STUDYING POTENTIAL IMPACTS AND RESPONSE OPTIONS FOR REDD PLUS

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PREFACE

REDD (Reducing Emissions from Deforestation and Forest Degradation) is the global endeavour to create an incentive for developing countries to protect, better manage, and save their forest resources, thus contributing to the global fight against climate change. REDD+ 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 (FCS). REDD+ conceptualizes the flow of positive incentives for demonstrated reductions in deforestation or for enhancing the quality and expanse of forest cover. It works on the basis of creating financial value for the carbon stored and enhanced in the biomass and soil of standing forests. Countries that reduce emissions and undertake sustainable management of forests will be entitled to receive funds and resources as incentives. The REDD+ approach incorporates important benefits of livelihood improvement, biodiversity conservation, and food security services.

India stands to gain a lot from a global REDD+ mechanism. It has specifically opened a possibility for the country to expect compensation for its pro-conservation approach and sustainable management of forests resulting in an even further increase of forest cover and thereby its FCS. Simply put, our sustained efforts for conserving and expanding our forest and tree resources have the possibility of being rewarded for providing carbon service to the international community, in addition to providing traditional goods and services to the local communities. The incentives so received from REDD+ would be passed to the local communities involved in the protection and management of forests. This will ensure sustained protection of our forests against deforestation. It is estimated that a REDD+ programme for India could provide capture of more than 1 billion tonnes of additional CO_2 over the next three decades and more than US$ 3 billion as carbon service incentives under REDD+.

REDD+ will benefit local communities as it explicitly safeguards their rights and those of indigenous peoples. India is committed that monetary benefits from REDD+ will flow to local, forest-dependent, forest-dwelling, and tribal communities. This is ensured for three reasons: First, in the Indian context, REDD+ is intended to be an additional co-benefit to the goods and services already accruing to and being enjoyed by the local community, and, therefore, it comes as a bonus without compromising on the existing benefits. Second, India's own acts, guidelines, executive instructions, and orders at the central and state level additionally ensure that REDD+ will not adversely influence the traditional and legal rights of the local communities over forests, but on the other hand will ensure more monetary benefits flowing to them. Third, all international REDD+ deliberations and negotiations recognize and respect national legislations relating to safeguards for the rights of indigenous peoples and local communities, and aim to promote their participation in implementation and monitoring of REDD+.

TERI took the initiative to hold a national-level consultation on the preparedness of REDD+ in India on 23 March 2012 in association with the Ministry of Forests and Environment (MoEF), with

a focus on forest governance, forest and poverty, methodology for carbon assessment, biodiversity conservation, and International Architecture on REDD+ for developing a policy framework for REDD+ in India. The outcomes of the workshop are the models for forest governance, methodology for carbon assessment and capacity building of the forest officials and community. TERI has also produced a policy brief on forest governance and implementation of REDD+ in India, livelihood of local communities and forest degradation in India, methodology for assessing carbon stock for REDD+ projects in India, conservation of biodiversity and ecosystem services by REDD+ project in India, and International Architecture on REDD+ and its relevance to India. The policy outcome on forest governance is affecting the advisories sent by the Government of India to the state governments, with respect to recent changes in forest governance, due to the implementation of the Forest Rights Act, 2006. The policy brief on methodology for the assessment of carbon helps Government of India to go for small-scale REDD+ projects at the Joint Forest Management Committee (JFMC) level. The policy brief on the livelihood of local communities and forest degradation in India affects the decisions of state governments to fix a minimum support price for minor forest produce, which is a milestone for enhancing the income of forest-dependent communities. The policy brief on International Architecture influences the Government of India's outlook in framing the national-level architecture for REDD+. The policy brief on conservation of biodiversity and ecosystem services by REDD+ project in India is impacting decisions of the central and state governments with respect to sustainable harvest of biological resource. Another result of the consultation was the MoEF's decision to build the capacity of state forest departments with respect to REDD+ through regional-level workshops. It is important to build the capacity of forest officials and communities with respect to the REDD+ concept. REDD+ is incentive mechanism to enhance carbon along with maintenance of ecosystem services, biodiversity conservation, and livelihood security of the forest-dependent community. The REDD+ approach is to be adopted for the forestry sector. It is Sustainable Forest Management with trading of carbon as additional co-benefit. The management plans are to be synchronized with the mechanism of measuring carbon including baseline and leakages.

CHAPTER 1

BACKGROUND AND INTRODUCTION

The process of REDD+ has its roots in the negotiations for Reducing Emissions from Deforestation (RED) in developing countries proposed by the Coalition of Rainforest Nations during COP-11 in 2005. The document produced at COP-13 known as the Bali Action Plan recognizes the process known as REDD+ and the role of conservation, sustainable management of forests, and enhancement of carbon stocks in developing countries. Post Copenhagen (2009), negotiations on climate change have progressed with inputs on REDD+ to have more clarity on the implementation aspects. This on-going phase of readiness activities include efforts such as the national plan, institutional reform for governance, national reference emission level, mechanism for monitoring, reporting, and verification (MRV), references to the principles and safeguards as well as providing finance need to be complied with for effective REDD+ programmes. Nevertheless, conceptually the process still awaits clarity of working definitions for issues such as forest degradation, forest conservation, sustainable forest management, and so on.

The on-going discussion on finance, MRV, and safeguards for REDD+ are of importance with regard to developing the scope of the mechanism. The financing aspect of REDD+ is based on two basic premises. Firstly, the countries conserving forests forgo the economic gain of harvesting them as well as the benefits from alternative land use and hence need to be compensated for the same. Secondly, costs involved in conservation and sustainable management of forests need to be shared by other countries too as the forests provide a range of offsite ecosystem services that benefits all. Given the livelihood linkage of forests in many developing countries, forest conservation imposes several direct and indirect costs. The Indian submission to UNFCCC has suggested the flexible combination of market-based and non-market-based approaches for providing positive incentives for incremental carbon stocks with reduced degradation and baseline carbon stocks.

In case of the MRV system, several critical issues such as deciding on reference line/reference emission level require international consensus. Different opinions such as historical reference line, global baseline, and others, have been argued upon. India has argued for establishing the reference line based on the independent expert review by UNFCCC of the proposal submitted by developing countries in a transparent manner. TERI has suggested 1990 as the reference line in connection to the initiation of Joint Forest Management (JFM) programme followed by the 1988 National Forest Policy (NFP), which has led to the enhancement of carbon stocks due to the participatory efforts in the afforestation and forest restoration. Monitoring is also suggested through the establishment of a REDD+ Cell at national and state levels and the verification is suggested by independent evaluators by UNFCCC in consultation with the national government. In order to address the social and environmental safeguards, the institutional architecture of

REDD+ should have opportunities and provisions. In the Indian context, the availability of policy and legal instruments in form the of JFM programmes, provisions of Forest Rights Act, Biological Diversity Act, etc., have provisions of ensuring the rights of the marginalized and local communities along with enabling the communities to be key players in the local-level governance of the natural resources.

The principles of REDD+ conservation of biodiversity, sustainable management of forests, and enhancement of carbon stocks are important in the context of India where about 350 million people are directly or partially dependent on the forests for subsistence and livelihoods. The impact of such magnitude of forest dependence has been evident in the form of reduction in the very dense forest category. The Forest Survey of India reports revealed demand–supply gaps for fuel wood, timber, and fodder that ultimately lead to degradation of forests and threaten the biodiversity and ecosystem services at large. The attempts to mitigate the impacts of forest degradation by increasing plantation efforts with limited success in restoring the natural forests have also been a reality. A mega diverse country like India is perfect for institutionalizing the REDD+ mechanism in order to strengthen participatory forest management, dovetailing poverty alleviation programmes for forest-dependent communities, and using alternative technologies to reduce the dependence on forests but at the same time strengthening the flow of ecosystem services for the local communities. The enhancement of FCS in process would then deserve the incentives to the local communities through the REDD+ mechanism.

The trajectory followed by national forest policies in India, from the commercial timber-centric policies of 1952 to the sustainability of ecosystems and dependency of local communities-oriented 1988 NFP followed by the National Environment Policy 2006, augur a policy environment that is conducive to conserving and restoring national forests and other ecosystems. In addition, these new policies are indicative of a resolve to strengthening the livelihoods of forest-dependent communities and hence, in process also to claim the share of the global benefit of local-level carbon enhancement.

The REDD+ mechanism in India could hope for developing a strong incentive-based system for more than 100,000 JFMCs. These committees manage about 22 million hectare (Mha) of forestland along with the State Forest Departments, an estimated potential of 35 to 40Mha of Community Forest Resources under the possible recognition of the Forest Rights Act, and a plethora of provisions in India's northeastern and Himalayan states for community-owned or community–managed forests.

Forest management in India is at a crucial juncture. It is developing decentralized governance to reform itself in the form of a technical agency that would assist Gram Sabhas and other local bodies in the management of forests for sustainable utilization. It is also receiving the benefits of legal provisions, such as the ownerships of non-timber forest produce (NFTP) with local communities and Gram Sabhas through the Forest Rights Act and PESA (Panchayat Extension to Scheduled Areas), while linking the JFMCs with the Gram Sabhas, the Green India Mission, and so on.

Hence, future forest governance systems would have to adapt to the prevalent legal systems with technical support from the forest departments, along with other line departments related to natural resources and livelihood programmes. These include revamping JFMCs, Forest Development Agencies (FDAs), and strengthening village-/Panchayat-level institutions like Biodiversity Management Committees, Self Help Groups, etc. These governance systems would have to develop a decentralized Sustainable Forest Management (SFM) system with a focus on

strengthening the protection and conservation of biodiversity, the sustainable use of NTFP for local-level value addition, and monitoring of the status of ecosystems along with carbon enhancement.

The desired policy environment requires a strong and robust methodology to execute the objectives on the ground and that remains a big challenge for a diverse, vast, and colonial legacy prone forest management in India. In the context of REDD+, to connect the prevalent and possible policies for implementation on the ground, it is necessary to understand the challenges posed by issues such as scale of operations, reference levels, monitoring, curbing leakages, and gain from enhanced carbon.

TERI proposes a hybrid nested approach for the scale of operation, which needs to be initiated at the local-project level which would then be expanded to the national level where the credits would be shared by the local project proponents and the central authority. The argument of reference levels of 1990 is strengthened due to the availability of the robust remote sensing based information of Forest Survey of India about the status of the forests in India. Monitoring needs a substantial guidance from the global process to identify the parameters and reduce the transaction costs due to unskilled staff and local communities at the local levels. The capacity building of the online departmental staff and the local communities need a special financial provision at the national level. To address the leakage mainly with respect to greenhouse gas (GHG) emissions, there is a need to have co-ordinated approach of dovetailing the poverty-alleviation programmes and forest-based enterprise development assisted by increasing productivity (by improving lands outside forests for yielding food, fodder, and fuel wood). Finally, measurement of carbon enhancement or reduction in the project area is proposed based on the systematic and stratified sampling approach with the help of remote sensing data supplemented by the ground truthing. The density-based classification of satellite imagery with 100m X 100m grids would be the sampling units where the data collection for woody biomass estimation along with qualitative information of soil and species would be done. Based on the carbon stock in each grid, estimation of carbon stock per hectare would be done. The carbon estimation in below-ground biomass and the canopy would be done using the prescribed factors as per the IPCC Good Practices Guidelines. The GIS–RS approach will enable to compare the estimated carbon with the baseline of 1990 and would allow us to project the possible enhancement by estimating the impacts of various measures to reduce the dependence of the local people on the forests.

Though the prevalent financial mechanisms insist on enhanced carbon stock, the international community is also debating on sharing the costs of conservation and sustainable management of forests, biodiversity, and ecosystem services at large, as a part of REDD+ mechanism. Similarly, the international debate on safeguards is more concerned about the conservation of biodiversity and preventing the carbon centric approach for managing the forests.

In the Indian context, the REDD+ policy regime for biodiversity should address the following:

1. The continued flow of ecosystem services to enhance the livelihoods of local communities;
2. ensure that the conservation of elements of biodiversity in the form of ecosystems, habitats, corridors, threatened and endangered species, wild relatives of cultivated plants, traditional crop varieties, and animal breeds takes place outside the protected area system; and
3. effective safeguards are in place to consider carbon as one of the benefits along with other ecosystem services, so as to balance the tangible and intangible benefits from biodiversity.

In conclusion, the REDD+ regime has to enhance the carbon and other ecosystem services. It should strengthen the efforts of biodiversity conservation and help secure the livelihoods of the ecosystem-dependent local communities in India. The proposed REDD+ regime provides an opportunity for sub-national actors, like states, to address the delicate issue of poverty in resource-rich regions such as forested and tribal-dominated states. Such a regime also gives an opportunity for developing a much-needed integrated approach for implementation of developmental programmes and enforcing biodiversity conservation at the local level. The state-level regime could assign a statutory role for facilitating the integrated approach to an identified agency like the REDD+ Cell.

CHAPTER 2

ISSUES OF CONCERN FOR IMPLEMENTING REDD+ IN INDIA

The process of REDD+ is in its formative stages and is simultaneously being negotiated at international levels. Based on the negotiations and to assist the negotiations, a number of case studies are being formulated across the world, especially in developing and tropical countries. The case studies been discussed are aiming at adopting the various on-going discussions on REDD+ in the context of the local situations. Some of the important issues, which are generally highlighted and discussed nationally in the context of national positions, are as follows:

1. International architecture and its implication for national implementation
2. Local livelihoods and forest degradation
3. Forest governance and management
4. Developing methodology for assessing the carbon enhancement
5. Biodiversity conservation and safeguards for REDD+ projects

In the initial REDD+ readiness stage of this process in the context of India, there are main five issues that are extremely important for international negotiations. These issues include revisiting national needs in the context of addressing the drivers of deforestation and forest degradation, livelihoods of the forest-dependent communities, evolving framework of governance and ecosystem management, identifying safeguards for ecosystems and biodiversity conservation, and the most critical aspect, developing methodologies for assessing carbon enhancement.

This chapter discusses in detail the nuances of these issues to bring on board critical points towards adopting REDD+ at the national level in India.

2.1. International Architecture

Forests are a natural resource of global concern. They offer a range of ecosystem services that include the global public goods of carbon sequestration and storage. Forests have been an issue of priority for international and national policy and a subject of much debate and discussion for the past 20 years. The 1992 United Nations Conference on Environment and Development (UNCED) saw the adoption of the “Forest Principles” as well as Chapter 11 of Agenda 21: Combating Deforestation. These principles are a Non-legally Binding Authoritative Statement reflecting a first global consensus on the management, conservation, and sustainable development of all types of forests. The Non-Legally Binding Instrument on all types of forests was adopted by the UN General Assembly (Resolution 62/98) on 17 December 2007. The purpose of this instrument is to strengthen political commitment and action at all levels in order to implement effectively the sustainable management of all types to forests. In addition, the instrument aims to achieve shared global objectives on forests, enhance the contribution of forests to the achievement of internationally agreed upon

development goals – including the Millennium Development Goals with respect to poverty eradication and environmental sustainability in particular – and provide a framework for national action and international cooperation.

The international negotiations on REDD issues have progressed considerably since COP-11 in 2005 when the Coalition of Rainforests Nations proposed an agenda item on "reducing emissions from deforestation (RED) in developing countries: approaches to stimulate action". It was during COP-13 in 2007 in Bali that the parties to the UNFCCC called for "policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation (REDD) in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries". Paragraph 1(b) (iii) of the Bali Action Plan refers to "REDD+" as "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".

In 2009, the Copenhagen Accord recognized deforestation and forest degradation as major issues and stressed on the need to combat these through the provision of funding resources and a mechanism in the form of REDD+. In 2010, the Cancun Agreement of COP-16 called for reducing emission, halting, and reversing the loss of forests. The Cancun REDD+ provided readiness guidance for countries seeking implementation of REDD+. The readiness activities include the national plan, institutional reform for governance, national reference emission level, mechanism for MRV, references to the principles and safeguards as well as providing finance – all these need to be complied with for effective REDD+ programmes. The COP-17 in 2012 in Durban marked some progress on REDD+ though there are several unresolved issues concerning the implementation of REDD+.

Deforestation and forests degradation in tropical regions is the second-largest source of greenhouse gases (GHG) with different studies estimating its share in total global anthropogenic GHG emissions from 12%–20% (Ghazoul *et al.*, 2010; IPCC, 2007). With increased concern for climate change in recent decades, the emphasis on reduction of GHG emission from deforestation and forest degradation, conservation of FCS, sustainable management of forests, and enhancement of FCS has been at the centre of discussions under the United Nations Framework Convention on Climate Change (UNFCCC). While enhancing the carbon sequestration services from the forest ecosystems, REDD+ can play a critical role for filling the gap between the mitigation pledges by Annex I countries. India has already demonstrated its leadership in climate negotiations by declaring that even as it pursues its social and economic development objectives, it will not allow its per capita GHG emissions to exceed the average per capita emissions of the developed countries. Besides, a range of policies and programmes have also been initiated at the national level to address the problem of climate change in the context of sustainable development.

