

Reference Document for REDD+ in India

**Ministry of Environment and Forests
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FOREWORD

India is a Party to the United Nations Framework Convention on Climate Change (UNFCCC) and the Government of India attaches great importance to climate change issues. Emissions from deforestation and forest degradation in developing countries according to the IPCC constitute about 18% of global greenhouse gas emissions. Today, with its immense unexplored mitigation potential, 'Reducing emissions from deforestation and forest degradation, conservation of forest carbon stocks, sustainable management of forests, and enhancement of forest carbon stocks' in developing countries (collectively known as REDD+) is an active agenda in UNFCCC. As well-being of forests is considered essential for healthy environment, sustainable livelihoods of local communities, and also for conservation of biodiversity and meeting the raw material needs of the forest-based industry, agenda of REDD+ in UNFCCC COP and SBSTA meetings attracts highest attention of not only the participating governments, but also of the civil society, local communities and scientific experts alike. India can rightfully claim the credit for giving the comprehensive shape to the concept of mitigation actions in the forest sector by assiduously working for transformation of REDD into REDD+. India played a key role in the path-breaking UNFCCC negotiations in COP 13 in Bali where the "*.....role of conservation, sustainable management of forest and enhancement of forest carbon stocks....*" found a place in Bali Action Plan (decision 1/CP.13). Presently, the international community is intensely engaged in developing guidelines and methodologies for operationalization of REDD+ in the true spirit of Bali Action Plan. Further, landmark progress was achieved three years later at COP 16 when the Cancun Agreements were adopted, and scope of REDD+ was also defined for the first time very clearly in terms of five REDD+ activities in paragraph 71 of decision 1/CP.16 as a belated but, rational culmination of famous paragraph 1 (b) (iii) of the Bali Action Plan.

In accordance with the Cancun Agreements, developing countries willing to undertake REDD+ activities are required to formulate and follow a national strategy or action plan, establish a national forest reference emission level or national forest reference level or, a subnational level as an interim measure, a robust and transparent national forest monitoring system for the measurement, reporting and verification (MRV) on the performance of the REDD+ activities, and a system for providing information on how the REDD+ safeguards are being addressed and respected. Since India is willing to implement REDD+ mechanisms, these stipulations are equally valid for it.

India is a large developing country with more than 700 million rural people directly dependent on climate sensitive sectors, i.e., agriculture, forests and fisheries, and natural resources like, water, biodiversity, mangroves, and grasslands for their subsistence and livelihoods. The Government has put in place a National Mission for a Green India as part of the country's comprehensive National Action Plan for Climate Change over a period of 10 years. Overarching objective of the Green India Mission (GIM) is to increase forest and tree cover in 5 mha, and improve the quality of forest cover in another 5 mha. Thus, the Mission will help in improving ecosystem services in 10 mha of land, and consequently improve the livelihood and income of about 3 million forest dependent households besides improving the country's REDD+ performance by way of increment in forest carbon stocks of the country, and simultaneously building resilience to climate change risks. GIM also offers a good opportunity for forest dependent communities to participate in REDD+ activities. The communities will not only get benefit of increased goods and services from the forests, but will also have the first claim on the incentives that will accrue from country's REDD+ performance in future.

India actively participated and took lead in international negotiations leading to REDD+ agreements. India is fully committed to implement REDD+ activities, and, therefore, also to develop a REDD+ strategy to be implemented in accordance with the UNFCCC agreements in its forest sector. For long, a need was being felt for a government document that would lay down the broad contours of the policy, processes, methodologies, responsibilities and institutions essential for implementing REDD+ in the country in tune with the relevant decisions of the UNFCCC. Many important issues like construction of national forest reference level, identification of the lead nodal government agency for MRV of REDD+, participation of local communities, treating forest carbon as one of the ecosystem goods and services, modalities to guide flow of incentives right down to the local communities, safeguards for rights of local communities and conservation of natural forests, and requirement of extensive capacity building for a range of stakeholders, needed more clarity to facilitate effective implementation of REDD+ in the country.

I am thankful to the Ministry of Environment and Forests, Government of India for taking the initiative of preparing the Reference Document to facilitate REDD+ implementation in the country, which clearly indicates Government of India's commitment to optimally explore the mitigation potential of forest sector in the country. I have great pleasure in presenting this Reference Document as a sincere contribution of team towards India's preparedness for early and effective implementation of REDD+.

India had taken the initiative to incorporate the 'plus' component of the REDD+ mechanism into the UNFCCC process. Now, it is important that India takes lead in formulating the definitions and guidelines for the operationalization of the 'plus' components. India also should participate in the international initiatives in REDD+ and implement pilot projects to learn lessons for long-term country-wide operationalization of the mechanism. I thank the Expert Committee Members and Invited Experts for their contribution in preparing the various chapters of this 'Reference Document for REDD+'. I would like to have individually named all the contributors and invitees with specific mention of their contribution, but paucity of space does not permit me to do so. All the same, I would like to name a few institutions to whom these contributors belonged, and who helped me in finally putting this document together. In this context, I would list IISc Bengaluru, TERI, New Delhi, FSI Dehradun, ICFRE Dehradun, IIFM Bhopal, IGNFA Dehradun, and WII Dehradun. Officers, experts and officials of the MoEF made valuable contribution in helping the committee to finish the task of finishing this document. The document in its present shape epitomizes the expertise, experience and deep understanding of the subject of the members and the invitees, and I am sure the document will be useful to, and appreciated by all interested in, and connected with the subject of REDD+, i.e., the policy makers, forest officers, members of the local communities and civil societies, donor organizations, and last but not the least the Indian UNFCCC negotiators. I would also like to express my gratitude to staff of the forestry wing, and Climate Change Division of the MoEF who helped in organizing the meetings of the Committee, and also in providing all support making it possible to come out with this Reference Document.

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Abbreviations for REDD+ reference Document

A/R	Afforestation/Reforestation
AD	Activity Data /Avoided Deforestation
AFOLU	Agriculture, Forestry and other Land Use
ARD	Afforestation, Reforestation and Deforestation
BAU	Business as Usual
BMC	Biodiversity Management Committee
CAT	Cap and Trade
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CO ₂ e	Carbon Dioxide Equivalent
COP	Conference of the Parties
CSR	Corporate Social Responsibility
DD	Deforestation and Forest Degradation
DNA	Designated National Authority
EDC	Eco Development Committee
EF	Emission Factor
EU	European Union
ETS	Emissions Trading Scheme
FAO	Food and Agriculture Organisation
FCS	Forest Carbon Stocks
FDA	Forest Development Agency
FRA	Forest Resource Assessment/Forest Right Act
FSI	Forest Survey of India
GHG	Green House Gas
GOFC-GOLD	Global Observation of Forest and Land Cover Dynamics
GPG	Good Practice Guide
GS	Gram Sabha
Ha	Hectare
HWP	Harvested Wood Products
ICFRE	Indian Council of Forestry Research & Education
IGNFA	Indira Gandhi National Forest Academy
IIFM	Indian Institute of Forest Management
IIRS	Indian Institute of Remote Sensing
IPCC	Intergovernmental Panel on Climate Change
IISc	Indian Institute of Science
ISFR	India State Forest Report
IUCN	International Union for Conservation of Nature
JI	Joint Implementation
LDC	Less Developed Countries
LULUCF	Land Use, Land Use Change, Forestry
MAI	Mean Annual Increment
MoEF	Ministry of Environment & Forests
MMU	Minimum Mapping Unit
MRV	Monitoring, Reporting and Verification
NAMAs	Nationally Appropriate Mitigation Actions
NCBs	Non Carbon Benefits

NFP	National Forest Policy
NFRL	National Forest Reference Level
NFMS	National Forest Monitoring System
NGO	Non Government Organisation
NRSC	National Remote Sensing Centre
NTFP	Non Timber Forest Produce
ODA	Official Development Assistance
PAM	Policies and Measures
PES	Payment for Environmental Services
REDD	Reducing Emissions from Deforestation and Degradation
SBSTA	Subsidiary Body for Scientific and Technological Advice
SFDs	State Forest Departments
SMF	Sustainable Management of Forests
TERI	The Energy and Research Institute
TDERM	Tropical Deforestation Emission Reduction Mechanism
tC	Metric tonnes of carbon
TgC	Teragrams of carbon = Million metric tonnes of carbon
ToF	Tree outside Forests
UNCCD	United Nations Convention to Combat Desertification
UNDP	United nation Development Programme
UNFF	United Nations Forum on Forests
UNFCCC	United Nations Framework Convention on Climate Change
UN- REDD Programme	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
UT	Union Territories
VER	Verified Emission Reduction
WB FCPF	World Bank Forest Carbon Partnership Facility

Executive Summary

1. Background

About 30% of the global land area is covered by forests, which provide a wide range of important products such as timber, fuelwood, paper, food and fodder as well as ecosystem services like protection of soil and water resources, conservation of biological diversity, and carbon sequestration. Forests are also important as these support livelihoods of a large number of people. REDD+ has given a new hope to the global community to seriously address 17.4% of global emissions that is caused by deforestation and forest degradation.

For a long time the need was being felt in India for a guidance document that could channelize the actions of all relevant stakeholders for an effective implementation of REDD+ in the country. It was in this background that the Ministry of Environment and Forests (MoEF) constituted the Expert Committee vide Office Memorandum F. No. 4/3/2011-CCC dated 20 February 2013 with leading experts on REDD+ of the country. The Committee was charged with the responsibility of formulating this Reference Document for REDD+ in India.

The Reference Document is divided into 9 chapters starting with an introduction and overview of the subject, moving on gradually and logically to required policy framework to support REDD+ implementation as part of the forest management in the country. The document describes in detail the issues and concepts related to definitions as also approach to construct national forest reference level. It also assigns the roles and responsibilities to different government and other organizations, including MoEF, FSI, ICFRE, State Forest Department, JFM Committees, Panchayats and Gram Sabhas, etc. Governance and safeguards to ensure that REDD+ implementation supports the rights of the local communities and indigenous peoples (tribals) as also conservation of biodiversity in natural forests. Reference Document comprehensively addresses the need of capacity building across all levels of the government, expert organizations, civil society, other organizations and local communities. Important aspects of National Forest Monitoring System comprising MRV and Safeguards Information systems have been dealt with lucidly in the document. Research needs of REDD+ are also compiled in a separate chapter.

2. Introduction and Overview of REDD+

2.1 This chapter traces the history of development of REDD+ right from its first introduction in different rudimentary forms in side events of COP since 2002. It also describes the watershed transformation of REDD into REDD+ in COP 13 at Bali, and first description of 5 REDD+ activities in Cancun Agreements in COP 16. In Durban COP 17, negotiations entered into crucial phase of essential requirements for REDD+ implementation, i.e., finance, safeguards, reference levels and MRV. COP 18 at Doha flagged the need for valuation of non-carbon benefits (NCBs), but did not achieve any progress on financing of results-based actions. Modalities for MRV also are yet to be agreed.

2.2 Although India has been in forefront in shaping the evolution of the comprehensive concept of REDD+ at the international level, it needs much more to do domestically to ensure

purposeful implementation of REDD+. It faces the challenge of constructing the National Forest Reference Level, a National Forest Monitoring System comprising independent MRV and Safeguards Information systems.

2.3 It is now evident that carbon service alone can neither sustain the forest ecosystem nor the livelihoods of local communities dependent on goods and services flowing from such an ecosystem. In India, this realization must be internalized in policy, planning and actions at Central and State levels with a view to according equal importance to all forest ecosystem goods and services, and treating forest carbon service as one of the important services. Sooner or later, international community including in the UNFCCC, will start debating ways and means of putting a value on each of the other forest ecosystem goods and services. India must prepare itself technically, politically and institutionally to participate effectively in the future negotiations with a view to safeguarding its national as well as the interests of its local communities dependent on forests.

2.4. India while ensuring transformation of REDD into REDD+ at Bali COP in 2006, was successful in ensuring the inclusion of positive incentives for conserved or stabilized forest carbon stocks in addition to saved or added forest carbon stocks. Indian negotiators must keep a note of this important fact, and ensure that incentives for conserved or stabilized forest carbon stocks are not pushed aside in future negotiations.

3. National Policy Framework for REDD+ Implementation

3.1 This chapter discusses the present national policies and legal framework including National Forest Policy, 1988 and how their emphasis on maintaining ecological balance, environmental stability, biodiversity conservation, priority for meeting forest-based needs of local communities, and stringent regulations for diversion of forest land relates to enhancing the mitigation service from forests. The chapter also discusses broad contours of National REDD+ policy and strategy and required institutional framework of national and sub national REDD+ architecture for effective implementation of REDD+. It also brings out the necessity of a comprehensive approach which gives equal importance to all forest ecosystem goods and services, and treats carbon as one of these services, and not the only or the overarching end objective. The chapter underlines urgent need to strengthen REDD+ Cell in the Ministry to work under the overall guidance of a Steering Committee headed by Secretary, MoEF with members drawn from various stakeholder ministries and departments and central institutions whose policy and programmes have a bearing on forestry sector. The National REDD+ Cell is intended to coordinate, guide, and work with proposed State REDD+ Cells for planning and implementing REDD+ activities and accounting at sub-national level. FSI is required to play an important role in building scientific and technical capabilities of SFDs in forest carbon estimation at periodic intervals. ICFRE, IIFM and other organizations can play important role in building capacities of local communities, Gram Sabhas, Panchayats, NGOs, field staff of forest and other relevant organizations for strengthening sustainable management of forests, biodiversity conservation, enhancing economic and ecological contribution of forests through valuation of ecosystem services, and addressing drivers of forest degradation through multiple approaches with participation of all stakeholders. The

chapter essentially underlines the following imperatives of a supporting policy and legal framework for REDD+ implementation.

3.2 All ecosystem services from forests are equally important and carbon is one of the important forest ecosystem services. Incentivization of carbon service will supplement the benefits of other goods and services from forests.

3.3 REDD+ incentives whenever these become available will flow in totality to the local communities in proportion to their REDD+ performance. Central Government in consultation with State Governments will formulate guidelines prescribing procedure and norms for flow of financial incentives from Central to State Governments and further down to the local communities.

3.4 Processes and methodologies for quick, accurate and cost effective MRV of forest carbon stocks will be finalized on top priority by FSI in consultation with other technical organizations like ICFRE, IISc, IIFM, etc., under the overall guidance of the MoEF.

3.5 Methodologies for MRV of other ecosystem services should be formulated and standardized to facilitate their incentivization in due course of time.

3.6 NFRL should be constructed on priority and without losing time as NFRL is a prerequisite for determination and incentivization of REDD+ performance. NFRL should comprise sub-national FRLs at State and UT level.

3.7 FSI will be the main coordinating organization at the national level to compile national level forest carbon stocks account. SFDs assisted by State Remote Sensing Application Centres will be responsible for compiling the forest carbon stocks account at the State or UT level. Local communities will play an important role in assisting the SFD in carrying out estimation of the forest carbon stocks at the local level.

3.8 ICFRE, IIFM and other technical organizations will discharge the responsibility of capacity building of the SFD staff, local communities and staff of other stakeholder departments in a time-bound manner, and on a war footing.

3.9 Although REDD+ is a national level FCS accounting concept, sub-national level projects covering specific aspects of REDD+ are also important to further the understanding of technical, policy and implementation related issues of REDD+ on appropriate sites in various States/ UT. India should be open to accepting offers for such sub-national projects from external funding agencies, and also be prepared to fund the same internally as and when the need arises.

4. Definitions of REDD+ Terms in the Indian Context

4.1 This chapter deals with the definitions of various terms associated with REDD+ and its implementation in India. It starts by defining five REDD+ activities, moving on to definitions of forest, deforestation and forest degradation, and also their relevance with respect to India. Important issues highlighted in the chapter are indicated below.

4.2 Since REDD+ is a national level accounting concept, it will be imperative that forest is defined in a way that helps FSI to seamlessly expand its responsibility to cover nationwide estimation of forest carbon stocks. It is, therefore, imperative to standardize and harmonize definition of forest and deforestation relevant to REDD+ with the definition of FSI.

4.3 It will be advisable to understand and interpret in the Indian context, the terms used for the plus components of REDD+, i.e., Conservation of Forest Carbon Stocks, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks. India should develop definitions for these terms, and assess implications for potential of each of the components, and specific requirement for their MRV. The understanding of these terms in the national context will help in negotiating the definitions of these terms in the UNFCCC in future.

4.4 Project proponents or financial agencies may have interest in supporting initiatives confining to specific plus element(s) of REDD+. For this purpose, it may be advisable to initiate technical and institutional process for identifying potential locations for REDD+ activities on a spatial basis.

5. Status of Current Forest Management Regime: Strengthening it to Support REDD+ Implementation

5.1 This chapter describes the essentials of the present forest management regime, and how it can be moulded by adjustments to support REDD+ implementation. Forest management in the country does not require any major change to support implementation of REDD+. However, certain components and aspects of management need to be strengthened by appropriate infrastructure and capacity building to support good performance of REDD+. Also, causes of forest degradation need thorough analysis and all future programmes in forest sector, like Green India Mission will need to be oriented in addressing drivers of degradation by providing alternate sources of fuelwood, fodder and other forest products required by forest dependent communities. Forests provide multiple benefits and involve multiple stakeholders. There are many agencies and departments whose programmes and policies have significant impact on forestry sector. Development and implementation of REDD+ at national level will require close coordination and strong linkages between all stakeholders of forest sector, which will need to be guided by the MoEF. Effective REDD+ implementation will require a proper supportive governance mechanism, which is described in following paragraphs.

5.2 For implementation of REDD+, appropriate policy and regulatory framework coordinated by MoEF will be needed at national, sub-national and lower levels, i.e., at Central, State or UT, and down up to the field level including village.

5.3 Coordination at national level with relevant stakeholders for close cooperation between various departments, like rural development, tribal welfare, panchayats, agriculture, water, health, tourism, power, finance, etc. and the forest sector will be necessary to ensure sustainable management of forests, to address drivers of forest degradation, and to improve the livelihoods of forest dependent communities including tribals. The institutional mechanism and processes need to be put in place for more effective cross sectoral cooperation for implementation of REDD+, which will require pooling of resources and

efforts for addressing drivers of forest degradation. For example, Ministry of Agriculture has an important role in promotion of farm and agroforestry for increasing area under ToF. MoEF will have the nodal role discharged through its REDD+ Cell, and work with the Planning Commission of India for effective coordination between various Ministries and Departments for integrated action enhancing REDD+ performance.

5.4 Similarly, institutional mechanism for strengthening of cross-sectoral cooperation among relevant stakeholders will be a prerequisite for successful planning and implementation of REDD+ in the States and UTs. Setting up of State level REDD+ Cell with members drawn from relevant stakeholder departments/agencies/NGOs/local communities, etc. will also be required to ensure proper REDD+ implementation.

5.5 Providing an effective mechanism for stakeholder consultation and for participation of all stakeholders including scientific institutions, civil society, communities, NGOs, etc. will be required at all levels of implementation, i.e., central, State and local.

5.6 Adequate technical and institutional capabilities will be required for effective implementation of REDD+ across the country, and also for securing incentives for REDD+ performance. In the beginning, technical preparedness may be required for securing effective, sustainable and predictable fast start financing for REDD+. Regular training of a minimum number of officials and community members will be necessary to establish critical mass of technical manpower.

5.7 Local communities in many places are heavily dependent on withdrawals from forests for sustaining their livelihoods posing the challenge of addressing serious problem of unsustainable demand of forest goods and services, like fuelwood and grazing, which is adversely affecting the extent and quality of services from forests. This will not only cause reduced flow of goods and services from the forests, but, in due course of time, also adversely impact the REDD+ performance of the forests in such localities. This challenge can be addressed by providing alternate clean sources of energy, like LPG, and fodder being grown outside forests, e.g., as an agroforestry component, and thereby confining the withdrawals from forests within limit of sustainable harvests.

5.8 To limit extraction of the NTFPs from forests within sustainable limits, it will be necessary to make periodical assessment of growing stock of different NTFPs to fix annual harvests. This can possibly be done by preparing appropriate working plans and by ensuring their effective implementation, and, if need be, steps could to be initiated to amend the National Working Plan Code.

5.9 Need of an effective communication strategy for involving communities and other relevant stakeholders in protection, management, monitoring of forests, and for carrying out measurements to assess the REDD+ performance. Forest department needs to be more facilitative and flexible and oriented towards preparing and guiding communities in protecting and sustainably managing the forest resources, and to participate in the REDD+ measurements.

5.10 India should join UN-REDD Programme and WB, FCPF to seek technical and financial assistance for REDD+ preparation.

5.11 Guidelines will need to be formulated to channelize flow of REDD+ incentives from the Central Government to the State and UT Governments, and further down to the local communities in proportion of their REDD+ performance.

6. Construction of National Forest Reference Level

6.1 This chapter deals with construction of National Forest Reference Level in accordance with the national circumstances. REL and RL serve as benchmark for assessing performance of implementation of REDD+ in a country. A country which undertakes to reduce emissions from deforestation by checking deforestation and forest degradation will be using REL as the benchmark to assess progress of its performance. On the other hand, RL is relevant benchmark when a country undertakes to increase removals by increased carbon sequestration by its forests. The main elements encompassed in the planning for construction of RL and REL include (i) transparent and conservative approach, (ii) use of best scientific data including historical satellite data for construction of RL/REL, (iii) comprehensive modeling of BAU, (iv) account for national circumstances, (v) periodic updates of RL/REL based on latest information and data.

6.2 Basic question is about choosing REL or RL to operationalize REDD+ in the country. Since India's forest cover is more or less stabilized, and deforestation largely checked, it will be appropriate for India to adopt the approach that would lead to incentivization of increase in removals, i.e., increase in forest carbon stocks. This would make it imperative for India to go for construction of RL.

6.3 It will be imperative for India to have RLs at sub-national level, i.e., at the level of States and UTs, which will coalesce or integrate into a single NFRL. This will help in ascertaining REDD+ performance of individual States and UTs with a view to incentivizing the same.

6.4 Since construction of NFRL is a complex issue, it will be necessary that a consortium of technical organizations comprising FSI, ICFRE, IISc, IIFM, IGNFA, NRSC, IIRS, and others is constituted. This consortium will be charged with the responsibility of constructing the NFRL as also State/UT level sub-national Forest RLs. It will also fully explain the concept, approach and methodology used in construction of the NFRL and SFRLs (State/UT level FRLs). MoEF will approve the same in consultations with the State Governments/State Forest Departments and representatives of civil society. Development of RL/REL at national or sub-national or project level requires significant technical and institutional capacity. Responsibility for building the requisite capacity could be discharged by the consortium of organizations mentioned in this paragraph above.

6.5 It will be necessary to enable use of SFRLs separately for incentivization of REDD+ performance of individual States/UTs. At times, a State may be able to mobilize external assistance for implementing a State level forestry project, inter alia, incentivizing REDD+

performance. SFRL can be used independently to assess and incentivize REDD+ performance of a State/UT during the project period.

6.6 Instances may occur when the SFRL of a State with heavy deforestation or negative removals is to be integrated with the NFRL. Such instances could be there in respect of some North-Eastern States. However, in such cases, the SFRL will be negative indicating net emissions and not removals. A negative SFRL can always be integrated with the NFRL.

6.7 A State/UT intending to address heavy deforestation and/or forest degradation separately and on its own, can always adopt the approach of reducing deforestation as part of the State strategy or as part of an externally funded project. For this initiative at the State level, the State Government may adopt an REL as a benchmark to assess State level REDD+ performance.

6.8 For a sub-State level or a small project, BAU of removals or deforestation as in case of a CDM project can be taken as RL/REL for in respect of the project.

7. Implementation of REDD+: Institutions, Governance and Safeguards; Roles and Responsibilities; Financial Arrangements; Drivers of Deforestation and Forest Degradation

7.1 This chapter addresses the issues related to institutions, governance, safeguards, roles and responsibilities of different organizations, financial arrangements and drivers of deforestation and forest degradation in so far as these have a bearing on REDD+ performance of the country. It also makes it clear that financial support under the aegis of UNFCCC for REDD+ implementation in developing countries is not likely to be available in the near future. REDD+ incentives in future are likely to flow from the UNFCCC to developing countries that undertake any of the 5 identified and agreed REDD+ activities resulting in mitigation of emissions. The Chapter explores multiple options like (i) Multilateral funding for results-based actions from GEF, World Bank, etc., (ii) Bilateral sources like JICA, GIZ, etc. (iii) FCPF, UN-REDD, IUCN, UNDP, etc support for project-level or specific objective or target-level funding, (iv) Internal resource mobilization through Finance Commission Award and private sector support. It also deals with the fact of human dependence on forest for livelihood or commercial needs, which results in degradation of forests. Degradation continuing unchecked for a long time may also lead to deforestation. Causative agents responsible for deforestation and forest degradation are called drivers of deforestation and forest degradation which may be classified into two categories (i) planned and projected in accordance with policies, legal framework and management plans, and (ii) spontaneous, beyond government and management control.

7.2 Although policy and legislative framework is adequate to ensure meaningful participation of the local communities in implementation of REDD+, capacity of the government machinery in the field is lacking to accomplish the task. Functionaries of SFD at all levels specifically at local level need to be adequately sensitized and trained to ensure that the processes, procedures and methodologies for REDD+ are followed in letter and spirit. This

will require a country-wide campaign of capacity building for the government officials as well as the members of the local communities on a war footing.

