministry of Environment Forest and Climate Change in coordination with Ministry of Coal, Ministry of Mines and Ministry of Steel

India, as of today, does not have a national level market for carbon emission trading. Pricing of carbon and ecosystem services could be a way to attract private funding since funding has been a challenge for climate

change mitigation in the Agriculture, Forestry and other Land Uses (AFOLU) sector. A national level carbon market within India is required.

Action: Ministry of Environment Forest and Climate Change in coordination with Department of Industries and Ministry of Corporate Affairs

There is no effective regulatory mechanism for preventing the mining of sand from riverbeds and along riverbanks

and therefore enforcement of Sand Mining Guidelines is required.

Enforcement of Sand Mining Guidelines



- States should be urged to adopt stricter rules in the light of guidelines issued by the MoEFCC and improve its implementation.

Action: Ministry of Environment, Forest and Climate Change and State Governments





Involving students in fighting land degradation. Leveraging the large population of students would have a multiplier

effect in raising awareness about fight against land degradation.

Involving Students in Increasing Tree Cover

Update Secondary School Curriculum	<ul style="list-style-type: none"> Strengthen the topics related to national and international commitment to fight climate change and land degradation.
Introduction of a Graduation Legacy	<ul style="list-style-type: none"> Cover students appearing in the 12th Board examinations and students who are in the final year of graduation under any stream. Under the policy, such students should plant at least 5 trees each for getting their high school leaving certificate or their graduation diploma or degree certificate. The trees can be planted in the two planting seasons before the award of the school certificate or anytime during the coursework of the graduation certificate. This programme can be initiated in Kendriya Vidyalayas, Sainik Schools, RIMC, Open University, Central Universities, IITs, IIMS, before upscaling at the National level to all schools and Universities. District administration would identify the piece of land where such tree planting would be done. The programmes can be integrated with the Van Mahotsava celebrations observed annually. Funding can be targeted by government as well through corporate contributions.

Action: Ministry of Environment, Forest and Climate Change, the Ministry of Human Resources Development and the State Forest, Revenue and Education Departments, Urban and Rural local bodies and the school administration

Establishing a mechanism for measuring SDG indicators related to SLEM can be an effective tool to coordinate interventions in addition to BAU methods. Comprehensive

monitoring and reporting framework for collating achievements under identified indicators will be necessary for uniformity across the country.

Monitoring of Sustainable Development Goals (SDGs) Related to SLEM

Cascade Targets	<ul style="list-style-type: none"> District-wise allocation of target against local benchmark, developing mapping and measurement infrastructures in place in districts. SDG Dashboard at the MoEFCC for monitoring achievement towards National goals.
Consolidating Action in the Context of SDG-15	<ul style="list-style-type: none"> Mapping of water bodies, restoration and rejuvenation of water bodies, implementation of actions as per the Wetland Management Rules, involvement of people for sustainable management of waterbodies. Mapping and monitoring of degraded land, identification of hotspot, planning restoration works, desert proofing productive farmland through ecosystem-based approaches. Establishing a wildlife crime tracking system. Developing tools to test and identify wildlife products. Taking active measure to manage man-wild animal conflict, tracking and neutralizing organized illegal trade in wildlife.

Action: Ministry of Environment Forest and Climate Change

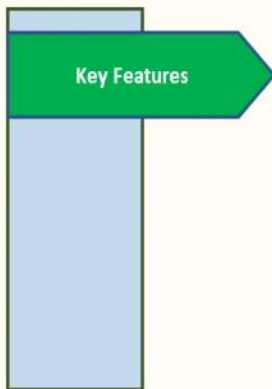


Interventions Overlapping with the Agriculture sector

Policy on development of grasslands and grazing lands are important. Grasslands are not only important from ecological perspective but also form one of the key pillars to support livelihoods. However, they are not covered

under any structured policy instrument. There is also the absence of detailed assessment of the biodiversity values and ecosystem services that the grasslands provide in the Indian context.

Policy on Grasslands



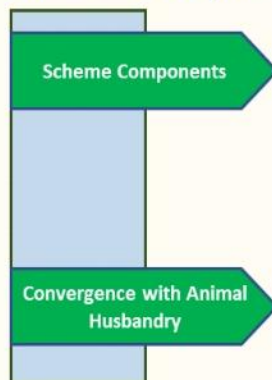
- Provide for a comprehensive study, mapping, delineation, recording and inventory of grassland.
- Creation of a national database for grasslands.
- Focus on rehabilitation of grasslands for ecological and fodder security.
- Integrate with larger policy objectives of animal husbandry and dairying through better management of livestock
- Consider the local specificities and rights over common property resources, recognizing grazing as tenurial rights.
- Institute a National Grasslands Authority to monitor grasslands and prevent its degradation.
- The authority with appropriate powers and functions would regulate the sale, misuse, land use change, encroachment and diversion of grasslands.

Action: Ministry of Agriculture and Farmers Welfare in consultation with Ministry of Environment Forest and Climate Change and Department of Animal Husbandry and Dairying

Unrestrained and overgrazing is one of the chief drivers of grassland degradation. There is no department which is explicitly targeting the development of grazing land in the country. Common lands in villages are under tremendous

pressure of land diversion and encroachment. It is recommended that a special scheme for the development of grazing and grassland may be taken up.

Scheme on Development of Grassland and Grazing Lands



- Mapping of gauchar, rangeland and other common grazing land based on remote sensing and revenue records and supporting measures to protect them.
 - Specific planned interventions for demarcation and protection of grassland based on their legal status.
 - Improve productivity of such lands through protection measures and rejuvenation of grass root stock.
 - Support grass development and range management inside forests wherever possible.
-
- Undertake behaviour change campaign for substitution of unproductive cattle with high yielding varieties along with rotational grazing.
 - Coordinated action with for improvement of dairying, and allied services to boost income of people and incentivise rearing of less but productive cattle.

Action: Ministry of Agriculture and Farmers Welfare, Ministry of Environment, Forest and Climate Change and Department of Animal Husbandry



The problems due to overuse of water are well known. National and state-level water policies need to identify measures to optimize the existing irrigation facilities, including building small reservoirs locally and reducing water transportation and distribution losses through long-

distance canals. Therefore, there exist an urgent need to disincentivize the overuse of water in agriculture, which is not only threatening water availability but also is a cause of land degradation.

Disincentivising Overuse of Water in Agriculture

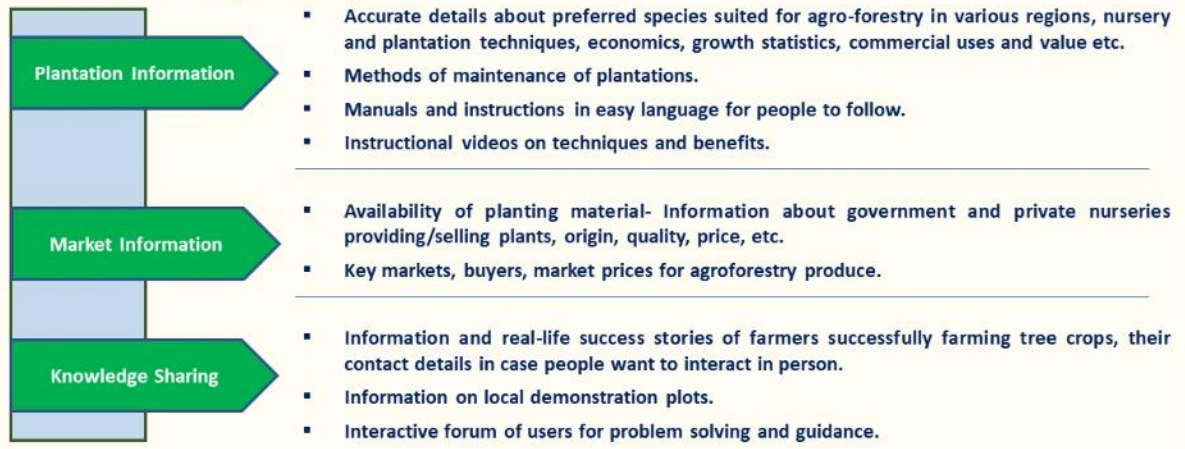


Action: Ministry of Power, the Ministry of Jal Shakti and the Ministry of Agriculture and Farmers Welfare

Promoting agroforestry requires the development of the entire ecosystem related to the supply and demand of wood. Though information on trees, viz. its characteristics, suitability as per site conditions, details of how and when to get seeds, nursery techniques, silviculture practices, diseases and cure, economics, plantation models, research-based techniques that can be taken to the field

and training manuals are available widely but unverified. A one-stop portal can solve many of these challenges related to the information gap. The portal can be expanded in reach and content with time via networking with larger number of organizations and users, so that in due course, it will become a useful repository of data, that can be used in planning and agroforestry extension activities.

National Portal on Agroforestry



Action: Ministry of Environment Forest and Climate Change in coordination with Ministry of Coal, Ministry of Mines and Ministry of Steel

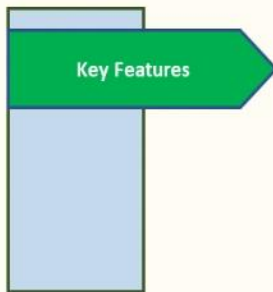




Wider extension of techniques and tools are also missing, which causes a hindrance in propagating sound agricultural practices to reduce or cease land degradation of agricultural lands. To increase the participation of

farmers and landowners in taking up land protection measures, facilitation in the form of a specific programme is required.

Incentives for Land Protection



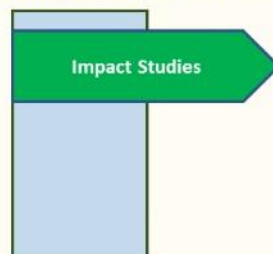
- Develop a programme where land owners can seek funding and technical support for land protection.
- Beneficiaries can apply for support as grant or bank loans.
- Projects can be prepared on the request of the beneficiary based on scientific principles.
- A cadre of local technical personnel could help the farmers for the same.
- The activities under the project can be funded using existing schemes or MGGREGS.
- Based on feasibility, some of the projects can be converted into bankable project and funded through credit.
- Interest subsidy can also be provided for taking up such works.

Action: Ministry of Agriculture and Farmers Welfare and the Ministry of Rural Development, Department of Land Resources

Subsidies have distorted the agriculture landscape and are required to be studied to aid far more informed discourse, as removing them outrightly may not be immediately

feasible. A study and the modelling of the impact of subsidies on land degradation have not been undertaken so far and is therefore being proposed.

Study on Impact of Subsidies on Land Degradation



- Study of cause and effect of subsidies on land degradation, agriculture biodiversity and sustainability of water and soil fertility.
- Study of effects on cropping patterns, total output and incomes if certain subsidies are optimized to achieve long term environment security goals.
- Study may also discount the requirement of funds in the future to address the ill impacts of land degradation due to subsidies at present.
- Assess and develop pathway to optimize economic welfare, food security and land degradation.
- Develop data and knowledge for enabling larger public discourse on subsidies.

Action: Ministry of Agriculture and Farmers Welfare and the Ministry of Rural Development, Department of Land Resources



Interventions Related to the Water Sector

Availability of water depends totally on how land on which it falls is managed. Integration of the policies on land, water and forests will enable coordinated action by various agencies. Focus on land and forests under the National Water Policy in the context of management of water

resources will give a boost to the sustainable management of land and forests by formally connecting it with the supply of a tangible resource, such as water, and will also in due course lay the foundation for payment of ecosystem services.



Linking National Water Policy with Land and Forests

Aspects to be taken care of in National Water Policy

- Establishing clear links of water with land and forest and suggesting contingent measures for land management and protection of forests as watersheds.
- Emphasis on identifying and maintaining the role of forests for water at basin level.
- Specific action points related to both land and water to improve seasonal availability.
- A national level institution needs to anchor the operationalization of IWRM wherein the States are guided with a wide range of interventions to be made by both, governments and citizens aimed at sustainable availability of water and reducing water footprint.