India recognizes that conservation, expansion, and improvement of the quality of its forests is a major national priority for India, as it is not only is a cost-effective mitigation measure against climate change but also has enormous benefits in terms of ensuring quality and sustained flow of ecosystem services (MoEF, undated;). India's NFP, 1988, has been formulated with the principal aim 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. It clearly states that the derivation of direct economic benefit must be subordinated to this principal aim.

India's National Action Plan on climate change identifies a national mission for a Green India as one of its eight missions. The mission acknowledges the role that the forestry sector has

in climate mitigation, food security, water security, biodiversity conservation, and livelihood security of forest-dependent communities. The main objectives of the mission include:

1. Doubling the area to be taken up for afforestation/eco-restoration in India in the next 10 years, thus taking the total area to be afforested or eco-restored to 20 million ha;
2. enhancing eco-system services and carbon sinks through afforestation on degraded forestland, in line with the national policy of expanding forest and tree cover to 33% of the total land area of the country;
3. increasing GHG removals by India's forests to 6.35% of India's annual total GHG emissions by the year 2020; and
4. enhancing the resilience of forests/ecosystems by maximizing infiltration, groundwater recharge, stream and spring flows, biodiversity value, provisioning of services (fuel wood, fodder, timber, NTFPs, etc.) to help local communities adapt to climatic variability.

The National Afforestation Programme (NAP) Scheme aims to increase the forest cover in the country ensuring participation from non-government organizations and local communities. Government of India has reviewed the NAP for regeneration of degraded forests in the country based on the feedback from the implementing states and other stakeholders, as well as mid-term evaluation of the programme (Press Information Bureau, 2011). The Ministry of Environment and Forests (MoEF) is implementing a centrally sponsored scheme, namely "Intensification of Forest Management Scheme", which aims at creation of infrastructure for development and conservation of forest resources in the country.

India is underlying the following initiatives related to REDD+. India has made a submission to UNFCCC on "REDD Sustainable Management of Forest (SMF) and Afforestation and Reforestation (A&R)" in December 2008. A technical group has been set up to develop methodologies and procedures to assess and monitor contribution of REDD+ actions. A REDD+ Cell has been institutionalized in MoEF and would help to coordinate and guide REDD+ related activities at the national level and guide and collaborate with State Forest Departments to collect, process, and manage all relevant information and data relating to forest carbon accounting. Functions also include guiding formulation, development, funding, implementation, monitoring, and evaluation of REDD+ activities in the states. The Cell would also assist MoEF and its appropriate agencies in developing and implementing appropriate policies relating to REDD+ implementation in the country. In addition, a National Forest Carbon Accounting Programme is also being established.

India has played an important role in REDD negotiations in different Conference of Parties (COPs) and been instrumental in shaping the REDD+ discourse by emphasizing the role of conservation and SFM in mitigating carbon emissions. In international negotiations, India's position on REDD+ underscores the need for reducing emissions from deforestation and forest degradation, conservation, sustainable management of forests, and enhancement of FCS. It is underlined that in the Indian context, carbon service from forest and plantations is one of the co-benefits and not the main or the sole benefit.

As India is poised to pilot REDD+ projects in the country, it is important to revisit some of the underlying issues for designing an appropriate national architecture.

Building Blocks for the Design and Implementation of REDD+ Activities

Finance

Financing for REDD+ has remained one of the bottlenecks so far because of huge uncertainty involving the mechanisms for its operation. However, it has largely been recognized since

COP-11 that developed countries should in their capacity financially support developing countries in implementing REDD+ activities. *The Eliasch Review* (2008) estimates that forest carbon is included in global emissions trading; the cost of halving net global carbon dioxide emissions from forests by 2030 would amount to US$ 17–33 billion annually.

REDD+ is a financial instrument to incentivize conservation and sustainable management of forests and thereby reduce GHG emissions from deforestation and forest degradation. It aims at compensating the forest owners in developing countries for conserving the forests by putting a value on the FCS, one of the ecosystem services that forests provide. The notion of REDD+ is based on two basic premises. Firstly, countries conserving forests forgo the economic gain of harvesting them as well as the benefits from alternative land use and hence need to be compensated for the same. Secondly, costs involved in conservation and sustainable management of forests needs to be shared by other countries too as forests provide a range of offsite ecosystem services that benefits all. Given the livelihood linkage of forests in many developing countries, forest conservation imposes several direct and indirect costs. Hence, any financial mechanism to compensate some of these costs by developed countries would encourage sustainable management of forest in developing countries.

The Eliasch Review (2008) identifies two types of financing needs that would arise regardless of the final design of the REDD mechanism. These include (i) the upfront capacity-building (readiness) costs which will require upfront investments in REDD infrastructure, monitoring systems, forest and carbon density data and stakeholder participation; and (ii) the on-going emission reduction costs which include forest protection costs for implementation of PAMs that enable and promote REDD investments and the opportunity costs for compensation foregone profits from reducing forest emissions.

Official Development Assistance (ODA) tends to be a short-term source of finance, and therefore, makes it less suited to long-cycle carbon forestry projects (Estrada Porrúra *et al.*, 2007). Because of this, ODA might be most useful for developing the national REDD+ strategy and undertaking preparedness activities. Voluntary markets are the predominant source of finance for the forestry sector contributing towards 18% of all projects globally in 2007 (Hamilton *et al.*, 2008). The compliance market is currently restricted to afforestation/reforestation under Clean Development Mechanism (CDM) and it is still not clear if it would become part of future REDD+ mechanism.

India in its submission to the UNFCCC recommends a flexible combination of market-based and non-market-based approaches for providing positive incentives for the two types of carbon stocks under the REDD+ regime: (i) Change in carbon stocks which include incremental carbon stocks and reduced deforestation and (ii) baseline carbon stocks. The market-based approaches that would be developed for incentivizing removals and emission reductions shall be separate from the CDM market.

Monitoring Reporting and Verification

One of the critical issues for REDD+ implementation are the reference baselines for emission measurements and Monitoring Reporting Verification (MRV). Some countries argue for a historical baseline where as some other advocates for using a global baseline (Dooley, 2008). A decision of the COP-16 on the Cancun Agreements, requests developing countries to develop a national strategy or action plan; a national forest reference emission level and/or forest reference level (or as an interim measure subnational ones); and a robust and transparent national forest-monitoring system (possibly with

subnational monitoring and reporting as an interim measure).[1]

India, in its submission to the AWG-LCA REDD+ Financing Issues, emphasizes that the Reference Level (RL) /Reference Emission Level (REL) for a developing country party shall be fixed in an open and transparent manner following the procedure agreed by parties for the purpose. This would include an independent expert review by the UNFCCC of the proposal of RL/REL submitted by the developing country party. India's NFP, 1988, embodies all elements of SFM. The NFP, 1988, led to a programme named the Joint Forest Management (JFM) when in 1990 the MoEF directed the state governments to involve local communities in the management of degraded forests and requested NGOs to facilitate the process. As a result, numerous states issued enabling resolutions to adopt JFM and people's participation became central to SFM. Therefore, in the absence of an agreed RL/REL at the international level, 1990 can be adopted as the baseline for REDD+ projects in India.

Along with the above-mentioned issues, implementation of REDD+ faces a host of ethical and operational challenges, which need to be addressed for its effective implementation. These include the issue of additionally which is a key criterion for valuing carbon stocks for the REDD+ project, system leakage so that the avoided deforestation in one area does not get displaced to another, and permanence of carbon storage even after the REDD+ project period has ended (Ghazoul *et al.*, 2010).

Monitoring of the REDD+ projects can be done by the National REDD+ Cell in consultation and the State REDD+ Cell. The data can be collected using RS/GIS and groundtruthing by actual measurements in the project site. The data will be the area change in the forest and trees outside forests (ToF) for estimating impact of deforestation, and the changes in FCS for estimating forest degradation. In addition, this will be compiled into a national-level forest inventory. India, in its submission to the UNFCCCalso suggests that the information collected will form the component of FCS in the national GHG inventory.

Verification will be done by independent evaluators having subject knowledge and not involved in any of the processes of preparing the FCS inventory. The independent evaluators can be appointed by UNFCCC in consultation with the national government. To ensure transparency, provisions will be made to involve and engage the local and indigenous communities, civil societies, and other interested stakeholders on the technological, methodological, policy, and financial aspects of the MRV processes and procedures. All process for quality assurance and quality control (QAQC) will be applicable to all processes, procedures, and methodologies used in generating the information (UNFCCC, 2011a).

Safeguards

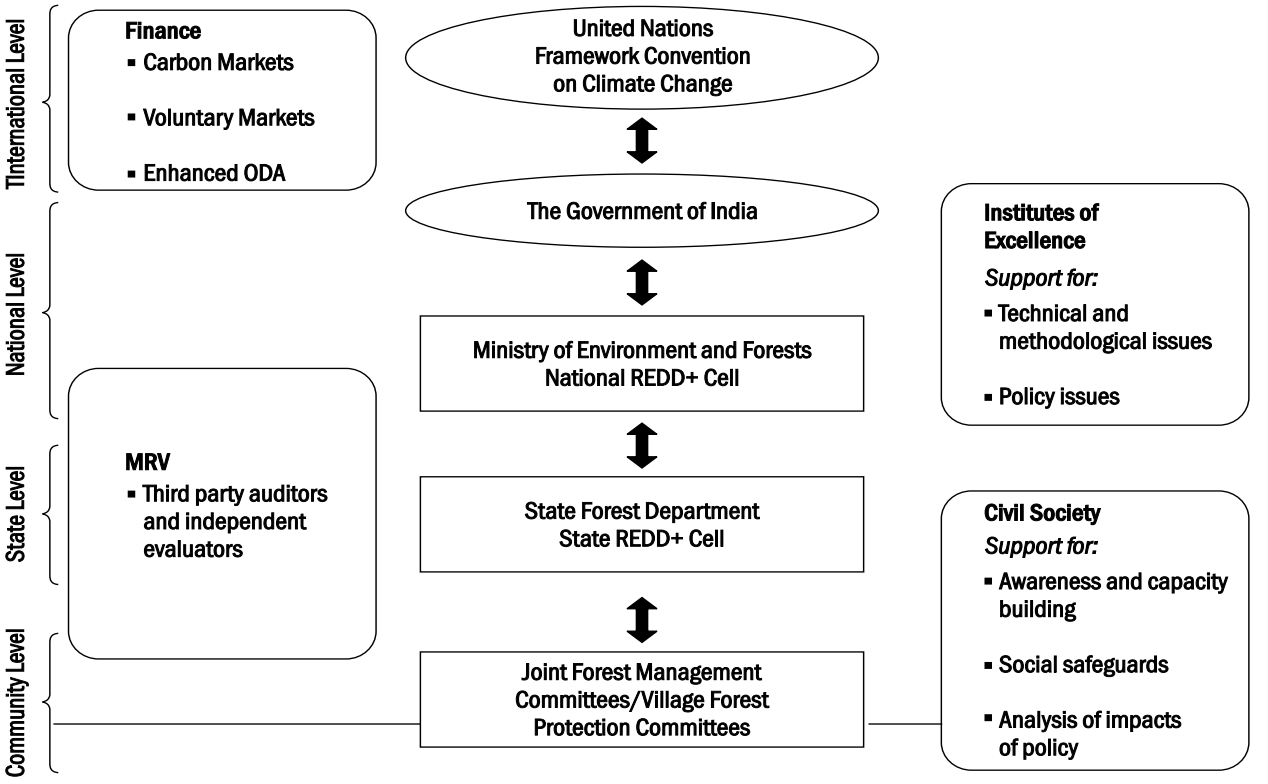
The IPCC (2007) report argues that good governance should closely respect procedural as well as consequential equity, which in other words means equity in both the decision-making process as well as the resultant outcome. Social accountability involves informed actions based on equally rigorous analysis of data, where stakeholders use their interpretation of such data and their rights responsibly, not only to assert their interests and the concerns of the marginalized, but also to develop their ability to influence and negotiate directly with official decision-makers (ANSA, 2010). The REDD+ architecture should be designed to ensure that it not only contributes to GHG emissions reductions but also fulfil social and environmental safeguards.

[1] See, "The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention" (decision 1/CP.16). Available at http://unfccc.int/documentation/decisions/items/3597.php?dec=j&such=j&cp=/CP#beg.

In India, there are safeguards to protect the customary rights and traditions of tribes, forest dwellers, and other local communities. Today, JFM has been successful in involving communities in protection and management of forests. Also, JFM has recently been integrated into local governance organizations with a more democratic structure, such as Gram Sabhas. The Forest Rights Act has further strengthened the legal framework in the country for safeguarding the rights of local communities. India will also adopt, as appropriate, the modalities of the system, as would be agreed in the SBSTA, for providing information on internal safeguards to the UNFCCC (including ensuring participation of local communities and conservation of natural forests and their ecosystem services).

Benefit sharing among the various stakeholders including local community shall be done in accordance with a set of guidelines that will be developed and finalized in an open and transparent manner involving all stakeholders including civil society, marginalized groups, and women.[2] Incentives gained from international sources from implementing REDD+ will flow to the local communities who are guardians of the forest resources and communities that depend on forest resources for their livelihood. A percentage of the incentives are expected to be invested in conservation and improvement of ecosystem services like biodiversity and NTFP. Local communities would be encouraged to develop micro-plans to incorporate such priorities.

Figure 2.1 Institutional arrangement for implementing REDD+ in India



[2] (Decision [-/CP.17] Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention, paragraph 69 (Advance unedited version).

At the international level, the UNFCCC will provide the financial allocation to the Government of India to implement REDD+ activities in the country. The National REDD+ Cell set up at the MoEF will place a key role in designing and implementing REDD+ strategies at the national and sub-national level. It will coordinate and guide REDD+ related activities at the national level and guide and collaborate with State REDD+ Cells to collect, process, and manage all relevant information and data relating to forest carbon accounting. Functions also include guiding formulation, development, funding, implementation, monitoring, and evaluation of REDD+ activities in the States. The Cell would also assist MoEF and its appropriate agencies in developing and implementing appropriate policies relating to REDD+ implementation in the country. The functions of the National REDD+ Cell may also include resource mobilization and disbursement and will engage with institutes of excellence in the country to provide technical guidance and support to the states as required.. The Cell would also actively participate in the deliberations of the UNFCCC on REDD+.

Each sState will be required to set up a State REDD+ Cell housed in the State Forest Department. The State Forest Department coordinates forest management at the state level under the guidance of a national policy and legal framework. The State REDD+ Cell will oversee the project preparation and implementation by the JFMC or VFPCs. They will also be responsible for ensuring that the projects designed are in compliance with the guidelines, and they will submit the project to the National REDD+ Cell for financing upon approval. They will also facilitate distribution of revenue to the JFMCs and VFPCs. In addition, they will organize training and capacity-building seminars and workshops for the officials of the state Forest Department and village-level institutions. The JFMCs and VFPCs will be directly involved in the implementation of REDD+ projects.

Institutes of excellence working on forestrelated issues will be identified to provide technological and methodological guidance and policy support to the National and the State REDD+ Cell. They will also review and refine technological, methodological, and infrastructural capabilities for operationalizing the national-level FCS accounting.

The civil society will be involved in awareness raising and capacity building of the indigenous communities, forest-dependent communities, and women. They will also ensure compliance to the social and environmental safeguards and will analyse the impacts of policy measures.

Making REDD+ Work for India: Key Issues and Priorities

1. *India is not reducing forest cover by area but by carbon stock due to forest degradation resulting in loss of biodiversity and ecosystem services*

   Climate change is seen as posing a challenge to meeting important development objectives (Sperling, 2003). There are large sections of population dependent upon the natural resource base and climate-sensitive sectors such as agriculture, water, and forestry in India. A total of about 200 million people are dependent on forests for their livelihoods. In addition, the shrinking common property resource base, rapidly increasing human and livestock population, and poverty are all responsible for the tremendous degradation pressure on the existing forest cover (World Bank, 2000). It is, therefore, a challenge before India on how to enhance carbon without undermining the dependence of local communities.

2. *Forest conservation and management requires an integrated approach and inter-departmental coordination*

   Critical inter-linkages exist between forest ecosystems and rural livelihood systems as well as the competing land-use demand

for furthering economic growth proliferate deforestation and forest degradation (Davidar, 2010; Chhatre and Agrawal, 2009; Mahapatra and Kant, 2005; Wunder, 2001). The forest sector alone cannot bear the burden of livelihood dependence of a large section of population. Other sectors, especially the links with agriculture and energy programmes, need to be studied in depth to develop a synergistic approach to address the challenge. Ministries such as Ministry of Rural Development, Ministry of New and Renewable Energy, among others, must come forward to provide alternate livelihoods and alternates to dependence.