7.3 Local communities may show a distrust or disinterest towards their participation in REDD+ because of lack of knowledge and sensitization, which may adversely impact the nationwide implementation in due course of time. To address this concern, it will be essential to launch a string of pilot projects at micro level aimed at sensitization and capacity building of the forest officials and local communities to help them understand the finer points and benefits of REDD+ implementation.

7.4 There is no dedicated mechanism to ensure adherence to the UNFCCC safeguards for upholding the rights of the local communities on forest resource, and also for biodiversity conservation in natural forests. Guidance would need to be provided in shape of simple guidelines detailing roles, responsibilities and actions on part of stakeholders including FD, local communities, Panchayats and Gram Sabhas.

7.5 REDD+ incentives would flow from Central Government to State Governments, and further down to local communities in proportion to their REDD+ performance. To ensure a transparent and just mechanism governing the flow of incentives, it will be imperative that guidelines are put in place by the Central Government in consultation with the State Governments and civil society to channelize flow of incentives from Centre to States, and subsequently to local communities. For ease of implementation, it will be desirable to have two separate set of guidelines- one governing incentives flow from Centre to States, and second from States down to local communities. The guidelines, *inter alia*, should provide for an appropriate oversight and monitoring mechanism to ensure fiduciary transparency and integrity of financial flows from Centre to States and onwards to local communities. Present institutional structures existing at State, district, forest division, and village levels like SFDA, FDA, JFMC, and EDC, etc can be strengthened and streamlined for channelizing REDD+ finances and incentives from Central Government to State, and further down to local communities.

7.6 REDD+ funding from UNFCCC is not likely to be available in near future. It is imperative that finances from diverse sources are mobilized for REDD+ implementation. These sources will be internal as well as external. Internal sources will include Finance Commission Awards, CAMPA funds and Additional Central Assistance from Planning Commission. External sources include multilateral agencies like World Bank, GEF, EU, UNDP, IUCN, FAO, etc. Bilateral funding can be sourced through agencies like, JICA, USAID, DFID, or directly from the donor governments like Norway, Denmark, etc.

7.7. Construction of NFRL will be a pre-requisite for ascertaining and incentivizing REDD+ performance.

7.8 India should reconsider participating in UN-REDD and FCPF to leverage resources for capacity building for implementation of REDD+.

7.9 Drivers of deforestation and forest degradation although damaging to environment, support local livelihoods and economies. Therefore, addressing these drivers will have a social and economic cost also. This linkage has been recognized by UNFCCC also, who has

elaborated that the drivers will need to be addressed keeping in view the national circumstances of a country. In view of this, it will be prudent in India to plan alternatives for minimizing use of forest products causing deforestation and forest degradation, and for providing better economic options to local communities simultaneously, else there will always be a possibility of the drivers to resurface and cause even more damage to forests.

7.10 Extraction of fuelwood and fodder from forests constitutes a major part of the destruction and degradation of forests. The situation will not improve unless energy, food and other economic needs of rural communities are met without impacting the environment. This will require huge investment in providing clean energy and developmental infrastructure and opportunities in the rural areas. Planning Commission, Ministry of Rural Development and MoEF may chalk out a workable strategy to mobilize the requisite investment, and technical support.

8. MRV Mechanism and Capacity Building for MRV

8.1 This chapter deals with measurement and monitoring systems necessary to assess the national level REDD+ performance of the country. It outlines the need to develop an overarching cost-effective, robust and compatible national forest monitoring system (NFRM), which, *inter-alia*, will have an MRV system, a safeguards information system, and a forest types and natural forest monitoring system. NFRM will provide tools and methodologies, conduct training, and facilitate knowledge sharing that will enable India to strengthen its technical and institutional capacity for effective MRV and other reporting systems. MRV system should be transparent and should be able to measure and report the level of emissions and removals from time to time which are consistent, accurate, and comparable in verifiable terms, and will form the basis of quantitative assessment of REDD+ performance. The focus of the work is GHG emissions and removals monitoring, measured against a National Forest Reference Level (NFRL) and Reference Levels (RLs)/Reference Emissions Levels (RELs) at sub-national stage, i.e., State/UT level, based on forest inventories and remotely sensed information on extent of forest area. Though the REDD+ concept, as agreed in international negotiations in UNFCCC, is a national level forest carbon stocks accounting approach, but because of specific interest either internally or externally at sub-national level, say an entire State, a district or even smaller sub-district project area, or a geographical or ecological area spanning parts of a number of States, the REDD+ accounting may confine to a State or a number of States, a project or a set of nested projects. MRV for REDD+ is an activity undertaken periodically, precisely, accurately, consistently, and transparently, to measure, report, and to verify the reduction in GHG emissions or increase in removals as a result of REDD+ activities. Defining base year is critical for operationalization of MRV of REDD+.

8.2 REDD+ is still being negotiated in respect of its MRV and many other associated aspects including relevant processes and methodologies. Every developing country participating in REDD+ is required to have a national forest monitoring system comprising MRV, safeguards information, and other supplementary monitoring systems. In view of the evolving international perspective on REDD+, and in the context of India's requirement for developing a robust MRV system, action on following elements is considered necessary for this system to be useful for regular and effective assessment of REDD+ performance in the country:

8.2.1 Development of National Level Strategy for the implementation of REDD+ national level approach.

8.2.2 Designation of FSI as national level institute for MRV.

8.2.3 ICFRE and other organizations should conduct studies to develop forest type and physiographic zone-wise equation/factors for below ground living biomass for important representative tree species and factors for proportion of biomass of shrubs/ climbers/herbs.

8.2.4 Region-wise information demands that the number of sample points should be increased which necessitates both involvement of state forest authorities in data collection work, and also enhancement of technical manpower in FSI.

8.2.5 REDD+ MRV demands repetitive measurements which again require more manpower as indicated in point 4 above. It is proposed that a 4 year cycle is appropriate for REDD+ reporting.

8.2.6 MoEF with the help of FSI, may nominate agencies at state level for MRV including additionality and leakages.

8.2.7 The reference/base year may be 1990, or 2000, or later.

8.2.8 There will be one National Forest Reference Level (NFRL), and State/UT Forest Reference Levels (SFRLs) at sub-national level for assessing REDD+ performance at national and State level.

8.2.9 The State/UT REDD+ cell will oversee the implementation of REDD+ at State and smaller level and National REDD+ cell will monitor and verify the implementation of REDD+ through its designated agencies.

8.2.10 Implementation of SMF shall be monitored on the basis of developed criteria.

8.2.11 Socio-economic survey shall be carried out to assess i) dependence of the local communities on forests, ii) safeguards, and iii) assessment of unsustainable harvest if any.

8.2.12 MoEF must designate centres of excellence to support national as well as State REDD+ cell.

8.2.13 Third party verification of enhanced forest carbon stocks under REDD+ with reasonable transaction cost will be ensured.

9. Capacity Building

9.1 This chapter deals with the need of capacity building and institutionalization of a mechanism to address the requirement of this crucial aspect. Ensuring long-term investment in capacity building is critical for development of a national forest monitoring system comprising MRV and safeguards mechanism for REDD+. Capacity building will need to be institutionalized at the national level with effective reach up to State, sub-State and local levels. Partnership with local communities will be necessary to involve them in regular capacity building and awareness programmes. Besides their participation in REDD+, it is important to enable local communities and other actors to steer their own social and economic development because they are best placed to consider local realities, needs, aspirations and dynamics. By enabling and empowering local communities to develop partnerships with funding agencies, national and local governments, the responsibility of organizing training and other capacity building activities at the local level can be shifted to the local communities. Mapping local forest stakeholders and their networks can identify influential players who should be compulsorily involved in the REDD+ training campaign.

9.2 Strengthening decentralized governance through *Gram Sabhas* and other similar thematic committees, groups, local institutions have significant bearing on forest conservation and sustainable use of forest resource. Empowered and strengthened *Gram Sabhas* hold the key to decentralized governance of the forests and natural resources. Informed *Gram Sabhas* would mean better coordination and linkages across different institutions at local level and improved accountability of such institutions including Gram Panchayats and JFMCs. Comprehensive REDD+ approach and programmes should, therefore, strengthen Gram Sabhas as overarching institutions, supported by thematic committees and user groups (JFMCs, CFM groups, BMCs, etc). Building capacity of local institutions is needed under REDD+ mechanism to enable them effectively protect, regenerate and manage forests, and also complement and share responsibility of SFD in MRV of REDD+ performance. Creating community stake in regeneration of forests and restoration of ecosystems requires that communities have sufficient stake in terms of enhanced biomass, NTFPs and environmental services (including REDD+ benefits) from such areas. Community driven innovative and adaptive silviculture is of critical importance to successfully implement mitigation and adaptation strategies in conservation of ecosystems and enhancement of associated carbon stocks.

9.3 Given the fast changing rural scenario with increase in the number of educated unemployed and underemployed youth, REDD+ should clinch the opportunity to contribute in providing gainful employment with added window for community development, to the local youth cadres, who in due course would be the champions of the forest cause with adequate knowledge of REDD+ implementation and benefits. Support of research institutions, universities, colleges, and schools from local area, Forest Department and NGOs would help develop this cadre of forest champions.

9.4 In order to ensure an integrated approach for REDD+ implementation and MRV at village or cluster or sub-landscape or sub-watershed level, the forest department will need additional capacity. Teams of Subject Matter Specialists at Range and Division level preferably on contractual basis could bring in new knowledge and skills in building capacity of the field staff, local communities and the youth. Capacity building activities for REDD+ implementation should support upgradation of the Range Office into a forest and wildlife resource centre with facilities for library, documentation, map room, GIS and MIS applications. This support should also be available to the partner agencies working in the sub-watershed and sub-landscape level.

9.5 REDD+ decisions presently are available in English and use very complex scientific text, full of technical terminology and acronyms. The concept of REDD+ still remains abstract for most stakeholders and local communities. REDD+ concepts and terms emanating from UNFCCC decisions are still highly technical. There is need to transform gist and spirit of these decisions and allied information into the native language enabling local people and communities to understand the objective of comprehensive REDD+ implementation, and the role that it can play in improving their livelihoods and local environment. REDD+ strategy should, inter-alia, incorporate the requirement to develop information material on the subject in local and vernacular language for use of front line forest staff, grass root level workers and local community.

9.6 It would be appropriate to recommend that an organization with maximum reach and coverage in the country should be given the responsibility of planning and executing the capacity building for REDD+ implementation at all levels including national, state, landscape, watershed and local levels, involving all stakeholders. ICFRE has all the qualifications to undertake this onerous country-wide task. It should coordinate the planning and execution of capacity building strategy in consultation with FSI, IGNFA, IIFM, SFDs and Universities, etc at national, state, local and other levels. In due course of time, ICFRE should develop a *Manual for the Trainers* that will be used by all those involved in capacity building of different stakeholders to facilitate implementation of REDD+. It should be written for trainers who intend to conduct training workshops for key stakeholders like Forest Department personnel, indigenous people, community members and others.

9.7 Capacity building for efficient operationalization of REDD+ is a formidable challenge as it needs to cover all relevant stakeholders, including i) State Forest Department functionaries of all levels specifically the field staff, ii) functionaries of other related departments like Agriculture, Rural Development and Tribal Affairs, etc, iii) members of civil society, and iv) members of local communities, JFM Committees, BMCs, Gram Sabhas, and Panchayats, etc.

9.8 MoEF may incorporate capacity building for REDD+ in its Integrated Forest Protection Scheme, or in the alternative, launch a separate nationwide campaign for REDD+ capacity building as an independent initiative of the Ministry during the ongoing 12 Five Year Plan itself.

10. Research and Knowledge Gaps in the Context of REDD+ in India

10.1 This chapter discusses research and knowledge gaps in the Context of REDD+ in India. Although there is a significant body of research on the science of identifying trends of deforestation, there is lack of credible tools, techniques and research on estimation of forest degradation, and defining and measuring the impact of sustainable management of forests. Forest degradation and the plus components have not yet been defined by UNFCCC. Since, there are no UNFCCC approved definitions for forest degradation and plus components, it would be appropriate to consider understanding, developing and promoting these definitions, particularly in the context of Indian circumstances.

10.2 The most challenging research question for REDD+ preparedness phase is developing a National Forest Reference Level (NFRL) supplemented by sub-national Reference Levels (RLs) covering individual States and UTs. States and UTs that still are facing heavy deforestation or forest degradation can opt for construction of a Reference Emission Level (REL) to measure the performance of checking deforestation and forest degradation. In order to set an RL/REL, along with the present and historic information on forest area and carbon flux, an analysis of factors driving deforestation and forest degradation is imperative. For the plus components, it is equally important to understand the drivers of deforestation and degradation, since these drivers are inversely linked to conservation of forest carbon stocks, sustainable management of forests (SMF) and enhancement of forest carbon stocks. Data on various drivers of deforestation, forest degradation and activities resulting in carbon stock

enhancement and conservation can potentially be gathered through a combination of remote sensing and other non-spatial information such as administrative records. For construction of RL, future areas likely to be subjected to deforestation, forest degradation, carbon stock enhancement, conservation and SMF, can be projected based on the past trends and policy drivers using time-series data on forest cover since 1987 and non-spatial information available from administrative records and other data sources. However, availability of consistent historical carbon stock information presents a significant challenge. It can be addressed to some extent by developing carbon stock values using proxies such as canopy cover through future monitoring and correlating them with the past forest monitoring data.

10.3 Multiple approaches, methods and models are available for developing RL at national or State/UT level. It is necessary to apply all the methods and models and evaluate them in the context of availability of data and maps, and their ability to reliably estimate and project RL. There is a need to evaluate and identify appropriate modeling techniques to develop a consistent approach towards establishing the RL/REL in the Indian context.

10.4 Some of the components of REDD+ may be difficult to implement in India given the limitations of Activity Data (AD) and Emission Factor (EF). Some of the potential challenges with respect to AD and EF that can be addressed through research are:

- Remote sensing maps for multiple time periods for each of the REDD+ activities for a given project location at a scale which would enable project development
- Land use change matrix for the IPCC land categories such as forest land, cropland, grassland, wetland, settlements and other lands
- Emission factor for different IPCC land categories and sub-categories subjected to transition or land use change
- Drivers of deforestation, forest degradation and other plus components

10.5 REDD+ is still a developing subject in terms of technology, methodology and financial options, and, therefore, all aspects of REDD+ require research. However, the identified research areas of REDD+ will need to be prioritized. Institutions will need to be identified in different parts of the country for undertaking research on various aspects related to REDD+ such as identification of potential locations for REDD+ implementation, setting up of NFRL, sub-national/project level RL and REL, generating data for developing project proposals for REDD+.

11. Implementation of Reference Document for REDD+ in India

11.1 This Reference Document for REDD+ will become meaningful only when it is implemented timely and in the right earnest. To facilitate this, it will be useful to prescribe strict timelines for important actions outlined in the document. For example, National Forest Reference Level (NFRL) should be constructed and agreed within 6 months, and capacity building campaign should immediately start covering all stakeholders, including i) State

Forest Department functionaries of all levels specifically the field staff, ii) functionaries of other related departments like Agriculture, Rural Development and Tribal Affairs, etc, iii) members of civil society, and iv) members of local communities, JFM Committees, Gram Sabhas, and Panchayats, etc. Nationwide capacity building exercise should be completed within a period of 1 year from now. Similar timelines can be prescribed for other key actions like strengthening of FSI, and REDD+ Cell of MoEF and State Governments.

11.2 MoEF may consider constitution of a Monitoring Committee to guide and oversee the timely implementation of the REDD+ Reference Document. Also, the Reference Document should be reviewed every 3 years to update it in accordance with the latest UNFCCC decisions and agreements, as also the advancement in policy, legal, institutional, and technological and scientific fields.

Introduction and Overview: National and International Status of REDD+

1. Introduction

Globally, forests are considered to provide a large climate change mitigation opportunity at relatively lower costs along with significant co-benefits. Forests and climate change are very intricately linked. Forests are both sources and sinks of carbon. Global forests cover around 30% of earth's surface, spread over about 4 billion hectares of landmass. The total carbon content of forests has been estimated at 638 Gt in 2005 by FAO, which is more than the amount of carbon in the entire atmosphere. FAO has also estimated that deforestation rates are around 13 million hectares per year. Today, emissions from deforestation and forest degradation in developing countries according to the IPCC constitute about 17.4% of global greenhouse gas emissions. The Stern Review in 2007 reported that globally loss of natural forests contribute more GHG emissions than the transport sector and added that reducing deforestation is one of the cheapest mitigation options. Reducing emissions from deforestation and forest degradation in developing countries is an active agenda in UNFCCC to achieve the climate change mitigation objectives. Rawat and Kishwan in 2008 presented a forest conservation based climate change mitigation approach for India, and advocated for compensating countries for the carbon conserved through sustainable management of forests and enhancement of forest carbon stocks. This Indian approach later on became the 'plus' part of REDD agenda in UNFCCC. Government of India has made several submissions to UNFCCC on various REDD+ related issues (available at www.unfccc.int) since 2007 expressing India's views on these matters. Many authors and organizations like Agarwal *et al.* (2009), Pant *et al.* (2010), and TERI (2012) have also analyzed India's readiness for implementing REDD+.

2. The Concept of REDD and REDD+

Reducing emissions from deforestation in developing countries was being discussed in the side events of the UNFCCC since its Conference of the Parties (COP) 9 in 2003 under different titles of 'Avoided Deforestation', 'Compensated Reduction', 'Reducing Emission from Deforestation (RED)', etc. At COP 11 in 2005 in Montreal, agenda item on Reducing Emissions from Deforestation in developing countries (REDD) was for the first time introduced by Papua New Guinea and Costa Rica. Among other range of policy approaches on REDD, India in 2006 in COP 12 at Nairobi proposed a new potential policy approach based on socio-environmental and technological perspectives and requirements of the country. India proposed that countries that have implemented strong conservation measures and regulations be suitably compensated under the instrument of REDD. The Potential policy approach presented by India was named **Compensated Conservation**. The Indian Proposal is intended to compensate the countries for maintaining and increasing their forests as carbon

pools as a result of conservation and increase/improvement in forest cover backed by a verifiable monitoring system. The Indian approach was discussed at greater length at COP 13 in Bali in 2007. India's push for inclusion of conservation and increment of forest cover as a policy approach to reduce emissions from deforestation was finally recognized and given effect to in the Bali Action Plan (Para 1(b) (iii) of Bali Action Plan) as "*.....Policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries.*" The above paragraph of Bali Action Plan {paragraph 1(b) (iii)} is collectively referred to as 'REDD-plus' or 'REDD+'.

2.1 REDD Plus: Bali Action Plan and after

The outcome of COP 13 at Bali (Indonesia) has been very encouraging for the countries that have practised strong conservation measures in respect of their forest resources. The intense negotiations on putting the agenda of conservation on board at Bali bore fruit when the "*.....role of conservation, sustainable management of forests and enhancement of forest carbon stock....*" found a place in Bali Action Plan, (Decision 1/CP.13) and COP decision on REDD (Decision 2/CP.13). The 'Bali Action Plan' of the UNFCCC mandates Parties to negotiate a post-2012 instrument to provide financial incentives for the mitigation of climate change from forest actions in developing countries.

2.2 Cancun Agreements on REDD+ (COP16 of UNFCCC)

In Cancun, Governments agreed to accelerate action to curb emissions from deforestation and forest degradation in developing countries with due technological and financial support. The Parties taking cue from paragraph 1(b)(iii) of Bali Action Plan also agreed on the list of forestry activities that will qualify for positive incentives under REDD+. Paragraph 70 of the decision 1/CP.16 of Cancun Agreements describes the 5 REDD+ activities as follows:

"Encourages developing country Parties to contribute to mitigation actions in the forest sector by undertaking the following activities, as deemed appropriate by each Party and in accordance with their respective capabilities and national circumstances:

- (a) Reducing emissions from deforestation;
- (b) Reducing emissions from forest degradation;
- (c) Conservation of forest carbon stocks;
- (d) Sustainable management of forest;
- (e) Enhancement of forest carbon stocks;"

In the above paragraph, activities relating to the 'plus' part of REDD+ are indicated at (c), (d) and (e). In Para 1 (b) (iii) of Bali Action Plan on REDD+, (c) above is referred to as 'the role of conservation'. This in Cancun Agreements has now been changed to measurable activity 'conservation of forest carbon stocks'. The REDD+ mechanism agreed by Parties at Cancun COP and contained in decision 1/CP.16, includes a number of principles and clauses concerning safeguards such as:

- need for good forest governance,
- respect for the rights of indigenous peoples and members of local communities,
- protection and conservation of biological diversity and ecosystem services.

Also, countries implementing REDD+ are required to follow safeguards ensuring, for instance, the full participation of indigenous peoples, local communities and other stakeholders. These concerns have been addressed, by adding text on safeguards which states:

‘Actions are consistent with the conservation of natural forests and biological diversity, ensuring that REDD+ actions are not used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits’. Cancun Agreements also prescribe a system for providing information on how the safeguards are being addressed and respected throughout the implementation of the REDD+ activities while respecting sovereignty.

2.3 REDD+ in Durban COP 17:

At COP 17 at Durban, negotiations on REDD+ centered around four key areas: finance, safeguards, reference levels, and measuring, reporting and verification (MRV) of carbon emissions or removals from forest activities. Parties adopted a decision on REDD+ safeguards, requiring them to submit “a summary of information on how all the safeguards established at COP 16 are being addressed and respected throughout the implementation of the REDD+ activities”. Decision on forest reference levels concluded that both forest reference emission levels (a measurement of the trend in emissions from a geographical area) and/or forest reference levels (a measurement of trend in emissions and removals from a geographical area) are required to be established as benchmarks for assessing performance of a country’s REDD+ activities. Durban negotiations could not clearly establish a financing mechanism and the issue of measuring, reporting, and verification (MRV) of REDD+ actions was also left largely unanswered.

In Durban, nationally appropriate mitigation actions (NAMAs) were accepted as a mechanism for developing country parties (non-Annex I) to achieve self-imposed, and currently voluntary, emission reduction goals. A range of mitigation activities, including REDD+ were accepted as eligible NAMAs.

2.4 REDD+ Negotiations in Doha COP 18:

On methodological guidance for activities relating to REDD+, Parties stressed that there was large volume of work on this issue, particularly MRV and national forest monitoring systems. Despite intense negotiations on the agenda, there was no agreement among the Parties on MRV (measuring, reporting and verification). On the issue of REDD+ finance, no concrete decision could be reached, and Parties agreed to undertake a work programme on results-based finance in 2013 capable of supporting the full implementation of the activities referred to in decision 1/CP.16, paragraph 70 (REDD+ activities). COP 18 in Doha also decided that the aim of the work programme was to contribute to the ongoing efforts to scale up and

improve the effectiveness of finance for REDD+ activities, taking into account decision 2/CP.17, paragraphs 66 and 67, and also wide variety of sources in paragraph 65, including:

- (a) Ways and means to transfer payments for results-based actions;
- (b) Ways to incentivize non-carbon benefits;
- (c) Ways to improve the coordination of results-based finance.

2.5 SBSTA 38 RED+ Outcome, and Warsaw COP 19 Expectations:

At the thirty eighth session of SBSTA in Bonn (3-14 June 2013), Parties discussed measuring, reporting and verification; forest reference emission levels and or forest reference levels; national forest monitoring systems; safeguards; drivers of deforestation; non-market based approaches; and non-carbon benefits. As per the REDD+ finance work programme agreed in Doha, two joint SBSTA-SBI workshops were planned to move forward on providing of financial support for REDD+ actions. First of the two workshops titled ‘results-based finance for the full implementation of activities relating to REDD+’ was organized during the 38 SBSTA session at Bonn in June 2013.

SBSTA plenary also adopted conclusions that included following three clean draft decisions for consideration at COP 19:

- (i) *modalities for national forest monitoring systems (NFMS)*, the draft decision called for systems being guided by the IPCC guidance and guidelines as basis for estimating GHG emissions by sources and removals by sinks, forest carbon stocks, and forest carbon stock and forest-area changes; that the NFMS should provide data and information that are transparent, consistent and suitable for MRV; and that the systems should build upon existing systems, enable assessment of different forest types, including natural forests (as defined by the Party), be flexible, and allow for improvement.
- (ii) *the timing and the frequency of presentations of the summary of information on the safeguards referred to in decision 1/CP:16, appendix I, are being addressed and respected*, The draft decision text contains that developing countries should provide a periodic summary of information on how all of the Cancun safeguards are being addressed and respected through national communications or communication channels agreed by the COP after the start of implementation activities; sharing lessons on safeguard processes and safeguard information systems through submissions and the UNFCCC Web Platform.
- (iii) *Addressing drivers of deforestation and forest degradation. And two annexes: i) With elements for a possible draft decision on modalities for MRV and ii) elements for a possible draft decision on guidelines and procedures for a technical assessment of submissions from Parties on proposed forest reference emission levels and/or forest reference levels.*

The text draft decision reaffirms the importance of addressing drivers in the context of national strategies; recognizes that drivers may have causes and actions that are unique to national circumstances/capacities/capabilities; calls on Parties, organizations and private

sector to take action; share the results of work on drivers via UNFCCC Web Platform; and to take note of such shared information.