Action: Ministry of Jal Shakti in coordination with the Ministry of Environment, Forest and Climate Change and the State Water Resources Departments

The statutory framework applicable to rivers consisting of the Water Act, the Environment Protection Act and the NWP 2012 do not make a minimum amount of flows needed by a river to survive and flow; only protection of rivers and streams from pollution is provided for. Preventing death of

rivers due to no or negligible flow would require legislative intervention. A legislation on mandatory e-flows in all rivers where water is impounded or water is extracted is being recommended.

Legislation on Ecological Flows in Rivers

Ecological Flow Notification based on Scientific assessment

- A Basin-wise scientific assessment of e-flows is required to be carried out given that the river systems in the country are very dynamic and diverse and e-flow requirements will be different for each river.
- A policy direction on ecological flows will be ineffective as water is a State subject and States tend to take time to adapt to National Policies.
- Based on the assessment, there should be a notification issued aided by a specific legislation wherein maintaining specific basin-wide ecological flows is made mandatory.

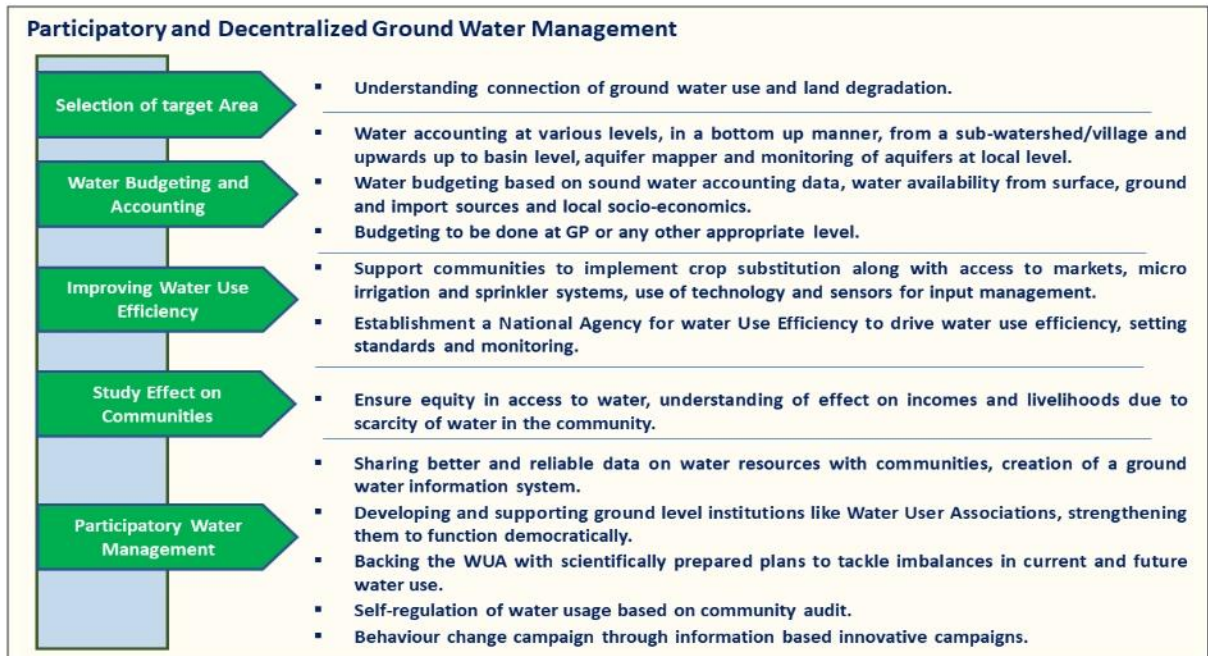
Action: Ministry of Jal Shakti and Ministry of Environment, Forest and Climate Change and implemented by the states





Changing the pattern of use of ground water would require significant behaviour changes in addition to reorganising economic activities. Participation and decentralization of

ground water management appear to be a possible solution, which needs to be upscaled in the water stress areas of the country.



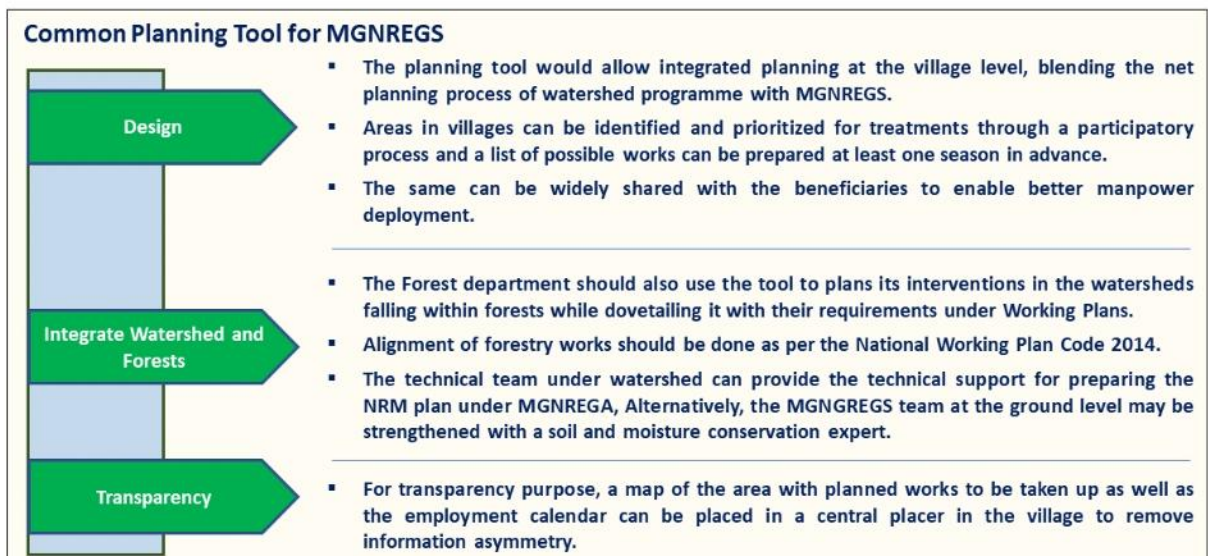
Action: Ministry of Jal Shakti, Ground Water Board and Central Ground Water Authority



Institutional Mechanisms and Decentralized Governance to Support SLEM

Funds under MGNREGA are being tapped by various departments, but an institution for common planning of

land related works would enhance outcomes.



Action: Ministry of Rural Development in coordination with the Ministry of Environment, Forest and Climate Change and the Department of Land Resources



Tribal areas require more livelihood support to relieve natural resources from sustenance related exploitation. It is recommended to allow up to 200 person-days of employment per household instead of 100 days in tribal

and forest fringe areas. Therefore, special provision in MGNREGA for Tribal and Forest Fringe Village areas are recommended.

Special Provision for MGNREGA in Tribal and FFV Areas

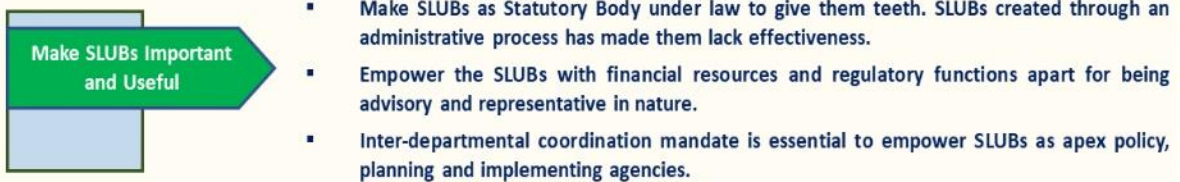


Action: Ministry of Rural Development

A nodal agency to address and manage land use related issues is missing today, therefore revival of Land Use

Boards is suggested.

Revival of State Land Use Boards (SLUBs)

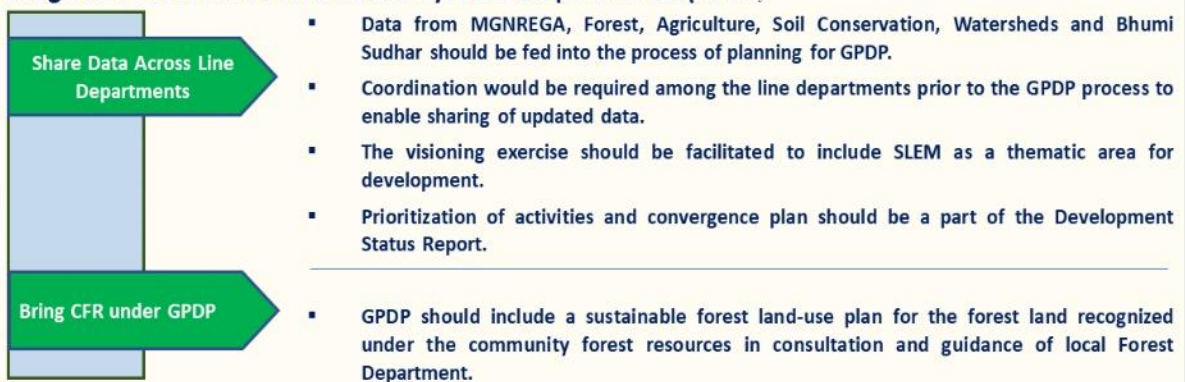


Action: Department of Land Resources in coordination with the Ministry of Environment Forest and Climate Change and the Ministry of Tribal Affairs

The integration of SLEM with the planning process at the grassroots level, i.e. in GPDP, Block and District plans, will

bring the focus of communities on sustainability and access to land and water resources.

Integration of SLEM with Gram Panchayat Development Plan (GPDP)



Action: Ministry of Panchayati Raj in coordination with the Ministry of Rural Development, the Ministry of Agriculture and Farmers Welfare, and the Ministry of Environment, Forest and Climate Change





Large variations are found in the institutions within panchayat in the country to deal with sustainable land management and environment protection. A standing committee on environment/forests/land conservation has

not been the norm at the Gram Panchayat level across the country and is therefore required as mandate to coordinate with JFMCs, EDCs and Watershed management committees at the village level.

Standing Committee on Land and Forests in Panchayat



- State Governments may be advised to incorporate the provision of constituting a Standing Committee on land management in the PGs within their State.
- The Standing Committee should have clearly demarcated responsibilities for land allotment, land conservation, addressing soil erosion and desertification, soil and moisture conservation and other problem lands, protection of common land, checking encroachment in common land, forest land and village water bodies, etc.
- The Committee can also function to coordinate with JFMCs, EDCs and Watershed Management Committees at the village level.

Action: Ministry of Panchayati Raj in consultation with the Ministry of Environment, Forest and Climate Change and the State Governments



Addressing Social Aspects for SLEM

People are an important component of SLEM and there should be equal amount of investment in addition to scientific inputs. Hence, strengthening the community

participation aspect in SLEM programmes through systematic interventions is proposed.