3. *Fostering dialogue between the centre and state governments*

   It is essential to ensure that the channels of communication between the centre and state governments are active for effective implementing REDD+ projects at the local level. Further to the establishment of a REDD+ Cell in the MoEF, a state-level REDD+ Cell should be established in every state for coordination with MoEF and village-level institutions. Pre-negotiation consultation and post-negotiation briefing on REDD+ need to be institutionalized. Debates often take place after policy-making instead of before, whereby the views of one or other important stakeholder affected by a decision seem to have not been adequately considered or canvassed before policy was made.

4. *Government of India should focus on capacity building of local communities*

   Capacity building is central to the REDD+ readiness process. The key elements of the REDD+ capacity building process include awareness-raising and REDD+ knowledge dissemination, various REDD+ policies and measures, benefit-sharing arrangement, MRV, social and environmental safeguards, economics of REDD+ among other key issues.

5. *Financing at least one pilot study in each state of the country*

   For strengthening research gaps and providing policy inputs for large-scale design of REDD+ projects, at least one pilot study should be undertaken in each state. This would not only help build technical capacity but also help identify barriers to implementation and thereby help draw important lessons that feed into the design of the national architecture for REDD+. REDD+ implementation may need to start at the sub-national level to gain experience before sufficient funding is available (Angelsen, 2009). India should try and avail grants under the readiness fund available in the Forest Carbon Partnership Facility of the World Bank.

6. *The international community must concentrate to provide adequate operating funds for SMF, i.e., maintenance of ecosystem services, conservation of biodiversity and ensuring livelihoods of forest-dependent communities*

   The Rio principles – adopted at the Rio Declaration on Environment and Development – and the forest principles underscore that states have common but differentiated responsibilities regarding collective global interests and concerns related to forests. States have sovereign rights to utilize their resources to meet their national policy objectives, and at the same time, emphasize that international cooperation should focus on building human and institutional capacity in the developing countries to conserve and manage their forests.

   Despite the fact that India is a developing country and receives only 30% of the total requirement for the forestry sector, it is among the few tropical countries where the forest cover has stabilized or increased (Ravindranath *et al.*, 2012). The factors contributing to stabilization of the forest cover as well as FCS in India include legislations

such as the Forest Conservation Act, 1980; afforestation programmes like social forestry and JFM ; and community awareness and participation. India's sustained efforts for conserving and expanding its forest and tree resources have the possibility of being rewarded for providing carbon service to the international community in addition to providing traditional goods and services to the local communities (Ravindranath *et al.*, 2008).

By implementing several ambitious policies and programmes such as the NAP, it is expected that the addition or improvement of forest and tree cover will add 2 million tonnes of carbon incrementally every year and post 2020 the forest and tree cover will be adding at least 20 million tonnes of carbon every year. This would require an investment of INR 90 billion (USD 2 billion) every year for 10 years.

REDD+ offers opportunities to attract financial resources which will not only have climate change mitigation benefits but will contribute significantly to sustainable management of forests and beneficial for biodiversity and ecosystems while also benefitting local communities. The forest principles have contributed significantly to the REDD+ discourse. The on-going discussions on REDD+ with a focus on climate change mitigation have an opportunity to generate new and additional sources of finance for SMF.

The additional money generated through additional carbon or carbon saved will support the communities for their livelihoods and other social needs. The incentives so received from REDD+ would be passed to the local communities involved in protection and management of the forests, ensuring sustained protection of India's forests and percentage of the incentives are expected to be invested in conservation and improvement of the ecosystem services like biodiversity and NTFP.

The international community should come forward to finance the for achieving sustainable development of forests so that carbon in the Indian forests would be enhanced without undermining the livelihood of the people living in and around the forests, biodiversity concerns and maintenance of ecosystem services.

7. *Clear definitions of forest degradation, forest conservation, sustainable forest management, and enhancement of carbon stocks among other issues*

The concept of Sustainable Forest Management (SFM) was articulated in the Forest Principles adopted at the Earth Summit in Rio in 1992. SFM has since been made operational through actions identified in UNFF and its predecessors, regional processes to develop criteria and indicators for SFM, and a range of guidelines and sound forest management practices (for forests managed for production, conservation, protection or other purposes). It was with this meaning of SFM in mind that the 14 members of the Collaborative Partnership on Forests (consisting of international organizations and secretariats) recognized that "sustainable forest management provides an effective framework for forest-based climate change mitigation and adaptation". The point emphasized was that, without a comprehensive approach to forests—recognizing that countries manage their forest estates for multiple socio-economic, productive, and environmental functions—and without sound policy, legislative and governance frameworks, forestry-related climate change mitigation and adaptation efforts on the ground will not be successful.

The Bali Action Plan refers to Sustainable Management of Forests in the REDD+ context. It defines REDD+ 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".

However, there is sti ll not enough clarity on the usage of the terms, "sustainable management of forests", and "sustainable forest management". According to an FAO (2009) paper, both terms are used in a way that is inconsistent with internationally accepted language describing SFM.

Although consensus has formed around the concept of REDD+ and pilot activities are now underway, more clarity is required on definitions of the terms like 'forest degradation', 'sustainable management of forests', and 'conservation'.

The Government of India should organize a national-level consultation to develop definitions of these issues so these form a basis for the negotiations at the international level while keeping the national interest intact.

REDD+ is designed not only to enable developing countries to contribute to a reduction in emissions under future arrangements to the UNFCCC, but also to strengthen Sustainable Management of Forests at local and national levels. By these means India stands to gain significantly from the emerging architecture for REDD+. This would not only contribute towards generating additional funding for forest conservation and management efforts but also contribute towards community development, biodiversity conservation, and enhancing ecosystem services.

Inadequate means of implementation is a grey area for the implementation of Sustainable Management of Forests, particularly in developing countries including India. Developing countries must show political commitment for the sustainable development of forests on one side and on other hand, developed countries must contribute towards helping developing countries for the sustainable development of forests to further strengthen commitment of developing countries towards REDD+. In addition operating fund for the on-going SFM efforts are also required to enhance the carbon stocks and contribute to continued delivery of the full range of goods and ecosystem services. The current levels of assistance under Overseas Development Assistance are largely insufficient for meeting SMF objectives. Funding should be increased under existing financial mechanisms such as ProFor, NFPF, ODA-WB, JICA, and UNDP. India should tap into new sources of finance World Bank Forest Carbon Partnership Facility (FCPF).

Finally, implementing REDD+ can prove to be an excellent opportunity for communities to secure additional financial resources from trading of enhanced carbon thereby enhancing their socio-economic conditions.

2.2 Livelihood of Local Communities and Forest Degradation in India: Issues for REDD+

India's current forest and tree cover is estimated to be 78.29 million ha, constituting 23.81% of the geographical area of the country (ISFR, 2011). Forest cover alone amounts to 69.20 million ha, against the recorded forest area of 76.95 million ha. Of the total forest cover, 12.06% is very dense forest (more than 70% crown density), 46.35% is moderately dense forest (40% to 70% crown density), and the remaining 41.59% is open forest (10% to 40% crown density). As per the India State of the Forest Report (ISFR) 2011, forest cover has declined by 367 sq. km compared to the forest cover in the preceding ISFR in 2009. Tree cover outside forest areas is assessed to be 9.7 million ha, and is experiencing an increase over the last few assessments, indicating a rise in green cover in non-forest land in the country.

Forest cover in the country has more or less stabilized since the 1980s. As per the estimates of the Forest Survey of India, forest cover has increased marginally from 64.08 million ha in 1987 to 96.2 million ha in 2011. The enactment of proactive forest conservation policies and changes in management approaches from 'timber' to 'forest ecosystem' during the last few decades have curbed deforestation, and promoted conservation and sustainable management of forest. The enforcement of the Forest Conservation Act, 1980, enabled the regulation of widespread diversions of forestland for non-forest uses, and hence put a check on deforestation. The changing priorities of the Forest Department from revenue generation to conservation-oriented forestry and the practice of doing away with clear felling of tress has resulted in a significant decline of formal pressure of deforestation and degradation on forest ecosystem. However, forest degradation of natural forest due to several factors remains a major concern of forest management.

Forest Degradation in India

The forest degradation is quite evident from low level of growing stock in India forest and declining trend of dense forest in the country. The growing stock per hectare of forest area as per both in 2009 and 2011 ISFR is estimated to be around 58.46 m^3 per hectare of forest area. This is far below the global average of 130.7 m^3/ha and the south and Southeast Asian average of 98.6 m^3/ha for the corresponding period (FAO, 2010). More than 40% of the forest in country are degraded and under-stocked (Aggarwal *et al*., 2009, Bahuguna *et al*., 2004). The National Forest Commission report 2006 indicated that around 41% of total forest in the country is already degraded, 70% of the forests have no natural regeneration, and 55% of the forests are prone to fire (MoEF, 2006). As the trend of change in dense forest is concerned, it has remained very moderate as compared to changes in open forest (see Table 2.1). For some assessment years, the change has been negative to the preceding assessment too. For instance, the moderately dense forest has declined by 936 km^2 from 2005 to 2007. However, the forest cover assessment exercise hardly reflects the extent of forest degradation and it is often difficult to compare the data in this regard due to lack of standardized methodologies (Davidar *et al*., 2010).

Table 2.1 Change in Forest Cover 1991–2011

State of the Forest Report Year	Dense (40 % and above crown cover) Forest (in km2)	Open (10 to 40 % crown cover) Forest (in km2)	Total Forest Cover (in km2)
1991	385008 (60.64)	249930 (39.36)	634938
2001	395169 (60.43)	258729 (39.57)	653898
2011	404207 (58.41)	287820 (41.59)	692027
Change from 1991 to 2011	19199	37890	57089

Note: Figure in parenthesis are the percentage to total forest cover
Source: Various issues of State of the Forest Report

The factors affecting forest degradation in India are:

1. Critical livelihood: forest linkage of a huge forest-dependent population (FSI, 2011; Davidar *et al.,* 2010)
2. Demand and supply gap of forest products, resulting in exploitation beyond its carrying capacity (Aggarwal *et al.*, 2009)
3. Forest fires, over-grazing, illegal felling, and diversion of forest land – both permitted and illegal for non-forest uses due to competing land use demand for developmental and other uses (FSI, 2011; Davidar *et al.,* 2010; Aggarwal *et al.*, 2009; MoEF, 2009b; MoEF, 2006).

In the forested landscapes of India, the livelihoods of the people living close to forest and within the forests are inextricably linked to the forest

ecosystem. People depend on the forest for a variety of forest products for food, fodder, agriculture, housing, and an array of marketable minor forest produces which can potentially degrade forest if harvested unsustainably. Field-based studies assessing the pattern of collection of these forest products and its impact on local forest found that local livelihood dependence results in degradation (Davidar *et al.,* 2010; Mishra *et al.,* 2008; Arjunan *et al.,* 2005; Sagar and Singh, 2004; Maikhuri *et al.,* 2001; Silori and Mishra, 2001). Hence, the livelihood concerns of the millions of poor people living in and around forest contribute to forest degradation along with other factors.

Forest survey of India (FSI) also made a comprehensive assessment of the production and consumption of forests in India and this has been discussed in detail in recently published IFSR (2011). The low productivity of forest coupled with ever-increasing demand for forest products due to India's huge and increasing population contributes to the degradation of forest (Gulati and Sharma, 2000). The development concerns in general and the rapidly growing economy has implications on forest cover and the land use pattern of the country (MoEF, 2009b). The forests are also subject to several other anthropogenic pressures like over grazing, shifting cultivation, and vulnerabilities to forest fire, and so on (World Bank, 2006; Bahuguna *et al.*, 2002). A host of these drivers are directly linked to the livelihood of the forest-dependent communities.

Livelihood of the Forest-dependent Communities and Its Impact on Forest Carbon Stock

India has a huge population living close to the forest with their livelihoods critically linked to the forest ecosystem. There are around 1.73 lakh villages[3] located in and around forests (MoEF, 2006). Though there is no official census figures for the forest-dependent population in the country, different estimates put the figures from 275 million (World Bank, 2006) to 350–400 million (MoEF, 2009b). People living in these forest fringe villages depend upon forests for a variety of goods and services. These includes collection of edible fruits, flowers, tubers, roots and leaves for food and medicines; firewood for cooking (some also for sale in the market); materials for agricultural implements, house construction and fencing; fodder (grass and leaves) for livestock and grazing of livestock in forest; and collection of a range of marketable NTFP. Therefore, with such a huge population and extensive dependence pattern, any over exploitation and unsustainable harvest practice can potentially degrade forest. Moreover, a significant percentage of the country's underprivileged population happened to be living in its forested regions (Saha and Guru, 2003). It has been estimated that more than 40% of the poor of the country are living in these forest fringe villages (MoEF, 2006). Apart from this, a significant percentage of India's tribal population lives in these regions. Several field-based studies have documented the adverse impact of such dependence pattern on the forest quality.

The forest fringe communities not just collect these forest products for their own consumption but also for commercial sale, which fetch them some income. The income from sale of the forest products for households living in and around forest constitutes 40% to 60% of their total income (Bharath Kumar *et al.*, 2011; Sadashivappa *et al.*, 2006; Mahapatra and Kant, 2005; *et al.*, 2003; Bahuguna, 2000). A study (Saha and Sundriyal, 2012) on the extent of NTFP use in northeast India suggest that the tribal communities use 343 NTFPs for diverse purposes like medicinal (163 species), edible fruits (75 species), and vegetables (65 species). The dependence for firewood and house construction material is 100 and NTFPs contributed 19–32 % of total household income for the communities under study (Saha and Sundriyal, 2012). Forests are not

[3] There are 6.41 lakh villages in India as per the 2011 census.

only a source of subsistence income for millions of poor households but also provide employment to poor in these hinterlands. This makes forests an important contributor to the rural economy in the forested landscapes in the country. The widespread poverty and lack of other income generating opportunities often make these people resort to over-exploitation of forest resources. The collection of firewood for sale in the market, though it is illegal, is also extensive in many parts of the forested regions in the country and constitutes the source of livelihood for 11% of the population (IPCC, 2007). However, many other forest products have been sustainably harvested by local communities for many years, and are a constant source of household income.

Agriculture and livestock are two other major sources of livelihoods in the forest fringe villages, which in turn depend extensively on the forest for various inputs. People rear both bovine and ruminant livestock and forests and other local common land are the major source of grass and tree fodder. Open grazing in the forest is the conventional rearing practices for forest fringe communities and this has adverse impact on growing stock as well as regeneration capacity of forest when there is over grazing due to more livestock. ICFRE (2001) estimates suggest that India's forests support 270 million cattle for grazing against its carrying capacity of 30 million. The incidence of grazing is estimated to be affecting 78% of the India's forests of which 18% are highly affected with remaining 31% and 29% medium and low respectively (World Bank 2006; MoEF, 2006). The large livestock population also results in huge collection of tree fodder, which affects the forest quality adversely. The annual requirement of dry and green fodder is estimated to be 569 MT and 1025 MT respectively against the availability of 385 MT and 356 MT (Roy and Singh, 2008). This explains the pressure on India's forest from livestock sector and its contribution to the state of degradation of forests in human-dominated landscapes of the country. Agricultural systems in the forested regions also inextricably related to the forest ecosystem. Farmers collect small timber, poles, and other materials from forest for agricultural implements and fencing the agricultural fields, leaf litter for manure, herbs, and medicinal plants to deal with pests, and so on. The agriculture in this region is predominantly subsistence and crop production is dependent on a highly vulnerable weather conditions and wildlife attack. However, such dependence does not affect crop production as long as these resources are extracted sustainably and are left well within the regeneration or carrying capacity of the forests.

Shifting cultivation that is still being practised in some regions of the country contributes to the forest degradation. With increased crop cycles and declining fallow period in shifting cultivation practices in recent decades, the impact of traditional agricultural practice is more severe. Different estimates for area under shifting cultivation ranges from 5 Mha to 11.6 Mha involving 3 to 26 million people in 16 different states in the country (MoEF, 2006). The practice is more prominent in northeastern states.

REDD+ and Livelihood of the Forest-dependent Communities

REDD+ is a financial instrument to incentivize conservation and sustainable management of forest and thereby reduce GHG emissions from deforestation and forest degradation. It aims at compensating the forest owners in developing countries for conserving the forests by putting a value on the FCS, one of the ecosystem services that forests provide. The idea of REDD+ is based on two basic premises. Firstly, the countries conserving forests forgo the economic gain of harvesting them as well as the benefits from alternative land use and hence need to be compensated for the same. Secondly, costs involved in conservation and sustainable management of forests needs to be shared by other countries too as the forests provide a range

of offsite ecosystem services that benefits all. Given the livelihood linkage of forests in many developing countries, forest conservation imposes several direct and indirect costs. Hence, any financial mechanism to compensate some of these costs by developed countries would encourage sustainable management of forest in developing countries.