Measuring, Reporting and Verification (MRV): The text of the draft decision on MRV for COP19 is far from agreement, and the present draft contains many brackets on issues related to the verification. Elements agreed included, the need to develop capacities; transparency and consistency of data and information on emissions by sources and removals by sinks, stocks, stocks and forest area changes, and its relevance with established FRELs/FRLs provided through biennial update reports, expressing of FRELs/FRLs in tonnes of carbon dioxide equivalent per year; use of improved methodologies over time; details on technical analysis of methodological consistency between the reference level and the results.

Forest reference levels and or forest reference emission levels (RLs and RELs): Elements for a possible draft decision on guidelines and procedures for technical assessment of submissions from Parties on proposed FRELs/FRLs have not been agreed to, and are currently bracketed. In essence, each submission on FRELs/FRLs as a follow-up of the Durban decision shall be subject to a technical assessment by experts; Parties and IGOs shall nominate technical experts to be on the UNFCCC roster of experts, and proposal by Parties on FRELs/FRLs will be considered for adoption at COP 19 in accordance with the objectives, scope and procedures of guidelines to be agreed for technical assessment.

Non-Carbon benefits and Non-market based approaches: The non-carbon benefits (NCBs) discussions revealed that further clarity is needed on definition of NCBs. On non-market based approaches, the general feeling is that these approaches are currently not excluded, and that these have a definite role. Seeking more clarity on such approaches, submissions have been requested from Parties by 26 March 2014, and an in-session expert meeting will be organized at SBSTA 40 to continue discussions on the subject.

2.6 COP 19 at Warsaw, 2013 agreed on a REDD+ framework. It reaffirmed that results-based new, additional and predictable finance, which may come from a variety of sources, public and private, bilateral and multilateral, including alternative sources, should be provided to developing countries for the implementation of REDD+. The result-based progression has to occur for all phases of action and activities of REDD+ as agreed by COP16 at Cancun. The result-based actions have to be fully measured, reported and verified. This will include development and implementation of national strategies or action plans, capacity building and in a phased manner.

3. Key Issues and Action Points

1. Although India has been in forefront in shaping the evolution of the comprehensive concept of REDD+ at the international level, it needs much more to do domestically to ensure purposeful implementation of REDD+. It faces the challenge of constructing the National Forest Reference Level, a National Forest Monitoring System comprising independent MRV and Safeguards Information systems.

2. It is now evident that carbon service alone can neither sustain the forest ecosystem nor the livelihoods of local communities dependent on goods and services flowing from such an ecosystem. In India, this realization must be internalized in policy, planning and actions at Central and State levels with a view to according equal importance to all forest ecosystem goods and services, and treating forest carbon service as one of the important services. Sooner or later, international community including in the UNFCCC, will start debating ways and means of putting a value on each of the other forest ecosystem goods and services. India must prepare itself technically, politically and institutionally to participate effectively in the future negotiations with a view to safeguarding its national as well as the interests of its local communities dependent on forests.

3. India while ensuring transformation of REDD into REDD+ at Bali COP in 2006, was successful in ensuring the inclusion of positive incentives for conserved or stabilized forest carbon stocks in addition to saved or added forest carbon stocks. Indian negotiators must keep a note of this important fact, and ensure that incentives for conserved or stabilized forest carbon stocks are not pushed aside in future negotiations.

National Policy Framework for REDD+ Implementation

1. Introduction

REDD+ refers to reducing emissions from deforestation and forest degradation in developing countries, combined with conservation, sustainable management of forests and enhancement of forest carbon stocks. Abatement of forest-based CO₂ emission is critical to limiting global warming. The UN's Intergovernmental Panel on Climate Change (IPCC) estimated in 2007 that the forest sector and other sectors that impact land use – through deforestation, forest degradation and other changes in forests – contribute approximately 17% of global greenhouse gas (GHG) emissions or approximately 5.8 Gt of carbon dioxide equivalent (CO₂eq), per year. These emissions are mainly taking place in tropical developing countries.

Forests are important for both adaptation and mitigation strategies of addressing climate change. Forests neutralize about 11% of India's GHG Emissions. India added around 3 mha of forests in the last decade, 1997-2007. India is world's 4th largest economy and 5th largest GHG emitter, accounting for about 5% of global emissions. Its emissions increased by 65% between 1990 and 2005 and are projected to grow another 70% by 2020. On a per capita basis, India's emissions are 70% below the world average and 93% below that of the United States. The total forest and tree cover of the country is 78.29 mha (23.81% of GA¹) which includes 69.20 mha of forests (21.05% GA) and 2.76% (SFR, 2011) area under trees outside forests (ToF). In terms of density classes, area of Very Dense Forest (VDF) is 83,471 km² (2.54% GA), Moderately Dense Forest (MDF) 320,736 km² (9.76% GA) and Open Forest (OF) 287,820 km² (8.75%). Total Growing stock of India's forest and ToF is estimated as 6,047.15 cum and the total carbon stock of the India's forest is estimated to be 6,663 million tonnes. India is one of the few countries of the world to have a robust and scientific system of periodic forest cover assessment.

There has been considerable progress in stabilizing and maintaining the overall forest cover, i.e., in checking deforestation. However, forest degradation due to various factors including dependency of local communities, is a formidable challenge to be addressed on priority. The problem becomes complicated as it is considerably difficult to measure and monitor forest degradation. Country's forests are under tremendous pressure to meet demands of fuelwood, fodder, Non Timber Forest Products (NTFPs), etc. of the local communities dependent on forests for livelihood and sustenance. Consequently, the issue of sustainable harvesting within the carrying capacity of forests has become very important. With increasing population and a nation fast-moving towards economic prosperity, demands on forests and natural resources are likely to rise steeply in the near future. REDD+ implementation is expected to facilitate monitoring and reporting of forest resource use trends and in ensuring conservation of existing forest cover, its enhancement, and more importantly, in improving quality of forests so that ecosystem services including carbon, are sustained and enhanced.

There are more than 300 million forest dependent people including around 104.28 million Scheduled Tribes, deriving their livelihood and substantial part of their income from forests. India started Joint Forest Management (JFM), a partnership between local communities and

¹ Geographical area

the Forest Department in the nineteen eighties following the “Care and Share” principle. Around 100 thousand JFM Committees involving around 20 million people are managing approximately 22 mha of forest area. JFM has contributed significantly in stabilizing forest and tree cover of the country. There is a great scope for improvement of forest cover by addressing drivers of forest degradation with people’s participation and cross-sectoral support. People’s involvement in assisting measurement and monitoring of forest carbon stocks will be essential for successful implementation of REDD+.

In view of the close linkage of the livelihoods of the local communities with the forests, it is imperative that India adopts a comprehensive approach for REDD+ implementation, which will give equal importance to all ecosystem services flowing from forests. Carbon will be considered as one such service in the basket of ecosystem services.

2. Present Policy Environment and its applicability for REDD+ Framework

The principal aim of National Forest Policy, 1988 (NFP) is to ensure environmental stability and maintenance of ecological balance. The policy aims for maintaining one-third of the country’s geographical area under forest and tree cover and calls for massive afforestation and social forestry programmes with people’s participation for increasing the forest and tree cover in the country. This strategy will also meet the domestic requirements of forest products including fuelwood, fodder, minor forest produce and small timber of the rural and tribal populations. NFP calls for increasing the productivity of forests to meet essential national needs and encouraging efficient utilization of forest produce through the application of scientific and technical inputs.

The NFP also provides for protection of rights and concessions of tribals and other poor people living in and around forests while making their domestic requirements of fuelwood, fodder, minor forests produce and construction timber to be the first charge on forest produce, within the carrying capacity of the forests. The policy recommends to closely associate the tribal people in the protection, regeneration and development of forests as well as to provide gainful employment to people living in and around the forested areas.

The subject “Forestry” falls in the concurrent list of Schedule-VII of the Constitution of India, thereby empowering both State and Central Governments to legislate and make laws on the subject. The management and protection of forests is the duty of State Governments, whereas the Central Government provides policy directions and guidelines on common forestry related issues from time to time. The Indian Forest Act, 1927 provides for law relating to forests, transit of forest produce, duty leviable on timber and other forest produce, arms forest officers with certain powers to ensure forest protection. The Wildlife (Protection) Act, 1972 provides for conservation, protection and management of Wildlife. The Forest (Conservation) Act, 1980 regulates diversion of forest land for non forestry purposes. The recently enacted “Scheduled Tribes and Other Traditional Forest Dwelling Communities (Recognition of Forest Rights) Act, 2006”, aims to recognize and vest the forest rights and occupation of forest land on forest dwelling Scheduled Tribes and other traditional Forest Dwellers, who have been residing in such forests for generations, but whose rights could not be recorded. This legislation has also empowered forest dwelling communities in managing

and conserving forest resources.

A closer look at the NFP and legal framework prescriptions makes it amply clear that the emphasis on maintaining ecological balance and environmental stability, giving high priority to meeting the forest-based needs of the local communities, creating a movement for increasing the forested area in the country, and strictly regulating the diversion of the forest land, are all indicators of a positive REDD+ performance.

3. Requirements for operationalization of REDD+ in India

Certain policy prescriptions and government support will be required for REDD+ implementation across the country in all States and UTs. Some of the major policy requirements are enumerated below:

- (i) A strong and enabling policy and legal framework for forest and biodiversity conservation.
- (ii) Strengthening cross sectoral cooperation in the forestry sector for realizing multiple benefits of forests and enhancing forest resource base for sustainably meeting livelihood needs of forest dependent communities.
- (iii) REDD+ readiness to be ensured through a) full stakeholder participation and consultation; b) existence of clear tenural rights; c) formulation of guidelines for equitable REDD+ benefit distribution and conflict resolution; d) establishment of transparent systems for revenue management and non-carbon monitoring; and e) institutionalization of cross-sectoral coordination.
- (iv) Effective national REDD+ governance based on transparency, inclusiveness and effective participation of all relevant stakeholders including tribals and forest dwelling people, civil society, NGOs and other stakeholder departments in national and international REDD+ decision making, strategy development and implementation.
- (v) Transparent, equitable and accountable management of financial incentives and funds from Central Government to States and UTs and thence to local communities on account of REDD+ performance based payments.
- (vi) Development of MRV and monitoring systems.
- (vii) Enabling of forest sector through strengthened national and sub-national capacities to develop sustainable REDD+ investment strategies and portfolios.

4. Broad contours of National REDD+ Policy and Strategy

The National REDD+ Policy should be subservient to the National Forest Policy, 1988 and National Environment Policy, 2006 and provide an instrument for better integration and effective coordination with other socio-economic sectoral policies. The REDD+ Policy should create a positive environment for recognition of forest and biodiversity conservation efforts of the country at the international level as well as create financial and other livelihood incentives for the local communities engaged in conservation, management and development of forest resource. The high point of the proposed REDD+ Policy is India's commitment to pass on the entire financial benefits on account of REDD+ implementation to the communities engaged in forest conservation.

The National REDD+ Strategy should focus on national coordination mechanisms and capacities of existing Indian institutions to estimate carbon and non-carbon benefits from the forest sector, such as biodiversity conservation and other ecosystem services which according

to national policy are integral to REDD+ implementation. The strategy calls for intra-sectoral as well as inter-sectoral cooperation to be facilitated and coordinated by MoEF through its REDD+ Cell. Important institutions in this context are FSI, ICFRE, State Forest Departments (SFDs) and relevant Ministries and Departments of Central and State Governments with policies and programmes having impacts on forests, and, therefore, on the implementation of REDD+. The REDD+ strategy should not only provide for a sustainable way forward for management of natural resources of the country, but also help in building capacities for addressing national resource planning and managing multiple stressors and climate related challenges. Following critical areas require attention at the initial stage to ensure smooth and efficient implementation of REDD+ in long run subsequently:

- (i) improving capacity for national coordination within MoEF through the REDD+ Cell involving all stakeholder ministries and departments such as Ministries of a) Rural Development, b) Agriculture, c) Tribal Affairs, d) Finance, e) External Affairs (for international cooperation), f) Water Resources, g) Tourism, h) Health, i) Panchayati Raj, j) Science and Technology, and k) Planning Commission, etc;
- (ii) strengthening processes of preparation and management of the National Forest Inventory (NFI) by enhancing capacities within the FSI, SFDs and local communities for improving the institutional framework and infrastructure for REDD+ carbon measuring and reporting. ICFRE and IIFM to play key role in organizing and implementing strategy for capacity building of SFDs, other stakeholder departments and organizations, and local communities;
- (iii) building capacity within ICFRE and its institutes, IIFM and other relevant institutions for comprehensive national level reporting and monitoring on improved ecosystem services, net positive benefits to communities and biodiversity from REDD + implementation; and
- (iv) planning and developing strategies at the regional, state and local levels for quick and effective estimation of forest carbon stocks at local, state, regional and finally at national level.

5. Institutional Framework for REDD+

A national strategy to build a well-connected network of institutional affiliations with standard protocols and methodologies will be essential for promoting REDD+ at the local, regional, sub-national and national levels. Coordination mechanisms, functional both at national and sub-national levels linking corresponding REDD+ entities will be required with nodal points of contact appointed for each of these entities. At State level, a State REDD+ Nodal Point or a Cell will be required to coordinate and implement REDD+ actions.

6. National Level REDD+ Architecture

6.1 REDD+ cell in the MoEF

MoEF, the national nodal Ministry with mandate for dealing with policy and technical issues relevant to the United Nations Framework Convention on Climate Change (UNFCCC) including REDD+ negotiations is, *inter alia*, responsible for reporting India's global greenhouse gas (GHG) inventory through National Communications. The REDD+ Cell created in the MoEF needs to be strengthened on priority to ensure proper implementation of REDD+ through effective coordination of India's REDD+ actions at all levels- national, sub-national, regional, state and local. The Cell should work closely with the Climate Change Division and the Forest Policy Division within MoEF for analytical application, implementation and reporting of REDD+ actions, and also actively facilitate nation-wide coordination. As REDD+ is a global endeavour, the Cell will need to be prepared to respond

both nationally and internationally on all issues related to policy, technical and implementation aspects of REDD+. This will require that the Cell is appropriately staffed and funded to carry out its pivotal role, and is guided by a Steering Committee chaired by the Secretary, MoEF.

At the national level, institutions responsible for carbon estimation as well as those institutions critical to carrying out measurements of non-carbon benefits will need to first of all engage on building capacity in several areas to address gaps and meet the challenges for REDD+ implementation. REDD+ multilevel institutional framework needs to allow for these multiple sub-national forest management and capacity building mechanisms to co-exist. For instance, in JFM areas, the Forest Development Agency (FDA) structure could be utilized for implementing REDD+ actions after realignment of JFM Committee working with that of the concerned Gram Sabha(s). Such arrangements should also take into consideration the requirement of implementation of Green India Mission (GIM).

REDD+ implementation is also related to incentives or compensation for encouraging activities that contribute to sustainable management and the enhancement of forest carbon stocks while at the same time reducing activities that contribute to degradation and deforestation of forests. As REDD+ international architecture is still evolving, it would be prudent to view financial remuneration from carbon accruals only as a means of augmenting and diversifying rural income. In any case, the overarching principle will be that all ecosystem goods and services from forests are equally important specifically for local communities, and carbon is not to be treated as an overriding service as financial incentives from carbon alone may not be sufficient motivation for communities to protect forests, or plant trees. Absence of REDD+ financing at the international level so far, requires integration of broader livelihood strategies with carbon strategies, such as establishing market linkages for NTFPs, increasing access to clean energy, and increasing efficiency of fuelwood use that could reduce consumption, and lower extraction rates of fuelwood from forests, which would result in reduction of emissions from forest degradation under REDD+. In order to make REDD+ a comprehensive and integrated approach to deal with climate change, collaboration with key ministries, such as the Ministry of Agriculture, Ministry of Power, Ministry of Rural Development, Ministry of Panchayati Raj, and Ministry of Water Resources is critical. An outline of the national and sub-national levels architecture for implementation of REDD+ is proposed below:

6.2 Estimation of carbon and non-carbon benefits

FSI has the requisite expertise to be able to conduct national forest carbon inventories. However, preparation of the national inventory for REDD+ will require FSI to have enhanced capacity for carbon estimation and measurement by way of strengthening its present technical manpower at both its headquarters and also its zonal offices. Monitoring of carbon stocks and development and standardization of remote sensing methodologies to measure carbon stocks will need close coordination between FSI and SFDs, with later taking the responsibility of doing the field work as per guidance of FSI. The key role of SFDs in measurement of forest carbon stocks will necessitate the capacity building of SFD staff at different levels along with the members of the local communities who will also be actively associated in the process of measurement of the forest carbon.

FSI, ICFRE, IIFM, WII, IISc and other scientific and technical institutions need greater collaboration for purposeful implementation of REDD+. The most important tasks at hand of these organizations or their consortium is to immediately launch a coordinated programme on

a war footing to build capacity of the SFD staff, local communities and personnel of other stakeholder departments for REDD+ implementation across the country. These organizations should also help in developing methodologies for quick, easy and cost effective measurement of other ecosystem services in forestry sector, so that as and when required, these services like carbon could also be incentivized. Collaboration with the National Bureau of Soil Survey and Land Use Planning (NBSS&LUP) would be useful for making measurements of the soil organic carbon (SOC). FSI will develop appropriate working arrangements with NBSS&LUP for the purpose. Similar action from FSI will be required in respect of the Central Soil and Water Conservation Research and Training Institute (CSWCRTI), whose role will be important in providing expertise regionally for technical guidance and capacity building in the context of SOC measurements. IMD would be useful in providing meteorological data for working on relationship between climate change parameters and the efficacy of mitigation measures including REDD+ in forest sector.

There is a need to carry out ecosystem and socio-economic research for developing REDD+ baselines or reference level(s) to facilitate measurement of quantum and value of ecosystem services and associated benefits periodically. ICFRE through its various institutes and associated centres is rightly suited for building capacity in areas relevant for comprehensive approach for REDD+, like ecosystem science, adaptation science, socio-economic research, and valuation of ecosystem services, including carbon. To accomplish this across the 14 physiographic zones of the country, it will be required to develop a measuring, monitoring and reporting infrastructure as well as standardized methodologies and protocols. Developing adaptation options for critical ecosystems and threatened and endangered plant and animal species will need to be addressed through the development of national protocols. The lack of taxonomic expertise for recording, reporting and monitoring biodiversity will need to be addressed. There is an urgent need to create scholarships at undergraduate and graduate levels in selected institutions, leading to degrees specializing in plant and animal classification and taxonomy with compulsory internships at FSI or its zonal offices or ICFRE institutes and other organizations as part of the coursework.

6.3 Sub-national Level Arrangements

At the sub-national level, SFDs, Regional Centres of FSI, ICFRE, State Remote Sensing Application Centres, etc. as well as expert NGOs, civil societies have an important role to play. Existing institutional and technical capacity at the regional and state levels for REDD+ implementation in respect of measurement of carbon, other ecosystem services, and application of ecological science, adaptation and assessment of ecosystem services needs to be strengthened after proper gap analysis. Collaborative arrangements that engage and bind sub-national partners to meet REDD+ implementation needs are extremely important, and hence necessary. There is a lack of awareness at the state and local level about climate change and REDD+. Building and raising awareness on climate change and REDD+ issues at both state and local levels is needed. The REDD+ implementation mechanisms at the state and local level should be able to integrate and leverage funds from other government schemes, such as MGNREGA and watershed development schemes and projects, that have provisions for undertaking tree planting and saving greenery on public as well as private lands.

6.4 National to Sub-national collaboration on carbon estimation

For specialized inventory and carbon estimation work for REDD+, SFDs will need technical and capacity building assistance from FSI for data collection, quality assurance and quality control (QA/QC), data input and analysis. From an ecosystems and administrative

perspective, it will be imperative that States and UTs have their individual forest reference levels (FRLs) that will ultimately merge with the NFRL. FSI zonal offices can help States and UTs in developing their FRLs. In addition, the zonal offices will coordinate and facilitate the REDD+ data collection in their respective States. Each FSI zonal office will need to have a nodal point to liaise with his counterpart nodal points in respective States and UTs. For effective REDD+ reporting and data collection, mechanisms and collaborations will need to be formalized and nodal points of contact for REDD+ will need to be established at the divisional and sub-divisional levels also. ICFRE and other institutes may also follow the same collaborative mechanism.

6.5 Participation of community in REDD+ implementation

At present, local communities are not involved in forest inventory data collection or forest monitoring. With adequate training, they can assist forestry professionals in preparing inventory and also undertake monitoring activities required for REDD+ measurement and reporting. This would also inculcate in the local communities an increased sense of ownership in the REDD+ implementation. Some measures that will be essential for facilitating the participation of local communities in REDD+ implementation are outlined below:

- (i) Implementation of REDD+ programme will require a good communicating strategy for involving local communities, Gram Sabhas, JFMCs to sensitize them about the benefits of REDD+, including the employment generated in preparation of periodic inventories and monitoring.
- (ii) Improving the efficient utilization of forest products by facilitating establishment of processing units for NTFPs at the village level to provide better returns to the primary collectors.
- (iii) In JFM areas, the FDA structure may be utilized for implementing REDD+. The scope of the FDAs would have to be widened to include state government funded or externally funded JFM Committee projects.
- (iv) Evolving a fair and equitable system for distribution of benefits from sales of timber and NTFPs, between forest departments and JFMCs, and appropriate guidelines for apportioning performance based carbon revenues amongst local communities from REDD+ implementation.
- (v) Integrating JFM institutions into state and national level REDD+ architecture will require time, resources and focused strategy for building capacities.

7. REDD+ Implementation at the Project Level

Although REDD+ is a national level forest carbon stocks accounting concept, the fact remains that REDD+ projects are also being implemented in many developing countries to focus on a specific aspect of REDD+ including construction of forest reference level at national or a sub-national level, or measuring, reporting and incentivizing REDD+ performance at sub-national or even at a smaller project level. India should be open to accepting offers for such sub-national projects from external funding agencies, and also be prepared to fund the same internally as and when the need arises.

8. Key Issues and Action Points

1. All ecosystem services from forests are equally important, be it timber, wood, NTFP, fodder, fiber, medicinal plants, water, soil conservation, biodiversity conservation, and carbon, from the point of view of livelihood support to local communities. Carbon is not the overriding service, but one in the basket of important forest ecosystem services. Incentivization of carbon service will supplement the benefits of other goods and services from forests.
2. REDD+ incentives whenever these become available will flow in totality to the local communities in proportion to their REDD+ performance. Central Government in consultation with State Governments will formulate guidelines prescribing procedure and norms for flow of financial incentives from Central to State Governments and further down to the local communities.
3. Processes and methodologies for quick, accurate and cost effective MRV of forest carbon stocks will be finalized on top priority by FSI in consultation with other technical organizations like ICFRE, IISc, IIFM, etc., under the overall guidance of the MoEF.
4. Methodologies for MRV of other ecosystem services should be formulated and standardized to facilitate their incentivization in due course of time.
5. NFRL should be constructed on priority and without losing time as NFRL is a prerequisite for determination and incentivization of REDD+ performance. NFRL should comprise sub-national FRLs at State and UT level.
6. FSI will be the main coordinating organization at the national level to compile national level forest carbon stocks account. SFDs assisted by State Remote Sensing Application Centres will be responsible for compiling the forest carbon stocks account at the State or UT level. Local communities will play an important role in assisting the SFD in carrying out estimation of the forest carbon stocks at the local level.
7. ICFRE, IIFM and other technical organizations will discharge the responsibility of capacity building of the SFD staff, local communities and staff of other stakeholder departments in a time-bound manner, and on a war footing.
8. Although REDD+ is a national level forest carbon stocks accounting concept, sub-national level projects covering specific aspects of REDD+ are also important to further the understanding of technical, policy and implementation related issues of REDD+. Such projects could cover an entire State or UT or a smaller part thereof, or even a well known region spanning more than one State or UT, like Western Himalayan Region, North-Eastern States, Central Tribal Belt, Western Ghats, to name a few. India should be open to accepting offers for such sub-national projects from external funding agencies, and also be prepared to funding the same internally as and when the need arises.

Definitions: REDD+ in the Indian Context

1. Introduction

In this chapter, the definitions of various terms related to forests under the UNFCCC are presented. Definitions of Reducing Emissions from Deforestation and Forest Degradation (REDD), Forests, Deforestation, Degradation, Role of Conservation, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks (REDD+) are presented along with relevance for India.

2. Definition of REDD+

The Bali Action Plan describes REDD+ comprehensively as follows:

“Policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries”. The components of REDD+ include:

- Reducing emissions from deforestation;
- Reducing emissions from forest degradation;
- Conservation of forest carbon stocks;
- Sustainable management of forests; and
- Enhancement of forest carbon stocks.

The MoEF (2010b) defined REDD+ as a mechanism that “goes beyond merely checking deforestation and forest degradation, and includes incentives for positive elements of conservation, sustainable management of forests and enhancement of forest carbon stocks”.²

3. Definition of Forest

3.1 UNFCCC, 2001³: Forest is a minimum area of land of 0.05-1.0 hectares with tree crown cover (or equivalent stocking level) of more than 10-30 per cent with trees with the potential to reach a minimum height of 2-5 meters at maturity in situ. A forest may consist either of closed forest formations where trees of various storey's and undergrowth cover a high proportion of the ground or open forest. Young natural stands and all plantations which have yet to reach a crown density of 10-30 per cent or tree height of 2-5 meters are included under forest, as are areas normally forming part of the forest area which are temporarily un-stocked

²Ministry of Environment and Forests, Government of India, 2010, *India's Forest and REDD+*

³<http://unfccc.int/resource/docs/cop6secpart/111r01.pdf>

as a result of human intervention such as harvesting or natural causes but which are expected to revert to forest.