Community Participation in SLEM Programmes

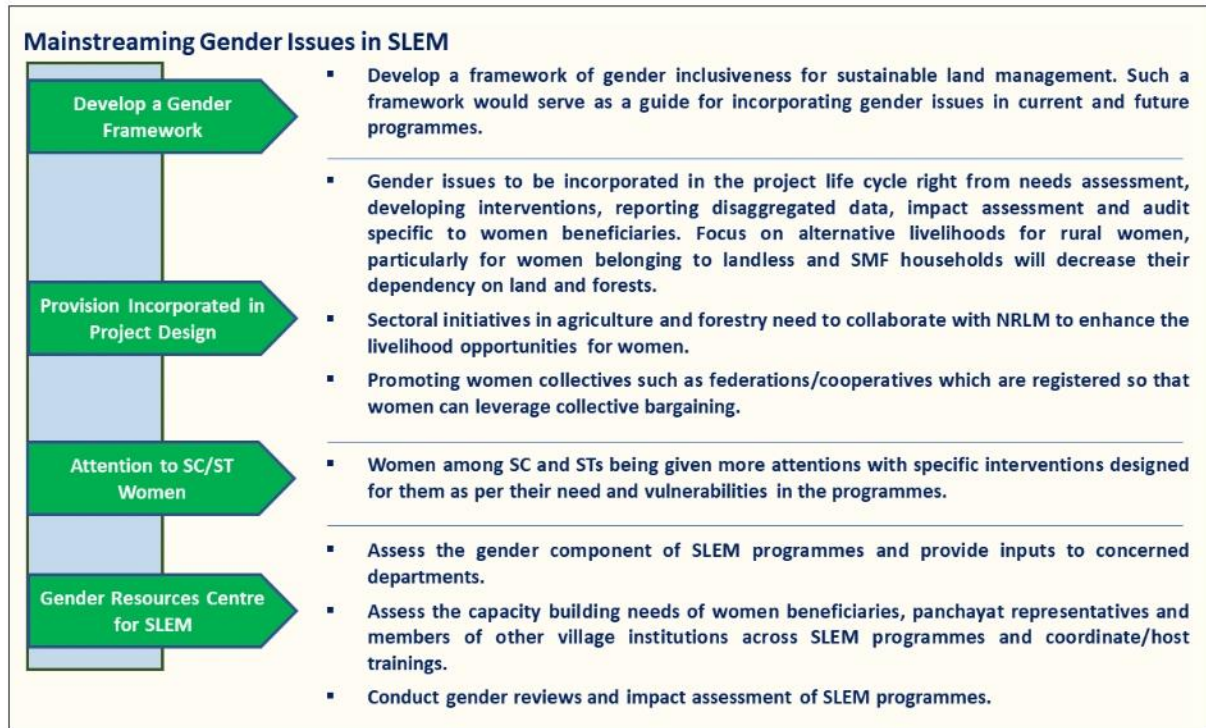


- Involve NGOs in facilitating particularly planning as resource institution. Training of project staff at block and panchayat levels on participatory planning and implementation.
- Trainings to project beneficiaries, gram panchayat members to build their understanding of SLEM issues, causes and solutions, and the role they can play in sustainable management of natural resources.
- Training on fund management and transparency.
- Exposure visit of beneficiaries to the sites of best practices.
- Developing and sharing material for awareness generation.
- Gender based facilitation to improve interface between women and governance institutions at the block and district.
- Effectives linkages of sector committees with Gram Sabha and panchayat as prescribed in policies and programmes.
- Institutionalization of monitoring mechanism by involving SHGs, CBOs, and NGOs.
- Training on social audit to panchayat members, Gram Sabha, members of sectoral committees, SHGs and members of other community groups.
- Documentation and dissemination of works done and compilation of best practices.

Action: Ministry of Environment, Forest and Climate Change; Ministry of Rural Development, Ministry of Agriculture and Farmers Welfare, Ministry of Panchayati Raj and Ministry of Tribal Affairs



Gender neutrality at times also is gender discriminatory. Women have a large role in managing land and forests, which needs recognition in policies and programmes.



Action: Ministry of Environment, Forest and Climate Change in consultation with Ministry of Agriculture and Farmers Welfare, the Ministry of Rural Development, Ministry of Panchayati Raj and Ministry of Women and Child Development

Women farmers are often clubbed with men folk assuming their disabilities are the same as men. Therefore, addressing needs of Women Farmers in implementation of SLEM is required.



Action: Ministry of Agriculture and Farmers Welfare in coordination with the states

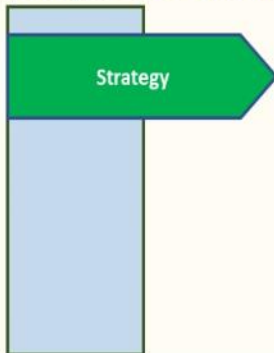




Weak institutional oversight on Common Property Resources (CPRs) is leading to their total misuse. Special

attention to the management of CPRs, along with support to institutions, is required.

Management of Common Property Resources (CPR)



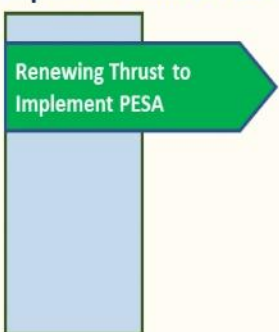
- Demarcation and notification of CPRs, specific guidelines for its protection, removal of encroachment and regulating diversion.
- Assessing productive capacity of CPRs and developing scientifically robust restoration plans with inputs from technical and research institutions.
- Including development of CPR as part of GDP.
- Synergizing programmatic interventions across MGNREGS, IWMP/ WDC-PMKSY, CAMPA and GIM in the rehabilitation plan.
- Identification of alternative sources for dependent communities till the CPRs is to be closed for rehabilitation, or instituting mechanism to reduce pressures through community action.
- Engagement of local communities in the management of common grazing land.

Action: Rural Development Department in consultation with the Ministry of Environment Forests and Climate Change and the Ministry of Panchayati Raj

Since PESA seeks to empower the Gram Sabha and Gram Panchayat, its implementation also requires people to be aware of the laws as well as information about the

programmes so that the Gram Sabha and gram panchayat can make informed choices.

Implementation of PESA



- Compliance of the State Panchayati Raj Acts and the State Subject Laws with PESA in the states where it is pending.
- Rectification of ambiguities in PESA in the states that have to led divesting/ diluting the power of Gram Sabha/ Gram Panchayat.
- Collaboration with NGOs and academic institutions in the Vth scheduled areas to develop a capacity building plan for the tribal communities.
- Running campaign to educate the communities for their rights and duties in the context of SLEM.
- Sharing local level data and scientific evidences to empower decision making.

Action: Ministry of Panchayati Raj and Ministry of Tribal Affairs





13

Roadmap for Institutionalizing SLEM

The roadmap identifies the key nodal or initiating agencies for each of the action points, their role, agencies that they would require support from, areas of support and timeline wise breakdown of milestones.

Overall objective that institutionalizing SLEM would seek to achieve in the long run are:

(i) Achieve Land Degradation Neutrality

(ii) In areas which nonetheless are impacted by land and ecological degradation, lessen the anthropogenic drivers of such degradation as well as manage the socio-economic fallout of the same.

(iii) Incorporate cost of land and ecological degradation in the economic choices that are made by government, communities and other agencies.

Goal for the Roadmap for Institutionalizing SLEM

(i) Government departments/ agencies understand the implication of their policy and programmatic actions on sustainable land management.

(ii) They are able to address concerns related to sustainable land management while making policies and programmes.

(iii) Enablers i.e., relevant data, science-based understanding and costs implications for action or inaction

are established to support agencies in decision making.

(iv) Adequate actions in proportion to the intensity of the problem are taken to address the challenges due to land and ecosystem degradation through committed resources and coordinated interventions.

(v) Knowledge and knowhow regarding SLEM is widely available in easily accessible mode to all stakeholders.

Recommendations of Road Map for Institutional and Policy Mainstreaming of SLEM

The recommendations which are relatively easier to implement and would convert to results faster have also

Actions with a shorter roadmap:

- Arriving at consensus definition of wasteland/ degraded land
- Targets for LDN
- Monitoring framework for LDN
- Digitization of forest map
- Mapping of wetlands
- Prioritization of afforestation on degraded forest land
- National portal for agroforestry

Actions needing sustained support:

- Develop national level specific project on SLEM
- Focus on FFVs
- Increased funding for forestry programmes
- Policy development on grasslands and grazing lands
- Revival of SLUBs
- Improving quality of planting material in afforestation

been identified as follows:

- Enabling ecosystem for growing trees
- Standing committee on land management in Panchayat
- Develop a Center of Excellence for SLEM
- Common planning tool for MGNREGA and watershed projects
- Contribute to LDN and NDC

- Special provision for MNREGA in tribal and FFVs
- Subsidy based study on agriculture
- Management of CPRs
- Intervention to reduce forest fires, invasive species, pest etc.
- Enforcement of sand mining guidelines, 2020

Detailed recommendations of road map are given in Table 2.



Table 2. Recommendations of road map for institutional and policy mainstreaming of sustainable land and ecosystem management in India

S. No.	Recommended Strategy	Nodal Agency	Role of Nodal/ initiating Agency	Supporting Agencies	Role of supporting Agencies	Capacity Building Needs	Implementation	Timeline					
								3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year
1	Develop a specific project on SLEM at the national level	MoEFCC	Design project, Seek approvals for funding	ICFRE institutions	Provide data research and learnings to develop project	Support by experts in concept design	MoEFCC	Develop project proposal after analysis of scientific data, identify landscapes to be covered under the project with interaction of stakeholders, and discussion with probable funding agencies,	Seek approvals	Implementation			
Critical activity: <ul style="list-style-type: none"> Development of the concept. Which should reflect the multi sectoral and multi discipline approach, integrate learnings on SLEM in the project components, and ties multi-sectoral agencies together in implementation. Funding arrangement with technical assistance providers.													
2	Focus on development of "Forest Fringe Villages"	MoEFCC	Develop concept, bring Rural Development, Agriculture and Skill Departments together for development of scheme, committing funds	MoRD, MoAFW, Ministry of Skill Development and Entrepreneurship	Identification of applicable schemes to be dovetailed for focussed implementation	Orientation of partner Ministries, Line Departments in the States; Development of institution at state level for evidence-based planning and for development of projects for FFVs	State Forest Department (lead for planning and monitoring), Rural Development Departments' Agriculture Department in States	Development of criteria for defining FFV for the purpose/ research and collection of secondary data/ Designing of primary data collection plan to fill gaps	Development of scheme and discussion with stakeholders/ Development of project Baseline	Approval of funding and implementation		Midterm-evaluation	
Critical Activity: <ul style="list-style-type: none"> Identification of target landscape and implementation mechanism. Support with local level data on the targeted FFV's dependence on forests and on losses due to degradation and land use change which could be avoided with project intervention. 													