Decentralized forest management through devolution of power to local communities is one of the important components of the sustainable management of forest under REDD+ regime. Besides this, REDD+ will also improve the livelihoods of forest-dependent communities by adding value to collected forest produce through a public–private partnership (PPP) model that would enhance income and employment opportunities for the local people. Assigning monetary value to the enhanced carbon stocks in the forest would also incentivize forest conservation and management. Since, 75% of forest-based income is from NTFPs (MoEF, 2009b), the NTFP enterprises can contribute significantly, to livelihood enhancement in forested areas. In addition, the two main barriers recognized in NTFP management are lack of sustainable harvesting practices and problems of NTFP productivity. To resolve this issue, the Government of India would support technology for value addition, certification, and improved marketing of NTFP. Further, sustainable management of forest safeguards the forests for the future generation.

Addressing Forest Degradation

Globally, there is no standard definition of forest degradation. It is a complex process and has several drivers, which pose a greater challenge to check the problem of degradation. The IPCC special report on methodological options to inventory emissions from direct-human induced degradation of forests and de-vegetation of other forest types' defines degradation as "direct-human induced long term loss of at least Y % of FCS since time T and not qualifying as deforestation". Given the widespread dependence of such a huge population on forest for subsistence livelihood, arresting forest degradation involves designing and implementing strategies that creates alternative livelihood opportunities and reduce their dependence on forest-based activities. The livelihood requirement of the people fully dependent and partially on forest varies and these need to be taken into consideration while designing the strategies. Unsustainable harvesting and extraction of fuel wood will be substituted by promoting alternative livelihood and energy sources like biogas, solar energy (solar lanterns and solar street lighting), and improved cook stoves. The expansion of provisions for cleaner cooking fuels such as LPG in rural areas will help to reduce pressure on forests and enhance carbon stocks. This would save fuel wood and reduce pressure on the forests. The Government of India has proposed to target 10 million households (in 0.1 million villages in forest conservation areas) for improved stoves (over 30% wood saving). Simultaneously, this would lead to saving of 2 million tonnes of fuel wood every year amounting to reduction of 3.6 Mt of CO_2 emissions per year. Some other measures could be as follows

Filling the gap of demand and supply of forest products

India's huge population contributes to the large demand base of the forest products. With limited forest cover, the supply of forest products does not match the demand and hence there is a substantial gap (see table 2 and 3). This gap often drives the over-exploitation of the forest. There has been different estimates of the demand and supply of major forest products. The estimates by TERI (Aggarwal *et al*, 2009) put the demand-supply gap for fuel wood, fodder and timber at 100, 853 and 14 million tonnes respectively (see table 2)

Table 2.2 Demand and Supply Gap of Various Forest Products

Forest Products	Demand (MT)	Sustainable Supply (MT)	Gap/ Unsustainable Harvest (MT)
Firewood	228	128	100
Fodder (green and dry)	1594	741	853
Timber	55	41	14

Source: Aggarwal *et al*., 2009

The IFSR (2011) made a compressive estimation of consumption of woods by commercial and household sectors for various purposes and production potential of woods from forest sources as well as from tress outside forest (table 3).

Table 3 Consumption and Production of Forest Products

Forest Products	Consumption	Production
Wood (RWE in m cum)	48.0	45.95
Firewood from Forests (million tonnes)	58.47 (27.14)*	19.254#
Livestock dependent on forest (in million)	199.58 (38.49)**	

Note: * Percentage of the total firewood consumed,

** Percentage of the total livestock in the country,

Annual availability of firewood from trees outside forest (TOF)

Source: India State of Forest Report (IFSR) 2011, Forest Survey of India

The total annual consumption of wood in constructions and furniture – both in in commercial and household sector – as well as for agricultural implements are estimated to be 48.0 million cubic meters in Round Wood Equivalent (RWE). However, the total production of timber stands at 45.95 million cubic meters, showing a gap of 2.05 million cubic meters annually (FSI, 2011). Of the total production of 45.95 m cum, the production of timber from forests are estimated to be 3.175 m cum whereas the annual potential production of timber from trees outside forest (TOF) is estimated to be 42.774 m3.

Firewood constitutes the major source of cooking energy in India and more than 853 million people use firewood for cooking in India (FSI, 2011). As per the 2011 census, 49%[4] of the households in the country use firewood for cooking. In some states, it is as high as 80%. The forest rich states have higher incidence of firewood use for cooking. This trend is evident from table 4, which shows the forest cover of the states with higher incidences of firewood use. As the total annual volume of firewood use is concerned, it is estimated to be 216.421 million tonnes and of which 58.747 million tonnes (27.14%) are sourced from forests (see table 3). There have been no estimates for the volume of firewood availability from forests and the annual availability of firewood from TOF is estimated to be 19.25 million tonnes.

Table 4 Forest Cover and Dependence on Firewood

Name of the State	Percentage of Households using Firewood for Cooking*	Percentage of Total Geographical Area of the State under Forest Cover#
Chhattisgarh	80.8	41.18
Tripura	80.5	76.07
Meghalaya	79	77.02
Nagaland	77.9	80.33
Assam	72.1	35.28
Arunachal Pradesh	68.7	80.50
Madhya Pradesh	66.4	25.21
Manipur	65.7	76.54
Odisha	65	31.41
Kerala	61.9	44.52
Jharkhand	57.6	28.82

Sources: *Census of India 2011; # India State of Forest Report 2011

[4] Of the 246.693 million households in the country as per 2011 census

India's total fodder consuming livestock population as per the 2007 Livestock Census is estimated to be 518.6 million. Of these 199.6 millions of livestock, depend, partially or fully on forest for fodder (IFSR, 2011).

Creating alternative livelihood opportunities through poverty-alleviation programme

The governments implement a series of rural development activities to generate employment for the rural poor in these forested regions and alleviate poverty. MNREGA, which ensures 100 days of employment to all poor adult population in the country, is a significant step in this regard. The effective implementation of these programmes among forest-dependent communities will reduce the dependence of the local communities on forests.

Provision of education to the children and other skill development trainings to youth enables these forest-dependent populations to diversify their livelihood options and look beyond forest as their source of income.

Provision of infrastructure and support for improved agricultural practices as well as other natural resource-based activities like apiculture would also ensure better income to these poor households.

Forests provide a range of marketable NTFPs like fruits, flowers, berries, tubers, resins, honey, leaves, creepers, etc., that have great nutritional, medicinal, and other use values. However, many of these products fetches a good price in cities and markets but the collectors (the forest dependent) sell these to the intermediaries at abysmally low prices. The support for marketing and value addition by creating processing facilities would not only enhance the income but also the employment opportunities in these hinterlands. Approximately, NTFP sector with annual growth rate between 5-15% also contributes to 75% of forest sector income.

Community-level forest management

Greater involvement of the local communities in the management of forest and devolution of power through access and ownership rights ensures greater tenurial security and improved forest management and conservation. In recent years, devolution of forest resource management and access rights to local communities has become an important policy tool for many developing countries. Over the last two decades, a profound change has been witnessed in the area of forest-resource management, with countries at least partially devolving rights and responsibilities over their forests to the users. Community-based management institutions often considered as a critical precondition for equitable, efficient, and effective implementation of REDD+ (Springate-Baginski and Wollenberg, 2010). India has also made significant efforts in involving the local community for management of forest through JFM institutions since the early 1990s. However, these JFM institutions need to be further strengthened by empowering the local communities with adequate power and responsibilities (Lele, 2011). The recent decision to integrate JFM with the Gram Sabha of the Panchayati Raj Institutions aims at strengthening decentralized forest governance objective. This would encourage association of committees or groups such as JFMCs/CFM/VPs, etc., as well as livelihood promotion groups like SHGs/CIGs to plan for forest protection, conservation and enhancing livelihood based activities. Livelihood activities are best addressed at cluster level/sub-landscape level/federation of SHGs/CIGs. The government also proposed to provide legal back up to JFMCs, build capacity of local institutions to effectively protect, regenerate and manage forests. Community-driven innovative management practices can further check forest degradation.

According to several estimates, India has traditionally been characterized as a low forest cover-low deforestation (LFLD) country exposed to significant direct-human induced deforestation

and degradation in past few decades (ISFR 2011; Ravindranath *et al.*, 2012). Consequently, India's forests harness a large potential for livelihood based activities for the forest-dependent communities, thus bridging the gap between the poor and forest-based market. With such a huge population depending on forest for subsistence livelihood, the strategies for controlling forest degradation need to be focused on reducing the dependence by creating alternative livelihood opportunities for the forest-dependent communities, providing alternative technologies to reduce the gap in demand and supply of forest products and making the community adopt sustainable harvesting practices.

This provides unhindered opportunities for the poor to utilize the traditional knowledge in sustainable management of forest with the help of the Forest Department and the Government of India. Linking the two – REDD+ and alternative livelihood-improvement activities – will ultimately reduce pressure on forests producing an increase in forest cover in future. Moreover, the international negotiations on REDD+ under the UNFCCC from Bali to Durban, provided a nested approach for REDD+ implementation leading to performance-based systems in countries undertaking REDD+ readiness activities like India. Communities here will be benefited through conservation of forest ecosystem, and will in turn improve their livelihoods and simultaneously increase the forest cover of the country. Although, India is partially ready for implementing REDD+ mechanism, but still a benefit-sharing mechanism needs to be framed properly, in order to overcome the livelihood issues in REDD+ and to conserve the degrading forest cover.

2.3 Forest Governance and Management

Forest governance in context to REDD+ is a complex issue as it involves the participation of multiple stakeholders and also holds diversified interests of individuals and communities across different scales such as local, national, and global, with unbiased decision making by a group of policy makers, community representatives, government officials, and other experts and practitioners. Good governance is a form of political decision making that emphasizes legality (rules to resolve conflicts), legitimacy (acceptance and trust by the public that ensure accountability), and participation (inclusiveness in decision-making process). The achievement of good governance is hinged on mutually supportive and cooperative relationships among different stakeholders such as the government, the private sector, and civil society.

Forest governance is identified as critical to the success of REDD+. Implementation of robust REDD+ strategy is possible through Community Based Forest Governance (CBFG). Historically, forest governance in India established towards the middle of the 19th century was mainly engaged in exploration, demarcation, reservation, and exploitation of forests for timber. The emergence of forest governance structures in India has also been influenced by the contested demand over land and several other factors historically apart from the ecological concerns (Singh, 2010). The forest department, which was set up in 1864 under the Government of India with Dietrich Brandis as its first Inspector General of Forests, dealt with all matters related to forests (Sarap, 2004). Thereafter, the Indian Forest Service was created in 1867 and Provincial Forest Service created in 1891 to provide link between Indian Forest Service and subordinate executive service. Following this, scientific forest management began in 1871. Over time, the forestry sector was adversely affected, not only by a rapid increase in human and livestock population, but also by inadequate investments and the transformation of forestland to non-forestry activities.

With increased understanding about the ecosystem services of forests and its role in mitigating climate change, the emphasis on conserving forest has grown manifold. Currently

forests are natural resources of local, national, and global concern. Globally, the major issues in the forestry sector are biodiversity conservation and enhancing carbon sequestration. Simultaneously, the key national issues are achieving biodiversity conservation, recognizing and maintaining the ecosystem services, and ensuring a sustainable supply of forest products. Besides these, forests are under watch locally for the collection of Minor Forest Produce, providing a livelihood to billions, and as sacred grooves by indigenous communities. Other problems include inadequate public awareness of the ecosystem services of forests, undervaluation of forest contributions to GDP, technological gaps, insufficient funding, and lack of adequately trained "frontline" forest staff.

The policy and legislative framework to manage forest was introduced in India by the colonial government with Forest Act 1865, which was followed with other acts and polices in subsequent years. The First Forest Policy, which emerged in 1894, aimed at managing the state forests for greater public goods. Certain regulations of rights and restrictions of privilege ensured the use of forests by neighbouring population and not only for commercial purposes. In 1921, the responsibility of forest management was transferred to the provincial governments, which was further confirmed by the Government of India Act 1935 (Anon 2006d). After Independence, the 1894 policy was replaced by NFP 1952, which identified vital national needs. The policy aims at preserving one-third of its total land area under forest (Anon, 1988).

In India, since the need for fuel wood, timber, and other forest products exceeded the country's ability to sustain the quality forest, some major initiatives were taken by the Government of India to improve the structure and functioning of forest governance. Because of the recommendations of the National Commission on Agriculture, Forest Corporations were created to harvest forest produce; the Indian Institute of Forest Management was established to produce administrators to manage forest resources as business managers; and social forestry on village and forestland was initiated. The formulation of a NFP, 1988, the creation of a separate Ministry of Environment and Forests, the initiation of JFM, and the enactment of the Panchayat Raj (extension to Scheduled Areas) Act 1996 could trace their genesis to the National Commission on Agriculture.

Globally, there is a growing consensus that as a country moves towards full-scale REDD+ implementation; it will need to develop a REDD+ strategy, which would focus on building capacity to create measurable, reportable, and verifiable (MRV) emission reductions and most significantly, establish a robust forest governance mechanism, which will provide a platform for REDD+ readiness. REDD+ is a global mechanism that aims at SFM through protecting forests and enhancing carbon sequestration. Primarily, REDD+ needs to have a carbon trading mechanism that would incentivize initiatives that contribute to reductions in emissions from deforestation and forest degradation or increasing the removals of CO_2 from the atmosphere through forest regeneration and protection. Policies and programmes will also be required to create economic incentives and management capacities to drive those reductions through improvements in forest management that is likely to be possible through community-based forest management. Bilaterally, the Forest Rights Act 2006 has to play a key role in strengthening of community-based forest management and in enhancing the income of forest-dependent communities.

Forest Policy in Pre-Independent India

Forest Act 1865: This was the first forest act under the new forest management regime of the British administration. Along with other factors, the concern to manage forest was fuelled by the widespread loss of forests to bring more land under settled agriculture, a major source of tax for the colonial government (Singh, 2010). This act provided power to the government to declare any

land covered with trees or jungle as government forest by notification (Nath, 1991 as cited in Sarap, 2004). This facilitated the acquisition of forest areas that could supply timber to the railways without abridging the existing rights of the people. The forest in this act was defined as "land covered with trees, brushwood, and jungle". Restrictions were introduced on the collection of forest produce, collected by the people living in and near forests. Timber, like teak, was declared as state property and trade on such timber was restricted. However, the existing rights of individual or communities were not touched in the act (Sarap, 2004). This act has alienated people from their rights over natural resources.

Forest Act of 1878: The Forest Act 1865 was amended with a new forest act in 1878 and some new provisions were made for the management of these newly acquired forests of the British administration. The forest act of 1878 reversed almost all provisions of the Forest Act of 1865 except the provision of "arrest without warrant". Some of the important provisions of the new act were as follows:

1. Any land whatsoever could be designated as forest
2. Treatment of customary rights of the Indian villager was based on privilege and not on right
3. A bar to addition of any further rights of people on Reserved Forests
4. Conversion of protected forests into Reserved Forests as and when required
5. The constitution of a third category of forests as Village Forests

This act provided a great deal of flexibility to the forest settlement officers that resulted in large variations between different regions in terms of rights of forest dwellers (Guha, 1983). Forests were classified into (i) Reserved Forest, (ii) Protected Forest, and (iii) Village Forest. Several new provisions were also made to curtail the use of forest by local communities. Restrictions were imposed on activities like the collection of timber and grazing of cattle in these demarcated forests. This act empowered the state with strong powers and curtailed the rights of individuals over the forest (Sarap, 2004).

The 1894 Forest Policy: This resolution made provisions for conversion of forestland for non-forest uses like agriculture.

Forest Act of 1927: A new Indian forest act was instituted in 1927 that incorporated a few substantive changes over the 1878 act and this remains the legislative basis for state forest management today. The Indian government adopted the 1927 act after redrafting of some clauses of the Forest Act 1878. One major change is stated to be its reference to individuals and not communities while referring to rights on forests (Guha, 1983).The forests taken over by the colonial government were often under community management, and their annexation by the government alienated the people from their former common resources, leading to their over-use by the same people. Although the colonial forest policy provided that the declaration of an area as government forest should not abridge or affect any existing rights or practices of individuals and communities, who were given three months to contest reservation, in actual practice the illiterate communities were seldom able to do so. Thus, by the turn of the present century some 20 Mha of land was brought under a category of forests called Reserve Forests. These were exclusively for the use of the Forest Department and the surrounding villagers had no rights other than those explicitly permitted by the state. Government forests were divided by the British into two broad categories: Reserve Forests and Protected Forests. The Protected Forests were also managed by the Forest Department but the people had certain rights within them such as collecting the Minor Forest Produce for household use. More than 90% of land legally classified as forests is today managed by the Forest Department. At the time of the country's

Independence in 1947, the areas under Reserve and Protected Forests were 31 and 15 Mha, respectively. Since then the net area under the control of the Forest Department has further increased to 67 Mha through several means. First, after the abolition of the princely states and landlordism, all uncultivated lands under their control became vested in the state. The larger tracts were handed over to the Forest Department, generally as Protected Forests, and the rest were vested in the Village Panchayats, which are under the overall supervision of the Revenue Department.