3.2 India's Definition of Forest for UNFCCC (Clean Development Mechanism)

India's current definition submitted to UNFCCC for Afforestation and Reforestation (A/R) under CDM (Clean Development Mechanism):

A single minimum tree crown cover value of 15%, a single minimum land area value of 0.05 ha and a single minimum tree height value of 2 metres.⁴

3.3 Definition of Forest according to FSI

The Forest Survey of India (FSI) defines forest cover as "all lands more than one hectare in area, with a tree canopy density of more than 10%, irrespective of ownership and legal status" and the minimum mapping unit is 1 hectare. Thus forest cover, as reported by the State Forest Report (SFR) does not make any distinction between the origin of tree crops (whether natural or man-made) or tree species; and encompasses all types of lands irrespective of their ownership, land use and legal status, thereby including all tree species along with bamboos, fruit bearing trees, coconut, palm trees, etc., and all areas meeting the above defined criteria, irrespective of whether it is forest, private community or institutional land⁵.

As will be reiterated in several of the definitions below, it is recommended that for ease of Measuring, Reporting and Verification (MRV), mapping unit should be consistent with FSI's mapping unit of 1 ha and the tree crown cover value should also be consistent with the definition of FSI, which is 10%.

3.4 Definition of Forest for REDD+

There could be a number of options for the purpose. However, here only two options are being mentioned, which are considered to be workable.

Option 1: The current definition with respect to CDM is adopted for REDD+ implementation. REDD+ being a national forest carbon stocks accounting approach, will include all vegetation that qualifies to be CDM forest across the country, and thus will include private plantations also. It is, therefore, important to formulate guidelines and safeguards that would ensure that the incentives are apportioned to the private planters in accordance with their REDD+ performance. Care will also be taken that the guidelines and safeguards so formulated are in tune with the spirit and principles of the National Forest Policy.

Option 2: The definition of forest as used by FSI for reporting the status of forest in the country every two years through publication of the State of Forest Report (SFR), is adopted by the GOI for reporting on the forest carbon stocks also. This will be a preferred option as FSI who will be the nodal point for guiding and compiling the forest carbon stocks accounts at the national level, will find it easier to discharge this additional responsibility without making changes in its basic methodology of sampling and digitization presently used for assessment of the forest cover. This fact may be kept note of, and whenever the subject

⁴<https://cdm.unfccc.int/DNA/index.html>

⁵ State of forest report, India, 2011; http://www.fsi.org.in/sfr_2011.htm

comes up for discussion, debate and decision in UNFCCC, India's negotiators should be adequately prepared to take care of the same.⁶

4. Definition of Deforestation

4.1 Deforestation occurs only when forest land is converted to non-forest purposes, for example, for agriculture. Deforestation does require to be defined in the context of UNFCCC. This does not, however, include forest areas subjected to harvesting as a part of forest management, where the harvested plots recover and forest regenerates. Most definitions describe deforestation as the long-term or permanent conversion of land from forest to non-forest use. In Decision 16/CMP.1, deforestation is defined as '*the direct human-induced conversion of forested land to non-forested land*'⁷. The Food and Agriculture Organization defines deforestation as 'the conversion of forest to another land use or the long-term reduction of the tree canopy cover below the minimum 10% threshold'⁸.

Implication of definition of forest on deforestation

1. *Tree canopy cover*: If for REDD+, we follow the forest definition submitted to UNFCCC for CDM by India, historical data will need to be reclassified, and it may result in higher rate of deforestation for the country. Further, for REDD+ accounting, the FSI maps may need to be reclassified for 15% tree crown cover, which will involve huge cost, human effort and delays. **Hence, the 10% crown cover definition used by FSI is recommended for REDD+ accounting as suggested in Option 2 on last page.**
2. The Minimum Mapping Unit (MMU) using LISS-III dataset is 1.0 ha which is readily available with FSI. REDD+ is a national accounting concept and approach, for claiming benefit through this mechanism, and requires measurement and monitoring in whole geographical area of the country, which is possible, as is being done for preparation of ISFR using LISS III remotely sensed dataset. If this threshold of area (1 ha) is reduced, dataset from a sensor having higher spatial resolution will have to be used, which has in general, problems of availability, manifold increase in work load, increased cost, and difficulty in meeting timeliness. **Hence, minimum area for assessment of REDD+ is recommended to be 1 ha, which is consistent with FSI definition.**

4.2 Potential for reducing deforestation in India

Based on latest FSI estimates of forest cover for the period 2007-2009 as appearing in SFR 2011, the gross annual loss of forests has been put at 99,850 ha, even though the total area under forests has increased⁹. All the same, there is scope of increasing the performance of REDD+ by further reducing the deforestation.

⁶ FSI has been reporting on the tree cover also in the SFR which includes areas of vegetation which are <1 ha in area, and could also be in linear formation. FSI and country's negotiators should keep a note of this also for continuously exploring the possibility of incorporating this component in the national forest carbon stocks accounting as the same has the potential of benefitting a large number of farmers practising agroforestry who are planting trees within and on the boundary of their agricultural fields.

⁷ UNFCCC: http://unfccc.int/files/meetings/workshops/other_meetings/application/pdf/11cp7.pdf

⁸ FAO, <http://www.fao.org/docrep/005/Y4171E/Y4171E10.htm>

⁹ Ravindranath N.H, Srivastava N., Murthy I., Malaviya S., Munsri M., Sharma N, 2012, Deforestation and forest degradation in India – implications for REDD+, Current Science, vol. 102, no. 8, 25

5. Degradation

5.1 Defining forest degradation is complex and has been variously described in different studies. Forest degradation is defined as ‘direct human induced long-term loss (persisting for X years or more) of at least Y% of forest carbon stocks (and forest values) since time (T) and not qualifying as deforestation’ or an elected activity under Article 3.4 of the Kyoto Protocol¹⁰. However this definition has operational limitations because X (human-induced long-term loss), Y (% of forest carbon stocks) and the minimum area of forest to be measured are difficult to define¹¹. Forest degradation is a complex process and its drivers may be completely different than those for deforestation. A degraded forest may not become totally deforested. Inclusion of forest degradation in REDD+ was important to avoid leakage of considerable amounts of forest based emissions (e.g., forest with crown cover of 70% could be degraded to 15% and still be classified as forest)¹².

In summary, degradation refers to changes within forest which negatively affect the structure or function of the forest stand or site and thereby lower the capacity of the forest to supply products or services.¹³

IPCC (2003) has defined forest degradation as follows:

- A direct human induced loss of forest values (particularly carbon), likely to be characterized by a reduction of tree cover. Routine management from which crown cover will recover within the normal cycle of forest management operations is not included.
- A direct human-induced activity that leads to a long-term reduction in forest carbon stocks.
- The overuse of poorly managed forests that leads to long-term reduced biomass density (carbon stocks).

No formal definition of degradation has yet been adopted by UNFCCC. India has been monitoring and reporting forest cover according to four tree crown density classes. Thus, in the Indian context, degradation may be defined as "***Transition from higher to lower tree crown density and/or removal of lower canopy biomass or disturbance of soil, leading to reduction in forest carbon stocks***". Monitoring of tree crown density is the most cost-effective and practical alternative to monitoring degradation. However, this will have limitation of the present categorization of crown cover into 4 density classes. Movement of forest degradation within the same crown class cannot be deciphered easily. However, use of statistically appropriate sampling for measurement of forest carbon stocks to supplement satellite data may capture the trend of degradation within the same density class on a micro scale. This can further be extrapolated to correlate the reduction in tree crown density to carbon stocks in different forest types and eco zones.

5.2 Potential for reducing forest degradation in India

Assessment of forest degradation based on tree crown densities shows that it varies across

¹⁰ http://unfccc.int/files/methods_and_science/lulucf/application/pdf/060830_killmann.pdf

¹¹ Angelson A, (2008) Moving ahead with REDD: issues, options and implications. Centre for International Forestry Research (CIFOR), Bogor, p 156

¹² Murdiyarto, D., van Noordwijk, M., Puntodewo, A., Widayati, A. and Lusiana, B, 2008. District scale prioritization for A/R CDM project activities in Indonesia in line with sustainable development objectives. Agriculture Ecosystems and Environment 126: 59-66

¹³ <http://unfccc.int/resource/docs/2006/smsn/igo/002.pdf>

different assessment periods. Based on the transition from higher to lower tree crown classes, degradation has occurred during the periods 2003–05 and 2005–07. However, during 2007–09 (SFR, 2011), there was no degradation. However, change in carbon stocks, if any may have to be accounted for (Ravindranath et al., 2012).

6. Conservation

6.1 Conservation could be interpreted as "Forest Conservation" and is a means to reduce GHG emissions. Conservation could be defined as "*Maintenance of area under existing forests to conserve, maintain, and possibly enhance the forest carbon stocks*" through conservation efforts. This could involve, i) consideration of forests with high carbon density and its maintenance through conservation and development to reduce pressure on forests, and ii) banning or regulation of extraction or harvesting of biomass, protection of forests and improved fire management. The role of conservation has not been defined under UNFCCC. Thus there is a need to suggest a definition for "Conservation". This definition should consider area as well as carbon stocks.

6.2 Potential for conservation under REDD+ in India

The area under Protected Area (PA) management is increasing in India. Since in the PAs, all extraction is regulated or highly restricted, the forest vegetation, biodiversity and in turn forest carbon stocks are potentially conserved. With the addition of biomass due to annual increment, the biomass as well as the forest carbon stocks are not only conserved but also grow with the time. REDD+ can be considered as a financing or resource mobilization tool to strengthen management of PAs in future. The Reserved Forest area may not be considered as forest conservation area in the UNFCCC context, since bulk of the forest is subjected to tree canopy cover change (Ravindranath et al., 2012).

7. Sustainable Management of Forests (SMF)

7.1 SMF in the Bali Action Plan context refers to the application of forest management practices for the primary purpose of sustaining constant levels of carbon stocks over time¹⁴. According to the submission to SBSTA, integral governance of forests promotes forest conservation, sustainable development of forest landscapes and sustainable livelihoods of local and indigenous people by valuing the potential of forests and other land uses in forest landscapes as well as of other natural resources without negatively affecting their multiple environmental functions, and by guaranteeing the sustained continuation of those functions in articulation with social, cultural, and economic aspects of forest management.¹⁵

SMF aims to minimize reduction in carbon stocks in forests and plantations through sustainable harvesting practices. SMF could be defined as "*Management of forests to sustain the biomass productivity, even if subjected to harvest or other management practices for prevention of long-term loss of carbon stocks*". SMF could include forests and plantations where carbon stocks exist and harvesting is permitted. By adopting sustainable harvesting practices, carbon stock or biomass productivity could be maintained.¹⁶ In due course of time when harvests become less than annual increments, SMF areas could register a

¹⁴ <http://climate-l.iisd.org/news/fao-releases-information-note-on-forest-management-and-redd/>

¹⁵ FCCC/SBSTA/2012/MISC.1 GE.12-60570/Subsidiary Body for Scientific and Technological Advice/Thirty-sixth session/Submission from Parties

¹⁶ http://unfccc.int/files/meetings/cop_13/application/pdf/cp_bali_action.pdf

net increase in carbon stocks.

7.2 Potential for SMF

SMF activities can be used to incentivize maintenance of forest carbon stocks, by means of improvement in the quality of existing stocks and sustainable extraction of biomass (e.g. reduced impact logging). Although Reserve Forests and plantations raised in the degraded forest area are supposed to be managed using the so-called 'working plan' approach, it is not clear if this approach is indeed based on sustainable management principles. It is, therefore, difficult to delineate the area subject to SMF in India. However, as a first order approximation, all forests being managed under an approved working plan could be considered to be subject to SMF (Ravindranath et al., 2012).

8. Enhancement of Forest Carbon Stocks

Carbon stock enhancement could involve restoring carbon stocks in degraded forests, or creating forests where none currently exist and approaches may include afforestation, reforestation, restoration (through natural regeneration, assisted natural regeneration or planting), rehabilitation, or forest landscape restoration¹⁷. Thus in the Indian context, enhancement of carbon stocks could be defined as "*Conversion of non-forest or degraded forests to forests through afforestation, reforestation, restoration forestry and forest management practices, leading to enhancement of carbon stocks*".

Potential for enhancement of carbon stocks in India

In India, there is a large potential for enhancement of forest carbon stocks through afforestation, reforestation, restoration forestry in degraded forest lands, and forest management through implementation of working plans.

9. Relationship of Conservation, SMF and Enhancement of Forest Carbon Stocks with REDD+ performance

It is good to start understanding and interpreting the meaning of different terms being used in REDD+ debate and decisions in the UNFCCC. All the same, different terms appearing in UNFCCC- REDD+ text will need to be debated and negotiated for agreement on their definitions by the country Parties. However, a rational understanding of the terminology at the national level will help Indian negotiators to safeguard the country's interest in UNFCCC negotiations. Also, the impact of all forest areas from REDD+ perspective, even when these are assigned under different definitions will be on the quantum of changes in the forest carbon stocks. Therefore, dividing the country's forest area under different definitions may not be material provided we are in a position to assess the forest carbon stocks of the entire country at regular intervals.

¹⁷ Miles, L., Dunning, E. and Doswald, N., Safeguarding and enhancing the ecosystem-derived benefits of REDD+. Multiple benefits series 2. UN-REDD Programme, UNEP World Conservation Monitoring Centre, Cambridge, UK, 2010.

10. Key Issues and Action Points

1. Since REDD+ is a national level accounting concept, it will be imperative that forest is defined in a way that helps FSI to seamlessly expand its responsibility to cover nationwide estimation of forest carbon stocks. It is, therefore, imperative to standardize and harmonize definition of forest and deforestation relevant to REDD+ with the definition of FSI.
2. It will be advisable to understand and interpret in the Indian context, the terms used for the plus components of REDD+, i.e., Conservation of Forest Carbon Stocks, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks. India should develop definitions for these terms, and assess implications for potential of each of the components, and specific requirement for their MRV. The understanding of these terms in the national context will help in negotiating the definitions of these terms in the UNFCCC in future.
3. Project proponents or financial agencies may have interest in supporting initiatives confining to specific plus element(s) of REDD+. For this purpose, it may be advisable to initiate technical and institutional process for identifying potential locations for REDD+ activities on a spatial basis.

Definition of REDD+ activities and implications¹⁸

Activity	Definition	Potential	MRV	Implications
Deforestation	The direct human-induced conversion of forested land to non-forested land	<ul style="list-style-type: none"> - 99,850 ha was subjected to conversion from forest to non-forest - The rate of forest loss has been changing over different assessment periods 	<ul style="list-style-type: none"> - Feasible to develop a reference level - Feasible to monitor rates of deforestation 	<ul style="list-style-type: none"> - Attribution of deforestation to drivers will be a challenge - Has potential to generate carbon revenue
Forest degradation	Transition from higher to lower tree crown density and/or removal of lower canopy biomass or disturbance of soil, leading to reduction in carbon stocks	<ul style="list-style-type: none"> - Rates of forest degradation seem to vary across different forest cover assessments by FSI - Potential exists to reduce degradation in most states, particularly in the north-east 	<ul style="list-style-type: none"> - Only tree crown monitoring is feasible and difficult for lower canopy and soil carbon estimation - Developing a reference level will be a challenge 	<ul style="list-style-type: none"> - Difficult to identify locations - Difficult to monitor changes in carbon stocks - Potential exists for generating carbon revenue for most parts of India
Conservation	Maintenance of area under existing forests to conserve, maintain, and even enhance the high carbon stocks	<ul style="list-style-type: none"> - Currently PA covers 16.5 Mha and has potential for expansion. 	<ul style="list-style-type: none"> - PA network exists and reference level (C-stocks) could be developed for the PAs and periodically monitored 	<ul style="list-style-type: none"> - Generate carbon revenue incentives to communities living in and around PAs to conserve the PAs
Sustainable Management of Forests	Management of forests to sustain the biomass productivity, even if subjected to harvest or other management practices leading to non long-term loss, even increment in carbon stocks	<ul style="list-style-type: none"> - Currently, not feasible to estimate the area subjected to SMF - May be difficult to estimate the potential 	<ul style="list-style-type: none"> - Difficult to develop reference level for areas subjected to SMF and practices leading to SMF - Difficult to monitor carbon stocks in areas subjected to SMF 	<ul style="list-style-type: none"> - Limited potential for carbon revenue
Enhancement	Conversion of non-forest	<ul style="list-style-type: none"> - Large potential 	<ul style="list-style-type: none"> - Reference level could 	<ul style="list-style-type: none"> - Large baseline

¹⁸These definitions will specially be useful in taking project level initiatives confining to a specific REDD+ activity, wherein the funder or the project proponent has an interest.

of forest carbon stocks	or degraded forests to forests through afforestation, reforestation, restoration forestry and forest management practices, leading to enhancement of carbon stocks	exists due to large afforestation programme and existence of wastelands or degraded forest lands	be established - Monitoring of areas subjected to enhancement of carbon stocks feasible	afforestation exists - Additionality would be an issue - Large potential for carbon revenue under JFM and farm forestry
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Chapter 4

Status of Current Forest Management Regime: Strengthening it to Support REDD+ Implementation

1. Introduction

The total forest and tree cover of the country is 78.29 mha (23.81% of the geographical area), which includes 69.20 mha of forests (21.05% of the geographical area) and 2.76% of Trees Outside Forests (TOF) as per India State of Forest Report, 2011 (SFR 2011). India is one of the few countries of the world to have a robust and scientific system of periodic forest cover assessment. The forest cover in the country is not uniform and varies in different States and regions. The country has very low per capita forest cover of 0.06 ha. There are 16 major forest types and 221 sub-group types.

The scientific forest management in India dates back to mid 19th century. The first planned working of forest in the country started way back in 1837 in Travancore. Uniform countrywide approach towards the preparation of Working Plans for scientific management of forests was started in 1884. After independence in 1947, a huge thrust on scientific management was given for conservation and development of forests.

There has been considerable progress in stabilizing and maintaining the overall forest cover, i.e., in checking deforestation. However, forest degradation, which still may be significant in many States of the country due to dependence of local communities, remains a problem to be addressed on priority. It is also a fact that forest degradation is not only difficult to check, but considerably difficult to measure and monitor. There is a great scope for improvement of forest cover by addressing drivers of degradation with people's participation and cross-sectoral support. A significant part of the country's forest cover falls in the open and medium categories of classification based on crown density. The country's forests are under tremendous pressure for supply of fuelwood, fodder and Non Timber Forest Products (NTFPs), etc. in view of demand of local communities for these products for their livelihood and sustenance. The issue of sustainable harvesting of forest products within the carrying capacity of forests has assumed great significance. With increasing population and a nation fast-moving towards economic prosperity, demand on forests and other natural resources is likely to increase steeply in the near future. REDD+ implementation is expected to facilitate monitoring and reporting of forest resource use trends and in ensuring conservation of existing forest cover, its enhancement, and more importantly, in improving quality of forests so that ecosystem services are sustained and enhanced. By bringing in safeguards for conservation of natural forests, and rights for the local communities, REDD+ has the potential of furthering the cause of inclusive growth with care for environment.

2. Forest Policy and Legal Framework

India has a comprehensive policy and legislative framework for guiding forest conservation and

management across the country. The subject “Forestry” falls in the concurrent list of Schedule-VII of the Constitution of India, empowering both- State and Central Governments to legislate on the subject. The management and protection of forests is the responsibility of State Governments, whereas the Central Government provides policy directions and guidelines from time to time. The principal aim of National Forest Policy, 1988 (NFP 1988) is to ensure environmental stability and maintenance of ecological balance including atmospheric equilibrium which are vital for sustenance of all life forms-human, animal and plant. The Policy subordinates the derivation of direct economic benefit to this principal aim of respecting environmental concerns. The Indian Forest Act, 1927 provides for law relating to forests, transit of forest produce, duty leviable on timber and other forest produce, and also empowers forest officers with relevant mandate and authority to ensure forest protection. The Forest (Conservation) Act, 1980 regulates diversion of forest land for non forestry purposes. Wild Life Protection Act, 1972 is the main legislation guiding conservation, management and development of wildlife and its habitat in the country. Recently, enacted “The Scheduled Tribes and Other Traditional Forest Dwelling Communities (Recognition of Forest Rights) Act, 2006”, aims to recognize and vest the forest rights and occupation in forest land on forest dwelling Scheduled Tribes and other traditional Forest Dwellers, who have been residing in such forests for generations, but whose rights could not be recorded. This legislation has also empowered forest dwelling communities enabling them to manage and conserve forest resources. The NTFP sector has good potential in creating jobs and supplement income of local poor people by way of enhancing the NTFP resource base, by modernizing processing and improving the market access for finished products. The Biological Diversity Act, 2002 provides framework for biodiversity conservation at the grass-roots level by involving the local communities.

India’s forests are quite diverse and rich source of non-timber forests produce. It is estimated that over 800 types of NTFPs are harvested and/or collected in India, some of which are nationalized. The Panchayats (Extension of Scheduled Areas) Act, 1996 (PESA) has given ownership rights of NTFPs to Gram Sabhas. In many States, like Madhya Pradesh, Maharashtra, Chhattisgarh, the management and trade of NTFP remains with the public sector and net profit is passed onto the Gram Sabha. However, some State Governments, like Bihar and Jharkhand have fully transferred the collection and trade activity of NTFPs to Gram Sabha. Government of India is also working on a scheme to provide Minimum Support Price (MSP) for some important NTFPs for improving livelihood of local people.

In some regions of the country, specially in Schedule VI areas, the forests are traditionally owned and managed by the tribal community and under the aegis of Autonomous District Councils. The Forest Rights Act and the Rules made thereunder give details of institutional arrangements for the protection, management and regeneration of Community Forest Resources (CFR), defined in section 2(a) of FRA as customary common forest land where the communities had traditional access, or which could be construed to be customary boundaries of a village, in other words, areas where communities can demonstrate their traditional access. The holders of right are empowered to protect wildlife, forest and biodiversity.

The principal aim of National Forest Policy, 1988 (NFP 1988) is to ensure environmental stability and maintenance of ecological balance. NFP 1988 with its overarching objective of caring for environmental stability and ecological balance aims at bringing one third of the country’s geographical area under forest and tree cover, and to achieve this goal calls for massive afforestation and social forestry programmes with people’s participation for increasing the forest and tree cover in the country. This movement has the twin objective of addressing environmental concerns, and also simultaneously meeting the domestic requirements of forest products including fuelwood, fodder,

minor forest produce and small timber of the rural and tribal populations. About 300 million forest dependent people including around 87 million tribals, derive their livelihood and substantial part of their income from forests. India has a long history of forest partnership with local communities who have contributed significantly in conservation efforts.

NFP calls for increasing the productivity of forests to meet essential national needs, and also encourages efficient utilization of forest produce through appropriate scientific and technological applications. Pursuant to the NFP 1988, Joint Forest Management (JFM), was started in India in 1990 based on the principle of “Care and Share”. Presently, there are more than 100,000 JFM Committees involving around 20 million people managing approximately 22 million hectare of forest area. JFM has contributed significantly in stabilizing forest and tree cover of the country.

The Policy also provides for adequate safeguards for rights of local communities and gives due emphasis for protection of rights and concessions of tribals and other poor people living in and around forests by making the domestic requirements of these communities for fuelwood, fodder, minor forest produce and construction timber, as the first charge on forests, within their carrying capacity. The policy recommends to closely associate the tribal people in the protection, regeneration and development of forests as well as to provide gainful employment to people living in and around the forest with a view to supporting their livelihoods.

3. Management of Forests

The day to day management of forests is the responsibility of the State Forest Departments of respective State/UT Governments, who are also responsible for the protection, conservation, administration and development of forests. The State Forest Department is headed by the Principal Chief Conservator of Forests (PCCF), who is assisted by Additional PCCFs and Regional CCFs and Conservator of Forests (CFs) exercising jurisdiction on their respective territorial units. The Executive Unit is headed by the Divisional Forest Officer, who carries out various functions related to forests with the help of Sub-Divisional Forest Officers of the rank of Assistant CF, and Forest Rangers. A forest range is the minimum functional unit of forestry administration for execution of works in the field. There are functional divisions within the State Forest Department to look after specific activities and responsibilities. Territorial Circle and associated Divisions generally administer forest laws on the ground, and also carry out protection, development and afforestation related activities. Functional Divisions include working plan, silviculture, wildlife, research, and watershed management divisions which carry out specific functions related to a particular aspect of forest. Forests in India are worked as per the approved working plans. There are around 197 Forestry Circles, 788 Divisions and 4,706 Ranges in the country.

The working plans are prepared as per the existing National Working Plan Code administered by the MoEF, and are usually valid for a 10 year period. The Working Plan Officer prepares the draft working plan which after approval of the State Government is sent to the Regional Office of the MoEF for obtaining approval of the Central Government. Presently, the National Working Plan Code is under revision.