S. No.	Recommended Strategy	Nodal Agency	Role of Nodal/ Initiating Agency	Supporting Agencies	Role of supporting Agencies	Capacity Building Needs	Implementation	Timeline									
								3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year			
3	Increasing funding for forestry programmes	MoEFCC	Increase budgetary support; Donor funding; coordinate with private sector	-	-	-	MoEFCC	Consultations with Finance Ministry for increasing allocation	Include increased budget in demand for grants	Finalize project funding document	Get necessary approvals and tie up funding	Start implementation					
								Start consultations with donor agencies on subject areas where donor agencies may be interested in funding projects/ facilitate discussions with States which want to go for funded projects	Develop consensus agreement; Identify critical gaps and high impact areas which would be supported with enhanced funding								
								Critical Activity: <ul style="list-style-type: none"> Tap sector funding programmes of International Funding Institutions. Apart from budgetary enhancement, exploring funding from private sector. Identify areas within forestry sector which requires enhanced funding. 									
4	Develop a Center of Excellence for Sustainable Land Management	MoEFCC	Develop concept and detailed plan, provide funds to establish COE	ICFRE	Provide inputs/ house CoE		MoEFCC	Develop concept and DPR; Identify funding opportunity through TA route	Seek approvals and funding	CoE starts functioning							
								Critical Activity: <ul style="list-style-type: none"> Identify most appropriate institutional design for the CoE. Forge international partnerships for impact, visibility and benefit from cross learning 									



S. No.	Recommended Strategy	Nodal Agency	Role of Nodal/initiating Agency	Supporting Agencies	Role of supporting Agencies	Capacity Building Needs	Implementation	Timeline						
								3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year
5	Arriving at a consensus definition of wasteland/degraded land	MoEFCC	Take lead in bringing the various agencies and research institutions together to arrive at consensus definition; Develop subsequent guidance to be followed universally	Institutions under MoAFW, MoS, Dept of Space; NGOs	Provide technical inputs, identify technical challenges and ways to address	Develop a LDN Cell at ICFRE	MoEFCC	3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year
								<p>Critical Activity:</p> <ul style="list-style-type: none"> Arrive at a common definition after scientific discourse and practical considerations, important that a common understanding is achieved by all key expert institutions so that datasets are reconciled. 						
6	Target setting for LDN	MoEFCC	Identify Central programmes where LDN is also a component; Collate data on targets and achievements; Assign voluntary target to the concerned Departments	ICFRE	Collation of data	Develop an LDN Cell at ICFRE	MoEFCC	3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year
								<p>Critical Activity:</p> <ul style="list-style-type: none"> Study the main programmes contributing to SLEM, disaggregate their reporting and monitoring parameters, assess land coverage. Modifying monitoring and data capture formats to suit LDN reporting 						



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								3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year	
7	Framework to monitor LDN	MoEFCC	Develop monitoring framework and data portal	ICFRE	Coordinate efforts behalf of MoEFCC	Orientation of Monitoring Framework to other Central departments connected with LDN, States	MoEFCC				Develop data reporting formats in consultation with respective Ministries and departments as per their programmes and schemes; develop IT based portal for reporting; identify and agree on who would take ownership of data reported				
8	Policy on development of grasslands and grazing lands	MoAFW	Nodal Ministry for policy development	MoEFCC, Department of Animal Husbandry and Dairying/ ICAR	Initiate requirement based on data and research inferences; science-based policy prescriptions		State Revenue, Agriculture and Forest Departments	Develop draft policy	Undertake consultation, finalize draft, seek approval of government						
9	Special scheme for development of grasslands and grazing lands	MoAFW	Scheme development	Revenue Department/ Forest Department/ ICAR	Share data on status of grasslands	Collaboration with institutions working in grassland research, Agriculture Universities	State Agriculture, Watershed Management, Forest Department	Develop scheme document, guidelines and monitoring framework; develop criteria for site which would be taken up under the project based on cattle population, land availability, contribution to local economy and vulnerability from droughts etc.	Stakeholder consultation, finalisation of scheme and approval	Implementation and monitoring					
Critical Activity: <ul style="list-style-type: none"> Engaging with relevant Ministries/ Departments of the Central government as well as the State governments. Develop flexible but compatible reporting formats. 								Critical Activity: <ul style="list-style-type: none"> Important that the policy is jointly owned by Agriculture, Animal husbandry, and Forests departments, ensure involvement and buy-in of the grazier community. Invest in communicating to the stakeholders for wider acceptability. 							
Critical Activity: <ul style="list-style-type: none"> Focussed coverage and not thinly spread across geographies, identification of grasslands to be restored would be important To go hand in hand with livestock improvement, dairy development, livelihood diversification and behaviour change programme 															



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								3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year
10	Digitization of Forest Maps	MoEFCC	Develop scheme; provide funds	State Forest Department	Monitor implementation	Develop GIS and mapping units at District level	State Forest Departments	Study of the current GIS / mapping capabilities of State forest departments, compilation of information of status of coverage and quality of digitization, identification of key institutions which would play a role in the scheme implementation	Development of scheme and funding proposal	Approval and implementation	Complete digitization of all maps/make available on open source GIS platform for use by various institutions/research purposes		
11	Mapping and Protection of Wetlands	MoEFCC	Engage with State Wetland Authority; Strengthen capacity	State Wetland Authority	Mapping and monitoring, prioritization for implementation	Awareness creation for line departments related to wetland; Demonstration and Pilot plans	State Wetland Authority	<p>Critical Activity:</p> <ul style="list-style-type: none"> Define technical standards, quality and use cases. Capacity enhancement in states to digitize maps as well as use them. 	Assessing capacity of state wetland authorities, assessing fund requirement, commissioning survey and study of wetlands and change analysis over previous study	Formation of local level community organisations specific to wetland management	Key wetlands identified for first phase, Wetland monitoring system established, development of wetland conservation plan, threats identified and government action to address taken	Data recording system put in place, orientation and capacity development of stakeholder departments continued	Implementation of plans and monitoring wetland status data
								<p>Critical Activity:</p> <ul style="list-style-type: none"> Document baseline of wetlands mapped, survey number coverage and land use in catchment areas. Guideline desirable to discourage land use change in wetlands above a threshold size and for management of wetlands in private land. Share information with community and other stakeholders in a transparent way. 					



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								3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year	
12	Prioritization in afforestation on degraded forest land	MoEFCC	Develop capacity at FSI and with States by providing guidance and funding, ensuring quality and consistency through SOPs and best practice	State Forest Departments	Develop prioritized, perspective plan in consonance with Working Plans	Development of SOPs for analysis of degradation in forest cover, establishing mapping units	FSI/ State Forest Departments	Institute a team at FSI for taking up the project, Develop action plan	Capacity development of GIS and mapping units at the State, FSI to make available the forest cover analysis data with states	Gaps identified and plan to cover the gaps through additional interpret action of data	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year	Complete the process of identification of degraded patches in demarcated forest area/ make available to field units for planning afforestation
13	Enabling ecosystem for growing trees	MoEFCC	Identify policy changes and incentives framework for certification; policy on wood based industry and development of roadmap for self-sufficiency in wood	State Forest Departments	Development of wood based industry clusters	-	State Forest Department	Industry consultations at national and state level, identification of key interventions, consultations with government stakeholders on action points	Identification of clusters to be developed in the country; identification of policy changes required for import substitution; development of road map as self-sufficiency can be achieved at least after one crop cycle	Plan for facilitating forward and backward linkages; Development of mechanism for sourcing certified seedling and variety preferred by industry	Implementation of plans, support through incentives where required				<p>Critical Activity:</p> <ul style="list-style-type: none"> Enhancement of capacity of FSI and State Forest Department to conduct such assessment. Sites within recorded forest area above a threshold to be identified where recent loss of canopy cover has been observed.
															<p>Critical Activity:</p> <ul style="list-style-type: none"> View the agroforestry in conjunction with the wood-based industry. Harness role of IT, especially in the supply side for better inventory assessment and management Although subject lies with Agriculture Ministry, MOEFCC would have to play the lead role in initiating the process



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14	National Portal for Agroforestry	MoAFW	Develop portal in consultation with MoEF/ State Forest Departments	State Forest Departments, ICAR and ICFRE Institutions	Providing verified scientifically robust data to be shared on the portal	CB modules to be included in the portal	MoAFW, State Forest Department	3 months Development of Portal after user requirement study	3 to 6 months Identifying institutions responsible for updating data; Populating portal with data	6 month to 1 year Commissioning and use, continuous updating of data and upgradation	1.5 to 2 year	> 2 year	> 3 year	
15	Improving quality of planting material in afforestation programmes	MoEFCC	Indicating as a priority area, Develop strategy and guidelines, including in a scheme, Providing funding	State Forest Departments	Implementation	Manuals and SPOs for seed selection; training; labs and equipment	State Forest Departments/ Forest Divisions	3 months Carry out preliminary study of seedlings grown in forest department nurseries and source of such seeds/ extent of such seeds from known origin/ outcomes of tree quality development work undertaken by the states, central research institutes	3 to 6 months Develop scheme document, seek inputs from states and take approval	6 month to 1 year Start implementation, inventorize all the seed stands, seed orchards and plus trees	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year
Critical Activity: <ul style="list-style-type: none"> Regular updation of data in the portal is key for increasing its utility and connect with users. The portal should be made self-sustaining by involving various business and service providers. 								Critical Activity: <ul style="list-style-type: none"> All the seeds used in the plantations should be of known origin 						
Critical Activity: <ul style="list-style-type: none"> Incorporation of existing knowledge on QPM which is widely spread in State Forest Departments, and other institutions Involving the marker operators would be important as majority of seed supply is undertaken by them. 														



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16	Common Planning Tool for MGNREGA and Watershed Projects	MoRD	Development of planning tool in consultation with MoEF, DoLR and MoAFW, monitoring usage once the Tool is deployed	State Departments of Forests, Watershed, Soil Conservation, Agriculture, Water Resources	Joint inputs for development of the design of the Tool, testing and mandatory implementation	Orientation of the key functionary of the agencies in the States; Manual of the Tool, training through appropriate medium	State Departments of Forests, Watershed, Soil Conservation, Agriculture, Water Resources	Start collecting user requirements after consultation and visit to selected states, develop concept document	Develop IT and web-based planning tool, develop manuals and CB modules	Capacity development of local teams, technical handholding	Implementation and upgradation as per requirement			
17	Contributing to LDN and NDC through greening of Highways	MoEFCC	Initiates concept with MoRTH, Develop engagement advisories for State Forest Departments	NHAI, State Forest Department	Share phased plan for highway development with SFDs; Enter into MOU with SFDs, Monitoring		NHAI/ State Forest Departments	<p>Critical Activity:</p> <ul style="list-style-type: none"> Need analysis detailing would be critical for convincing stakeholder departments for such a common tool. Separate detailed study of the planning process for the key programmes should be undertaken and strengths and weaknesses of the existing process should be made part of the concept document. 	Develop phased plan for covering highways under development, consultations and MoU with state forest departments as implementing agencies	Implementation and monitoring				
								<p>Critical Activity:</p> <ul style="list-style-type: none"> Bringing state forest departments and NHAI together for discussions and understanding of requirements form each of the sides would be key to implementation of this recommendation. MOEFCC would have to facilitate such a dialogue. A robust monitoring system would increase mutual trust on the success of the intervention. 						



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18	Special provision for MGNREGA in Tribal and Forest Fringe Village areas	MoRD	Issue necessary orders for revision of maximum persondays of employment per HH; Implementation in a phased manner	MoEFCC	Identification of Forest Fringe Villages; Prioritization of villages	CB for dovetailing with MGNREGS planning tool, Scheme for development of FFV and forestry programmes	MoRD	Collect data on forest fringe villages through existing data bases, CSO sample surveys, SECC data, MGNREGS job cards; Prioritization matrix for selection of landscapes based on social economic data (deviation from average)	Develop proposal for coverage of FFV in phased manner based on prioritization	Take up phased implementation; integration of livelihood security with the outreach by forest department, invigorating community participation in forest management, activities undertaken by FD for improving quality of forests	Conduct studies on impact on status of forest protection			
19	Subsidy specific study on Agriculture	MoAFW	Develop research project, Commission research	Subordinate research institutions, Agriculture Universities	Coordinated research		MoAFW	Design study; identify institution	Conduct study	Share results through policy papers, seminars and workshops	Aim to use findings in future policy discourses			
Critical Activity: <ul style="list-style-type: none"> Identification of villages or clusters where the intervention would be implemented will build stronger arguments for its implementation as well as for successful outcomes. To truly reach the intended beneficiaries, resource or support organisations like NGOs and VO should be made part of the programme design. 								Critical Activity: <ul style="list-style-type: none"> Involving quality and reputed institutions for conducting the study for higher credibility. A communication strategy for wider dissemination of results so that the finding and possible solutions become part of discourses should be integrated into the intervention. 						