Forest Policy in Post-Independent Years

The 1952 Forest Policy was the forest policy declaration in Independent India. According to the newly enacted Indian Constitution, forests were placed under the state list on which state legislatures have a primary right to make laws. Later in 1976, the Indian Forest Act was added to the Concurrent List of the Constitution of India, giving the centre and states shared responsibility and control over forest matters. The responsibility of administering the forests lies primarily with the state government. The Indian Forest Service manning all bureaucratic positions, an all-India Service which has traditionally looked up to the Government of India that controls its recruitment and service conditions, the ideas contained in these policy pronouncements carry a great deal of weight. However, four factors have limited their implementation. First, these were all non-statutory and advisory statements issued by the Government of India, not backed by law. Secondly, actual implementation of forest projects and policies is under the control of the state governments, who may have different political compulsions to the Government of India. Thirdly, what are implemented in the field are generally, what is provided for in the budget and funded. Therefore, many policy prescriptions requiring budgetary support may remain unimplemented, if not otherwise funded. Lastly, bureaucracy in India is quite powerful and its own predictions may act as a filter to what is demanded of it by governments. It is generally believed that the Forest Service emotionally identifies with the first two sets of policies, but has reservations about the 1988 policy and this has hindered its translation into action.

The Forest Policy of 1952: The Forest Policy of 1952 declared that village communities should not be permitted to use forests at the expense of national interest. It wanted forests to be used to produce valuable timber for industry and other national purposes. The policy stated:

> The accident of a village being situated close to a forest does not prejudice the right of the country as a whole to receive benefits of a national asset. The scientific conservation of a forest inevitably involves the regulation of rights and the restriction of the privilege of users depending upon the value and importance of the forest, however irksome such restraints may be to the neighbouring areas. Therefore the needs of the local population must be met to a reasonable extent, national interests should not be sacrificed because they are not directly discernible, nor should the rights and interests of future generations be subordinated to the improvidence of the present generation.

From the first plan in 1952, emphasis was placed on the conversion of 'low' value mixed forests into 'high' value plantations of commercial species such as teak and eucalyptus. Forestry at that time meant raising trees to achieve a sustained yield of timber in perpetuity. Exotic species were introduced to create man-made forests. Of the Rs 670 million spent on afforestation during 1966–74, roughly Rs 560 million was for production forestry alone (Saxena, 1997). There is much greater emphasis on man-made forests, in which a diverse forest ecosystem was converted by the government into a single-species timber mine. The foresters became the main agents of reducing the diversity of forest species. The forest policy during the colonial period was also commerce-oriented, and this

orientation persisted for about a century from 1875 to 1976 and for forestlands up to 1988.

The National Commission on Agriculture 1976: The National Commission on Agriculture (NCA) recommended that forest corporations should be created to attract institutional finance. There should be a change over from the conservation-oriented forestry to more dynamic programme of production forestry. The future production programme should concentrate on clear felling of valuable mixed forests, mixed quality forests, and inaccessible hard wood forests and planting these areas with suitable fast growing species yielding higher returns per unit area. With reference to meeting tribal demands for fruit and medicinal herbs from forestlands, there have been no special measures, which could directly contribute to the upliftment of the tribal economy (Saxena, 1997). The programmes executed were essentially the forest development programmes, which benefited the tribal only indirectly, by creating wage-earning opportunities.

By the mid-1970s, it became clear that if the demands of the forest-dependent people were not met then it would be impossible to save the forests. This was then sought to be achieved through a social forestry programme on village and private lands. It is significant that social forestry was not tried on forestlands, except on a small scale in SIDA projects in Bihar and Orissa, since such lands were, as in the past, used for producing timber. In order to reduce pressure on forests, the NCA recommended growing trees on lands accessible to village people. Its report stated, "Free supply of forest produce to the rural population and their rights and privileges has brought destruction to the forest and so it is necessary to reverse the process. The rural people have not contributed much towards the maintenance or regeneration of the forests. Having exploited the resources beyond the sustainable limit of the forest, they cannot in all fairness except that somebody else will take the trouble of providing them with forest produce free of charge. One of the principle objectives of social forestry is to make it possible to meet these needs in full form readily accessible areas and thereby lighten the burden on production forestry. Such needs should be met by farm forestry, extension forestry and by rehabilitating scrub forests and degraded forests". Thus, social forestry was seen by the NCA as a programme that would release industrial forestry from social pressures. Forest lands were still to be used for production of commercial timber, but in order to keep people out it was necessary to make them produce what they consumed free of charge using village lands to draw some of the pressure away from forest lands.

Forest Conservation Act 1980: In 1980, the central government reasserted some of its control over forest-based resources because the 1980 act restricts the state government's power to de-reserve a forest, and it restricts the use of forestland for non-forestry purposes without the prior approval of the central government. It is important to note that the Forest Conservation Act of 1980 has been problematic for a number of reasons and has achieved little improvement in the conservation of India's forest. For instance, there are only six regional offices for the entire country, due to which the government's monitoring programmes continue to be one of the major drawbacks (WWF, 1999). For the first time, a forest act in India emphasized on the social and ecological importance of forest resources. However, there has been little effort to empower the users of the act. The restrictions by Forest Department have led many conflicts among the local people and the Forest Department officials.

National Forest Policy 1988: NFP 1988 was a paradigm shift in the forestry sector. The new forest policy framed in 1988 radically differed from the previous policies of Independent India. The 1988 forest policy stated:

Forests were not to be commercially exploited for industries, but were meant to conserve the soil and environment, and meet the subsistence requirements of local people prioritizing environmental stability than to earn revenue.

Deriving direct economic benefit from forests was subordinated to the objective of ensuring environmental stability and maintenance of ecological balance. It discouraged monocultures and promoted mixed forest. The focus shifted from 'commerce' and 'investment' to ecology and satisfying basic needs of the people such as providing fuel wood and fodder, and strengthening the tribal–forest linkages.

Para 4.3 of the new policy reads, "The life of tribal and other poor living within and near forests revolves around forests. The rights and concessions enjoyed by them should be fully protected. There domestic requirements of fuel wood, fodder, Minor Forest Produce, and timber should be the first charge on forest produce." Para 4.6 of the policy states:

With regards to the symbiotic relationship between the tribal people and forests, a primary task of all agencies responsible for forest management – including the Forest Development Corporations (FDC) – should be to associate tribal people closely in the protection, regeneration, and development of the forest as well as to provide gainful employment to people living in and around the forest. While safeguarding the customary rights and interests of such people, forestry programmes should pay special attention to undertake integrated area development programmes to meet the needs of the tribal economy in and around the forest area, including the provision of alternative sources of domestic energy on a subsidized basis to reduce the pressure on the existing forest areas.

The policy stressed the importance of NTFPs and states in Para 3.5 that "minor forest produce should be protected, improved and their production enhanced with due regard to generation of employment and income". Referring to supplies to industry, the first part of Para 4.9 stated:

As far as possible, forest based industry should raise the raw material needed for meeting its own requirements, preferably by establishment of a direct relationship between the factory and the individuals who can grow the raw material by supporting the individuals with inputs including credit, constant technical advice and finally harvesting and transport services.

It is also stated in the same para, "the practice of supply of forest produce to industry at concessional prices should cease. Industry should be encouraged to use alternative raw materials. Import of wood and wood products should be liberalized". Para 4.3.3 determined that production forests, which were in the past used exclusively for timber, while meeting national needs should also be oriented to narrowing the increasing gap between demand and supply of fuel wood. Para 4.4.2 bans the giving of mining leases without a proper mine management plan appraised from the environmental perspective and enforced by adequate machinery. Therefore, there has been a complete change in the policy orientation towards forests and the new policy recognizes the ecological value of the forest and identifies the stakes of its primary stakeholders, the forest-dependent communities.

Participatory Forest Management in India

Following the mandate of NFP, 1988, the Government of India has issued guidelines for regularization of eligible encroachment and conversion of forest villages into revenue villages in 1990. Consequently, 10 states have regularized 367,000 ha of forestland but the process was stopped due to order of Supreme Court by putting ban on de-reservation of forests. Simultaneously, the Government of India initiated the process of people's involvement in the conservation, management, and protection of forests with benefit-sharing mechanism on the principle of 'Care and Share' through JFM in 1990, that was the so-called JFM 1990 Resolution.

Joint Forest Management is a concept of developing partnerships between fringe forest user-groups and the Forest Department based on mutual trust and jointly defined roles and responsibilities with regard to forest protection

and development. In JFM, the user (local communities) and owner (government) manage the resource and share the cost equally; however, it is difficult to generalize the JFM concept and approach in the light of variations across the nation with respect to geography, resource base, socio-economic status, cultural diversity, and pressure on forests. The JFM programme is another initiative by the Government of India to involve the forest-dwelling communities in the management of forest since 1990 and has been implemented by most state governments in India.

The JFM programme has generated many positive outcomes in different locations (Anon, 2005). It has improved protection and increased the availability of Minor Forest Produce and fuel wood in many places. In some places, JFM institution is not functioning well (Anon, 2010). The experience of implementation of JFM in different states reveals that the whole concept remains to be institutionalized. The essence of the programme is the empowerment at the grass roots level. However, necessary decentralization has not been attempted in the Forest Department. Nor, has any change been noticed in the hierarchical structure. Further delegation of power and decentralization of authority are yet to take place at various levels. Entry point activities have not been able to stimulate the local villagers to participate fully in the developmental activities. In many areas, people have been found to demonstrate withdrawal system, once entry point activities have been completed and the periodic input intervention by the department is either withdrawn or made irregular. Examples of Arabari in West Bengal, Harda in Madhya Pradesh, and many other places point out this fact that villagers are not prepared to participate voluntarily in the overall developmental activities without regular intervention from the different agencies. They need to be given inputs at regular intervals in the form of some employment generation schemes, plans, etc., by the Forest Department. Such psychological and financial bathers have inhibited the sustainability of the entire JFM programme (Anon, 2010). Absence of a clear-cut relationship between JFM committee and the existing village panchayat has made the smooth progress of entire JFM process quite difficult in many places. Because of absence of productive functional relationship between the JFM bodies and the Panchayats in the wake of increased decentralization of powers to the Panchayati Raj Institutions through the 73rd Constitutional amendment, a lot of problems are coming to the fore (Anon, 2010). The Ministry of Environment and Forests, Government of India, has sent an advisory to the state government to place JFMCs under Panchayat Raj Institutions. These institutions have the legal backing of the Constitution of India while JFM institution lacks it. Mere advisory from Government of India cannot resolve the conflicts of interests between JFMCs and the Panchayati Raj Institution.

Status of Joint Forest Management Committees (JFMCs)

More than 106,000 JFMCs were managing more than 22 Mha forests with benefit-sharing mechanisms on the principle of care and share. Currently, more than 118,213 JFMCs are managing around 23 Mha of forest in the country (FRI, 2011). The JFMCs are largely involved in the plantation and other forestry activities and getting benefits of wages as workers. The mechanism of benefit sharing of 'minor' and 'major' forest produce has not been translated largely from government circulars to the action. The empowerment of Gram Sabha with ownership of Minor Forest Produce under the Panchayat Raj (Extension to the Scheduled Areas) Act 1996 has created conflict between JFMCs and Gram Sabhas. Status of JFM varies across the country such as in Uttar Pradesh and Uttarakhand JFM rules are under Section 28 of IFA, in Uttarakhand. All Van Panchayats are covered under the JFM programme and governed by Van Panchayat Rules 2005. Unlike in Jharkhand, JFM rules under Section 28 of the IFA are under

process, and unlike in Andhra Pradesh, a chapter on Community Forest Management needs to be included in the Andhra Pradesh Forest Act 1967. In states like Gujarat, Maharashtra, Tamil Nadu and Haryana, forests are managed as per the Societies Registration Act; Karnataka follows the legislation under Section 31-A of Karnataka Forest Act; and rest of the states like Bihar, Chhattisgarh, Madhya Pradesh, Goa, Himachal Pradesh, Jammu and Kashmir, Orissa, Punjab, Rajasthan, West Bengal, and Kerala are working under the guidelines notified under JFM.

Community Forest Resource (CFR)

As per the provisions of the Forest Rights Act 2006, the sizable area which is around 35–40 Mha (Anon, 2008) is likely to fall under the category of Community Forest Resource (CFR) where forest-dwelling communities will exercise the community forest rights to protect, regenerate, and conserve CFR. Such forests, if managed, protected, and regenerated by the communities would affect the forest governance in these areas, so far done by the State Forest Department. There are several other examples in India where local communities have been formally recognized and empowered to govern and manage the forests of their villages, or where they have self-initiated CBFG systems. These include some areas of Chota Nagpur region of Jharkhand; several thousand Van Panchayats In Uttarakhand; a large area in North-East; and several thousand community forest protection initiators in Orissa, Maharashtra, and other states. Potential of CFR areas are likely to overlap with JFM and areas managed by Eco-Development Committees. There is, therefore, urgent need to think about trajectory of forest governance as a whole and the location of community managed systems within this and their relationship with the Forest Department and other agencies.

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006

The enactment of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006 popularly known as Forest Rights Act 2006 further broadened the conflict between JFMCs and Gram Sabhas by empowering Gram Sabhas with the ownership of Minor Forest Produce and right to protect, regenerate and conserve CFR (Anon 2006a, 2006b). JFMCs and Gram Sabhas have overlapping jurisdiction on forests. The central government has also issued an advisory to the state governments in 2011 to put the JFMCs under the Gram Sabha. Gram Sabhas do not have a legal tool for the protection of forests, therefore, the Forest Rights Act authorizes Gram Sabha to take assistance of any government department, as Forest Department has powers under Indian Forest Act, 1927, and state forest acts. The Gram Sabhas also lack capacity to conserve and manage forests scientifically, in spite of having traditional knowledge only (Anon, 2010).

Following the mandate of NFP, 1988, the Government of India has issued guidelines for regularization of eligible encroachment and conversion of forest villages into revenue villages in 1990 (Anon, 1990, 2004). Ten states have regularized 367,000 ha forestland (Sharma, 2009). The process was halted due to order of Supreme Court in 2001 by putting ban on de-reservation of forests. Huge numbers of forest dwellers were left away from the regularization of eligible encroachment process. So, the central government came with legislation named as the 'Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006', popularly known as Forest Rights Act 2006, to recognize the tenure and occupational rights of forest dwellers. The Gram Sabha has been empowered with authority to recognize rights and conservation of CFR. The Forest Rights Act was the first act enacted in Independent India that addressed the question of community ownership of Minor Forest Produce and rights and management/governance of forests at the legislative level. The Forest Rights Act 2006 is being implemented in India for last three years with the help of rules framed for its

implementation. Until now, more than 1.23 million titles have been recognized covering 1.6 Mha forestland. Most of the titles are individuals except 6,559 community rights (Anon, 2011). The implementation of the Forest Rights Act 2006 is slow with respect to recognition of other rights such as community rights, conversion of forest village into revenue village and the right to protect, regenerate, and conserve CFR. The implementation of FRA has tended to focus on individual rights to cultivate and live; in fact, the Forest Rights Act makes significant contribution towards changing forest governance from being exclusively state centred to being much more community centred and democratic. At the outset, by setting individual land rights of those who have been historically cultivating or living in forestland, the Forest Rights Act tries to break the encroacher-eviction conflict cycle for the last time. This would secure the tenure and basic rights of the forest dwellers, enabling them to focus on managing and protecting the uncultivated landscape falling within the CFR.

FRA provides a statutory procedure for recognizing CFR and community forest rights. Equally important, the rules framed for the implementation of the Forest Rights Act provides statutory basis for protection of CFR and other forests where rights are recognized under the act. It also creates room for co-management of protected areas and Section 5 of Forest Rights Act empowers Gram Sabhas and communities to protect, regenerate, and conserve CFR (Sharma, 2009). The question of forest governance and the role of community are enormously complicated to begin with. The Forest Rights Act attempts to address this question along with land rights of forest dwellers. The rules framed for the implementation of Forest Rights Act does not provide the mechanism of the CBFG as mandated in the legislation. Rights, powers, and responsibilities given to local communities on such scales must be accompanied by clear rules and mechanism on how those responsibilities will be discharged, and what happens when they are not carried out. The rules do not provide mechanism for sustainable harvest of MFP, requirement of democratic and fair forest governance within GS and its accountability for non-performance (Anon 2007a). The NFP, 1988 changed its goals and priorities of forest management and admitted that the local forest-dependent community is the legitimate stakeholder and recommended community participation in forest regeneration (Anon, 1988). Subsequently, there has been a clearer shift in the state policy towards recognizing that the rural communities have right to manage and govern their immediate environment as seen in the 73rd Amendment of the Constitution, the PESA, and the statement made in the National Conservation Strategy, National Environment Policy, and the National Biodiversity Action Plan. The Forest Rights Act 2006 takes the first step towards national-level legislation to recognize this right and setting in motion this process of devolution and democratization in the context of forest use and management (Anon, 2007, 2007a). The rules framed for the implementation of the Forest Rights Act are inadequate. Section 12 of the act empowers the Ministry of Tribal Affairs in the central government of India to frame rules for the implementation of the Forest Rights Act in the spirit of its preamble.