Protected Areas (PAs) approximately cover 5% of the country’s geographical area in shape of

National Parks, Wildlife Sanctuaries, Conservation Reserves and Community Reserves which are the store house of rich flora and fauna of the country. The Wildlife Institute of India (WII) imparts training to the forest officers and scientists in protected area management. Each National Park and Wildlife Sanctuary is managed as per approved management plan. Wildlife wing of the State is generally responsible for management and protection of National Parks, Wildlife Sanctuaries, Conservation Reserves and Zoological Parks. For management of wildlife in forest areas other than PAs, officers heading territorial divisions have the responsibility to take care of wildlife protection and management in their territory. The jurisdiction of territorial and wildlife wings many times overlaps. The range and beat type structure in the National Parks and Wildlife Sanctuaries are often not clearly defined.

4. National Level Forestry Institutional Mechanism

MoEF: Ministry of Environment and Forests is the nodal ministry to administer for forest sector in the country. Forestry wing in the Ministry is headed by Director General of Forests and Special Secretary, who is also the Principal Advisor to the Government on forestry matters. The Forestry wing is further divided into Forest Conservation and Wildlife wings, each headed by an Additional DGF. There are various Divisions like Forest Conservation, Forest Policy, Survey and Utilization, Research and Training, Externally Aided Projects, National Afforestation and Eco-development Board (NAEB), Forest Protection, etc. which are headed by IG/DIG level officers, who assist the two Additional DGFs and DGF in respective matters. India has a good network of national institutions of forestry and wildlife. The Ministry is supported by many forestry institutions which are mentioned below:

Indian Council of Forestry Research and Education (ICFRE) with 8 forestry research institutes in different parts of the country provides forestry research support. Indira Gandhi National Forest Academy imparts training to Indian Forest Service Officers and Central Forest Academy/State Forest Service Colleges provide training facilities for State Forest Service Officers. There are training colleges for field frontline staff like Forest Rangers and forest schools for field foresters. Forest Survey of India carries out regular assessment of forest cover and prepares national forest inventory. It also carries out remote sensing based monitoring and resource mapping, Wildlife Institute of India carries out research and training in wildlife. Indian Institute of Forest Management (IIFM) imparts training in forest management focusing on economics and local livelihoods. These national level institutions have played important role in capacity building, research support and providing technical capacity for forest management in the country. There are a number of Agricultural Universities which have degree and post graduate level courses on forestry, and contributing to adding quality human resource to the technical pool of forest sector.

5. Forestry Sector Management to Support REDD+

Forest management in the country does not require any major change to support implementation of REDD+. However, certain components and aspects of management will need to be strengthened by appropriate infrastructure and capacity building to support good performance of REDD+. Also, causes of forest degradation will need to be thoroughly analyzed and all future programmes in forest sector, like Green India Mission will need to be

oriented in addressing drivers of degradation by providing alternate sources of fuelwood, fodder and other forest products required by forest dependent communities. Because of involvement of multiple stakeholders, working of forestry sector is complex. There are many agencies and departments whose programmes and policies have significant impact on forestry sector. Development and implementation of REDD+ at national level will require close coordination and strong linkages between all stakeholders of forest sector, which will need to be guided by the MoEF. Following mechanism needs to be put in place for effective implementation of REDD+ in the country:

- (i) **Strengthening of Governance Structures:** For implementation of REDD+, appropriate policy and regulatory framework will be needed at national and sub-national, i.e., State/UT level.
- (ii) **Cross-sectoral Coordination Mechanism at National Level:** Coordination at national level with relevant stakeholders for close cooperation between various departments, like rural development, tribal welfare, panchayats, agriculture, water, health, tourism, power, finance, etc. and the forest sector will be necessary to ensure sustainable management of forests, to address drivers of forest degradation, and to improve the livelihoods of forest dependent communities including tribals. The institutional mechanism and processes need to be put in place for more effective cross sectoral cooperation for implementation of REDD+, which will require pooling of resources and efforts for addressing drivers of forest degradation. For example, Ministry of Agriculture has an important role in promotion of farm and agroforestry for increasing area under ToF. MoEF will have the nodal role discharged through its REDD+ cell, and work with the Planning Commission of India for effective coordination between various Ministries and Departments for integrated action promoting REDD+ performance.
- (iii) **Strong Coordination Mechanism at State Level:** Similarly institutional mechanism for strengthening of cross-sectoral cooperation among relevant stakeholders will be a prerequisite for successful planning and implementation of REDD+ in the States/UTs. Setting up of State level REDD+ cell with members drawn from relevant stakeholder departments/agencies/NGOs/local communities, etc. will also be required to ensure proper REDD+ implementation.
- (iv) **Partnership Building for Engagement of Stakeholders:** Providing an effective mechanism for stakeholder consultation and for participation of all stakeholders including scientific institutions, civil society, communities, NGOs, etc. will be required at all levels of implementation, i.e., central, State and local.
- (v) **Capacity Building:** Adequate technical and institutional capabilities will be required for effective implementation of REDD+ across the country, and also for securing incentives for REDD+ performance. In the beginning, technical preparedness may be required for securing effective, sustainable and predictable fast start financing for REDD+. Regular training of a minimum number of officials and community members will be necessary to have critical mass of technical manpower.
- (vi) **Communication Strategy:** An effective communication will need to be established for involving communities and other relevant stakeholders in protection, management, monitoring of forests, and for carrying out measurements to assess the REDD+ performance. However, the communication strategy should ensure that the role of forest department is more facilitative than authoritative, and oriented towards preparing and guiding

communities for their role of protecting and sustainably managing the forest resources, and to participate in the REDD+ measurements.

(vii) **Partnership with International Institutions:** India should join UN-REDD Programme and WB, FCPF to seek technical and financial assistance for REDD+ preparation.

(viii) **Guidance for Benefit Sharing:** Guidelines will need to be formulated to channelize flow of REDD+ incentives from the Central Government to the State/UT Governments, and further down to the local communities in proportion of their REDD+ performance.

6. Key Issues and Action Points

1. Local communities in many places are heavily dependent on withdrawals from forests for sustaining their livelihoods. Many States and UTs are facing the challenge of addressing this serious problem of unsustainable demand of forest goods and services, like fuelwood and grazing, which is adversely affecting the extent and quality of services from forests. This will not only cause reduced flow of goods and services from the forests, but, in due course of time, also adversely impact the REDD+ performance of the forests in such localities. This challenge can be addressed by providing alternate clean sources of energy, like LPG, and fodder being grown outside forests, e.g., as an agroforestry component, and thereby confining the withdrawals from forests within limit of sustainable harvests.

2. To limit extraction of the NTFPs from forests within sustainable limits, it will be necessary to make periodical assessment of growing stock of different NTFPs to fix annual harvests. This can possibly be done by making necessary amendments in the National Working Plan Code, which is presently under revision in the MoEF.

Construction of National Forest Reference Level

1. Introduction

The Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) adopted at its sixteenth session (COP-16) a milestone decision on Reducing Emissions from Deforestation and Forest Degradation (REDD+). This decision encourages developing countries to develop a “National Forest Reference Emission Level (REL) and/or National Forest Reference Level (RL) or, if appropriate, as an interim measure, sub-national REL and/or RL, in accordance with the national circumstances”. REL and RL serve as benchmark for assessing performance of implementation of REDD+ in a country. A country which undertakes to reduce emissions from deforestation by checking deforestation and forest degradation will be using REL as the benchmark to assess progress of its performance. On the other hand, RL is relevant benchmark when a country undertakes to increase removals by increased carbon sequestration by its forests.

Further discussions at Durban led to defining the REL and RL in the following manner;

Reference Emission Level (REL): REL refers to emissions from deforestation and forest degradation. REL is to serve as a benchmark for assessing performance of a country in reducing emissions from forests.

Reference Level (RL): RL refers to the ‘plus’ side of REDD-plus activities (conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon stocks) and, hence, reflects the carbon stocks in forest lands. RL is to serve as a benchmark to assess performance of a county in increasing removals (sequestration) in forest sector.

Theoretically, it is possible for a country to have two numbers– one for REL and another for RL. However, since the forest carbon stocks accounts are compiled at the national level, the country may choose one of the two benchmarks depending on whether it is controlling high rates of deforestation, or low deforestation coupled with high removals. In former case REL is more relevant, whereas in later, RL is a better option.

2. Concept

Reference level is the future projection of emissions from deforestation and forest degradation under the absence of REDD+. In line with decisions taken by the COP, reference levels can be understood as business-as-usual (BAU) baselines developed by taking into account historic GHG emissions and removals, adjusted for national circumstances; where it is necessary to improve reliability.

The REL and the RL are the key elements to ensure environmental integrity and cost-

effectiveness of the REDD+ mechanism. Comparison of the current level of emissions and removals with REL and RL is needed to assess whether and how policies and measures implemented for REDD+ have resulted in quantifiable mitigation actions, and the mitigation performance of a country is expected to be incentivized by the appropriate REDD+ financing.

The reference level (REL/RL) and baseline in REDD+ refer to three concepts:

A. For Reducing Deforestation and Forest Degradation

- i) A historical baseline is the rate of deforestation and forest degradation (DD) and the resulting greenhouse gas emissions over a specific number of years, e.g., the last 10 years.
- ii) A business as usual (BAU) baseline is the projected DD and associated emissions without any REDD+ interventions.
- iii) A crediting baseline or reference level is a benchmark below which emissions must fall before a country or project is rewarded for reductions, e.g., before it can be rewarded for REDD+ credits.

B. For Enhancement of Removals ('+' Activities of REDD+)

- i) A historical baseline is the rate of sequestration or removals after duly accounting for deforestation and forest degradation and the resulting greenhouse gas emissions over a specific number of years, e.g., the last 10 years.
- ii) A business as usual (BAU) baseline is the projected removals without any REDD+ interventions.
- iii) A crediting baseline or reference level is a benchmark only above which, removals in a country or project can be incentivized for REDD+ credits.

REL and RL are critical in the REDD+ mechanism due to the following:

- A reference or benchmark for measuring reductions in emissions from deforestation and forest degradation
- A reference or benchmark for measuring addition in removals due to '+' activities of REDD+
- Need to show performance in respect of reduced emissions or increased removals as measured against the RE/RL

Technical Components

REL/RL expressed in tonnes of CO₂eq per year that are implemented at the national and, as an interim step, sub-national level serve as benchmarks for assessing each country's performance in implementing the activities referred to in decision 1/CP.16, Paragraph 70. It is prudent and environmentally conservative for a country to construct sub-national REL/RL that eventually, in their aggregate, will serve to develop a national REL/RL, as indicated in Paragraph 71 b of Decision 1/CP 16¹⁹. One of Durban's more positive messages is that we do not have to get this completely right at the first attempt.

¹⁹Agreement: 1.CP.16 Paragraph 70: Encourages developing country Parties to contribute to mitigation actions in the forest sector by undertaking the following activities, as deemed appropriate by each Party and in accordance with their respective capabilities and national circumstances

Since, forest cover in India has more or less been stabilized, and so are the emissions from forest sector, and also in view of the future vision for massive tree planting, and regeneration of natural forests, it will be advisable at national level to opt for the approach that is more relevant to increasing the removals than reducing deforestation. In case of India, States/UTs are considered to be the sub-national units for which separate RLs are to be constructed, which can subsequently be aggregated into a National Forest Reference Level. Sub-national RLs at State/UT level can also follow this approach. Individual States and UTs still having massive deforestation and forest degradation can have RL, which in some cases could be negative showing net emissions.

In general, a step-wise and environmentally robust approach in the development of national RL/REL includes the development of sub-national RL/REL that helps to build a transparent set of data and supporting systems and expertise which serve as a step towards an integrated, national RL/REL. RL/REL submitted to the UNFCCC will need to be substantiated with information that allows for technical assessment of the data, methodologies, and procedures used in their development.

The main elements encompassed in the planning for construction of RL and REL include:

1. ***Transparent and conservative approach:*** The RL and REL should be characterized by a transparent and conservative approach.
2. ***Driven by best scientific data:*** The RL and REL should be data driven, based on historical data and estimates should be verified scientifically.
3. ***Allow historical satellite data for RL/REL:*** Reliable historical data on removals, or emission factors do not exist in almost all the REDD+ countries. Thus current emission factors combined with historical satellite data from 1990, 2000 and 2005 (and potentially up to 2010) could be used for construction of the REL. Similarly for construction of RL, historical satellite data on forest cover for the period from 1990 and onwards could be used.
4. ***Comprehensive modeling of BAU:*** Projection of removals and deforestation and forest degradation should include all relevant policies and activities, which can potentially impact forest land use in the country in the future.
5. ***Fact based:*** Significant gaps in historical data may not allow to build RL/REL with annual accuracy, and, therefore, may question accuracy of projections for future trends based on past trends (BAU).
6. ***Account for national circumstances:*** The RL/REL should be developed through conservative approaches in combination with relevant assumptions, and adjusted following national circumstances, allowing an adjustment factor (AF). The AF should be built on national circumstances, address different social and development needs, and use the most recent relevant information.
7. ***Periodic updates:*** The RL and REL shall be periodically recalculated, and preferably every five years. However, this will be subject to guidance from UNFCCC on the subject.

3. Development of Reference Level

Reference scenarios accounting for removals or for deforestation and forest degradation under REDD+ will need to be based on historical assessments of past sequestration or deforestation rates, extended to projections of future. These will be constructed using time series data over a period, which still has to be negotiated under UNFCCC, and which may be different for different countries. Alternatively, baseline approaches could be used, which also take into account and model or simulate changes in drivers (population growth, increases in road network, demand for forest products, etc) affecting removals and deforestation and forest degradation. The carbon implications will probably be calculated by multiplying areas deforested by typical or average carbon densities per hectare, for each type of forest and perhaps for each particular set of drivers. Similarly, removals could be calculated for different types of forest by multiplying the forest type area by average carbon densities per hectare. Although, there is still debate on whether simple historical data or a modelled approach is superior, the basic data on past forest cover is generally available from remote sensing images, which can be used for estimating removals as well as deforestation.

4. Approach

The approach and steps for the preparation of reference levels for REDD+ are given in Box 1 (Adapted from Meridian Institute, 2011).

Box 1: Steps for the preparation of REDD (deforestation and degradation) reference levels

Step	Implications for India
Define the pools and gases included in the reference level with a justification for their inclusion	Above-ground (including litter, herbs and shrubs), below-ground and soil carbon are critical pools
Specify the definition of forest used	India has defined forests for CDM A/R under UNFCCC, but for REDD+ a separate definition will be required for consistency with the national definition followed by FSI for estimating forest cover (FSI definition of forests)
Establish the historic time period within which emissions and removals will be estimated	2000-2012 since digital interpretation of remotely sensed (RS) data by FSI was initiated in 2000 and when the scale was also refined to 1:50,000
Start of historical baseline period	2000, to coincide with digital interpretation of RS data
Describe the methods used to estimate forest carbon stocks for the selected time period	FSI has been monitoring and reporting forest area and has also initiated estimation of forest carbon stocks. FSI has adopted the stock change method for calculating forest carbon stocks, which is appropriate keeping in view the expertise, availability of historical data, and regularity of assessments. However, preparation of full national forest inventory on a repetitive basis at agreed (under UNFCCC) time intervals will need to be completely institutionalized by creating additional, and strengthening existing capacity and infrastructure of FSI

Estimate the area of forest annually converted to different land uses	Land use change matrix is being prepared by National Remote Sensing Centre (NRSC) periodically and can be adapted easily
Document past trends in forest conversion	This can be generated from NRSC and FSI maps and data
Estimate the area of forest deforestation by each driver	This will be a challenge in India. No readily available data exists, potentially NRSC could generate this. However, this may not be material as stock change method adopted by FSI would take into account the resultant change in forest carbon stocks due to any reasons including deforestation and/or forest degradation.
Describe the methods used to estimate emission factors for deforestation	FSI has initiated the estimation of forest carbon stocks. For the methodology adopted by FSI, expansion factors and ratios to correlate different pools of forest carbon for different tree species or forest types will be more appropriate than emission factors. Expansion factors correlating different carbon pools for all species or forest types are not currently available. FSI and ICFRE will need to collaborate to develop more expansion factors and ratios for important tree species and forest types.

5. Methods for estimating reference levels (REL and RL)

Developing reference levels for India could be a complex process. The SB 28 decision: describes REL as follows: “Means to establish reference emission levels, based on historical data, taking into account, inter alia, trends, starting dates and the length of the reference period, availability and reliability of historical data, and other specific national circumstances.” There are multiple methods available and their suitability for Indian National Circumstances is yet to be tested. The broad methods for developing reference levels are given in Box 2.

The suitable method for India for developing RL could be based on the historical approach, the rationale being that India has been systematically and rigorously monitoring forest cover and land use pattern using remote sensing techniques for nearly past two decades and especially since the year 2000, using refined techniques. Further, India has a strong and time-tested stable policy and legal framework that encourages protection, conservation and development of forest resources in the country, such as the Forest Conservation Act 1980 and the Wild Life Protection Act 1972. India’s strong commitment to the National Forest Policy and legal framework has resulted in a stabilized forest cover in the country. Thus, India can make reliable projections of future removals taking due note of deforestation and associated emissions, based on the historical approach.

Box 2: Methods for developing reference levels

Method	Description	Implications for India
Historical	Historical RL is an average of the past trends. This requires defining the start year for development of historical RL	India has been monitoring change in forest area since 1985-87. However, digital interpretation of remotely sensed data on 1:50,000 scale started only in 2000. Thus India could adopt 2000 as the 'start year'.
Projected/modeling	Projected baselines predict how future removals or deforestation rates might change. Econometric models that are based on socio-economic, policy and institutional factors driving deforestation, could be used.	This approach would require very detailed socio-economic and other variables which influence the rates of deforestation as well as removals in the country's forests. Such data may be difficult to generate.

6. Data needs for establishment of reference level

While planning construction of reference level, the methodology followed by India for calculating forest carbon stocks, i.e., 'stock change method' should be kept in view. Activity data, expansion factors and ratios, and emission factors are required for estimating reference levels. Activity data for REDD+ activities include area change data, expressed in hectares per year and land use change matrix. Emission factors refer to GHG emissions or removals per unit area, (e.g., tonnes of CO₂ emitted per hectare of deforestation, or tonnes of CO₂ sequestered per hectare of forest area), or in other words carbon stocks and changes according to different forest strata, comprising the total area under forests. Box 3 presents the type of data required and its relevance for India. Some of the critical data needed for establishment of RL are as follows:

Box 3: Data requirements and its implications for India

Type of data	Implications for India
Stratification of forest land	India has forest cover data according to forest types and according to tree crown density classes. Thus, India could adopt a multi-tier stratification procedure consisting of: <ul style="list-style-type: none"> - State - Forest type - Tree crown density class
Geo-referenced spatial maps of forest area and related characteristics	India has forest maps according to forest types and according to tree crown density classes at the State level. Other indicators such as slope, elevation, and soil type may also need to be added.
Geo-referenced data on deforestation and afforestation	Time-series spatial maps required for forest cover, deforestation and afforestation along with other physical attributes such as slope and elevation could be generated by FSI and NRSC.
Geo-referenced area data for forest degradation (Activity Data)	India is generating periodic spatial forest cover according to density classes which could be used for identifying locations and extent of forest degradation.

	Interpretation of these maps may need to be supplemented with other attributes of slope, elevation, etc, and ground truthing.
Land use change matrix according to IPCC land categories	NRSC is generating land use change matrix for India according to IPCC land categories for the National Communications project, which could be adapted for REDD+ implementation.
Selection of carbon pools	India should select and inventorize the following dominant forest carbon pools. <ul style="list-style-type: none"> - Aboveground biomass - Belowground biomass - Soil organic carbon
Drivers of deforestation and forest degradation	<ul style="list-style-type: none"> - Forest cover change, and deforestation, and forest degradation data is not recorded currently according to the different drivers. - There is a need to identify drivers of deforestation and forest degradation. - There is a need to generate historical deforestation and degradation drivers such as forest land converted to agriculture, and for infrastructure development.
Carbon stocks and changes in all relevant land use categories, including forest area, afforested area, plantations, non-forest, etc. (Emission Factor)	<ul style="list-style-type: none"> - There is a need to establish and institutionalize a full-fledged national forest inventory programme to generate data for carbon stocks and changes therein. - There is a need for generating forest carbon stocks data for non-forest land categories also such as forest land converted to grassland, cropland, etc.

7. Key Issues and Action Points

1. What will be appropriate for India to chose- REL or RL to operationalize REDD+ in the country? Since India's forest cover is more or less stabilized, and deforestation largely checked, it will be appropriate for India to adopt the approach that would lead to incentivization of increase in removals, i.e., increase in forest carbon stocks. This would make it imperative for India to go for construction of RL. While planning construction of reference level, the methodology followed by India for calculating forest carbon stocks, i.e., 'stock change method' should be kept in view.

2. For a big country like India, how the National Forest RL (NFRL) can be constructed? How can the REDD+ performance of States of the Union be assessed? It will be imperative for India to have RLs at sub-national level, i.e., at the level of States/UTs, which will coalesce or integrate into a single NFRL. This will help in ascertaining REDD+ performance of individual States/UTs with a view to incentivizing the same.

3. Who will construct the NFRL for India? Since construction of NFRL is a complex issue, it will be necessary that a consortium of technical organizations comprising FSI, ICFRE, IISc,

IIFM, IGNFA, NRSC, IIRS, and others is constituted. This consortium will be charged with the responsibility of constructing the NFRL as also State/UT level sub-national Forest RLs. It will also fully explain the concept, approach and methodology used in construction of the NFRL and SFRLs (State/UT level FRLs). MoEF will approve the same in consultations with the State Governments/State Forest Departments and representatives of civil society.

4. Can SFRLs be used separately for incentivization of REDD+ performance of individual States/UTs? At times, a State may be able to mobilize external assistance for implementing a State level forestry project, inter alia, incentivising REDD+ performance. SFRL can be used independently to assess and incentivize REDD+ performance of a State/UT during the project period.

5. How shall the SFRL of a State with heavy deforestation or negative removals be integrated with the NFRL? Such instances could be there in respect of some North-Eastern States. However, in such cases, the SFRL will be negative indicating net emissions and not removals. A negative SFRL can always be integrated with the NFRL.

6. Can a State/UT intending to address heavy deforestation address it at a sub-national level? A State/UT intending to address heavy deforestation and/or forest degradation separately and on its own, can always adopt the approach of reducing deforestation as part of the State strategy or as part of an externally funded project. For this initiative at the State level the State Government may adopt an REL as a benchmark to assess State level REDD+ performance.

7. What kind of RL/REL can be adopted for a sub-State level or a small project? BAU of removals or deforestation as in case of a CDM project can be taken as RL/REL for a project.

8. Does requisite capacity exist for construction of NFRL and SFRLs? Development of RL/REL requires significant technical and institutional capacity. Key institutions mentioned in paragraph 3 above can help in developing capacity in different regions of the country to facilitate construction of SFRLs or even project level RLs/RELs as part of assisting REDD+ project proponents for development and implementation of the State/sub-State level REDD+ projects.

Implementation of REDD+: Institutions, Governance and Safeguards; Roles and Responsibilities; Financial Arrangements and Drivers of Deforestation and Forest Degradation

A. Institutions, Governance and Safeguards; Roles and Responsibilities

1. Introduction

Good governance is essential for balanced development of the country and the society. Governance is administered through a process that embodies expectations of stakeholders, decentralization of power, monitoring of performance, set of guiding principles, policy as fountainhead of all actions, and most importantly a supportive legislative framework of laws, rules and regulations. Transparency is the central pillar of governance. In the Indian context, REDD+ will be integral part of forest governance, and, therefore, it will be imperative to have an assessment of the status of forest governance in the country with a view to assessing the gaps and addressing the same to meet the requirement of country-wide REDD+ implementation.

2. Forests in Mitigation of Climate Change- REDD+

Forests are a national resource of global concern with countries exercising sovereign rights to utilize the resource in accordance with their National Forest Policy. Forests have been a subject of global negotiations on account of their key role in sequestering carbon from the atmosphere, and thus mitigating adverse impacts of climate change. REDD+ signifies the enhancement of forest carbon stocks without compromising on the flow of other ecosystem services, and rights of the forest dependent communities. Carbon sequestration is a co-benefit with other ecosystem services and biodiversity conservation being the mainstay of livelihood support to the local communities are more important for comprehensive implementation of REDD+ in India.