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20	Standing Committee on Land Management in Panchayats	MoPR	Issuing of guidelines/ advisory for the States	State Panchayat Department	Government order to formalize the formation of standing committee on land management	Thematic support to elected representative (ER), development of training material, handholding of ER local specific issues in coordination with State Forest Department	State Panchayat Departments	3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year
21	Management of Village Common Property Resources (CPRs)	MoRD	Initiating discussion about treatment and protection offered in various laws and programmes	MoEFCC, MoPR	Development of specific guidelines for incorporation of CPR in their programmes, inclusion of development plan mandatorily in GPDP	Status report on CPRs would be a precursor work to initiate action	MoRD/ MoEFCC/ MoPR to suitably include actions points in programme guidelines	3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year
22	Interventions to reduce Forest Fires, invasive species, pest and diseases in forests area	MoEFCC	Audit of divisions vulnerable to fire to assess readiness; Strengthening of fires protection scheme, Funding	State Forest Departments/ FSI	Implementation of scheme; strengthening forest division; scientific assessment of damage by fire, invasive species and pests	Dissemination of leading practices globally, National seminars to share experiences	State Forest Departments	3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year
<p>Critical Activity:</p> <ul style="list-style-type: none"> Incorporating the subject of SLEM in the capacity development programmes for elected representatives as well as the panchayat functionaries. Nudging states for issuing amendment orders. 								<p>Critical Activity:</p> <ul style="list-style-type: none"> Facilitate GPs to map and assess CPRs under their territorial boundaries along with the nature and extent of rights over the CPRs and prepare a status report. 						
<p>Critical Activity:</p> <ul style="list-style-type: none"> Institutional capacity enhancement to respond to challenges is more important rather than short term programmatic interventions. Measures against pest and invasive species should be integrated in the forestry management interventions rather than being standalone attempts, except in case of pest and disease outbreaks. 								<p>Critical Activity:</p> <ul style="list-style-type: none"> Institutional capacity enhancement to respond to challenges is more important rather than short term programmatic interventions. Measures against pest and invasive species should be integrated in the forestry management interventions rather than being standalone attempts, except in case of pest and disease outbreaks. 						



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23	Focus on Wildlife Corridor Development	MoEFCC	Prioritize corridors based on scientific assessment; Increase funding support for corridor development to non-Tiger Reserve PAs	State Forest Department, WII, Local research institutions	Mapping of possible corridors based on data and imperative to link source populations; coordination with other departments for notification of corridor; scientific backstopping	-	State Forest Departments	3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year
Critical Activity: <ul style="list-style-type: none"> Recognizing land use which is conducive to wildlife movement in the identified corridors, designing measures for disincentivising land use change. 								Identify critical corridors to be taken up under this scheme based on scientific study already conducted	Develop scheme plan and manual, identify activities to be take up the identified corridors, milestones to be achieved	Implementation and monitoring				
24	Focused attention on rehabilitation of mined-out areas and abandoned mines	MoEFCC	Assessment of mining waste especially where forest land diversion has taken place; audit of EMP and mine closure plan	Ministry of Coal, Mines and Steel	Coordination with Mining units; Research and Development institutions under them; develop cost norms	Specialized training for implementation units at local level	State Forest Departments/ specialized institutions in partnership with vendors	Assessing current mechanism of monitoring EMPs, their strengths and weaknesses; identification of stakeholders	Identification of sites/ mines to be covered; finalizing implementing agencies and funding required	Audit of identified sites; Project formulation and implementation; monitoring				
Critical Activity: <ul style="list-style-type: none"> Problem of abandoned mines of both minor and major minerals have to be addressed and should not be left out. States should be involved so that illegal mines are also taken into the fold of the programme. 														



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25	Strengthening involvement of students to fight land degradation	MoECC	Develop Scheme: Provide funds	Department of Higher Education, State Forest Departments, State Revenue Departments	Policy development, identification of land at local level; involvement of social forestry wings for development and maintenance of site	Awareness campaign, involves school teachers and students,	State Forest Departments/ Social Forestry Wings	3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year
26	Incentives for investment on land protection	MoAFW	Develop incentive scheme; Develop platform to capture beneficiary requirement; Link to Watershed and MGNREGS for provision of technical support and funding; Modalities for tying up credit to landowners	MoRD, DoLR	Provide funding and technical support; help in field inspections and reporting, preparation of beneficiary wide case; use secondary information for prioritization	Use farmers database and database from other schemes like PMKSY-PDMC, Watersheds and Fertilizer distribution	Agriculture Department in States	<p>Critical Activity:</p> <ul style="list-style-type: none"> Tracking beneficiaries and users over long term will be required. Aadhar enabled portal could be developed Campaign to be run in schools and colleges and systems set up for smooth implementation. 	Develop scheme parameters and operational guidelines, Use existing farmer data base,	Develop portal to collect application from beneficiaries; Popularize scheme	Implementa tion starts, collect with bare foot engineers and barefoot hydrologists make plan for land protection of the beneficiaries, funding tied up from schemes like MGNREGA and Watershed Development	Implementa tion	Impact assessment	
								<p>Critical Activity:</p> <ul style="list-style-type: none"> Design of model interventions for various agro zones and soil types for ease of uniformity and monitoring. Use of IT portal to capture requirement from beneficiaries and subsequent management of workflow. 						



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								3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year
27	Enforcement of Sand Mining Guidelines, 2020	MoEFCC	Analysis of action taken reports; Monitoring mechanism; Conduct demand supply studies on use of sand; developing of alternatives; design incentives	State Governments	Enforcement, prosecution of infringers		State Governments Mining Departments, Law enforcement Agencies	Identification of critically vulnerable areas; assessment of compliance mechanisms and its strengths and weakness; assessment of demand and supply and strategy to fulfil gap	Preparation of action plan in coordination with Revenue, Police and Mines/Geology Departments of states	Policy on use of substitutes, incentives or disincentives in active consultation with construction industry	1.5 to 2 year	> 2 year	> 3 year
Critical Activity: Demand supply gap assessment and planning for alternatives which have least environmental impact.													
28	Integrated Policy on land addressing land degradation	MoEFCC	Develop white paper and draft policy document; consultations	MoAFW; MoJS	Provide data, sector inputs on gaps and action points	Set up a policy unit at nodal agency	Central Government; State Departments on Revenue, Forests, Agriculture and Water	Initiating meeting with stakeholders	Put research data on board	Develop draft policy document	Issue policy statement		
29	Strengthening Forest Policy	MoEFCC	Policy analysis, gaps, consultation; drafting	State Forest Departments; Industry; civil society	Support gaps with data and evidence	Set up a policy unit at nodal agency	Central and State Government Departments	Work already ongoing-stakeholder consultation for wider participation	Develop revised draft of Forest Policy				



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								3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year	
30	Disincentivising overuse of water for agriculture	MoS	Develop concept based on evidence and studies; Develop draft and finalize in coordination with stakeholders	MoAFW, Ministry of Power	Initiate proposal jointly; Estimate impact on incomes of farmers and ways to mitigate impact; Estimate funding requirements	CB of the officials of the concerned department for effective communication to farmers; Transparency in sharing local level resource data	MoS, MoAFW, MoP	3 months	Improving efficiency of irrigation projects; Identify affected communities and measures to lessen impact of crop substitution	6 month to 1 year	Initiate Electricity sector reforms; Share data on water balance study; initiate campaign	1 to 1.5 year	Share data on water	> 2 year	> 3 year
31	Legislation on ecological flows in rivers	MoS	Draft notification/ legislation in consultation with states and other stakeholders	MoEFCC	Support with scientific evidence, outputs of research studies	Secondary research for development of sound scientific justification	MoS	Initiate the review process, discuss role of resource institutions to work with communities	Collate studies and data from river monitoring	Develop white paper based on thorough water use study of the key rivers covered under study	Legislation passed and enforced	Critical Activity: Information on regional and local level water balance situation would aid in transparency and communicating alternative options The impact on incomes specially on the smaller and marginal farmers, also at the regional and local levels need to be understood in the alternate scenario.			
32	Strengthening Community Participation in SLEM Programmes	MoEFCC	Develop agenda, coordinate with MoPR; Review existing programmes and strengthen component for mobilizing community participation	MoPR	Include CB activities in MoPR Programmes like RGSAs, provide guidance to States	Orientation training and IEC material both for programmes implementors and community	MoEFCC/ MoPR	Initiate review of existing guidelines and processes; discuss role of institutions working with communities	Stakeholder consultation on draft strategy and action plan	Integrate into SLEM program mes; develop CB material	Implementation	Critical Activity: The social and political barriers to community participation are required to be identified and addressed. Information sharing and transparency is critical for trust building, so that people remain interested in participation.			



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33	Integrating SLEM with panchayat development plans	MoPR	Amendment to GPPD guidelines, issuing directions	MoEFCC/ SFDs	Sharing draft guidelines from their side with MoPR based on best practices from JFM, resource mapping at GP level; developing pilots involving SFDs	Develop capacity development material	Panchayat Department/ SFDs	SLEM to be included in the GPPD formats; Forms to be prepared for addressing data on status of land degradation and management; instruction to line departments for sharing data with GPs for integration in GPPD	Appropriate CB modules to be developed with MoPR and MoEFCC; dissemination during capacity development effort	Achieve integration of SLEM with GPPD planning process				
Critical Activity: <ul style="list-style-type: none"> Sharing of development plan by the main department with GP needs to be institutionalized. 														
34	Linking National Water Policy to land and forest	MoJS	Nodal for policy development/ amendment	MoEFCC/ institutions under it like ICFRE	Develop proposal and draft based on research inputs, and evidence		Development of concept, statement of object and draft: MoEFCC in coordination with ICFRE	Draft to be prepared with the support of MoEFCC		Putting in place mechanism for evaluation of policy measures				
35	Forest Carbon Assessment	MoEFCC	Develop plan, guidelines; manuals; funding criteria; monitoring and data recording platform, integration with climate programme, funding	ICFRE/ State Forest Departments/ Agriculture Universities	Develop manuals and guidelines; demonstration at selected sites; Establishment of soil labs	Training at the State HQ and District level, quality	State Forest Departments/ Forest Divisions	Set up permanent grids within 5 sq km, by the end of one year based on the digitized forest maps	Ground truthing and finalization of the sampling points, develop digital inventory system for storing data and for analysis	Start collection of data from field, States to identify the laboratories for analysis of sample	Cover first round in the end of year 5			
Critical Activity: <ul style="list-style-type: none"> Development of SOPs and operation manual Database management and analysis. 														



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36	Collaboration with Research Institutions	MoEFCC	Identify institutions on basis of themes or geography; Develop modalities for collaboration; Develop network of institutions	ICFRE, State Universities, State Forest Departments	Disseminate key learnings; Conduct Seminars; Rejuvenate Research wing in Forest Departments	Run internships and Research studies within Forests in collaboration with FRI and other Universities	State Forest Departments at Circle level	3 months Collation of the knowledge products developed which are relevant to SLEM, selecting some successful projects in the field and documentation of success stories	3 to 6 months Development of knowledge sharing platform, reviewing existing schemes and put enabling provisions for collaboration with research institutions	6 month to 1 year Implementation	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year
Critical Activity: <ul style="list-style-type: none"> Integration of research findings in the programmes for SLEM Interactions and engagement of implementing departments with research institutions on regular basis through conference of implementers. 								Critical Activity: <ul style="list-style-type: none"> Strengthening mechanism for post approval monitoring, development of IT based monitoring and reporting tool Identification of certain projects where FCA clearance was accorded 10-15 years ago, designing impact assessment study post forest land diversions, identify institutions who could do such studies Award Studies Analyse and discuss the findings from the studies, use findings to reassess norms for CA, NPV and penalty in cases of violations Use study report for policy level readjustments 						
37	Division of Forest Land – improving monitoring and assessing impact post land diversion	MoEFCC	Development of monitoring framework; Ensure compliance, take action as per law in case of violations	State Forest Departments	Inspection, reporting	Develop monitoring SOPs; train and develop local monitoring units; guidelines for initiating legal action in case of violations	MoEFCC/ State Forest Departments	Critical Activity: <ul style="list-style-type: none"> Developing models for valuing ecosystem services provided by land and forests. Assessment of depletion of forest stock within and outside the diverted area would be a critical information. 						