Photo 2.1: Discussion with the Village Forest Management Committee

Photo 2. I Interaction with local communities on REDD + in Uttarakhand

Photo 2.2 Interaction with local communities on REDD+ in Madhya Pradesh

Photo 2.3 Interaction with local communities on REDD+ in Orissa

Photo 2.4 Interaction with local communities on REDD+ in Uttar Pradesh

CBFG is based upon the following principles:

- Democratization has to include decentralization to the community of forest-user groups.
- Democratic decentralization of power and governance requires operational autonomy for the lower-level entity (such as community) within a transparent regulatory framework.
- Safeguard against elite capture at the local level are necessary to enable them to protect the community and individual rights and resources.
- Monitoring the sustainable use of resources and enforcing norms by the government to conserve these resources.
- State support will be required by many communities in any decentralized system for forest protection, conflict resolution between the Gram Sabha and the JFMCs, technical knowledge for harvesting, resource mapping as well as monitoring, marketing, and trade of Minor Forest Produce.
- Local forest governance and management must be nested within a larger landscape, enabling sustenance of ecosystem functioning, corridors for movement of wildlife and genetic flow and other functions and benefits that are external to the community.
- The shift to the community-based management not only involves devolution of power but also requires changes in rights, responsibility, and structure of institution and attitude of the governing bodies.
- Besides this, the government must play a pro-active role in ensuring that the interests of the weaker sections of the society are safeguarded and no elite capture takes place.
- National-level framework should be flexible enough to adapt to regional variation accomplishing the overall goals.

Based on these principles, CBFG institution at the village level may be set up headed by the Gram Sabha/Panchayati Raj Institution under the following options such as the following.

- *FRA and PESA Areas*: The CFR Management Committee (CFRMC) can carry out functions on behalf of the Gram Sabha and the Panchayati Raj Institution. The CFRMC should be an elected and democratically constituted body of the Gram Sabha/ Panchayati Raj Institution for a period of 5 years (Anon, 2010). Minimum 50% members should be women and president must be a member of Scheduled Tribes Forest Dwellers or Other Traditional Forest Dweller.
  - The following may be the rights, responsibilities and powers of CBFG:
  - Gram Sabha/Panchayati Raj Institution is responsible for ensuring fare 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 those of external right holders such as nomads.
  - Gram Sabha is primarily responsible for ensuring sustainable use of forest produce including Minor Forest Produce.
  - Gram Sabha is authorized to make rules regarding use, harvesting, protection, and regeneration of CFR.
  - CFRMC office bearers are vested with powers to prevent forest offences and penalize violators.
  - Gram Sabha regenerates revenue, receive, and spend grants for its forest-related activities.
  - Gram Sabha should be encouraged to prepare community forest management plans with a technical support of State Forest Department.
  - Gram Sabha has an option of merging the CFRMC with the Biodiversity Management Committee, or any other existing natural resource-related committee existing in the village.

Further, there is need to amend Indian Forest Act 1927 and Wildlife Protection Act 1972 to assign authority to Gram Sabha/Panchayati Raj Institution for preventing offences related to biodiversity. The role of State Forest Departments is also crucial for the success of CBFG. The role of the Forest Department is as under:

- Forest Department may be responsible for providing protection and technical support to the Gram Sabha/Panchayati Raj Institution.
- Forest Department may be empowered to carry out monitoring, i.e., the extent of compliance with sustainable use and conservation regulations in community-based managed areas.
- It may also be responsible for taking action on any violation.
- Forest Department will continue to exercise additional powers to implement regulatory provisions of Wildlife Protection Act 1972 and other forest-related state-level acts.
- Greater interaction of foresters with forest dwellers and ensuring their all-round economic and social development, involving them at all stages of planning and implementation of forestry programmes run by the Forest Department, and supporting their own planning and implementation of community-based forestry programmes.
- Increasing focus on understanding and managing complex ecosystems conserving range of native biodiversity, rather than mega fauna species and conserving endangered flora and fauna.
- The CBFG must aim for ensuring livelihood within sustainable use and conservation framework, and ensure the tenurial security

on forestland for their occupation and habitation rights.

- CFRMC under Gram Sabha should be the most appropriate institutions along with technical support of the Forest Department.
  - *Non-PESA and FRA Areas*: This will follow existing JFM structure with following changes:
  a. JFMC at village level not Panchayat level
  b. Chairman will be elected from the village
  c. Sarpanch/Gram Pradhan–Patron
  d. Forest Department would provide technical support from within the committee
  e. Gram Sabha may appoint Forester/Forest Guard as Members
  f. Village forests may be notified under IFA and assigned to JFMCs
  - North East States
  a. CBFG is for community-owned and government-owned forests.
- Role of Forest Department will be to provide protection and technical support to the Gram Sabha or the Panchayati Raj Institution.
- Forest Department may be empowered to carry out monitoring, i.e., the extent of compliance with sustainable use and conservation regulations in community-based managed areas.
- It may also be responsible for taking action on any violation.
- Forest Department will continue to exercise additional powers to implement regulatory provisions of Wildlife Protection Act 1972 and other forest-related state-level acts and adjustment as per the need of specific north-east states.
- Mandatory management plan is for Private Forests.

Strengthening Institutions for a Robust Decentralized Forest Governance Mechanism to Achieve Mandate of REDD+

Local institutions play a significant role in forest conservation and its sustainable use, especially when market forces are putting tremendous pressure on natural resources. The institutions at the local level to deal with forests include JFMCs (a large number in Sonbhadra, Uttar Pradesh), Community Forest Management groups (a large number in Orissa), Van Panchayats (Uttarakhand), traditional village-level institutions/village councils (Schedule VI area), Biodiversity Management Committees, forest committees set up under Rule 4 of the Forest Rights Act, etc., as well as SHGs/CIGs that have been set up at the village level to promote forest-based livelihood activities. Although, JFMCs have certain limitations such as tenurial insecurity, inadequate silvicultural development, restricted harvesting, and market access but setting up of JFMCs have also helped in regenerating forests and meeting local and indigenous needs. Panchayat Raj Institutions are constitutionally mandated bodies for decentralized development planning and proceeding at the local level. The Scheduled Tribes and Other Forest Dwellers (Recognition of Forest Rights) Act, 2006, provides for individual rights as well as empowers community with community forest rights, including the right to protect, regenerate, and manage CFR. The Gram Sabhas has been given the responsibility to set up institutions to ensure this (4e of Rules). Strengthened Gram Sabhas can only withstand the decentralized governance of forests. Informed Gram Sabhas would further establish better coordination and linkages across different institutions at the local level and improved liability of such institutions.

Gram Sabhas needs to set up a village-level institution for protection and management of forests. This would not only help in strengthening the Gram Sabha, but would also help in necessary union of resources and integrated planning

at the village level that would surely benefit all stakeholders. Leadership provided by the committees of the Gram Sabha and SHGs would contribute to strengthening of the Gram Sabha. Livelihood activities and enterprises as well as protection of forests have often been effectively addressed at the cluster level/sub-landscape level, led by federations of SHGs/CIGs and federations of forest committees. The Government of India would, therefore, encourage federations of thematic committees/groups such as JFMCs, CFM, Village Panchayats, Forest Rights Act committees, etc., as well as livelihood promotion groups like SHGs/CIGs to plan for forest protection, conservation, and livelihood activities. However, making of such federations needs to be the decision of communities and their respective Gram Sabhas.

Revamping JFMCs: As an institution, the JFMC must be conventional and contribute to decentralized forest governance. The sole responsibility of JFM should be to empower the community on the one hand while securing SFM. To allow greater decentralization of decision-making, transfer of power, and adequate support, the following steps would be helpful to reform the JFMCs:

- The JFMC will be set up by the Gram Sabha. Its constitution and processes need to be harmonized with the provisions as laid out in the State Panchayat and PESA 1996 legislation. The JFMC, as a committee of the Gram Sabha, must be given power to protect and manage as well as derive benefits from forests. The Government of India will also examine provisions of the Indian Forest Act to provide power of forest officer to such a committee in order to strengthen it.
- The JFMC must be provided resources and necessary skills to carry out and achieve its mandate.
- Silvicultural management of the area assigned to JFMC must be as per the plan approved by the Gram Sabha, following the technical approval by the Forest Department.
- Forest Department's role would be to provide demand-based support, as required according to the need of the Gram Sabha and its mandated committees to strengthen decentralized forest governance leading to sustainable management of the forests.

Revamping FDA: The current Forest Development Agency (FDA) structure and its role needs to be revised in order, to make the FDA a primary institution in contributing to decentralized forest governance and providing valuable services for forest conservation and improved livelihoods of people living in and around the forests that would further achieve poverty eradication and enhancing carbon sequestration.

- The FDA at the district/division level will be chaired by the elected representative such as the Zilla Parishad president which would help in programme convergence with the Panchayat Raj Institutions.
- The FDA at the state level will be chaired by the elected representative such as the Minister of Forests and Environment.
- The executive body of the FDA would have elected representatives from clusters/wards, comprised revamped JFMCs. Such clusters could be formed at sub-block, sub-range, and range or sub-landscape/landscape level.
- Federations of the Committees of Gram Sabha would also be represented at the district/division level.
- SHGs/UGs and their federations occupied in forest-produce-based enterprise would be represented at the division level/district level FDA.
- Representation of civil society organizations would be ensured.
- Representation of line agencies, particularly, rural development, agriculture, livestock,

fisheries, horticulture, revenue, drinking water, health, tribal welfare, and education will be secured. All government officials will be ex-officio members and would not have voting rights.

- The CEO of the FDA will be the DFO.

The function of the FDA will be to facilitate demand-based planning and implementation of forest conservation and community development by the local bodies mandated by Gram Sabha. It will need to create partnerships with local NGOs/CBOs, academia, Panchayati Raj Institutions, research and training organization, people's representatives, media, and government line agencies to carry out its function and to strengthen forest governance.

In order to carry out the above functions on ground, the FDA, as an institution would need to be strengthened with capacity building through skill/knowledge support, sourced on contractual basis and adequate infrastructural support will be provided for this.

The Government of India will also support capacity building of the local community institutions as a long-term measure to help them effectively protect, regenerate, and manage forests and commence forest-based livelihood enterprises. Sustainable forest management SFM and forest produce utilization will require good skills and knowledge in inventorization, adaptive silvicultural practices, sustainable NTFP harvesting, value addition and marketing, and monitoring of impacts. Traditional knowledge, forestry science, ICT will promote capacity-building initiatives.

The Government of India will support development of youth cadres as community foresters to take the charge at the local level. Support of the Forest Department, research institutions, universities/colleges from the local area, and NGOs would help develop this cadre of community foresters. These youths will provide support in community-based forest conservation, community livelihood enhancement, change monitoring, etc. They will also act as a bridge between the community and the service providers like the Forest Department, NGOs, and Process Support Groups would help in strengthening of institutions at various levels, from local (hamlet/village level) institutions to the state bodies. This will ensure representation of NGOs in decision-making bodies at different levels.

The Government of India also identifies a new role for the Forest Department. The engagement of community institutions in facilitating field actions will require sensitization of the Forest Department officials and front-line staff. The Forest department would act as an "enabler" in addition to its statutory role in protection and management of forests. The Forest Department will also need to ensure compliance with technical prescriptions as per the Micro Plan. It would be essential to respond to the community institutions in providing greater support in "protection" in case of sensitive areas. The technical knowledge of the department will come to the front to assist developing quality planting material, designing eco-restoration programmes, pilot testing of climate change adaptation measures, creating an enabling regime that helps farmers and communities to plant, protect, and harvest trees/forests without having to incur huge transaction costs. The frontline formation of the department currently suffers from serious limitations such as lack of frontline staff. The Government of India will support the recruitment process by focused advocacy and even provide financial support for salaries of frontline staff for a limited period. Capacity building of front-line staff, on a regular basis, to carry out the emerging role will be given high priority. Teams of Subject Matter Specialists at the level of revamped FDAs could bring in new knowledge and skills. The arenas include ICT (including RS/GIS capabilities), community mobilization, watershed/soil moisture/water harvesting; hydrogeology, finance, ecological restoration/REDD issues, etc. The Government of India will support strengthening of the Range Offices inter alia developing them as

forest and wildlife resource centre (with library, documentation, map room, GIS, and MIS cell facilities). This support could also be availed by the partner agencies working in the sub-watershed /sub-landscape. Infrastructure support in terms of enhanced mobility and communication at forest range and section level will enhance the rapid response needed for forest protection, fire protection, control of crop-raiding wildlife, etc. India has about 1 million recognized schools and some 10,000 colleges. Programmes such as the National Green Corps (NGC) coordinated by MoEF, NCC, and NSS, and many other initiatives taken by NGOs have shown a great deal of potential to engage school and college students and teachers in monitoring natural and restored forests and other landscapes. They have conducted actual "greening" activity, which would raise a sense of responsibility among the local people to conserve natural resources.

Although, the Forest Rights Act 2006 has already empowered community with ownership of Minor Forest Produce but the communities are still, sharing less than 10% of total turnover of MFP which is in the tune of 27 billion US $ per annum. States like Madhya Pradesh, Chhattisgarh, Orissa, and Uttar Pradesh have taken proactive initiatives for enhancing the income of forest-dependent communities and building capacity of community through value addition, processing, and marketing of Minor Forest Produce (Sharma, 2009). The PPP model for helping the communities with respect to value addition, processing, and marketing of MFP will definitely enhance their income. CBFG strengthened by the Forest Rights Act 2006 is certainly the productive future of Indian Forestry. Rules framed for the implementation of Forest Rights Act 2006 are inadequate and need to be thoroughly revised in order, to formulate additional rules to provide mechanism for sustainable harvest of Minor Forest Produce, enhancing income of forest-dependent communities and for the recognition of CFR. The dynamic change in forest governance from participatory approach of forest governance (JFM) to CBFG will be an explicit transformation of power across the nation. This has evolved the new term JFM+. The plus stands for more empowered JFMCs. JFM+ will be JFM constituted at village or hamlet level and will be represented by chairman elected from the village or Sarpanch-Patron, if where applicable. JFM+ will be assisted by the Forest Department for capacity building to protect and conserve the resources by providing technical support and use of forest legislation. In JFM+, the JFMCs will work under the Gram Sabhas in the Panchayat Raj Institutions. The power from the Dorest Department will be decentralized to the Panchayati Raj Institutions, which are proposed to work in co-ordination with the JFMCs. The management plan for JFM+ will incorporate both scientific and traditional knowledge, which could be used in resource management with regular flow of funds. The benefit sharing will be based on the principle of "care and share" mechanism. The JFM+ concept not only nourishes the JFM but also enhances the intensity of good governance under PRIs to promote sustainable management of forest in addition to improving livelihoods of local people who are dependent on forest for their bona fide livelihood needs providing a strong platform for REDD+ to emerge in India. Moreover, the CBFG briefly, is a process to achieve the mandate of REDD+ in India. Henceforth, this would result in poverty eradication and will support livelihood of the indigenous groups dependent on the forestland and resources for their basic needs.

2.4 Developing Methodology for Assessing the Carbon Enhancement

REDD is an international initiative that was started at CoP-15 (Copenhagen) in 2009. Forests store a great deal of the world's carbon and an estimated 12–18% of global CO2 emissions come from land use change, mainly deforestation and forest degradations. REDD has emerged as a central strategy in efforts to reduce global

greenhouse gases emissions. By creating financial incentives to reduce forest-sourced greenhouse gases, REDD projects could generate funding from developed to developing countries. This can yield significant sustainable development benefits, and may generate a new financing stream for SFM in developing countries such as India. REDD+ goes beyond deforestation and forest degradation, and includes the role of conservation, sustainable management of forests, and enhancement of FCS (www.un-redd.org).