3. Legislative Framework of Forest Governance

Forest is a concurrent subject under the Constitution of India. Policy and planning are the responsibility of the Central Government, while implementation relating to development and management of forests is the responsibility of the State Governments. Fountainhead of the forest governance in India is the National Forest Policy, 1988, supported by extensive legislation comprising Indian Forest Act, 1927 with its State amendments, Forest conservation Act, 1980, Wild Life Protection Act 1972, Biological Diversity Act, 2002 and Forest Rights Act, 2006. This set of legislation which has evolved keeping pace with the

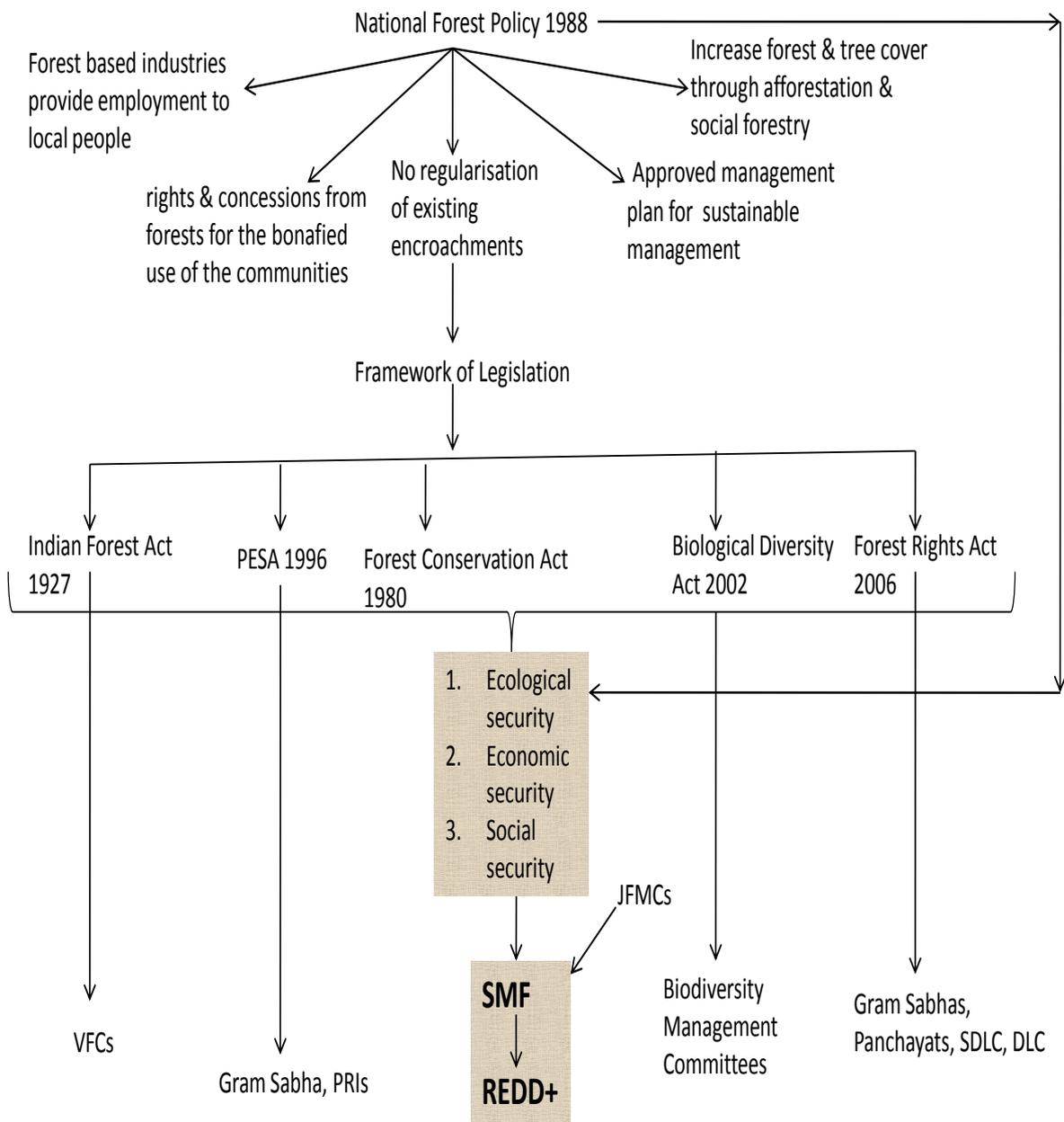
increasing concerns for conservation of natural resources, need of a healthy environment, and respect for livelihood rights of the local communities. National Forest Policy (NFP), 1988 mandates people's participation in the management of forests while Forest Rights Act, 2006 recognizes and ensures community based forest governance. The prime objective of the NFP, 1988 is ecological security of the nation and other objectives are subordinate to this prime objective. It also provides space to the forest dependent communities, particularly tribals to meet their sustenance and livelihood needs as first charge on forests.

Forestry sector impacts other sectors, and is also impacted by other sectors such as rural development, energy, power, industry, infrastructure, agriculture, water, tribal development and many more. India has targeted 8% economic growth with inclusiveness and sustainable development for 12th Five Year Plan. The role of state and community has become crucial for the forest governance.

Joint forest Management (JFM) is now a well established integral part of forest management. More than 100000 JFM Committees (JFMCs) are managing more than 22 million ha amounting to 30% of country's forests following the benefit sharing mechanism built on the principle of care and share. Under the JFM institution, forest dependent communities and state forest departments (SFDs) are jointly managing the forests. The enactment of Forest Rights Act, 2006 has further strengthened the community based forest governance and put forward the option of institutional mechanism under the Gram Sabha for management of forests. Ministry of Environment and Forests (MoEF) has also suggested state governments to keep JFMCs under Gram Sabha. Maharashtra has notified the resolution for keeping JFMCs under Gram Sabha. Odisha has replaced member secretary of JFMCs by a member of user group. Now the JFMCs in Odisha exclusively comprise forest user groups with no representation of forest department officials.

4. Forest Governance at Grassroots Level

Forest Rights Act, 2006 (FRA) assigns the right to Gram Sabha to protect, conserve and regenerate community forest resource (CFR). It is the empowerment of Gram Sabha for the community based forest governance. Forest Rights Act, 2006 is applicable in whole country except Jammu and Kashmir State. Sooner or later, the CFR will be recognized in its true spirit, and the problem of overlap of areas between JFMCs and Gram Sabhas will be sorted out. There is need to have Gram Sabha based forest governance model to take care of JFM and FRA. The forest governance is extensively supported by a strong policy, legislative and institutional framework, which is shown in the following diagram:



There are many unresolved issues regarding rights and responsibilities of Garma Sabha if Gram Sabha based forest governance is operationalized. Role of forest department will be curtailed, wherever Gram Sabha starts discharging the responsibility of governance under FRA. In such cases, revised role of forest department will need to be spelt out. This dispensation will also entail that the pattern of forest governance will not be uniform throughout the country, because of the existence of specific characteristics of the grass root level organizations including Gram Sabha. Consequently, different models of forest

governance will need to be worked out with regional variability. Following principles are suggested for devising workable governance models:

- In the context of day-to-day forest use, and in the interest of democratization, devolution of powers to the community of users, will be the first step.
- Democratic decentralization of governance requires operational autonomy for the lower level entity (such as community) within a transparent regulatory framework.
- Safeguards against elite capture at the local level are necessary.
- Monitoring and enforcement of the sustainable use and conservation norms by the government will need to be ensured..
- State support for forest protection, conflict resolution, technical expertise and backup, and marketing will still be required by many communities in any decentralized system. Local forest governance and management must be nested within larger landscape, enabling sustenance of ecosystem functioning, existence of corridors for movement of wildlife and genetic flow, and other functions and benefits that are external to the community.
- The shift to community based management is a slow process requiring changes in rights, responsibility, structure, capability and attitudes, and during this period government must play an active role in ensuring that the interests of the poorest are safeguarded and no elite capture takes place.
- National level framework must allow for regional variations and corresponding adaptability within overall goals.

The Community Forest Resource Management Committee (CFRMC) can carry out functions on behalf of the Gram Sabha/PRI. The CFRMC should be an elected, democratically constituted body of the Gram Sabha for a period of five years. Minimum 50% members should be women and President should be preferably ST.

Indicative roles and responsibilities of the Gram Sabha and Forest Department are given below:

5. Roles and Responsibilities

5.1 Gram Sabha (GS) or Community

- GS to be responsible for ensuring fair access to right holders who have rights under the Community Forest Rights and provide reasonable access for meeting needs of other members of Gram Sabha as well as the external right holders such as nomads.
- GS to be primarily responsible for ensuring sustainable use of forest produce including Minor Forest Produce.
- GS to be authorized to make rules regarding use, harvesting, protection and regeneration of CFR.
- CFRMC office bearers to be vested with powers to prevent forest offences and penalize violators.
- GS authorised to generate revenue, and receive and spend grants for its forest related activities.
- GS should be encouraged to prepare Community Forest Management Plans with technical support of forest department.
- GS has the option of merging CFRMC with Biodiversity Management Committee, or any other such natural resource-related committee existing in the village.

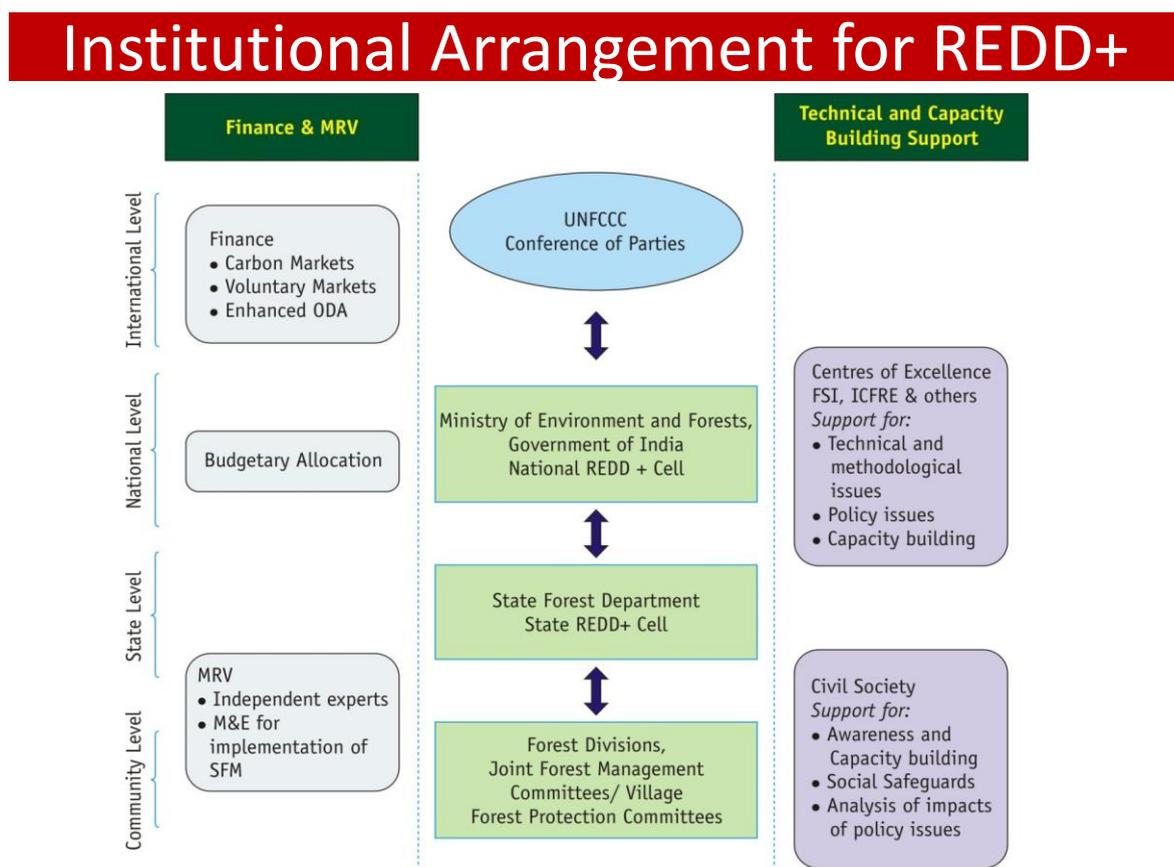
5.2 Forest Department (FD)

- FD to be responsible for providing protection and technical support to the Gram Sabha.
- FD to be empowered to carry out monitoring, i.e., the extent of compliance with sustainable use and conservation regulations in community managed areas. It could also be authorised to take action in respect of any violation.
- FD to continue to exercise additional powers to implement regulatory provisions of Wild Life Protection Act, 1972 and other forest related Acts with State-level jurisdiction.

The ideal model of forest governance could be one that has the chairperson and members of the executive body elected from the village and Headman of the village made the patron. FD could provide technical, regulatory and monitoring support to the Gram Sabha. Capacity of the community would need to be built before initiating this model of Forest Governance.

6. Institutional Mechanism for REDD+ Implementation

India has a long history of scientific forest management, spanning over a century and a half. This resulted in the formulation of a robust legal and regulatory framework and formalized system of forest governance. Forest department is key institution along with JFM in the implementation of sustainable forest management. In the recent past, the community based forest governance has further been strengthened under FRA. The broad institutional framework for implementing REDD+ is already in place. However, for REDD+ to be functional, a system capable of forest carbon stocks accounting, Measuring, Reporting and Verification (MRV), and of enforcing social and environmental safeguards, will be required. India's submission to the UNFCCC/AWGLCA (2011) states its commitment to transfer the REDD+ benefits to the local forest dependant, forest dwelling, and tribal communities that are contributing to forest conservation and enhancement of forest carbon stocks. The institutional arrangement for the implementation of REDD+ in India is shown in the following diagram:



The REDD+ architecture agreed at international level, takes cognizance of the sovereign rights of a nation to design and implement nationally appropriate policies and measures supporting implementation of REDD+. The institutional mechanism at international level provides overall oversight for REDD+ in accordance with the principles of the UNFCCC. Any COP mechanism of the UNFCCC to impart guidance and exercise monitoring, needs to

have provisions for balanced representation from both developed and developing countries to ensure equity, transparency and accountability in the decision making process.

The National level REDD+ Cell set up in the MoEF will play a key role in the design and implementation of REDD+ strategies at the national and sub-national level which are in consonance with the agreed international prescriptions. The National REDD+ Cell is charged with the following functions:

- Design and implement REDD + strategies at the national and sub-national level
- Coordinate and guide at national level REDD+ related activities across the States
- Assist MoEF and its appropriate agencies in developing and implementing appropriate policies relating to REDD+ implementation in the country
- Identify REDD+ opportunities and collaborate with FDs in developing appropriate REDD+ initiatives including projects focusing on specific aspects of REDD+ implementation
- Collaborate with State REDD+ Cell to collect, process and manage all relevant information and data relating to forest carbon stocks accounting
- Guide formulation, development, funding, implementation, and MRV of REDD+ activities in the States
- Actively ensure resource mobilization and disbursement of incentives by formulating appropriate guidance
- Engage with institutes of excellence in the country to provide technical guidance and support to the States, State Forest Departments and village level institutions
- Actively participate in the deliberations of the UNFCCC on REDD+ to safeguard national interest and to ensure that the procedures and methodologies agreed in the UNFCCC are simple, implementable and promote equity and transparency

The State REDD+ Cell should preferably be set up in the State Forest Department with the following functions:

- To oversee REDD+ preparation and implementation by JFMCs/VFPCs
- To ensure that REDD+ initiatives including projects are designed in accordance with the guidelines

- To approve and submit the plans and projects for REDD+ implementation to the National REDD+ Cell for financing
- To facilitate and ensure disbursement of incentives or revenue to the JFMCs and VFPCs
- To organize training and capacity building seminars and workshops for the officials of the State Forest Department and village level institutions
- To institutionalize data collection and management, and adherence to safeguards
- To devise mechanisms to absorb lessons from pilots, as an input to the national and international policy processes and development

The village level institution will be suitably involved in the design and implementation of REDD+ projects under the technical guidance of the local forest authorities. FD will assist village level institution in the formulation of pilot projects, their implementation and monitoring. Implementation of REDD+ at ground level needs to be backed by strong institutional support at national, state and local level. The national level institution such as Forest Survey of India (FSI) can play an important role in providing the required technical input, and undertake capacity building exercise on issues such as MRV, enforcement of safeguards and assessment of forest carbon. Government of India must focus on many more pilots with in-built fund based incentive mechanism to sensitize and educate the local communities about the processes, methodologies and benefits of the REDD+. This would help in acceptance and institutionalization of REDD+ at the local level, and building capacity of the local communities to explore in future market based carbon trading opportunities.

7. Key Issues and Action Points

1. Although policy and legislative framework is adequate to ensure meaningful participation of the local communities in implementation of REDD+, capacity of the government machinery in the field is lacking to accomplish the task. Functionaries of FD at all levels specifically at local level need to be adequately sensitized and trained to ensure that the processes, procedures and methodologies for REDD+ are followed in letter and spirit. This will require a country-wide campaign of capacity building for the government officials as well as the members of the local communities on a war footing.

2. Local communities may show a distrust or disinterest towards their participation in REDD+ because of lack of knowledge and sensitization, which may adversely impact the nationwide implementation in due course of time. To address this concern, it will be essential to launch a string of pilot projects at micro level aimed at sensitization and capacity building of the forest officials and local communities to help them understand the finer points and benefits of REDD+ implementation.

3. There is no dedicated mechanism to ensure adherence to the UNFCCC safeguards for upholding the rights of the local communities on forest resource, and for biodiversity

conservation in natural forests. Guidance would need to be provided in shape of simple guidelines detailing roles, responsibilities and actions on part of stakeholders including FD, local communities, Panchayats and Gram Sabhas.

4. REDD+ incentives would flow from Central Government to State Governments, and further down to local communities in proportion to their REDD+ performance. To ensure a transparent and just mechanism governing the flow of incentives, it will be imperative that guidelines are put in place by the Central Government in consultation with the State Governments and civil society to channelize flow of incentives from Centre to States, and subsequently to local communities. For ease of implementation, it will be desirable to have two separate set of guidelines- one governing incentives flow from Centre to States, and second from States down to local communities.

B. REDD+ Financing Arrangements

1. Introduction

Financial support under the aegis of UNFCCC for REDD+ implementation in developing countries is not likely to be available in the near future. Parties could not reach an agreement on Monitoring, Reporting and Verification (MRV) related to REDD+ implementation. SBSTA has been given the responsibility of initiating a Work Programme on results-based finance. It will also find ways and means of incentivizing non-carbon benefits. In a nutshell, there was no concrete decision on financing for REDD+ in Doha.

2. REDD+ Financing Options

REDD+ is intended to be a national level incentive-based mechanism for promoting and rewarding stabilization, maintenance and enhancement of forest carbon stocks as a mitigation service. Conservation and enhancement of forest carbon stocks effected with observance of prescribed safeguards for biodiversity conservation, and for upholding rights of local communities, helps in improvement of the forest ecosystem.

REDD+ incentives will flow from the UNFCCC to developing countries that undertake any of the 5 identified and agreed REDD+ activities resulting in mitigation of emissions. However, at present, it is not certain as to when the finances will start flowing from the Climate Change Convention. Fact of the matter is that presently, there is no dedicated money set aside for REDD+ implementation by the UNFCCC. All the same, with clarity of the REDD+ concept, Annex 1 countries have invested good amount of money for controlling deforestation in countries like Brazil and Indonesia. Norwegian financial support (USD 1 billion each) to these two countries for checking tropical deforestation is a good example. It is now accepted that REDD+ is required to be supported with a wide range of funding options, market as well as non-market based, which include multilateral, bilateral, project-specific, objective-specific and target-specific funding.

Multilateral funding for results-based actions can be leveraged from GEF, World Bank, etc., whereas bilateral sources for such actions may include JICA, GIZ, etc. Project-level or specific objective or target-level funding can best be resourced from external agencies like FCPF, UN-REDD, IUCN, UNDP, etc. FCPF and UN-REDD have a good track record of supporting policy development, capacity building and demonstration activities in developing countries willing to participate in REDD+ implementation.

However, leaving REDD+ implementation solely at the availability of financial support from external funding agencies is not advisable. In the interregnum, till external multilateral, bilateral, or UNFCCC, or other kind of funding becomes available, it will be in the interest of the country to invest internal resources to encash mitigation services from REDD+ actions in forest sector. The GOI may consider channelizing additional funds for REDD+ implementation by States through Finance Commission Rewards. To optimize the REDD+ potential, it will be prudent to invest within and outside the forest sector, *inter alia*, to address the drivers of deforestation and forest degradation, which have a significant bearing on carbon sequestration in forest.

Despite many sources available for REDD+ financing, it is not easy to secure the same. Though REDD+ short-term finance is available, disbursements are slow and investment

opportunities scarce; at the same time, there is no adequate and predictable long-term strategy to meet the financial needs of countries implementing REDD+. In the absence of an ambitious climate change mitigation goal for developed countries in the foreseeable future, most REDD+ finance will be mobilized from the public sector. In this phase, financing for REDD+ is likely to be fragmented, and will come from different sources. Therefore, it will be important to test a variety of financing options that leverage private sector finance and directly address the drivers of deforestation to enhance the mitigation services from REDD+.

It is also expected that REDD+ countries with large economies, availability of resources, and stronger institutions may opt to self finance a significant part of REDD+. They may also quickly engage in agreements to finance results-based REDD+ actions with donors and international agencies. Other developing countries are more likely to rely on official development assistance (ODA) type finance, which combines financial support with technical assistance and policy guidance.

3. REDD+ Financing and Safeguards

The Cancun Agreements include guidance and safeguards for REDD+ that focus on social and environmental risks, addressing governance, maintaining environmental integrity and ensuring the participation and upholding of stakeholders' rights particularly in relation to indigenous peoples and local communities. It will be imperative to have safeguards to address fiduciary risks and to ensure financial transparency for REDD+. Since, incentivization of REDD+ would involve flow of finances from Central Government to State Governments and further down to local communities based on their performances, it will be necessary to have guidelines prescribing norms and procedures for apportioning quantum of incentives amongst State Governments. Similarly, State Governments in consultation with the Central Government and civil society will be required to formulate guidelines for flow of financial incentives to the local communities.

4. Key Issues and Action Points

1. REDD+ funding from UNFCCC is not likely to be available in near future. It is imperative that finances from diverse sources are mobilized for REDD+ implementation. These sources will be internal as well as external. Internal sources will include Finance Commission Awards, CAMPA funds and Additional Central Assistance from Planning Commission. External sources include multilateral agencies like World Bank, GEF, EU, UNDP, IUCN, FAO, etc. Bilateral funding can be sourced through agencies like, JICA, USAID, DFID, or directly from the donor governments like Norway, Denmark, etc.

2. Construction of NFRL will be a pre-requisite for ascertaining and incentivizing REDD+ performance.

3. Guidelines for channelizing financial incentives from Central Government to State Governments and further down to local communities will need to be formulated. The guidelines, *inter alia*, should provide for an appropriate oversight and monitoring mechanism to ensure fiduciary transparency and integrity of financial flows from Centre to States and onwards to local communities.

4. India should reconsider participating in UN-REDD and FCPF to leverage resources for capacity building for implementation of REDD+.

C. Drivers of Deforestation and Forest Degradation

1. Introduction

Human dependence on forest for livelihood or commercial needs results in degradation of forests, and also deforestation. Degradation continuing unchecked for a long time may also lead to deforestation. Causative agents responsible for deforestation and forest degradation are called drivers. For example, in India extraction of fuelwood from forests by local communities for cooking and heating purposes is a driver of forest degradation.

2. Categories of Drivers of Deforestation and Forest Degradation

Drivers of deforestation and forest degradation may be classified into two categories. One, that are planned and projected in accordance with policies, legal framework and management plans and second, that are spontaneous, beyond government and management control.

2.1 Planned Drivers include developmental activities, management initiatives and projected uses such as road and railway construction; coal, iron and other mining activities; hydro-electric power and irrigation projects; industrial requirements; expansion of cities and towns and removals from forests as per silvicultural requirements.

2.2 Unplanned Drivers comprise mainly unauthorized activities, which include unregulated anthropogenic removals by nearby households for consumptive uses like extraction of fuelwood, small timber and NTFP; illegal logging and uncontrolled felling; social causes such as encroachment of forest land for agriculture and housing; unregulated livestock grazing and fodder collection; natural disturbances caused by forest fires, insect attack, disease outbreak, forest dieback; and illegal mining operations.

3. Impact of Drivers on REDD+ Implementation

Unchecked and unregulated drivers will cause continuous depletion of forest growing stock and thereby reduction in biomass and associated forest carbon stocks. Therefore, for sustainable flow of ecosystem goods and services from forests and also for conservation and enhancement of forest carbon stocks, it will be imperative to effectively address the drivers of deforestation and forest degradation. Whereas it may not be necessary to focus on planned drivers as these can always be adjusted to conform to the principle of sustainability, challenge will lie in addressing the unplanned drivers, which may require a planned strategy to offer alternatives to replace or reduce the use of forest products by the local community and others.

4. Addressing Drivers

Key to sustainability will be, meeting the challenge of addressing and managing the unplanned drivers and activities which are mainly the anthropogenic removals of forest products by local people from the adjoining forest, and the illegal logging and mining activities within forest, besides losses caused due to occurrence of natural calamities.

Strategy to address the drivers has to be two pronged- it should ensure the protection of the existing forests, and simultaneously should make arrangements for providing the desired goods and services to the people through alternatives. The effective implementation of regulation will help to minimize the unplanned drivers. The natural calamities are unavoidable, but attempts can be made to minimize the impacts. The effective policy, legal and management framework for managing these drivers include, National Forest Policy, 1988; National Environment Policy, 2006; Forest (Conservation) Act, 1980; and Wild Life Protection Act, 1972, etc.

Implementation of REDD+ in India should, *inter alia*, take into account the need for a workable strategy to address the drivers of deforestation and forest degradation. This strategy should be chalked out in a transparent manner in consultation with the stakeholders including the local community, whose greater involvement, in any case, will be required in the management of forests. Besides, the stakeholdership of civil society, forest managers, academicians and researchers will provide requisite feedback on the effect of the measures taken to address the drivers and, consequently, for maintaining forest sustainability through enhancement of forest ecosystem goods and services. Drivers will be addressed by providing alternatives of forest use to the local community, and also by ensuring sustainable management of local forest resources through preparation and implementation of community-centered microplans. The microplans could secure equitable rights of members of local communities to forest utilization, and corruption-free accounting and disbursement of benefits and future REDD+ incentives.