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38	Implementation of PESA	MoPR	Renew campaign for implementation of PESA, bring out status report, conduct seminars, engage with States; Support states in developing draft PESA rules	MoTA	Bring out status report, conduct action research on ground, share best practices and experiences from states where PESA has been implemented	Workshop and seminars with States, civil organisations	MoPR	Review of the existing status of PESA by collecting information from States; document bottlenecks	Initiate the process of drafting of the status report; develop a framework for campaign, action research, and engagement with civil society organizations	Address gaps in data collection mechanism	Start reporting	Monitor progress and feedback learnings into new or existing programmes	Engagement with States for implementation; capacity building trainings	Implementation
39	Mechanism for measuring SDG indicators related to SLEM	MoEFFC	Break down of the identified indicators to States; Develop additional indicators to cover objective of SDG-15	State Forest Departments	Break down of SDGs target for the identified indicators to sub-district units	Manual on de-constructing Sustainable Development Goals with respect to SLEM; Explain indicators and baselines, data capturing methodologies	MoEFFC/ State Forest Department	Breakdown national targets, identify institutions to collect data; identify gaps in capacity to collect data	<p>Critical Activity:</p> <ul style="list-style-type: none"> Development of state level SDG goals and targets and fixing similar goals for district level units. 					
40	Participatory and decentralized groundwater management	MoIS	Issue of Framework Legislation empowering WUA and prescribing power, functions and duties	Central Ground Water Board, Central Ground Water Authority	Provide data and previous experience, use best practices to draft legislation; develop training and CB programmes for WUA; Provide data on water resource for use of WUAs in developing water budget and water accounting	WUA supported for water budgeting	Water Resources Department and Watershed Development Department in States; Water User Associations	Draft framework legislation on WUA	With wider consultations, urge states to adopt the legislation; Develop capacity development plan for WUA; Data sharing local information on water availability	Support WUA through existing programmes; Strengthen panchayats bodies for better integration of WUA and PRI	<p>Critical Activity:</p> <ul style="list-style-type: none"> Establish mix of incentives and disincentives, communication campaign, and sharing water related data at the local level in a transparent form with the communities. 			



S. No.	Recommended Strategy	Nodal Agency	Role of Nodal/ initiating Agency	Supporting Agencies	Role of supporting Agencies	Capacity Building Needs	Implementation	Timeline								
								3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year		
41	Strengthening State Biodiversity Boards	MoEFCC	Assess the institutional strengths and weaknesses; engage with SFDs; Propose amendments in BD Act if required Increase support to SBBs	State Forest Departments, SBB, NBA	Identify key constraints; redefine role of SBBs	-	State Biodiversity Boards	3 months	Develop proposal and estimate funding requirement, outputs and outcomes of funding, setting targets in mutual consultation of NBA and SBBs	6 month to 1 year	Start funding to SBBs/ take up concurrent monitoring on meeting agreed milestones	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year	
Critical Activity: <ul style="list-style-type: none"> Increasing resources and research orientation of the SBB for developing bioresources related data base. 								Consultations with stakeholders	Formulation of policy	Legislation/ issuing guidelines						
42	National Carbon Market	MoEFCC	Developing structure of the National Carbon markets in consultation with stakeholders, studying global examples	Department of Industries; Department of Corporate Affairs	Facilitate consultations and develop guidelines for respective sector players; Consultation with corporates for finalization of implementation, guidance on carbon neutrality; eligibility criteria for corporates which are to be covered	Joint action group of MoEFCC, corporate entities and research institutions	Eligible corporates	3 months		3 to 6 months		6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year
Critical Activity: <ul style="list-style-type: none"> Fixing a price for carbon for the Indian economy. Applying the cost of carbon to selected sectors initially to fund mitigation efforts against climate change. 								Consultations with stakeholders	Formulation of policy	Legislation/ issuing guidelines						
43	Revival of Land Use Boards	MoRD/ DoLR	Issue advisory to states; include revival as part of a programmes	-	-	-	DoLR	3 months	Assess current status of SLBs in States; Develop action plan for revival which includes defining role, constitution of board, functional relationship with other state level institutions, powers and function backed by suitable legislations	6 month to 1 year	Engage with states through discussions, workshops and seminars	1 to 1.5 year	Aim for issue of necessary orders for revival of SLUBS	1.5 to 2 year	> 2 year	> 3 year



S. No.	Recommended Strategy	Nodal Agency	Role of Nodal/ initiating Agency	Supporting Agencies	Role of supporting Agencies	Capacity Building Needs	Implementation	Timeline							
								3 months	3 to 6 months	6 month to 1 year	1 to 1.5 year	1.5 to 2 year	> 2 year	> 3 year	
44	Gender mainstreaming in SLEM policies and programmes	MoEFCC	Develop Framework specific for SLEM projects	MoRD, MoPR, MoAFW	Sharing experiences, best practices and evaluations reports	Sensitization on the concept, designing campaign for larger participation of women	MoEFCC	Stakeholder consultation and framework development	Completion of the framework; initiation development of guidelines and strategies	Drafting of guidelines and strategies to be completed; CB plan and materials to be completed	Drafting of legal and programmatic directions; development of capacity building plan	Review process to be completed	Implementation	Implementation	
45	Addressing needs of Women Farmers in implementation of SLEM	MoAFW	Developing guidelines and action points to be implemented across Departments/ States	MoEFCC	Accessing current status; data and analysis; Implementation, Developing capacity development material	Capacity development of staff on the aspects of women farmers; Sensitisation of field level staff; Identify champions	MoAFW	Data collection on the status of women farmers and the type and pattern of services accessed by them as a broad group; Identification of key areas of interventions; Stakeholder consultation for development guidelines to address the legal aspects of tenurial rights, identify programmatic interventions, develop strategies and action plan; review of existing data and field inputs from programmes	Review process to be completed	Drafting of legal and programmatic directions; development of capacity building plan	Drafting of legal and programmatic directions; development of capacity building plan	Review process to be completed	Implementation	Implementation	



14

Capacity Development for Policy and Institutional Mainstreaming of SLEM Approaches

Capacity of the institutions concerned to implement the recommendations would be as critical for achieving the desired results. Capacity development is an important aspect for developing knowledge, skills and attitudes of individuals and institutions. Improved capacity leads to a better understanding of the issues at hand, leading to better outcomes, both at the personal as well as organizational levels.

The action points flowing out of the recommendations will have to be finetuned as per the requirement of various stakeholders in view of the current capacities, expected roles they are to play, and the gaps that exist both at the individual stakeholder as well as the institutional ecosystem level.

Gaps in Current Capacities for Addressing SLEM

Gaps in the current capacities can be broadly classified as thematic or subject-specific gaps and institutional gaps.

Thematic Gaps

A Conceptual gaps - treating land, water, vegetation separate from ecosystems

Land and ecosystem management has been practised in various forms in the country for many centuries. However, due to the existing institutional structure and functioning of the government machinery, the issues have been primarily treated in isolation, with each sector having a different view of such problems and their solutions as per their core mandate.

A holistic view of the ecosystem, its dynamics and interplay with humans and their development needs has been

necessitated. It will require a common conceptual framework to be accepted by the various sectors; which needs to be formulated and widely promoted through training programmes and awareness generation at all levels, the officialdom, providers of finance and the community at large.

B Lack of standardization of approaches and frameworks

SLEM is still a relatively new approach, and a few people are conversant with it. As an approach, it is yet to become an acceptable terminology or common parlance in NRM circles. The standardization of definitions, approaches and

frameworks is still a work in progress. As of today, there is no ready toolkit or guideline available for integrating SLEM in projects.



C SLEM not part of training or study Curriculum

SLEM today is not part of the training curriculum of training institutions of either the state government or the Centre. Little research is being conducted on SLEM in the context of the cross-cutting and complex interplay of systems. The

integrated approach to SLEM is also not part of the curriculum of premier training institutions on NRM, Forestry or Social Sciences.

D Lack of research and wider dissemination

There is a need to build SLEM conceptually and thematically through action, policy and academic research. However, it is imperative that the current

understanding, lessons and impacts of SLEM approaches are shared with practitioners and policymakers to build their perspectives on SLEM.

Action: Training institutes for higher and provincial civil services, professional colleges, ICAR & ICFRE Institutions

Institutional Gaps

SLEM adopts a multi-stakeholder approach requiring various departments to work together at multiple levels to make it successful. SLEM entails a higher degree of teamwork and coordination across departments, which given the current scenario of departments working independently, will entail learning new ways of working.

More specifically, convergence has to be affected right from the choice of target areas, complementing activities and coordinated implementation, through a common planning methodology, sharing of data and information and monitoring of outcomes beyond simple outputs.

Action: All key Ministries implementing programmes for SLEM

Strategic Interventions for Mainstreaming SLEM

The strategy proposed is on the following main areas:

- Sensitization and awareness of Law and senior policymakers
- Capacity building of State and District level officers
- Capacity building of implementation level staff
- Development of functional capacities of support units and research organizations
- Development of a unit at the State level to take care of capacity building needs
- Involvement of resource organizations, i.e. NGOs, not for profit organizations, to support in reaching out and delivering quality training of a uniform standard
- Centre of Excellence on Sustainable Land at the National level to coordinate efforts.

Capacity Development Strategy for Different Stakeholder Sets

A Lawmakers and senior policymakers



i Sensitization workshops for parliamentarians and state assembly representatives

Land is finite and a highly contested resource. It is also a sensitive issue with political ramifications. SLEM entails working on land. Intergenerational equity, a concept difficult to understand and even more difficult to implement, given the multifarious sets of community stakeholders and their different perspectives of how much apparent benefits a group should forgo to maintain such equity, requires

sustained sensitization of the key decision-makers.

Such sensitization should start from the top through day-long sensitization workshops on SLEM for parliamentarians and members of legislative assemblies. Such workshops may be repeated after reasonable and practicable intervals.

Action: MoEFCC in coordination with secretariats of various Legislative houses in the States or Union Territories

ii Capacity development for senior policymakers and government officials

Senior policymakers both at the Centre and states need to be updated on key challenges related to land and ecosystems, how it affects the sectors they are responsible for, and SLEM approaches that take a holistic view on the issues and possible solutions. Given that many solutions

will require incremental changes from one regime to another for an extended period so that the community can accept them, this will require a long-term commitment from policymakers where such sensitization will bear results.

Action: Training institutions of various Central and State services

iii Capacity development for state and district level officials

This section of stakeholders will consist of senior officers managing the various programmes and schemes at the state level and officials at leadership positions like District Collectors, Dy. Conservator of Forests, Heads of Agriculture and other line departments.

The capacity development on SLEM for these officials will also be through state or national level seminars and

conferences, learnings from pilot experiences, as well as policy briefs. Capacity building at this level will mostly focus on appreciating landscape-level issues and enhancing planning capabilities.

Action: State administrative training Institutes and the concerned department through research institutions, such as the National Institute of Hydrology, NIRD, and NGO partners

iv Capacity development of the field functionaries and frontline staff working on SLEM related projects

The frontline staff working at the field level on SLEM projects should be trained on SLEM through structured module-based training, which focuses on imparting functional skills. Apart from structured instructional sessions, capacity building efforts at this level will also include the development of tools and

frameworks, manuals, instruction booklets, and process standardization, among others. Various media can be used for increasing the effectiveness of such programmes, i.e. peer learning, mentoring, digital learning platforms, simulation and videos.