India's submissions to the United Nations Framework Convention on Climate Change (UNFCCC) have consistently reiterated its position to get recognition and encouragement for conservation, sustainable management of forests, and increase in forest cover as a potential policy approaches under REDD+. India has maintained that all countries engaged in efforts to maintain and increase FCS in their broader national policy framework of conservation and sustainable management of forests should be rewarded. The REDD+ approach incorporates important benefits for improving livelihoods, biodiversity conservation, and food security services. Recently, India submitted the methodological guidance for a REDD+ project to the UNFCCC, where it states that stratification of forest areas, Tree-outside-Forest (ToF), crown density classes, sampling design, precision of estimates, protocols for collecting sample data, and models and equations used in computing FCS will form an essential part of accounting the report. All equations, growth, and biomass yield models used in the computation of FCS will be based on published records, and freely and readily accessible to all for evaluation. Developing countries will have the option to choose all or any of the pools of FCS. Indigenous peoples, local communities, civil societies and other interested entities will be fully involved and informed about the technological, methodological, policy, and financial aspects of the Measuring, Reporting, and Verification (MRV) processes and procedures. The objective of this discussion is to examine the methodological issues such as scale, baseline reference, measuring, monitoring, and verifications of the REDD+ project in context to India.

Methodological Issues

Scale

Scale is one of the most critical policy issues of REDD+ project in the country since other important parameters such as base line reference level, permanence, leakages, monitoring, and investment all depend on it. While implementing the REDD+ project, a key question that arises is at what scale (level) should the project be implemented in the country? Should it be at the national level, or subnational level (project level) or a mix of both (nested or hybrid approach). There are various arguments in favour and against for all these options. At the national level, favourable points are that it allows broad set of policies and creates country ownership. National approach acknowledges tackling deforestation and forest degradation more, effectively which would require policy amendments in the country.

However, there are various serious constrains while implementing the REDD+ project at the national level, such as the lack of strong federal central government systems in many developing and under developed countries. Management of the project at a national level would be another constrain in larger countries such as India. It requires large number of skilled and trained forestry professionals across the nation. There would be higher transaction cost due to complex bureaucratic procedures and various complex processes at a nation-level approach.

In case of a sub-national approach, which is more suitable for a large country like India, individuals, communities, NGOs, civil societies, private companies, and national or local governments can implement REDD+ activities in a defined geographical area or at a project scale. Smaller projects can help in building capacity at the grass roots level, and spread knowledge and

awareness. Smaller projects can clearly define project stakeholders and distribute the benefits more efficiently, and there are good possibilities of attracting private investors due to simple processes and well-defined stakeholders.

There are some negative arguments that smaller projects might not fulfil the emission reduction targets at a national or global level. Sometimes, it is difficult to monitor leakages on a small scale, and the cost of monitoring would be relatively higher than a bigger project.

A hybrid, or nested, approach tries to include positives from both the above-mentioned approaches. The hybrid approach suggests implementing REDD+ policy at the project level first and then extending it at a national level. Building the capacity of various sub-national stakeholders would be helpful in implementing the policy at national level. Credits generated could be shared between the project proponent and the central authority.

There are various other options suggested by researchers from time to time. In one case, it might be possible to sub-divide one national project into a number of small projects and then implement them with the participation of local communities and private entities. However, a more feasible scale for the country would be at the subnational level, keeping in view the various positive points of the project-level approach. Initially, some projects could be started at the project level, in order to build the capacities of various stakeholders — including the forest staff at the grass roots level — and then implement it at the defined geographical area. From the Indian context, village forests, community forest resources, forest areas assigned to JFM, and other areas of a similar nature may be undertaken as a unit for implementing the REDD+ project. Since there is no mechanism to transfer the money generated from carbon trading to the community, it would be appropriate to have smaller project areas, so that the fund would reach the community smoothly and efficiently.

Baseline Reference Level

Baseline refers to the forest cover of an area at a certain period against which progress of the REDD+ project interventions can be measured. Baseline reference level is another key parameter for implementing the REDD+ project, and assessing its overall impact in terms of reduced GHGs and tradable carbon credits. There are various arguments in setting up the baseline reference level for the REDD+ project. In this case, if a baseline were established based on data from recent years only, it would discourage countries who have already made efforts for checking the deforestation rates. Such baseline will not yield any significant credits for them, hence would demotivate countries to participate in the process. India favours a baseline reference level of 1990, while countries such as Brazil and Latin America favour average of historical 10 years period. Baseline reference level should depend upon the availability of the data. India favours the 1990 baseline due to availability of GIS, RS, and forestry data for the entire country. India has one of the most advanced forest mapping programmes in the world; the FSI conducts a biennial cycle of forest and tree cover assessments throughout the nation. In addition, larger activities under the gamut of SFM started during the 1990s within the country.

Monitoring

Regular monitoring of the carbon stock is very important for the REDD+ project. However, there are various issues in monitoring and verifying the REDD+ project, such as, there is no uniform defining of various terms like forests, deforestation, and degradation, across the globe. There is a lack of uniformly agreed density classification, which makes it difficult to monitor the progress and effectiveness of REDD+ projects across the nations. There is a lack of historical data, technical skills for field measurements, carbon stock calculations, and

interpretation of satellite imageries in most of the world's developing and under-developed nations. Besides, monitoring and verification requires huge expense. In India, there is an urgent need to organize capacity-building programmes of local communities and forest staff at the project level on methodologies for assessing carbon, in order to ensure minimal transaction cost for the preparation of REDD+ projects.

Leakages

Leakages are defined as changes in GHG emissions outside the project boundary due to project interventions. Leakages can reduce the impact of the project significantly, hence it should be addressed properly while implementing the REDD+ project. In India, the primary sources for leakages from the forest are fuel wood, fodder, and timber extraction. Fuel wood leakages can be reduced by deploying energy-efficient mechanisms, such as renewable energy sources — especially solar energy sources — and providing alternate employment to the people who were dependant on fuel wood extraction for their livelihood. Fuel wood requirements could be tackled through the installation of improved cooking stoves, biogas plants, LPG, and various other means at the village level. Leakages in the forms of fuel wood and fodder can be managed through properly implementing the management prescriptions provided in the working plans and various other forestry documents, and cultivating nutritive grass species such as Barseem and Napier at private farms. Tree species of fodder grass such as Bhimal, Oak, Neem, and Bauhinia should be encouraged. The leakage of timber could be managed through the proper implementation of silviculture and the management techniques provided in the working plans of the respective forest divisions. In addition, conservation practices and sustainable harvesting would be encouraged.

Photo 2.1: Firewood Collected from the Forest

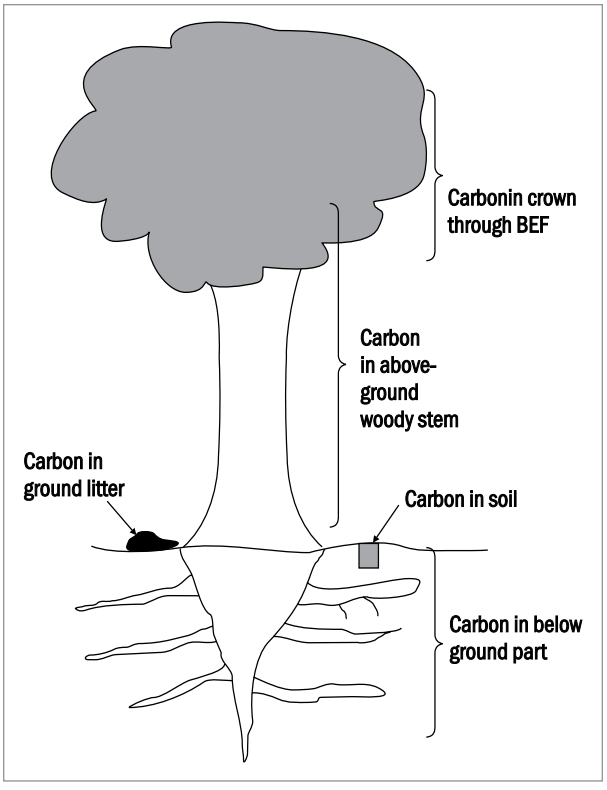
Carbon Stock Assessment

India has more than 70 Mha under forest cover and added around 3 Mha of forest cover and ToF over the last decade. India has a good set of historical data of its forest area and thus, may propose the methodology, which is based on RS and GIS followed by ground truthing. The benchmark year may be considered as 1990 or 1991 depending upon the availability of the satellite imageries and other forestry data set. Forest cover map of 1990 and 2012 (Project year) may be prepared using Landsat satellite data. The area would be divided into homogenous strata based on forest types (or species composition) and canopy density through interpretation of satellite imageries.

It is proposed to classify the satellite image into three density-classes, viz., "D1" with tree canopy density between 10 to 40%, "D2" with tree canopy density between 40 to 70%, and "D3" with tree canopy density of more than 70%. Species composition, if not discernible from satellite data, can be determined from ground truthing. Field inventory data would be collected based on an appropriate sampling design. A combination of systematic and stratified random sampling may be proposed based on methodology of the FSI (2011). In case of the project-based approach, where average project size area is small

(approximately 100 to 1000 ha), the entire project area may be divided into grids of 100m x 100m (1 ha). Each grid can be assigned a unique ID and classified according to the stratum it represents. Sampling intensity and sample plot size would be determined as per standard statistical tools. Field data such as project area, legal status of the project area, rights and concessions, topographical details, soil types and quality, site quality, status, forest types, species composition, number of stems of each species, girth, height, number of stems in each diameter class, and soil carbon data would need to be collected. Above-ground carbon-stock would be calculated by taking the local volume equations available in the Working Plan document of the area or those published by FSI, (1996). Below-ground carbon and carbon in the branches would be estimated using default values provided by IPCC Good Practices Guidelines.

Figure 2.2 Accumulation of Carbon in the Forest Ecosystem



Carbon stock in each grid would be determined based on field data, and simultaneously, carbon stock per hectare would be estimated for each stratum. This would help in estimating carbon stock in the site for the benchmark year. The grids where an increase in canopy density is observed with respect to benchmark year will indicate additionality due to SFM initiatives (or other effective management practices). Similarly, a decrease in density over the years would indicate loss of carbon from the area due to unsustainable management practices and/or anthropogenic pressures. Carbon estimation from soil, woody litter, and decompose material would be estimated based on the present data, and it can be further compared in future projects of the same area. Socio-economic data including dependency on forest produce (firewood, small timber, etc.) from the adjoining villages would be collected through conducting household surveys and group discussions. Such data would help in understanding the anthropogenic demands and further improvement of management interventions for SFM.

Remote sensing and GIS-based methodology will help in estimating carbon stock of the benchmark year as well as for future temporal estimation at periodic intervals. The output generated would help in understanding the impact of on-going management practices, suggesting improved practices, and supporting decision-making processes. Annual increment data of the dominant species from the secondary sources, like Working Plan Document, can be used to refine the estimate, particularly in grids where there is no change in the density class over the past few years. Such data is needed as, while remote sensing data may not show any increase in grids where there is no change in canopy density, there would certainly be an increase in carbon stock because of annual increments in the above ground woody volume of the tree.

2.6 Biodiversity Conservation and Safeguards for REDD+ Projects

REDD+ and the role of conservation, sustainable management of forests, and enhancement of FCS) provides an opportunities to adapt resilience-oriented ecosystem management, to ensure biodiversity conservation, and flow of ecosystem services for sustainable development.

India is one of 17 mega-diverse countries, and has four biodiversity hotspots. India contains 668 protected areas comprising of wildlife sanctuaries, national parks, tiger reserves, elephant reserves, community reserves, and conservation reserves. India is recognized as one of the eight Vavilovian centres of origin and diversity of crop plants, and possesses more than 300 wild ancestors and close relatives of cultivated plants, which are still evolving under natural conditions. India is also a vast repository of Traditional Knowledge associated with biological resources (MoEF, 2009a).

At the same time in India, a large population is dependent on forests for their livelihood, either fully or partially. The figures estimated for forest-dependent communities in India vary from 200 to 350 million people. This dependence is in the form of collection of a variety of NTFP for subsistence and livelihood purposes, collection of fuel and fodder for subsistence and livelihood purposes, and lifestyles such as shifting cultivation or pastoral nomadism, which are dependent on natural resources. At the same time, local communities have been continuing with diverse sets of ownerships, rights, and concessions over the use of natural resources such as forests, inland waters, coastal areas, and alpine meadows, etc. Thus, the ecosystem services, as characterized by the framework of Millennium Ecosystem Assessment, form an integral part of association of local communities with the ecosystems in India.

Thus, in the context of REDD+, the scope of biodiversity is not restricted to species diversity and populations, but also encompasses the strong dependence of local communities on the ecosystem services for subsistence and livelihood purposes. As the definition of REDD+ suggests, the regime provides an opportunity for not only carbon-oriented management of the natural resources, but also the scope to develop biodiversity conservation as an important objective of the management of natural ecosystems.

Issues to Address

Thus, considering the complexity of the subject in terms of conservation of biodiversity, sustainability of the natural ecosystems, and the livelihood dependence of the local communities, the policy needs to address national and global issues related to carbon accumulation, biodiversity conservation, and continued flow of ecosystem services.

At the global level, the various international processes have warned about the possible faulty design of REDD+ implementation due to the carbon-centric process of financial compensation. Hence, there is a need of effective and strong safeguards.

In the Indian context, the REDD+ policy regime for biodiversity should address:

- The continued flow of ecosystem services to enhance the livelihoods of local communities;
- ensure that the conservation of elements of biodiversity in the form of ecosystems, habitats, corridors, threatened and endangered species, wild relatives of cultivated plants, traditional crop varieties, and animal breeds takes place outside the protected area system; and
- effective safeguards are in place to consider carbon as one of the benefits along with other ecosystem services, so as to balance the tangible and intangible benefits from biodiversity.

In order to achieve these objectives the policy regime will have to incorporate the following aspects.

Enhancement measures for biodiversity conservation and ecosystem services

Conservation of various elements of biodiversity (genes, species and ecosystems as defined by the Biological Diversity Act, 2002) outside the protected area system is governed by a variety of legislations in a sectoral manner. In this, there has been a very distinct separation of wild and domesticated biodiversity in terms of management. Most of the wild biodiversity, mainly in form of trees, are regulated through prevalent central/state forest legislations such as the Indian Forest Act, 1927. In the overall management of forests and biodiversity, apart from the Working Plan, there is neither any information gathered at the sub-national level for assessing the health of forests, nor is there any to generate an understanding about the functioning of an ecosystem. The conservation of habitats, corridors, and threatened and endangered species is largely governed by the provisions of the Wildlife (Protection) Act, 1972. The REDD+ regime needs to value these habitats and biodiversity outside protected areas with an ecosystem perspective, which would enhance the efficacy of biodiversity conservation efforts. The selected tangible and intangible ecosystem services provided by such areas need to be understood in terms of harvesting limits and available stocks, and enhancement observed over the period. At present, sourcing of firewood, NTFPs, and agriculture such as shifting cultivation, have been considered under various policy and legal provisions for management. Overall dependence of people on the nearby forests has been substantially argued by the NFP, 1988, and hence also highlighting the need of 33% forests to strengthen the livelihoods of the people.

The network of more than 668 protected areas is the largest system for the conservation of wild biodiversity in the country. National parks are managed with a perspective of ecosystems and habitats, whereas wildlife sanctuaries are managed with a species-specific perspective. For every protected area, a management plan is developed and backed by government sponsored financial mechanisms. Apart from this network of protected areas, there are softer forms of conservation measures such as Biosphere Reserves, UNESCO Heritage Sites, and Ramsar Sites; identified on the basis of international priorities. Ecologically Sensitive Areas and Biodiversity Heritage Sites, as defined by national legislations, as well as variety of community conservation efforts in form of community forests and sacred forests form the main source of enhancement of carbon stocks.

Through the processes like certification, and Criteria and Indicators (e.g. Bhopal-India process), there should be mechanisms to recognize the change due to enhancement measures undertaken for REDD+ related activities.

Convergence of policy and legal provisions

Over the period, a variety of policy measures has been developed. Many of these measures provide opportunities for strengthening documentation and data collection; empowering local communities by recognizing responsibilities, ownerships, rights, and concessions; and creating suitable institutions. The mandates of NFP, 1988, and National Environment Policy, 2006, recognize the need to address the conservation of areas of biodiversity importance, increasing forest productivity, and restoring degraded areas; which are also anticipated as part of REDD+ policy regime. The legislative provisions developed as a follow-up to such national policies are listed below for cognizance to develop policy environment conducive for REDD+.