Creation of proper awareness amongst stakeholders can also play a key role in deciding the level of participation and commitment of different stakeholders in addressing the drivers. Government supported relevant initiatives, such as supply of cheap cooking fuel; promoting non-conventional energy sources; low cost housing; improving agricultural and livestock productivity; effective and quality education for children; better infrastructural facilities including health; and effective use of modern communication, i.e., audio-video tools for creating awareness among community can mobilize public opinion in favour of protection and conservation of forests.

5. Drivers and Food Production

Food security is high on the national developmental agenda. A balance is required to be struck between the necessity to increase the national food production for growing population and the urgency to halt deforestation and subsequent encroachment usually caused by rural poor for subsistence agriculture. This can be achieved by effecting increase in agricultural production of existing farmlands with improved land planning and substantial investment in technology. Strengthening of agricultural and allied field research will be imperative to enhance agricultural productivity in a sustainable manner. Similar approach will be needed for livestock production management.

6. Research

Effective deployment of the proposed initiatives and interventions mentioned in paragraph 4 above will be incumbent upon commissioning of, and inferences from appropriate research in tune with the local requirements. Some of the identified research priorities for the purpose are:

- Effective and improved silvicultural operations for improving site specific productivity with focus on local livelihoods
- Assessment of site specific performance of species for better productivity of basket of forest products including small timber, fuelwood and NTFPs
- Assessment of fast growing tree species with higher productivity and their site evaluation for inclusion in local agroforestry practices
- Development of quick and effective insect and disease control mechanism including prediction of such outbreaks and remedial measures thereof
- Forest fire prediction and control mechanism
- Production of fuelwood, fodder, and NTFPs to suit local requirements
- Increased soil and water conservation measures

7. Key Issues and Action Points

1. Drivers of deforestation and forest degradation although damaging to environment, support local livelihoods and economies. Therefore, addressing these drivers will have a social and economic cost also. This linkage has been recognized by UNFCCC also, who has elaborated that the drivers will need to be addressed keeping in view the national circumstances of a country. In view of this, it will be prudent in India to plan alternatives for minimizing use of forest products causing deforestation and forest degradation, and for providing better economic options to local communities simultaneously, else there will always be a possibility of the drivers to resurface and cause even more damage to forests.

2. Extraction of fuelwood and fodder from forests constitutes a major part of the destruction and degradation of forests. The situation will not improve unless energy, food and other economic needs of rural communities are met without impacting the environment. This will require huge investment in providing clean energy and developmental infrastructure and opportunities in the rural areas. Planning Commission, Ministry of Rural Development and MoEF may chalk out a workable strategy to mobilize the requisite investment, and technical support.

MRV Mechanism and Capacity Building for MRV

1. Introduction

In order to assess mitigation performance in forest sector, and to measure its quantum, the national strategy for REDD+ implementation will include the establishment of a collaborative framework of survey and research institutions who will be responsible for developing a robust system for measuring, reporting and verification (MRV) of status of forest carbon stocks, and changes therein with respect to time and area. There is a need to develop an overarching cost-effective, robust and compatible national forest monitoring system (NFRM), which, *inter-alia*, will have an MRV system, a safeguards information system, and a forest types and natural forest monitoring system. NFRM will provide tools and methodologies, conduct training, and facilitate knowledge sharing that will enable India to strengthen its technical and institutional capacity for effective MRV and other reporting systems. MRV system should be transparent and should be able to measure and report the level of emissions and removals from time to time which are consistent, accurate, and comparable in verifiable terms, and will form the basis of quantitative assessment of REDD+ performance. The focus of the work is GHG emissions and removals monitoring, measured against a National Forest Reference Level (NFRL) and Reference Levels (RLs)/Reference Emissions Levels (RELs) at sub-national stage, i.e., State/UT level, based on forest inventories and remotely sensed information on extent of forest area. Though the REDD+ concept, as agreed in international negotiations in UNFCCC, is a national level forest carbon stocks accounting approach, but because of specific interest either internally or externally at sub-national level, say an entire State, a district or even smaller sub-district project area, or a geographical or ecological area spanning parts of a number of States, the REDD+ accounting may confine to a State or a number of States, a project or a set of nested projects. Internal interest here refers to investment in REDD+ by the Central or a State Government or Planning Commission or Finance Commission, etc. whereas external interest refers to other interested parties from market, multilateral international funding agencies, developed countries and their funding agencies through mutually agreed bilateral agreements, etc. Some adjustment and changes may need to be effected in scope, definitions and standards of MRV system befitting the requirements of the external funding agencies.

MRV for REDD+ is an activity undertaken periodically, precisely, accurately, consistently, and transparently, to measure, report, and to verify the reduction in GHG emissions or increase in removals as a result of REDD+ activities.

2. Base year

There are many options available for fixing the base year at national level for operationalizing national MRV system for forest carbon stocks accounting. For example, year of watershed changes in national policy that impact forest carbon stocks could be a choice for fixing the same. In this sense, the year of enactment of the Forest (Conservation) Act, 1980 or the year of the JFM Resolution, etc. could also be considered for this purpose. Fixing of base year, *per se*, is not that difficult, but the continuous availability of reliable and precise information

about ‘activity data’ and ‘emission factors’ for all the strata and carbon pools, may pose a formidable challenge. If information availability is one of the main criteria, in that case the year 2000 may be considered to be the base year as country has sufficient and precise information this year onwards about activity data which qualifies the range set for parameters for the definition of forests relevant to forest carbon stocks accounting.

3. Measuring and Monitoring

For measurement of forest carbon stocks, ‘stock change method’ is the most appropriate method for adoption in the Indian context. FSI is well versed with this approach for calculating the forest carbon stocks in the country. Periodic surveys are conducted for measurement and monitoring of change of forest carbon stocks and/or GHG emissions resulting from the activities of REDD+ which consist of (1) decreased rate of deforestation; (2) decreased rate of forest degradation; (3) conservation; (4) increased carbon stock through sustainable management of forest; and (5) carbon stock enhancement. In the IPCC Good Practice Guidance, measurement includes two different kind of information one relating to extent of area under forest which is further divided into two groups, i.e., ‘forest land remaining forest’, and ‘land converted to forest land’ (using satellite data). This information is known as ‘Activity data’. The other information which is required is pool-wise ‘Emission factors’ which refers to emissions or removals of GHG per unit of area, data for which comes from forest inventory plots.

4. Reporting

Reporting on GHG emissions or removals as the outcome of REDD+ performance shall include: (i) Reporting to the Ministry of Environment and Forests as the coordinator of National Communication (NatCom) to UNFCCC, (ii) Report which has to be submitted to REDD+ Cell of MoEF to be forwarded to the UNFCCC, (iii) Report which has to be submitted to REDD+ Cell of MoEF to be forwarded to the funding institution in order to receive the incentives as per agreement between the REDD+ proponent (project/nested project) and funding institution and REDD+ credit buying agency, (iv) Reporting to the public through website.

Reporting should follow the principles, as laid out in *UNFCCC/SBSTA technical paper on costs of monitoring for REDD* (<http://unfccc.int/resource/docs/2009/tp/01.pdf>). The principles of (i) Consistency (systematic and consistent measurement); (ii) Transparency (information is open and easily accessible for review and check and re-check as well as public verification); (iii) Comparability (general methodology must ensure comparable results); (iv) Completeness (the data, data source, sampling design, analysis, assumptions should ensure comprehensiveness); and (v) Accuracy (the level of accuracy and uncertainty of data must be calculated and declared).

5. Verification

Verification is a review process to check the quality of data, and the accuracy and precision of information reported. This process is envisaged to be independently conducted by the Secretariat of UNFCCC in respect of the submitted report of the country. The purpose of verification process for REDD+ performance report is “*to assess whether the information is well-documented, based on IPCC methodologies, and transparent and consistent with the UNFCCC guidelines*” (Meridian Institute 2009). For the REDD+ projects supported with

bilateral or multilateral financing arrangements, the entire process of verification will need to be decided and mutually agreed, on project-to-project basis. It is believed that in such cases verification and certification processes of CDM A/R and Verified Carbon Standard could provide useful lead.

6. MRV Mechanism

MRV system as part of the overall National Forest Monitoring System as stated earlier, needs to be cost-effective, robust, compatible and capable of measuring, compiling and reporting the national forest carbon stocks accounts following processes and methodologies as agreed in UNFCCC. It should also provide tools, and methodologies, and facilities for training and knowledge sharing to strengthen institutional capacity of the country to undertake regular accounting and monitoring of forest carbon stocks. Forest Survey of India (FSI) has been monitoring the forest cover in India since 1987; and growing stocks and other parameters from time to time. FSI with NRSC, ICFRE and IISc has been compiling GHG emissions inventory of LULUCF sector, quite regularly. The success of REDD+ depends on the country's capacity to coordinate and collaborate amongst different governmental bodies, channelize adequate funds for strengthening technical and human infrastructure, and build capacities to deliver transparent data on GHG emissions in forest sector. The requirement of REDD+ MRV at different levels (national, sub-national, project based or nested projects) throw different challenges and invaluable opportunity for institutionalizing and strengthening India's existing monitoring mechanisms to take on and handle the additional responsibility for REDD+ reporting.

For the national level, with the support of ICFRE and IISc, FSI is monitoring and reporting the GHG emissions, for the country from forests. Operationalization of MRV for REDD+ as per the decision of COP, will require strengthening of FSI, reorganization of its survey methodologies including change of sampling design, and some research work, in-house as well as in ICFRE and other relevant organizations. To enable flow of performance-based REDD+ incentives from the Central Government to sub-national level of States/UTs, and further down to local communities, a standardised protocol will need to be formulated for preparation of carbon inventory at the State/UT level or down below to project/nested projects level, which will be verifiable by FSI and/or any other central agency or agencies, nominated by MoEF for the purpose. As per need, separate guidance may be prepared for channelizing incentives to the local communities.

For the sub-national level, where sub-national is reporting agency, same process as indicated above should be followed substituting above mentioned institutions by other state agencies which have matching competence or else their capacity can be build to acquire requisite level of competence for REDD+ MRV. For measuring the forest carbon stocks, the MoEF in consultation with FSI can identify organizations for carrying out measuring and monitoring of activities at the state level or sub-state level, if required, and, subsequently, the validation of this information can be done by the FSI. This will not only strengthen the State Forest Departments, and build their capacity, but also help overcome some of the constraints in measuring and monitoring that would otherwise be required to be undertaken by FSI. As regards other ecosystem services, a set of indicators can be developed that can be monitored to adequately address the issue of safeguards for biodiversity conservation as also for rights of local communities.

Though for national REDD+ accounting, leakage is not relevant being non-existent as forests

of whole country will be under measurement and monitoring, and consumption cannot be shifted to other forest land, but for sub-national and for project/nested project level, REDD+ accounting, leakages will also need to be addressed by evolving new techniques and methods for measuring it.

For the REDD+ project/nested projects, the project proponent is required to conduct or arrange to conduct MRV related activities as per the guidance of UNFCCC or mutually agreed third party standards. For distribution of incentives to different communities accruing from the REDD+ project wherein they are participating, a standardised protocol will be required to prepare forest carbon inventory which may be verifiable by some independent designated agency.

The REDD+ accounting process being pan-national may give rise to financial ambiguity at sub-national levels. It can be illustrated from the following hypothetical example. Suppose, at the reporting stage it is found that there is no net additional forest carbon emission or removal from the country, which will mean that there cannot be any financial incentive at the national level. However, at the sub-national level, a few of the units including some States, may have performed considerably well and at their level, they might be legitimately qualified for getting financial incentives because of their positive performance. Since, there was no gain at the national level, resulting in no financial gain to the country, consequently the performing units can also not be awarded for their positive REDD+ performance. This kind of anomalous situation will be applicable up to the lowest unit of implementation, i.e., the community. Thus, for awarding the efforts of performing units, there is need to establish a funding mechanism that could rightfully incentivize the positive REDD+ performance at the sub-national level and even at levels lower than sub-national.

7. Capacity Building

To ensure transparency and involvement, provisions should be made to engage all concerned stakeholders including local communities, civil society organizations, etc in all processes of REDD+ preparation, planning and execution including MRV. There is need to build the capacity of state forest departments and communities with respect to assessment of carbon stocks as well as assessment of multiple benefits from forest ecosystems. They may be trained by the FSI and/or any other suitable institution(s) on technological, methodological, policy, and financial aspects of MRV processes and procedures which should be supported by National and State REDD+ Cell. ICFRE with its formidable reach in the country through its network of institutes and centres can play a lead role in collaboration with the FSI to build the capacity of important stakeholders like forest departments, civil society and the local communities.

The MoEF may designate centres of excellence to support both national as well as state REDD+ Cells. These centres of excellence may provide capacity-building support and perform other facilitating functions as may be required under the overall coordination of FSI and ICFRE.

8. Safeguard Information System

It is a mandatory requirement to build safeguards information systems for providing information on safeguards, and as to how the safeguards are addressed and respected throughout the implementation of REDD+. At COP17 in Durban, decision was taken to

include information on safeguards as part of national communication for the countries undertaking REDD+. COP18 in Doha observed that monitoring of multiple benefits from forest ecosystem identifies the additional benefits that REDD+ can generate, in addition to carbon. Examples of multiple benefits can be socio-economic, like improved livelihoods, or ecosystem services, such as protection of biodiversity and watersheds. By identifying and monitoring multiple benefits, it is possible to adapt national REDD+ strategies in a manner that could avoid harm, and maximize multiple benefits. India is measuring a few of the multiple benefits from forest ecosystems through National Forest Inventory and also assessing the dependence of local communities for fodder and fuelwood on forests.

9. Quality Assurance and Quality Control

The quality assurance is the process which surveying/assessing institution puts in place for assuring the quality of product prior to implementation of work, viz, defining objective(s) and all the terms and concepts, designing of work plan, preparation of working manuals, capacity building of concerned officials, testing of all developed procedures before finalisation, preparation of regression equations and indices using validation, use of suitable factors (e.g., carbon content, wood density), etc. The forest carbon stocks estimation carried out by FSI uses four products, viz., Forest cover maps, Forest type maps, NFI data sets and results of biomass study (for developing biomass expansion factors). All these products have been generated following the strict quality assurance processes specifically developed for assured performance of each of the products.

The quality control is the process which is put in place for controlling the errors which may arise during the implementation of the work, viz., data acquisition/collection, data recording, coding, data entry, data processing, interpretation of results, etc. For each of the programme and for each of the error mentioned above separate quality control processes are evolved and put in place for an assured quality product.

The second level of Quality Assurance Process is independent verification procedure carried out by a third party arranged by the implementing agency before reporting to UNFCCC or other approving agency. This process ensures the transparency and suitability of adopted procedures of whole process, i.e., from designing to the final estimation protocols.

10. Quantities to be Measured and Reported

India from the very beginning in the UNFCCC negotiations has been highlighting the importance of not only the incremental stocks as a result of contribution of ‘+’ activities of REDD+, but also of the necessity of maintaining the stabilized or the baseline stocks as any reduction in these stocks would negatively impact the overall mitigation service from forest sector at national and global level. Therefore, it will be advisable to report not only the incremental forest carbon stocks in a reporting period, but also the baseline stocks to claim REDD+ incentives. Care must be taken to prepare the national forest carbon stocks inventory and accounts accordingly.

11. Key Issues and Action Points

‘Stock change method’ is the most appropriate method for measurement of forest carbon stocks in India, keeping in view the expertise and experience of the FSI in dealing with such measurements. Also, REDD+ is still being negotiated in respect of its MRV and many other

associated aspects including relevant processes and methodologies. Every developing country participating in REDD+ is required to have a national forest monitoring system comprising MRV, safeguards information, and other supplementary monitoring systems. In view of the evolving international perspective on REDD+, and in the context of India's requirement for developing a robust MRV system, action on following elements is considered necessary for this system to be useful for regular and effective assessment of REDD+ performance in the country:

1. Development of National Level Strategy for the implementation of REDD+ national level approach.
2. Designation of FSI as national level institute for MRV.
3. ICFRE and other organizations should conduct studies to develop forest type and physiographic zone-wise equation/factors for below ground living biomass for important representative tree species and factors for proportion of biomass of shrubs/ climbers/herbs.
4. Region-wise information demands that the number of sample points should be increased which necessitates both involvement of state forest authorities in data collection work, and also enhancement of technical manpower in FSI.
5. REDD+ MRV demands repetitive measurements which again require more manpower as indicated in point 4 above. It is proposed that a 4 year cycle is appropriate for REDD+ reporting.
6. MoEF with the help of FSI, may nominate agencies at state level for MRV including additionality and leakages.
7. The reference/base year may be 1990, or 2000, or later.
8. There will be one National Forest Reference Level (NFRL), and State/UT Forest Reference Levels (SFRLs) at sub-national level for assessing REDD+ performance at national and State level.
9. The State/UT REDD+ cell will oversee the implementation of REDD+ at State and smaller level and National REDD+ cell will monitor and verify the implementation of REDD+ through its designated agencies.
10. Implementation of SMF shall be monitored on the basis of developed criteria.
11. Socio-economic survey shall be carried out to assess i) dependence of the local communities on forests, ii) safeguards, and iii) assessment of unsustainable harvest if any.
12. MoEF must designate centres of excellence to support national as well as State REDD+ cell.
13. Third party verification of enhanced forest carbon stocks under REDD+ with reasonable transaction cost will be ensured.

Capacity Building

1. Introduction

Reducing Emissions from Deforestation and Forest Degradation, along with conservation and enhancement of forest carbon stocks (collectively called REDD+) is an active agenda of negotiation with the UNFCCC for climate change mitigation. Defining of REDD+ activities finally in Cancun Agreements (COP-16) brought home clarity to the Governments on the options to be pursued and preparations to be made by the developing countries to achieve positive performance with respect to REDD+ implementation. The Agreements also speak of necessity of providing technological and financial support to developing countries for the purpose, and also allowing them to implement REDD+ in phases beginning with preparation, followed by demonstration and pilots, and finally moving into results-based actions. Capacity building was envisioned to be a critical requirement for the preparatory and demonstration phases, and a general need for the third phase of results-based implementation. Preparatory phase involved development of national strategies or action plans, policies and measures, and capacity-building, followed by the demonstration phase comprising implementation of national policies, measures and strategies, or action plans that could need further capacity-building, and technology development culminating in the nationwide implementation of results-based REDD+ actions that should be fully measured, reported and verified.

As a part of the comprehensive REDD+ strategy, developed countries are expected to support capacity-building efforts of the developing countries to enable them implement all phases of REDD+. For example, under the Capacity Development for Reducing Emissions from Deforestation and Forest Degradation (CD REDD) programme of United Nations, a series of technical workshops to enhance the capacity to develop the national greenhouse gas inventories and forest monitoring systems were organized in the year 2008-09. The programme during the period was carried out with the support of the then German Technical Cooperation Agency (GTZ), the German Ministry of Environment (BMU), the World Bank's Forest Carbon Partnership Facility (FCPF), the Global Environmental Facility (GEF), the Brazilian Space Research Agency and the Indian Council of Forestry Research and Education (ICFRE). The first capacity building workshop was held in Berlin and the second workshop was held in Brazil in 2008. The third workshop in this series was hosted by the ICFRE in Dehradun from 27-29 April 2009, on "National Forest Inventory: The Experiences of non-Annex I Countries". The workshop featured presentations from IPCC experts, and sharing of information on the integration of inventories into measuring and reporting systems of forest carbon stocks. The workshop aimed at capacity building and presenting methodological issues to facilitate wider understanding and implementation of the UNFCCC agenda on REDD+. The objective of the workshop was to enable experts of developing countries to better understand the technical aspects and options related to the measurement of forest carbon stocks for developing national forest carbon inventories. One finding that conclusively

and very clearly emerged from the ICFRE workshop was that capacity building for effective implementation of REDD+ in India cannot be accomplished by a single organization, but would require collaborative arrangements between expert organizations like ICFRE, IISc, FSI, IGNFA, IIFM, State Forest Departments besides other organizations. ICFRE with its country-wide presence through its 8 Institutes and 4 Centres is considered to be the best option to take on the responsibility of REDD+ capacity building of personnel of all levels including members of the local communities.

Government of India has also set up a REDD+ cell under the overall guidance and supervision of the Ministry of Environment and Forests (MoEF) to coordinate REDD+ activities with the task of creating awareness and undertaking capacity building on the subject for all stakeholders, including the community institutions. Capacity building of indigenous peoples, local communities, State Forest Departments (SFDs), national organizations and NGOs is a key foundation for effectively securing the opportunities that REDD+ will provide, and also for addressing risks and safeguards mandated by UNFCCC, thus contributing to more equitable REDD+ implementation in India.

2. Current Status

India is in a reasonably comfortable position, *vis-à-vis*, many other developing countries, as far as the capacity and capability to implement REDD+ is concerned. Still, a lot needs to be done on the capacity building front to ultimately follow strict adherence to the time limitations that are likely to be put by the UNFCCC for the MRV of REDD+. The following paragraph illustrates India's capacities, as these exist now.

(i) *Monitoring, reporting and Verification*: To begin with, India is among the few countries to regularly use satellite based remote sensing technology in detecting, recording and reporting forest cover changes. This practice has got tremendous application in Measuring, Reporting and Verification (MRV) of performance of REDD+ activities. The application of satellite remote sensing technology to assess the forest cover of the entire country in India began in early 1980s. The National Remote Sensing Agency (NRSA) prepared the first forest map of the country in 1984 at 1:1 million scale by visual interpretation of Landsat data acquired for two periods: 1972-75 and 1980-82. The Forest Survey of India (FSI) has since been assessing the forest cover of the country on a two-year cycle. Over the years, there have been improvements both in the quality of remote sensing data and the accuracy of interpretation techniques. The 12th biennial cycle has been completed in 2011 using digital interpretation of data at 23.5 m resolution with a minimum mapping unit of 1 ha of area.

(ii) *Research in Climate Change*: ICFRE along with its network of institutes is carrying out basic and applied research in the field of forests and climate change in India. In addition, a lot of training courses are conducted for scientists and forest officers working in the Central as well as the State Governments. ICFRE is already engaged in capacity building programmes for the officers of the Indian Forest Service (IFS) on REDD+ related issues and has already conducted three such training programmes for IFS officers on the significance and scope of REDD+ for India's forest sector. Among the non Annex countries, only a few countries are equipped with such elaborate research and capacity building network. India can help in the capacity building programmes of other non Annex countries in respect of MRV as also

research priorities under the REDD+ umbrella. A suitable multilateral financial mechanism can be developed to deliver such capacity building packages for developing countries intending to undertake REDD+ implementation.

(iii) *Local Capacities*: The institutions dealing with the forests at local level include Gram Sabhas, Joint Forest Management Committees (JFMCs), Community Forest Management (CFM) groups of Odisha, Van Panchayats of Uttarakhand, Village Councils of North Eastern States, etc, besides the Self Help Groups and Common Interest Groups that have also been set up at village level to promote forest based livelihood activities. Spread of Joint Forest Management (JFM) has been a reality, despite several limitations and uncertainties like tenural insecurity, inadequate development of appropriate silvicultural practices, and restricted harvesting and market access. JFM has certainly helped in regenerating forests and meeting local needs. Some of the local communities, like Natural Resource Management Committees (NRMCs) established under Haryana Community Forestry Project have capabilities to carry out participatory monitoring and evaluation (PME) of their forest resources.

3. Evaluation of Current Situation

Forest sector in India is facing unprecedented challenges, which, of course, can be turned around as opportunities as well. Forests are being increasingly recognized as a key resource in resolving global issues such as poverty, climate change, biodiversity loss and dwindling goods and services from natural resources. And consequently, growing interest in forests is opening up a wide range of promising new funding sources, instruments and mechanisms like REDD+. These opportunities, if effectively realized, could both enhance the livelihoods of forest-dependent people and also simultaneously improve the state of the world's forests by providing steady flow of funds, and ultimately reposing trust in the forest-dependant people by allowing them to sustainably manage the nearby forests, and rise out of poverty.

Full and effective participation of indigenous people and local communities in developing, implementing and monitoring REDD+ actions and initiatives require investment in capacity building and inclusive decision-making process. Financial resources for such investment need to be explored and assured for successful implementation of the same, as currently no such mechanisms are specifically available. On technical front, considerable capabilities have been developed in India in forest resource assessment. However, from the perspective of REDD+ implementation, requiring preparation of national forest carbon stock accounts at regular intervals, involvement of a good number of field, technical, ministerial, and supervisory government forest staff, and also of members of local communities and civil societies, and of other department officials will be required. They will also need exposure to, and awareness about the technical aspects of the measurements. This will require a massive capacity building exercise. Also, the resolution of the satellite imageries used at present for assessment of forest cover is not very high. Certainly, the present technical capability to procure and work on high resolution imageries needs to be upgraded. Also, the resource assessment at the State and local level is neither accurate nor properly institutionalized. To upgrade the skills and capability at the local level, the capacity building programme will be extended up to community level.