Action: The concerned department through research institutions, such as the National Institute of Hydrology and NIRD, and NGO partners





v Capacity development of the elected representatives of the PRIs involved in implementing SLEM related projects

The representatives of the PRIs engaged in the implementation of the SLEM projects need to be trained on SLEM. These training programmes will be part of the training undertaken by the SIRDs or their regional centres.

Appropriate programmes and content development will be required, and this will have to be integrated into the capacity development programmes being carried out by the Panchayati Raj Ministry.

Action: NIRD, SIRDs

vi Handholding autonomous district and tribal councils

Land administration in NE consists of a multilevel regulatory and institutional framework due to the special constitutional and legal position. The tribal councils have not been able to document the customary laws relating to land use and forest management as practised by tribes or existing within a village jurisdiction. The community tradition and rules of land distribution or community tenurial systems are also not documented except by scholars and researchers. The tribal councils have made very little effort in this direction, limiting the introduction of

appropriate interventions that align with the community land management system.

Various types of land tenurial systems in the North Eastern (NE) states determine the allotment of land for Jhum, making it difficult to control despite the understanding that the slash and burn cultivation is deleterious for the environment, soil, biodiversity, ecosystems management and conservation. The unique situation of the tribal councils in the NE requires special efforts towards their capacity strengthening.



Handholding of autonomous councils by the forest departments

As institutions of self-governance, they have also established forest departments that exercise administrative control. However, at the council level, forest departments are not well equipped and lack technical as well as administrative capacity to manage forest areas.

Therefore, the Autonomous Development Council Forest Departments need to be trained and their capacity needs to be built to prepare conservation plans and sustainable forest land use plans that can be implemented within their jurisdictions.

Action: MoEFCC, State Forest Departments and Autonomous Development Councils

B Building capacities of support units

Support units both at the state and district levels will be required to enable programme implementation in a scientific manner. It can be categorized as units supporting with GIS, interpretation of maps and satellite images and data from national portals on land degradation, units supporting with IT and other technology-related infrastructure, and wider user of IT-based reporting and monitoring systems for programmes management, which

strengthens the institutional capacity of the programme implementation units

Developing such capacity will require proper investment in both manpower resources and equipment/ software applications with provision for maintenance and upgrade to reduce downtime.

Action: Concerned line departments in states with support from the MoEFCC/ State Forest Departments



C Establishment of a central capacity development unit at the state level

A central unit coordinating efforts on capacity development needs is required at the state level. They will be responsible for conducting Training Needs Assessment, developing

modules, testing, updating, SOPs for delivering capacity development programmes on the ground and monitoring the depth and coverage of capacity building efforts.

Action: State Forest Departments

D Orientation of young civil servants on the aspect of sustainable management of natural resources

Sensitization of young civil servants early on in their careers is important to mould their understanding towards optimal and efficient use of natural resources. It has been observed that officials who have got the opportunity to work closely in

the areas of land, water and watershed management, among others, at the early stages of their careers have remained more appreciative of the challenges of the sector subsequently in their career.

Action: The administrative department of the concerned service officers, in coordination with the MoEFCC, DoPT and State Line Departments

E Integrating SLEM in the curriculum of premier national level institutions

For exposing future professionals to the subject of sustainable management of land and water, at least one course on challenges and management approaches should be added to the curriculum of the premier institutions in the country, such as FRI, IIFM, IIM, IRMA, WII,

and Law institutes etc.. Such exposure will trigger more empathy and understanding of future challenges, and some of the professionals may get further interested in aligning their profession to this subject area.

Action: Ministry of Human Resources Development in coordination with the MoEFCC

F Introducing SLEM in the school curriculum

A review of the higher school curriculum reveals that due coverage is being given to the issue of environment conservation, including land degradation, pollution, water scarcity and climate change in the current school curriculum, which also covers the drivers of land degradation in some detail. However, there is little mention

of technologies and approaches to be followed to address the issue. Action incumbent upon the state as per international commitments for addressing climate change, land degradation, biodiversity conservation needs to be strengthened.

Action: Ministry of Human Resources Development in coordination with the MoEFCC

14.2.2 Centre of Excellence on Sustainable Land Management to play a central role in capacity development on SLEM

The MoEFCC is in the process of establishing a Centre of Excellence (CoE) on Sustainable Land Management at ICFRE, Dehradun. One of the mandates of the CoE is to develop capacities for achieving land degradation

neutrality across the country. As part of this, it is proposed that the CoE will also design the overall capacity development strategy for mainstreaming SLEM in the country.

Action: Ministry of Environment, Forest and Climate Change



15

Cost Estimations of the Recommendations for Institutional and Policy Mainstreaming of SLEM in India

The recommendations for operationalizing SLEM consists of three sets of action points- Policy development and harmonization; Institutional strengthening; and Programme related interventions.

Each set of recommendations will have a different implication on the financial requirement for implementing this plan. Ordinarily, the policy recommendations may not require much upfront investment in financial terms except for the effort that will go into fresh research or collection of data. However, the overall financial impact of how the goods and services will flow post the policy implementation may change substantially, which can only be gauged at a higher level for now. For example, while the development of the policy for implementing cropping based on water availability may take minimal additional investment, but the impact of actual implementation of the policy will mean substantial changes in the production of certain crops, which will affect the supply chain, prices, margins, and financial surpluses that various value chain players are used to currently.

Institutional strengthening can also be viewed from two perspectives; first, where new institutions are to be created and second, where realignments are to be made in the current arrangements of coordination and reporting. While in the former case, there will be significant financial ramifications for establishing a new institution (on human resources and infrastructure), in the latter case, not much direct financial impact is envisaged. However, existing institutions have a critical role in operationalizing SLEM and are working under sub-optimal resource conditions, which will require additional support if the institutional capacity gap is to be bridged. Given the lack of detailed visibility on how the institutional landscape will emerge, estimating the financial investment for such a scenario may become just an academic exercise and may not serve to be useful.

However, estimation of programmatic interventions can be done based on the cost norms at present and has been covered in the subsequent section.

Cost estimation of programmatic interventions for SLEM

Funding has been estimated based on a 10-year period for the implementation of the roadmap. The cost estimation of

the programmatic interventions as per the roadmap provided in the Table 3.





Table 3. Cost estimation for implementing roadmap recommendations

S. No.	Recommendations	Policy/ Institution/ Programmatic intervention	Amount (In Rs. billion) / Year										Total	Primary Ministry/ Department responsible
			1	2	3	4	5	6	7	8	9	10		
Action points for Forests and Environment Sector														
1.	Accounting environmental effects of economic development	Policy	-	-	-	-	-	-	-	-	-	-	-	MoEFCC
2.	Dedicated institutions for implementation of SLEM	Policy	-	-	-	-	-	-	-	-	-	-	-	MoEFCC
3.	Integrated Policy on Land addressing land degradation	Policy	-	-	-	-	-	-	-	-	-	-	-	MoEFCC
4.	Strengthening Forest Policy	Policy	-	-	-	-	-	-	-	-	-	-	-	MoEFCC
5.	Increasing funding for forestry programmes	Programmatic	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	100.00	MoEFCC
6.	Focus on development of "Forest Fringe Villages"	Programmatic	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	200.00	MoEFCC
7.	Strengthening Forest Management		-	-	-	-	-	-	-	-	-	-	-	MoEFCC
8.	Digitization of Forest Maps	Programmatic	0.70	1.00	0.50	-	-	-	-	-	-	-	2.20	MoEFCC
9.	Prioritization in afforestation of degraded forest land	Programmatic	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.50	MoEFCC
10.	Improving quality of planting material in afforestation schemes	Programmatic	0.50	0.50	0.50	-	-	-	-	-	-	-	1.50	MoEFCC



11.	Interventions to reduce Forest Fires, invasive species, pest and diseases in forests area	Programmatic	2.50	2.00	2.00	-	-	-	-	-	-	-	6.50	MoEFCC
12.	Forest Carbon Assessment	Programmatic	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.50	MoEFCC
13.	Collaboration with research institutions	Institutional	-	-	-	-	-	-	-	-	-	-		MoEFCC
14.	Biodiversity Conservation and SLEM		-	-	-	-	-	-	-	-	-	-		MoEFCC
15.	Focus on Wildlife Corridor Development	Programmatic	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	25.00	MoEFCC
16.	Strengthening State Biodiversity Boards	Institutional/ Programmatic	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	5.00	MoEFCC
17.	Mapping and protection of Wetlands	Programmatic	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	15.00	MoEFCC
18.	Enabling ecosystem for growing trees	Programmatic	-	-	-	-	-	-	-	-	-	-		MoEFCC
19.	Diversion of Forest Land – improving monitoring and assessing impact post land diversion	Institutional	-	-	-	-	-	-	-	-	-	-		MoEFCC
20.	Strategy for achieving LDN		-	-	-	-	-	-	-	-	-	-		MoEFCC
21.	Arriving at a consensus definition of wasteland/ degraded land	Policy	-	-	-	-	-	-	-	-	-	-		MoEFCC
22.	Target setting LDN	Policy	-	-	-	-	-	-	-	-	-	-		MoEFCC
23.	Framework for monitoring LDN	Policy	-	-	-	-	-	-	-	-	-	-		MoEFCC



No.	Recommendations	Policy/ Institution/ Programmatic intervention	Amount (In Rs Bn) / Year										Total	Primary Ministry/ Department responsible
			1	2	3	4	5	6	7	8	9	10		
24.	Develop a Centre of Excellence for Land Degradation	Programmatic	0.43	0.57	0.47	0.45	0.52	-	-	-	-	-	2.44	MoEFCC
25.	Develop a specific project for SLEM at national level	Programmatic	100	100	100	100	100	100	100	100	100	100	1,000	MoEFCC
26.	Contributing to LDN and NDC through greening of National Highways	Programmatic	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	1.50	MoEFCC
27.	Focussed attention on rehabilitation of mined out areas abandoned mines	Programmatic	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	2.00	MoEFCC
28.	National Carbon Market	Policy	-	-	-	-	-	-	-	-	-	-		MoEFCC
29.	Enforcement of Sand Mining Guidelines, 2020	Institutional	-	-	-	-	-	-	-	-	-	-		MoEFCC
30.	Encouraging involvement of students in fighting land degradation	Programmatic	4.63	7.40	9.71	10.64	11.56	11.56	11.56	11.56	11.56	11.56	101.75	MoEFCC
31.	Establishing mechanism for measuring SDG indicators related to SLEM	Institutional	-	-	-	-	-	-	-	-	-	-		MoEFCC
Interventions overlapping with Agriculture Sector														
1.	Policy on development	Policy	-	-	-	-	-	-	-	-	-	-		MoAFW



	of grasslands and grazing lands													
2.	Special scheme for development of grasslands and grazing lands	Programmatic	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	200.00	MoAFW
3.	Disincentivising overuse of water for agriculture	Policy	-	-	-	-	-	-	-	-	-	-		MoAFW
4.	National portal for Agroforestry	Programmatic	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.14	MoAFW
5.	Incentives for investment on land protection	Policy	-	-	-	-	-	-	-	-	-	-		MoAFW
6.	Subsidy specific study on Agriculture	Programmatic	0.10	0.10	-	-	-	-	-	-	-	-	0.20	MoAFW
Interventions related to Water Sector														
1.	Linking National Water Policy to Land and Water	Policy	-	-	-	-	-	-	-	-	-	-		MoJS
2.	Legislation on ecological flows in rivers	Policy	-	-	-	-	-	-	-	-	-	-		MoJS
3.	Participatory and decentralized ground water management	Institutional/Programmatic	4.00	4.00	-	-	-	-	-	-	-	-	8.00	MoJS
Institutional mechanisms and Decentralized Governance to support SLEM														
1.	Common Planning Tool for MGNREGS and Watershed Projects	Institutional	0.25	0.10	-	-	-	-	-	-	-	-	0.35	MoRD
2.	Special provisions in MGNREGA for	Programmatic	93.00	93.00	93.00	93.00	93.00	93.00	93.00	93.00	93.00	93.00	930.00	MoRD