4. Development of Capacity-Building Mechanism

Ensuring long-term investment in capacity building is critical for development of a national forest monitoring system comprising MRV and safeguards mechanism for REDD+. Capacity building will need to be institutionalized at the national level with effective reach up to State, sub-State and local levels. Partnership with local communities will be necessary to involve them in regular capacity building and awareness programmes. Besides their participation in REDD+, it is important to enable local communities and other actors to steer their own social and economic development because they are best placed to consider local realities, needs, aspirations and dynamics. By enabling and empowering local communities to develop partnerships with funding agencies, national and local governments, the responsibility of organizing training and other capacity building activities at the local level can be shifted to the local communities. Mapping local forest stakeholders and their networks can identify influential players who should be compulsorily involved in the REDD+ training campaign.

Following suggestions are given for effective capacity building to support REDD+ implementation:

(i) *Strengthening local community institutions*: Strengthening decentralized governance through *Gram Sabhas* and other similar thematic committees, groups, local institutions have significant bearing on forest conservation and sustainable use of forest resource. Empowered and strengthened *Gram Sabhas* hold the key to decentralized governance of the forests and natural resources. Informed *Gram Sabhas* would mean better coordination and linkages across different institutions at local level and improved accountability of such institutions including Gram Panchayats and JFMCs. Comprehensive REDD+ approach and programmes should, therefore, strengthen Gram Sabhas as overarching institutions, supported by thematic committees and user groups (JFMCs, CFM groups, BMCs, etc). This would help in bringing about the necessary convergence of resources essential for integrated planning at local level. Leadership provided by the thematic committees and the user groups and self help groups would then contribute to strengthening of Gram Sabhas and the Gram Panchayats. Legal backing should be provided under REDD+ umbrella to JFMCs as in the majority of States, they are not set up under any specific statute. To allow greater decentralization of decision making and devolution of power, and secured community tenure, providing legal backup to JFMCs could be helpful. The composition, and rules and regulations related to forest protection committees (FPCs) under JFM differ from state to state. Uniform guidelines across the states are needed to institutionalize REDD+ actions and implementation at the national level.

(ii) *Capacity Building of local institutions*: Building capacity of local institutions is needed under REDD+ mechanism to enable them effectively protect, regenerate and manage forests, and also complement and share responsibility of SFD in MRV of REDD+ performance. Creating community stake in regeneration of forests and restoration of ecosystems requires that communities have sufficient stake in terms of enhanced biomass, NTFPs and environmental services (including REDD+ benefits) from such areas. Community driven innovative and adaptive silviculture is of critical importance to successfully implement

mitigation and adaptation strategies in conservation of ecosystems and enhancement of associated carbon stocks. Implementation of REDD+ should provide and support greater space for local level planning and management for restoration and improvement of forest and ecosystem. Capacity building and awareness for implementation of REDD+ and associated benefits and safeguards are also equally important for participating communities as for the other stakeholders from government and civil society.

(iii) *Building a cadre of community youth for REDD+ implementation and MRV*: Given the fast changing rural scenario with increase in the number of educated unemployed and underemployed youth, REDD+ should clinch the opportunity to contribute in providing gainful employment with added window for community development, to the local youth cadres, who in due course would be the champions of the forest cause with adequate knowledge of REDD+ implementation and benefits. Support of research institutions, universities, colleges, and schools from local area, Forest Department and NGOs would help develop this cadre of forest champions. The example of the carbon assessment project in Lamgarha Block in Uttarakhand proves the point that rural educated youth are quick to pick up skills, and have huge potential to provide support to the community in planning, implementation and monitoring of the greening initiatives and associated forest measurements at the local level. The cadre of community youth will help streamline the REDD+ activities at the local level with active support of SFD and other agencies. This will also augment capacity of Forest Department to effectively manage forests near human habitations, and also ensure quick and cost effective MRV of REDD+ performance.

(iv) *Strengthening Forest Department and other partner agencies*: In order to ensure an integrated approach for REDD+ implementation and MRV at village or cluster or sub-landscape or sub-watershed level, the forest department will need additional capacity. Teams of Subject Matter Specialists at Range and Division level preferably on contractual basis could bring in new knowledge and skills in building capacity of the field staff, local communities and the youth. Capacity building activities for REDD+ implementation should support upgradation of the Range Office into a forest and wildlife resource centre with facilities for library, documentation, map room, GIS and MIS applications. This support should also be available to the partner agencies working in the sub-watershed and sub-landscape level.

(v) *Training and extension manual in vernacular language*: REDD+ decisions presently are available in English and use very complex scientific text, full of technical terminology and acronyms. The concept of REDD+ still remains abstract for most stakeholders and local communities. REDD+ concepts and terms emanating from UNFCCC decisions are still highly technical. There is need to transform gist and spirit of these decisions and allied information into the native language enabling local people and communities to understand the objective of comprehensive REDD+ implementation, and the role that it can play in improving their livelihoods and local environment. REDD+ strategy should, inter-alia, incorporate the requirement to develop information material on the subject in local and vernacular language for use of front line forest staff, grass root level workers and local community.

5. Future prospects

Capacity building will support a number of priorities of the Government of India, State Forest Departments, indigenous people and local communities with regard to REDD+ implementation. These include:

- Understanding climate change, its impact, mitigation and adaptation in general, comprehensive REDD+ approach, potential benefits of REDD+, and essential safeguards to avoid potential risks.
- Ensuring full, effective and willing participation of stakeholders at multiple levels including local, sub-national and national in development of REDD+ strategies and programmes.
- Managing activities and controlling drivers of deforestation and forest degradation.
- Benefitting from REDD+, especially through increased capacity of the communities to negotiate an equitable share of the multiple goods and services from REDD+ implementation.
- Monitoring results and performance of REDD+ activities, as part of measuring, reporting and verification (MRV) of REDD+ including impacts on ecosystem and biodiversity.
- Translation of gist and spirit of complex issues concerning global climate debate, climate policy and financing in local language for benefit of rural communities.
- Informing indigenous people and local communities of their role in engagement with REDD+ initiatives along with prescribed safeguards.
- Providing information on both potential opportunities and risks in absence of adequate safeguards associated with REDD+ in keeping with best practices of free, prior, informed consent (FPIC).
- Developing a safeguard information system (SIS) for REDD+ with reporting coverage from local to national level.

Any capacity building programme of REDD+ should engage communities and their organizations with a view to informing them fully on all relevant aspects of REDD+, and build their capacity to effectively participate in implementation and MRV of REDD+ in the field as well as at State and national levels.

6. Nodal Capacity Building Organization

In the end, it would be appropriate to recommend that an organization with maximum reach and coverage in the country should be given the responsibility of planning and executing the capacity building for REDD+ implementation at all levels including national, state, landscape, watershed and local levels, involving all stakeholders like officials of forest department of all levels, other government officials, members of civil society, local communities, local youths, etc. ICFRE has all the qualifications to undertake this onerous country-wide task. It should coordinate the planning and execution of capacity building strategy in consultation with FSI, IGNFA, IIFM, SFDs and Universities, etc at national, state, local and other levels. In due course of time, ICFRE should develop a *Manual for the*

Trainers that will be used by all those involved in capacity building of different stakeholders to facilitate implementation of REDD+. It should be written for trainers who intend to conduct training workshops for key stakeholders like Forest Department personnel, indigenous people, community members and others.

7. Key Issues and Action Points

1. Adequate capacity of the country is key to successful implementation of the REDD+. Capacity building for efficient operationalization of REDD+ is a formidable challenge as it needs to cover all relevant stakeholders, including i) State Forest Department functionaries of all levels specifically the field staff, ii) functionaries of other related departments like Agriculture, Rural Development and Tribal Affairs, etc, iii) members of civil society, and iv) members of local communities, JFM Committees, Gram Sabhas, and Panchayats, etc.

2. MoEF may incorporate capacity building for REDD+ in its Integrated Forest Protection Scheme, or in the alternative, launch a separate nationwide campaign for REDD+ capacity building as an independent initiative of the Ministry during the ongoing 12 Five Year Plan itself.

Research and Knowledge Gaps in the Context of REDD+ in India

1. Introduction

REDD+ is an emerging and challenging mechanism not only for the policy community but also for the research community. Although there is a significant body of research on the science of identifying trends of deforestation, there is lack of credible tools, techniques and research on forest degradation and sustainable management of forests, two key components of REDD+. Some of the critical research, knowledge and data gaps that need to be addressed are discussed below to enable India to successfully design, implement, measure, monitor, report and verify REDD+ actions and their results in the coming years.

2. Definition of forest degradation and plus components of REDD+

UNFCCC has defined forest and deforestation. Forest degradation and the plus components have not yet been defined by UNFCCC. IPCC provides a definition of forest degradation, which is yet to be approved by the UNFCCC. Since, there are no UNFCCC approved definitions for forest degradation and plus components, there is no harm in India understanding, developing and promoting these, particularly in the context of Indian circumstances. This should be the first knowledge gap to be addressed by the Indian Government and the research community. While developing the definitions, it is necessary to keep in mind the technical feasibility and cost-effectiveness of measurement methodology required for assessing performance of the actions relevant to the particular definition.

3. Identification of potential locations and scale of REDD+ components

There is strong possibility of investment by funding agencies to support specific REDD+ actions in forest areas suitable for the purpose. Thus, once forest degradation and the plus components are defined, combined with the agreed definition of deforestation, the first step will be to identify and estimate the extent of area suitable for each of the components and also the spatial spread to select the States and the districts with maximum potential for undertaking activities corresponding to a particular definition. This is a crucial step before further analysis or assessment of any of the components could be attempted. For identification of focus areas, it will be necessary to estimate the actual rates of deforestation and forest degradation (DD) using a bottom-up approach. For all potential REDD+ areas, it will be imperative to generate geo-referenced maps of the districts and locations wherein these REDD+ areas fall.

4. Setting the forest reference level and forest reference emission level

The most challenging research question for REDD+ preparedness phase is developing a National Forest Reference Level (NFRL) supplemented by sub-national Reference Levels

(RLs) covering individual States and UTs. States and UTs that still are facing heavy deforestation or forest degradation can opt for construction of a Reference Emission Level (REL) to measure the performance of checking deforestation and forest degradation. In order to set an RL/REL, along with the present and historic information on forest area and carbon flux, an analysis of factors driving deforestation and forest degradation is imperative. For the plus components, it is equally important to understand the drivers of deforestation and degradation, since these drivers are inversely linked to conservation of forest carbon stocks, sustainable management of forests (SMF) and enhancement of forest carbon stocks. Data on various drivers of deforestation, forest degradation and activities resulting in carbon stock enhancement and conservation can potentially be gathered through a combination of remote sensing and other non-spatial information such as administrative records. For construction of RL, future areas likely to be subjected to deforestation, forest degradation, carbon stock enhancement, conservation and SMF, can be projected based on the past trends and policy drivers using time-series data on forest cover since 1987 and non-spatial information available from administrative records and other data sources. However, availability of consistent historical carbon stock information presents a significant challenge. It can be addressed to some extent by developing carbon stock values using proxies such as canopy cover through future monitoring and correlating them with the past forest monitoring data.

5. Methods and approaches for developing Forest RL

Multiple approaches, methods and models are available for developing RL at national or State/UT level. It is necessary to apply all the methods and models and evaluate them in the context of availability of data and maps, and their ability to reliably estimate and project RL. There is a need to evaluate and identify appropriate modeling techniques to develop a consistent approach towards establishing the RL/REL in the Indian context.

6. Recommending modifications to the National Forest Inventory (NFI) for REDD+

Generation of data and maps for REDD+ components: Based on the currently available voluntary standards and the IPCC guidelines, it is possible to state that development of RL or developing REDD+ project at sub-national level would be highly data intensive, often making the feasibility of a project difficult. In fact, some of the components of REDD+ may be difficult to implement in India given the limitations of Activity Data (AD) and Emission Factor (EF). Some of the potential challenges with respect to AD and EF are:

- Remote sensing maps for multiple time periods for each of the REDD+ activities for a given project location at a scale which would enable project development
- Land use change matrix for the IPCC land categories such as forest land, cropland, grassland, wetland, settlements and other lands
- Emission Factor for different IPCC land categories and sub-categories subjected to transition or land use change
- Drivers of deforestation, forest degradation and other plus components

7. Development of national REDD+ strategy

As part of the first phase (preparatory) of activities, countries are supposed to develop a national REDD+ plan or strategy. It would involve selecting the most effective REDD+ strategies with the highest returns by assessing the status of national forests, identifying the location of deforestation, forest degradation and activities resulting in carbon stock enhancement and their drivers; assessment of the abatement opportunities as to their economic costs and benefits; and prioritizing them in a national REDD+ pathway through a broad suite of policies and measures while ensuring the relevant safeguards for rights of local communities, conservation of natural forests, and biodiversity conservation, as agreed in UNFCCC. While India has a broad suite of policies and measures in place for addressing deforestation and forest degradation and enhancing forest carbon stocks, a dedicated institutional structure needs to be put in place to formulate and implement a national REDD+ strategy with a clearly defined mandate, roles and responsibilities.

8. Developing an MRV system for REDD+

As part of the Cancun Agreements, countries are supposed to develop a robust and transparent national forest monitoring system with the capacity to consistently and accurately monitor changes in forest cover and associated carbon stocks over time. There is a general consensus that this forest monitoring system would be a combination of remote sensing and ground-based systems. India has a distinct advantage of having a mature and well-developed national forest monitoring system based on remote sensing combined with extensive ground truthing with a long time series of data on forest cover according to different canopy cover density classes. With some modifications, it is possible for India to detect the location of deforestation and forest degradation with sufficient accuracy. Information on the areas subject to conservation, SMF and enhancement of forest carbon stocks could also be obtained through a combination of data from administrative and other sources, and remote sensing. Currently, India does not have a forest inventory system based on permanent plots. India will have to develop a robust system for monitoring of carbon stocks in forests through a network of permanent monitoring plots to provide sufficiently accurate sub-national estimates of carbon stock changes.

The international negotiations on REDD+ under UNFCCC culminating in the Cancun Agreements provide for a phased approach towards REDD+ implementation with the countries undertaking REDD+ readiness activities including development of appropriate policies in the initial phases, leading up to a full-scale performance-based system in the final phase. The Cancun Agreements also identifies the specific elements of REDD+ readiness activities that countries need to work on: national REDD+ strategy, MRV system, reference level/reference emission level (RL/REL) and a system for monitoring safeguards. While the Cancun Agreements provide clarity on some elements of REDD+, much work needs to be done on some key aspects such as scale, source of financing, RLs, safeguards and MRV systems. The provision in the Agreements to allow sub-national REDD+ approaches as an interim measure opens the door for future forestry-based REDD+ projects to be incorporated into sub-national programmes. Execution of such projects could be a vital source of

experience to REDD+ negotiators as they examine options for financial, technical and institutional arrangements for results-based implementation of REDD+. Voluntary market institutions, particularly the Voluntary Carbon Standard, present a vital testing ground for innovative practices.

9. Key Issues and Action Points

REDD+ is still a developing subject in terms of technology, methodology and financial options, and, therefore, all aspects of REDD+ require research. Some of the areas requiring research on priority are indicated below:

1. The broad research areas have been identified above and there is a need to prioritize research issues
2. Identify institutions in different parts of India for undertaking research on various aspects related to REDD+ such as identification of potential locations for REDD+ implementation, setting up of NFRL, sub-national/project level RL and REL, generating data for developing project proposals for REDD+
3. Initiate a process for forest monitoring to assist in MRV for REDD+ activities
4. Generate remote sensing maps and creating access to such maps to project developers

Glossary of Technical Terms

Additionality

Refers to the nature of projects under the Kyoto Protocol. Projects must demonstrate ‘additionality’ – real, measurable and long-term benefits in reducing or preventing carbon emissions that would have occurred without the project. Alternatively, additionality in crediting systems means payments for reducing emissions to a level below the business-as-usual scenario.

Afforestation

Afforestation is defined under the Kyoto Protocol as the direct human-induced conversion of non-forest land to permanent forested land (for a period of at least 50 years).

AFOLU

Acronym for Agriculture, Forestry and Other Land Uses. Recommended by IPCC Guidelines (2006) as a new term covering LULUCF (Land Use, Land Use Change and Forestry) and agriculture.

Annex I and Non-Annex I Countries

Under the UN Framework Convention on Climate Change (UNFCCC), nations fall into two categories: developed countries (referred to as Annex I countries) and developing countries (referred to as Non-Annex I countries). In accordance with the principle of common but differentiated responsibilities, Annex I countries have higher levels of commitments related to policy enactment and reporting, and most of them have emissions reductions commitments in the Kyoto Protocol.

Bali Action Plan

The Bali Action Plan refers to Decision 1/CP.13 that sets out the framework for international negotiations on a ‘...comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to the beyond 2012’. The Action Plan includes provisions for ‘Policy approaches and positive incentives on issues relating to reducing emission from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries’.

Baselines

Baseline or reference line can refer to three concepts (i) the historical baseline, that is, the rate of deforestation and forest degradation (DD) and the resulting CO₂ emissions over the past x years; (ii) the projected DD under a business-as-usual (BAU) scenario. A BAU baseline is the benchmark for judging the impact of the REDD measures and ensuring additionality; and (iii)

the crediting baseline, or reference level, is a benchmark for rewarding the country (or project) if emissions are below that level.

Biomass

The total dry mass for living organic matter.

Business-as-Usual (BAU)

A policy neutral reference to future emissions, that is, projections of future emission levels without the REDD activity.

Carbon Markets

Any market in which carbon emissions trading, usually in the form of carbon credits, takes place. Markets consist of voluntary markets (where emissions reductions targets are not regulated) and compliance markets (where carbon credits are traded to meet regulated emission reductions targets). The largest carbon market at the moment is the EU's Emissions Trading System (ETS).

Carbon pool

A reservoir or stock which has the capacity to accumulate or release carbon. In forests there are five main carbon pools aboveground biomass, belowground biomass, dead wood, litter and soil organic matter.

Carbon rights

Carbon rights refer to the claims on the benefit streams from carbon pools, for example, the benefit from a specific parcel of forest. Where a market exists for GHG emissions reductions carbon rights may have a financial value. Carbon rights may also define the management responsibilities associated with a specific area of forest. Issues concerning carbon rights include how the rights are defined, how they work in places where land ownership is unclear, and whether legal institutions are strong enough to protect the rights.

Carbon sequestration

The removal of carbon from the atmosphere and long-term storage in sinks, such as ocean or terrestrial ecosystems, through physical or biological processes, such as photosynthesis.

Carbon sink

A pool (reservoir) that absorbs or takes up carbon released from other components of the carbon cycle.

Carbon stocks

The quantity of carbon contained in a carbon pool.

Certified Emission Reduction (CER)

The technical term for the output of CDM projects. A CER is a unit of GHG reductions that has been generated and certified under the provisions of Article 12 of the Kyoto Protocol, the Clean Development Mechanism. One CER equals one tone of carbon. Two special types of CERs can be issued for net emission removals from afforestation and reforestation CDM projects: (i) temporary certified emission reduction (tCERs); and (ii) long-term certified emission reductions (lCERs).

Clean Development Mechanism (CDM)

A mechanism under the Kyoto Protocol designed to help developed (Annex I) countries to meet their emissions reduction targets. The mechanism allows the Annex I countries that finance and implement projects that reduce emissions in developing (Non-Annex I) countries to get credits that can be used to fulfill their own emissions reduction targets. The CDM aims not only to reduce emissions or increase sinks, but also to contribute to sustainable development in developing countries.

Co-benefits

Benefits arising from REDD schemes (other than reducing GHG emissions), such as alleviating poverty, protecting the environment, enhancing biodiversity, improving forest governance and protecting human rights.

Conference of the Parties (COP)

The governing body of the UNFCCC, which meets once a year.

Crown cover

The percentage of the surface of an ecosystem that is under the tree canopy. Also referred to as 'canopy cover' or just 'tree cover'.

Deforestation

Most definitions describe deforestation as the long-term or permanent conversion of land from forest to non-forest. In an annex to a decision made by the UNFCCC Conference of Parties (COP), which serves as a meeting of the Parties to the Kyoto Protocol, deforestation is defined as 'the direct human-induced conversion of forested land to non-forested land'. The FAO defines deforestation as 'the conversion of forest to another land use or the long-term reduction of the tree canopy cover below the minimum 10% threshold'. Definitions also stipulate minimum tree heights (FAO: 5 m *in situ*) and minimum areas (FAO: 0.5 ha), and that agriculture must not be the dominant use. But the definitions of minimum canopy cover, height and areas vary from country to country.

Degradation

Changes within the forest which negatively affect the structure of function of the forest stand or site, and thereby lower the capacity of the forest to supply products and/or services. In the context of a REDD mechanism, forest degradation results in the net loss of carbon from the ecosystem. One way to measure degradation results in the net loss of carbon from the ecosystem. One way to measure degradation is to measure the decrease in the carbon stock per area unit (e.g. hectare).

Forest transition

Describes the changes in the forest cover over time as a sequence of four stages. These are (i) initially high forest cover and low deforestation; (ii) accelerating and high deforestation; (iii) slow-down of deforestation and stabilization of forest; and (iv) a period of reforestation.

Fungibility (of REDD credits)

The degree of exchangeability between REDD credits and carbon credits in carbon markets. When REDD credits are fully fungible, they can be sold without restriction and used for purposes such as meeting emission reductions targets in countries that have committed to such targets.

Hot air

Emissions reductions that are not truly additional (see ‘additionality’). To illustrate, consider the situation in former Soviet Union and Eastern Europe. Economic decline in the 1990s led to a sharp decrease in GHG emissions. Levels were lower than those in 1990, which was the crediting baseline level. Under the rules of the Kyoto Protocol, these countries were eligible to sell the difference as credits, despite the fact that credits came from emissions reductions that would have occurred anyway (i.e. not additional).

Input-based payments

Payments that are made conditional on inputs which are assumed to produce emissions reductions, but where the outcome cannot be measured directly (or is very costly to measure). Input-based payment schemes are often referred to as ‘policies and measures’ (PAMs).

Joint Implementation (JI)

A mechanism under the Kyoto Protocol (alongside CDM) designed to help Annex I countries to meet their emission reduction targets by investing in emission reduction projects in other Developed countries as an alternative to reducing emissions domestically. Unlike the CDM, JI emission reduction take place in countries that have GHG emission targets.

Kyoto Protocol

An agreement made in 1997 under the United Nations Framework Convention on Climate Change (UNFCCC). Annex I countries that ratify this Protocol (categorized as Annex I countries) commit to reducing their emissions of carbon dioxide and five other GHGs. The

Kyoto Protocol now covers more than 170 countries globally, but only 60% in terms of global GHG emissions. As of December 2007, the US and Kazakhstan are the only signatory nations not to have ratified the Protocol. The first commitment period of the Kyoto Protocol ends in 2012, and international talks began in May 2007 on the next commitment period.

Leakage

In the context of climate change, carbon leakage is the result of interventions to reduce emissions in one geographical area (subnational or national) that lead to an increase in emissions in another area. For example, if curbing the encroachment of agriculture into forests in one region results in conversion of forests to agriculture in another region this is considered to be 'leakage'. In the context of REDD, leakage is also referred to as 'emissions displacement'.

LULUCF

Acronym for Land Use, Land-Use Change and Forestry. See also AFOLU

Mitigation

Actions to prevent further accumulation of GHG in the atmosphere by reducing the amounts emitted, or by increasing the storage of carbon in sinks.

Nested approach

A hybrid approach that includes elements of both sub-national and national approaches to REDD.

Payments for environmental (ecosystem) services (PES)

Voluntary payment by a (minimum one) buyer to a (minimum one) provider to 'buy' an environmental service (or a land use likely to secure that service), if, and only if the provider secures the environmental service.

Permanence

The duration and non-reversibility of a reduction in GHG emissions. Non-permanence can be seen as a form of inter-temporal leakage.

Reducing Impact Logging (RIL)

Intensively planned and carefully controlled harvesting to minimize the impact of logging on residual forest stands and soils, usually by selecting individual trees for felling.

Reducing emissions from deforestation and forest degradation (REDD)

REDD refers to mechanisms currently being negotiated under the UNFCCC process to reduce emissions from deforestation and forest degradation. REDD may refer to a broad set of

approaches and actions that will achieve this, but the core idea is to create performance-based mechanisms that reward projects or countries that produce emission reductions.

Reference level/line

Commonly used in the sense of crediting baseline.

Reforestation

Reforestation is ‘the direct human-induced conversion of non-forested land to forested land through planting, seeding and/or the human-induced promotion of natural seed sources, on land that was forested, but that has been converted to non-forested land’. In the first commitment period of the Kyoto Protocol, reforestation activities have been defined as reforestation of lands that were not forested on 31 December 1989, but have had forest cover at some point during the past 50 years.

Remote sensing

A method of measuring deforestation and/or forest degradation by a recording device that is not in physical contact with the forest, such as a satellite.

Revegetation

The growth of new vegetation on an area that has previously been cleared.

Reserve leakage

A mitigation activity that results in emissions reduction in areas outside the original mitigation area. Also referred to as ‘positive leakage’.

Verification

Independent third party assessment of the expected or actual emission reductions of a particular mitigation activity.

Voluntary Carbon Standards

Certification schemes for emission credits not regulated under the Kyoto Protocol.