	Tribal and Forest Fringe Village areas													
3.	Revival of Land Use Boards	Institutional	-	-	-	-	-	-	-	-	-	-	-	MoRD
4.	Integrating SLEM with GPDP	Institutional	-	-	-	-	-	-	-	-	-	-	-	MoP
5.	Standing Committee on Land Management in Panchayats	Institutional	-	-	-	-	-	-	-	-	-	-	-	MoPR
Addressing Social Aspects for SLEM														
1.	Strengthening community participation in SLEM programmes	Institutional	-	-	-	-	-	-	-	-	-	-	-	MoEFCC
2.	Gender mainstreaming in SLEM policies and programmes	Institutional	-	-	-	-	-	-	-	-	-	-	-	MoEFCC
3.	Addressing need of women farmers in implementation of SLEM	Institutional	-	-	-	-	-	-	-	-	-	-	-	MoAFW
4.	Management of Village Common Property Resources (CPRs)	Institutional	-	-	-	-	-	-	-	-	-	-	-	
5.	Implementation of PESA	Institutional	-	-	-	-	-	-	-	-	-	-	-	
Total			261	264	261	259	260	260	260	260	260	260	2,605	



Summary of the Estimated Financial Requirement for Implementing the Roadmap

The overall funding requirement for ten years is estimated to be Rs. 2,605 billion over a period of 10 years. The yearly

distribution of the financial requirement is given in Figure 1:



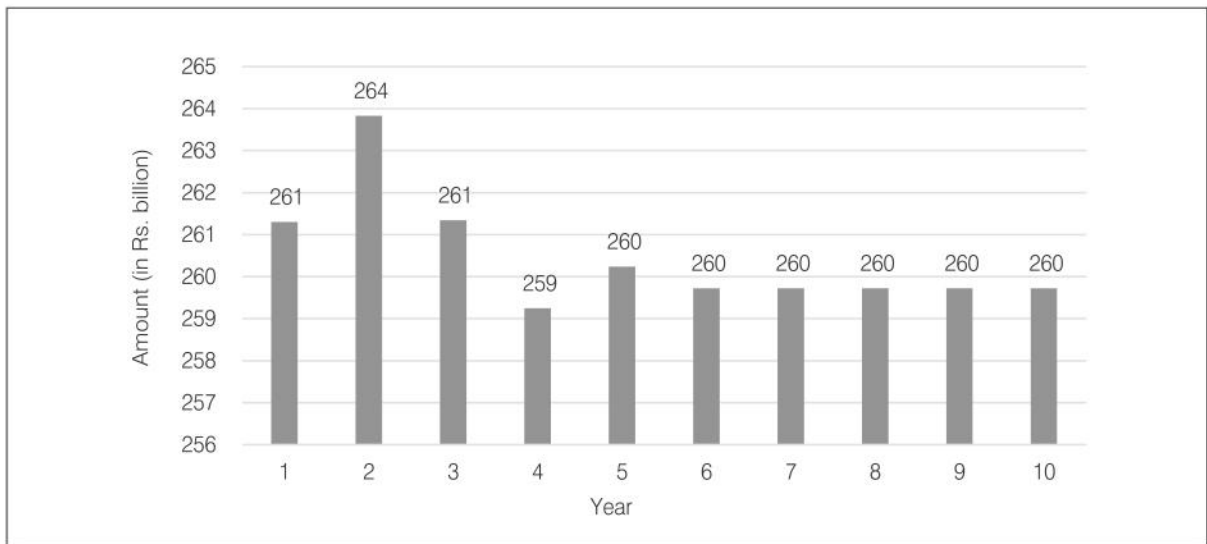


Figure 1. Ministry wise breakup of financial requirement

Further, the distribution of the financial requirement over the key Central ministries is given in Figure 2:

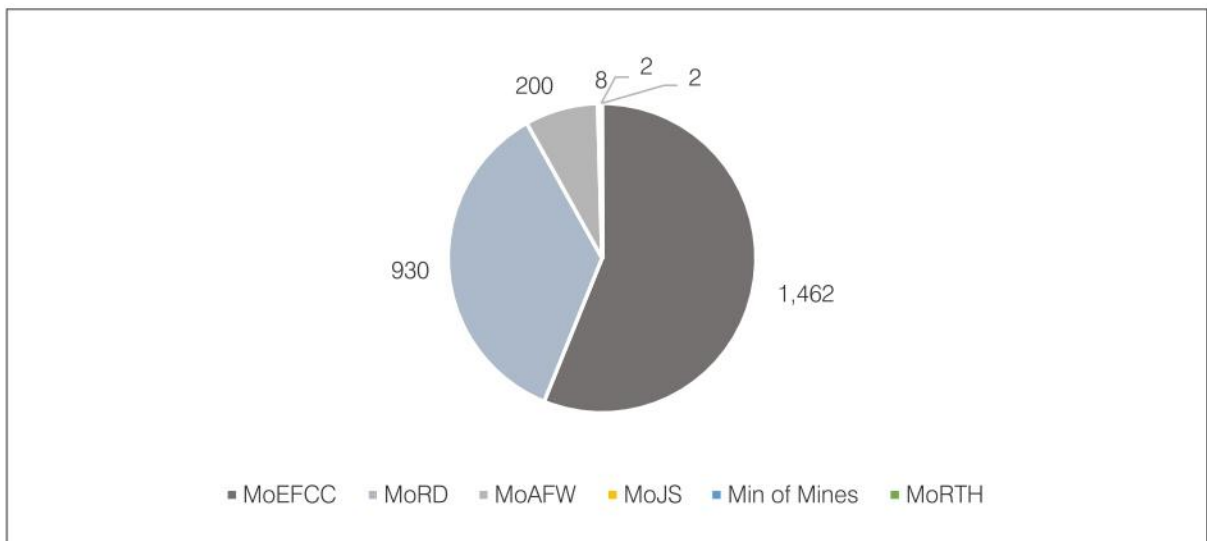


Figure 2. Ministry wise breakup of financial requirement (in Rs. billion)



Cost-benefit of the Recommendations for SLEM Roadmap

The benefits of implementing the roadmap will include:

- (i) Improving resilience of farmers, especially small and marginal farmers, to droughts and incidents of heavy rain through the protection of soil fertility and diversification of incomes
- (ii) Increasing the areas of irrigation due to better water management
- (iii) Facilitating direct wage-earning to the landless and those dependent on wages as primary sources of income



- (iv) Sustaining and improving the capacity of land, vegetation, forest and biodiversity to provide ecosystem services

Broadly, direct benefits will accrue over three areas:

benefits from the protection of land, forests, agriculture and wasteland, improvement in livelihoods and wage income, and increase in carbon stocks in forests and other vegetation. The indirect benefits arising due to the multiplier effect of public expenditure, efficient utilization of natural resources, sustainability and reduction of stress in society is very difficult to account for, so only direct benefits have been estimated for this section.

Benefits due to avoidance of land degradation/reclamation of land:

The economic cost of land degradation requires both direct and indirect costs to be taken into consideration. The overall losses due to land degradation are because land gets converted from a higher value biome into a lower value biome. Globally, the Total Economic Value approach (TEV) has been used by researchers to arrive at the cost of land degradation. The TEV method will facilitate the accounting of losses of both direct and indirect ecosystem services. Further, the losses due to land degradation have both on-site and off-site dimensions. It has been estimated that only about 46% of the global cost of land degradation due to land use land cover change is borne by the land user, while 56% is borne by the users of the ecosystem services off the farm. Estimating losses also encounter challenges as some of the ecosystem services are not marketable, and therefore their price cannot be quantified.

The action points for implementing the SLEM roadmap impact key areas like addressing forest land degradation and improving their capacity to provide ecosystem services, including the capacity to sequester carbon, improvement in the net value of output from agriculture, horticulture, agroforestry and animal husbandry and increase in the net area under irrigation due to more efficient water use. However, the direct and indirect impacts of the recommendations in each domain will be difficult to quantify.

Even if we take a sectoral view, the total value of the output of the livestock sector in the country was Rs. 11,596 billion in 2018-19. The recommendation regarding the

improvement of grasslands will largely benefit the livestock sector in addition to other ecosystem services made available to a larger set of beneficiaries. A total of Rs. 200 billion over 10 years has been allocated for the improvement of grasslands and grazing lands in the roadmap.

We may also take cues from the study by TERI (TERI, 2018), in which it has been estimated that the annual cost of land degradation and land use change is about 2.5% of India's GDP in 2014/15 and about 15.9% of the GVA from the agriculture, forestry and fishing sectors. The cost of land degradation in the year 2020, based on the GVA from the agriculture sector of Rs. 39,889 billion, can be estimated at Rs. 6,342 billion. In comparison, the financial impact of the roadmap is Rs. 2,605 billion over 10 years.

Benefits due to improvement of livelihoods and income:

The implementation of the roadmap's recommendations will also provide direct benefits to people in terms of wages and livelihoods as most of the interventions recommended in the roadmap will require human labour, which is estimated conservatively at 40% of the total expenditure. Thus, about 3.5 billion person-days of labour of value Rs. 1,000 billion will be produced during the 10 years. It does not include the improvement in livelihoods due to increase in productivity or output from land-based activities.

Benefits due to an increase in carbon stock: Growth in carbon pool in forests will require addition both on account of increase in area as well as improvement in forest health. It will also be important to avoid losses from the pool due to further degradation of forest land and change in land use. The recommendations in the roadmap are expected to not only help in the addition of area under the green cover but also in avoiding losses. It will thus support the BAU in the timeline of 10-15 years. As argued earlier, even achieving increment in the forest carbon stock in the BAU scenario will require additional interventions beyond those committed at present.

To make the analysis simple, certain assumptions are made before arriving at a monetary value of the carbon stock created in forest and tree outside forests due to the interventions recommended in the roadmap. We use 6% as the discount rate, between the 2% and 7% suggested in some publications for discounting benefits of climate change mitigation (Newell, Richard *et al.* 2001). The rate of





carbon per tonne is assumed to be 30 USD per tonne (accepted by the World Bank in 2016), increasing at 5% per year, to reflect a change in the currency, as well as an expected increase in the value of carbon, as the need to reduce global emissions becomes more urgent in the future.

The carbon addition rate in India's forests was 0.3% as per the India State of Forest Report (ISFR), 2019. With improved forest management, restoration of degraded forest land and reduction in pressure on the forests, we assume the annual yield from India's forests will increase by 50% over the next 15 years. The increase will be gradual, with some lag after the interventions are implemented.

The growing stock in TOF has been varied over the last few years as evident from successive ISFRs from 2011 to 2019. However, a 2% increase in the growing stock net of harvesting has been assumed over the next 15 years. The

growing stock in TOF is important as it is expected to be the main contributor to increasing the green cover in the future.

With the above assumptions, the present value of the carbon pool added in 15 years due to forest and tree cover after the start of interventions is estimated to be at Rs. 1,150 billion.

Fiscal Impact of the proposal: The total cost of implementing the roadmap is Rs. 2,605 bn over 10 years. The current annual Govt. of India contribution for SLEM related programmes is Rs. 576 billion. On an annual basis, the roadmap's budget impact will be 31% of the current allocation in such programmes and 0.74% of the overall budgetary allocation of the Central government. As far as the sectoral budgetary impact is concerned, the additional allocation required from the key ministries/sectors over 10 years is given in Table 4.

Table 4. Impact of roadmap recommendations on sectoral budget

Sector	Cost of Roadmap (Rs. billion)	Increase over current allocation
Environment and Forests	1466	523%
Rural Development	930	7%
Others	209	-





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