- Indian Forest Act, 1927 (Defined concessions, Village Forests, Protected Forests, Transit of forest produce)
- Wildlife (Protection) Act, 1972 (Management of National Parks and Wildlife Sanctuaries, protection to Scheduled Species, Community and Conservation Reserves)
- Environment Protection Act, 1986 (Restoration of degraded lands, management

of watersheds, Wetland management, and identification of Ecologically Sensitive Areas)

- Biological Diversity Act, 2002 (Guidance on sustainable use of biodiversity, Access and Benefit sharing of biodiversity for commercial use, identification of species of conservation importance, documentation of People's Biodiversity Registers (PBRs), declaration of Biodiversity Heritage Sites, local institutional mechanism in form of Biodiversity Management committees, and financial mechanism in form of National-State-Local Biodiversity Fund)
- Protection of Plant Varieties and Farmer's Rights Act, 2001(Mandate of conservation of plant genetic resources, financial mechanism in form of National-State-Local Gene Fund)
- The Scheduled Tribes and Other Traditional Forest Dwellers Act, also referred to as Forest Rights Act (FRA), 2006 defines community forest resources, critical wildlife habitats, provides ownership of minor forest produce to the local communities, and provides tenurial security for forest dwelling communities. The functioning of the provisions is also linked with the performance of the ecosystems, in terms of delivering ecosystem services for livelihoods.
- State-level legislations pertaining to various aspects of biodiversity conservation and ecosystem services are important in understanding the local mechanisms and their efficacy. Legislations such as United Khasi-Jaintia Hills Autonomous District (Management and Control of Forests) Act, 1958 and Garo Hills Autonomous District (Management and Control of Forests) Act, 1961 recognize the traditional forest land-use systems such as *Law Lyngdoh, Law Kyntang,* and *Law Niam*.
- The guidelines and orders issued by the Ministry of Environment and Forests, and other central ministries, on aspects such as Joint Forest Management and Best Practices for extraction of medicinal plants are important for understanding the sustainability of implementation at the local level.
- Green India Mission has been launched; where10 million hectares of land are targeted for improving qualitatively and quantitatively through village level institutions.

There is a need to develop a co-ordinated approach for having convergence of these numbers of provisions. To evolve this convergence there is need to understand the utility and the interconnectedness of these provisions at local, sub-national, and national levels. For example the provision of People's Biodiversity Register documentation in the Biological Diversity Act, 2002 is of importance not only in the context of documentation of traditional knowledge, but also in the preparation of JFM micro-plans, the number of requirements under FRA, and so on. Such convergence should benefit to avoid the multiplicity of the local institutions being created under various legal provisions and for short-term purposes.

The REDD+ policy regime also takes guidance from the international process for developing the mechanism for monitoring, reporting, and validation.

Developing safeguards for biodiversity conservation

The enhancement of carbon has been an important factor in REDD+ to receive the monetary benefits. It could become a driving factor to evolve the REDD+ programme into a carbon-oriented approach instead of treating carbon as one of the ecosystem services and reduce the biodiversity value. Apart from these, there could be possible undermining of rights of the local communities associated with the project landscapes. These threats have been also recognized by the Convention on Biological Diversity and United Nations Framework Convention on Climate Change (UNFCCC).

Potential risks for biodiversity of poorly designed REDD+ efforts include (UNEP/CBD/WS-REDD/1/3):

- The conversion of natural forests to plantations and other land uses of low biodiversity value; and the introduction of growing of biofuel crops;
- The displacement of deforestation and forest degradation to areas of lower carbon value and high biodiversity value;
- Increased pressure on non-forest ecosystems with high biodiversity value; and
- Afforestation in areas of high biodiversity value

Specific risks of REDD+ for indigenous peoples and local communities include (UNEP/CBD/WS-REDD/1/3):

- Loss of traditional territories and restriction of land and natural resource rights;
- Lack of tangible livelihood benefits to indigenous peoples and local communities and lack of equitable benefit sharing.
- Exclusion from designing and implementation of policies and measures; and
- Loss of traditional ecological knowledge

These risks can be mitigated through the appropriate implementation and monitoring of the application of safeguards as outlined in UNFCCC COP decision 1/CP.16, including by ensuring that conversion of natural forests is avoided, and by ensuring full and effective participation of indigenous peoples and local communities based on the United Nations Declaration on the Rights of Indigenous Peoples. Steps must be taken to ensure that REDD+ follows a comprehensive approach to forest-based carbon storage by setting appropriate baselines and reference scenarios; and by monitoring biodiversity impacts of REDD-plus efforts, for example, in the context of reporting under CBD.

In conclusion, the REDD+ regime has to enhance the carbon and other ecosystem services, it should strengthen the efforts of biodiversity conservation, and help secure the livelihoods of the ecosystem dependent local communities in India. The proposed REDD+ regime provides an opportunity for sub-national actors, like States, to address the delicate issue of poverty in resource-rich regions such as forested and tribal dominated States. Such a regime also gives an opportunity for developing a much-needed integrated approach for implementation of developmental programs and enforcing biodiversity conservation at the local level. The state-level regime could assign a statutory role for facilitating the integrated approach to an identified agency like REDD+ Cell.

CHAPTER 3

PROCEEDINGS OF THE WORKSHOP ON PREPAREDNESS OF REDD+ PROJECT IN INDIA

TERI and MoEF conducted a workshop on "Preparedness of REDD+ Project in India" on 23 March 2012. It was attended by the delegates of State Forest Departments from various parts of India, NGOs, MoEF officials, and researchers.

REDD means reducing emissions from deforestation and forest degradation, and + means enhancing carbon through SFM, without sacrificing the ecosystem services, livelihood, and biodiversity. Thus, REDD+ is SFM through conserving forest and enhancing carbon stock. REDD+ primarily talks about reductions in emission levels and that nations or communities that are willing and able to reduce emission from deforestation should be financially compensated. REDD+ refers to a broad set of approaches and actions to reduce emissions from deforestation and forest degradation.

REDD+ although is a simple idea, but implementing it at the ground is much complex. Concerns such as social, environmental, and economic at the national, sub-national, and local levels are the key issues for critical examination. The idea of organizing this workshop was to spread awareness among forest officials from different states about the REDD+ and its preparedness in the country. The key issues of REDD+ in context of India are forest governance, baseline reference, methodologies for assessing carbon, biodiversity conservation, maintenance of ecosystem services and livelihood, and identification of carbon market for trading. The agenda for the workshop had been designed in such a way that all these critical issues could be discussed in details among the senior forest officials of various states, NGOs, and researchers. The outcome of this workshop will benefit the state government officials from various states in understanding the key issues of REDD+ in India and officials from the central government in preparing the REDD+ project and climate negotiation at the International level.

The major objectives of the workshop are:

- To apprise State Forest Department officials with respect to the concept of REDD+ and its preparedness within the country
- To seek views of the various state forest officials on various key elements of REDD+ such as forest governance, forest and livelihoods, biodiversity conservation, working plans and International architect on REDD+
- To understand and develop a methodology for baseline carbon assessment, leakages, and additionality

To achieve the above-mentioned objectives, the agenda of the workshop was designed to have themes on forest governance, forest management and working plans, forest and livelihoods, methodology for carbon assessment, and International architect on REDD+.

The workshop started with the introductory remarks of Dr Jagdish Kishwan, ADG (WL) and Mr AK Bansal, ADG (FC). Dr Kishwan

emphasized that REDD+ is an ecosystem services based approach of forest management to enhance carbon without sacrificing the biodiversity and livelihood of the people. He mentioned that five sectors namely power, industries, habitation, agriculture, and forestry have mitigation potential. REDD+ is an incentive for positive action and forests are central to holistic climate change mitigation option. The country has to meet its international and domestic commitments. Eight national Mission on Climate Change have been initiated, one of these being National Mission for Green India.

He impressed on the participants to deliberate on issues such as (i) whether there is a clear understanding of REDD+ in the country; (ii) whether we have necessary administrative and managerial capabilities and matching policy and legal frameworks in place in the country for SMF and conservation of biodiversity; and (iii) finally whether we have proper institutional frameworks for carrying forward REDD+. There is also a need to strengthen methodologies for national carbon accounting. He suggested that the first task before us is to fix reference level/ benchmark for forest carbon stock (FCS). The question before us is whether it should be historical or fixed reference level or a dynamic or a mix of both historical and dynamic by embedding development parameters. There are also issues about procedure. The role of State Forest Departments is very important and therefore they must have a clear understanding of their role and responsibilities, as well as in building of capacities of civil societies so that they can play active role in implementation of REDD+. Not only the carbon but also other ecosystem services from forests are also very important. Therefore, not only improving FCS but also enhancing the environmental and ecosystem services should be the aim of implementation strategy. Therefore, the focus should be on checking the drivers of deforestation and forests degradation by providing alternative clean energy to rural and forest-dependent communities. He clarified that the financial benefits of REDD+ will be passed on to communities.

Mr Bansal, ADGF, FC, informed that this is the first ever workshop to sensitize states on REDD+ issues. He highlighted the objectives of the workshop to seek views of state government officials and other stakeholders to finalize national strategy on REDD+ preparedness in India. He stressed for an important role for the State forest Department since, state governments are directly involved in implementing REDD+ projects in India. Thus, it is necessary that state forest officials have a proper understanding about the concept of REDD+. He mentioned that MoEF has initiated a USAID Project recently, which will also supplement and strengthen capacities of State Forest Departments and other stakeholders. Mr Bansal emphasized that implementation strategy for REDD+ should follow "simple and easy to do approach" with a focus on saving existing carbon and adding additional carbon stocks and acknowledged that foresters are already doing this in various afforestation and conservation schemes. The focus should be on enhancing forest resources to meet the demands, as not fulfilling demands for forest produce will lead to further degradation of forests. It will require multipronged strategies from wood substitution to better forest products processing supported by R&D and appropriate technologies. There is urgent need to standardise methods of reliable estimation of carbon including protocol for MRV.

He suggested that the JFM+ model needs to be evolved in order to take care of livelihood needs and rights of local communities. Readiness in REDD+ requires proper strategy and action for deriving benefits. He also highlighted Green India Mission as the recent major initiative of the MoEF towards climate change mitigation.

The proceedings of the workshop were covered under various themes.

REDD+ and Its Relevance to India

Mr Subhash Chandra, Deputy Inspector General of Forests (Forest Policy), MoEF, GoI, made a presentation on REDD+ and its relevance for India.

Mr Chandra introduced the topic of REDD+. He said, REDD+ means reducing emissions from deforestation and forest degradation, and '+' means enhancing carbon through sustainable management of forests, without sacrificing the ecosystem services, livelihood and biodiversity which are mandated in the NFP, 1988. The only additional element is trading of enhanced carbon.

He further went on introducing key drivers of deforestation and means to reduce direct dependence of communities on forest resources. He elaborated on India's approach to REDD+ and potential impacts of the REDD+ Program on tribal and local communities. He concluded by highlighting the national institutional mechanism for REDD+ and underlying methodological issues in Forest Carbon Stock (FCS) estimation. REDD+ is a window of opportunity for foresters as well as forest-dependent communities for getting benefits by ensuring sustainable management of forests. This can bring forestry into the mainstream of developmental agenda of the nation as enhanced ecosystem services together with greater forest resources will not only benefit livelihoods and supplement income of local communities but will have a positive impact on the national economy.

Forest Governance

Dr JV Sharma made a comprehensive presentation on forest governance in India in the context of REDD+ by delineating various aspects including the conceptual issues of governance and key stages of forest governance in India. Forest governance is a complex issue due to the fact that it involves diverse stakeholders with more diversified interests across the scales, i.e., global, national, and local. The global concerns for forests are centred on biodiversity conservation and carbon sequestration objectives. The national priorities are flow of ecosystem services, meeting the demand for forest products and conservation of biodiversity. At the local level, the concerns over forests revolve around the MFP for the livelihood of the forest-dependent communities and cultural aspects like scared groves. There have been several efforts towards integrating these diverse interests into forest governance through national polices and laws. Dr Sharma reiterated the need for revamping JFMCs as well as FDAs through appropriate legal backup and defining their roles and responsibilities in implementing the REDD+. This new institutions may be termed as JFM+. It is important to define the role of the state forest departments as well as the Gram Sabhas for REDD+ activities. He has discussed this in details in the context of three different governance regime in the country, i.e., FRA and PESA areas, Non-PESA and FRA areas, and north-eastern states.

Forest and Livelihood

Dr Rekha Pai, Chief Project Director, Watershed Management Directorate, Dehradun, made her presentation on "Forest and Livelihood issues in the context of REDD+". Topics related to importance of forests as a source of livelihood for the forest-dependent communities, climate change related challenges and their impact on local communities, and the increasing vulnerability of these people, etc., were focused on in her presentation. She stressed on the importance of focusing on sustainable livelihood, defining it to be resilient, unaffected by natural capital, and not based on external support. She concluded that community dependence on forest would continue, and hence efforts to reduce this dependence were required, which included replacing fuel wood by alternative energy sources (e.g., increasing use of pine briquettes, biogas, in Uttarakhand, etc.). She felt that the value chain concept should be internalized to ensure sustainable natural

resource management and remuneration for harvest, and create alternative job opportunities concentrating on niche and high value products, as seen in the success of agribusiness in the State of Uttarakhand.

After the presentation, there was an open discussion during which comments were made on a number of issues: (i) transparency and accountability; (ii) declining quality of forest staff; (iii) returns expected out of REDD+ for communities; (iv) empowering communities and implementiation of large-scale projects despite vacancies in the forest department; (v) REDD+ being money-centric; (vi) aspects important under the REDD+ national strategy for countries – benefit-sharing mechanism, policy; and (vii) the extent to which livelihood aspect can be addressed.

Methodology for Carbon Assessment

Dr Alok Saxena, Additional Director, IGNFA, Dehradun, ,ade a presentation on "Methodologies for Baseline Carbon Assessment, Leakages, and Additionality of Carbon". The key objectives of the present REDD+ study, as highlighted by Dr Saxena, were:

- To assess baseline carbon in the identified sites with reference to a baseline year
- To assess additionality (gains) in carbon stock in the sites because of SMF and other good practices.
- To assess leakage (loss) of carbon from the identified sites because of unsustainable practices
- To apply the methodology for monitoring success of REDD+ at the national level

He proposed a methodology of carbon assessment for a REDD+ project which entails deciding upon a baseline year (1990 or 1994), identifying small-size project sites using satellite data, deciding upon a sampling strategy (stratified, judgemental/random sampling), and inventory parameters.

This was followed by a presentation on "Methodological Issues: Scale, Baseline reference and Monitoring" by Mr Suresh Chauhan, Fellow, TERI. Mr Chauhan explained that there are three scales for the REDD+ project, i.e., national, sub–national, and hybrid (combination of both). He further explained the pros and cons of all the three approaches. He elaborated that India suggests a reference year of 1990, whereas other nations like Brazil and Latin American favour average of historical 10 years period. He further explained key issues in monitoring of REDD+ projects like for instance there are no uniform standards for defining various terms such as forests, deforestation, and degradation at a global level. Also, there is variation in the density classifications across the nations. There is lack of historical data availability in most of the developing and under developed nations. There is lack of technical skills such as field measurements, carbon calculations, interpretation of satellite imageries, etc., in most of the developing nations and finally the expenses that would need to be incurred for monitoring. Dr Rajesh Kumar, FSI, Dehradun, added further with his presentation on "Forest Carbon Accounting". He urged the need for a new definition of forests under REDD+ for better accounting of carbon under the mechanism, giving considerable importance to below-ground biomass and increasing the scope of REDD+, and following methodological guidance for REDD+ resulting from the COPs (Conference of Parties).

Forest Management and Working Plans

Dr R N Saxena, Additional Principal Chief Conservator of Forests, Madhya Pradesh, made a presentation on "Forest Management (SFM) and Working Plans". He showed evidences of climate-related changes in various parts of Madhya Pradesh forests through GIS maps, including insignificant regeneration of trees. He suggested

efforts made to address these issues should incorporate long-term climate change concerns to long-term forest policies, conserving forests and minimizing forest fragmentation, expanding protected areas, promoting mixed species forests to decrease vulnerability, etc. Among the action points suggested for adaptation and development of REDD+, some of the more crucial points included replacing the National Working Plan Code, 2004, with a new code; considering economic rotation v/s carbon rotation for forest management in vulnerable regions; and replacing forest crops with species more likely to adapt to climate change. Dr Saxena also highlighted some key issues involving development of the REDD+ market; need for security for REDD+ mechanism to work; legal instrument for trading REDD+ credits (on the lines of SEBI); the risk attached to loss of forest carbon post selling of REDD+ credits; etc.

This was followed by an open-house discussion during which the following issues were raised: (i) Clubbing SEBI with climate change as unacceptable and (ii) how to implement the REDD+ project. Dr Saxena addressed each question with conviction, replying that SEBI working principles was required for mobilization of resources. He was of the opinion that it would not be possible to generate huge funds without mobilizing market-related mechanisms. As for implementing REDD+, he believed that an agency would be required to take care of REDD+ securities.

Biodiversity Conservation and REDD+

The discussion on biodiversity conservation and REDD+ was started with the presentation by Dr Yogesh Gokhale. He emphasized the critical linkage between the carbon sequestration and biological diversity of a forest landscape. This linkage implies that both the objectives can be go hand in hand and hence REDD+ provides an opportunity to conserve the biodiversity of India's forests. Implementation of REDD+ in the country would also provide an opportunity to define the sustainable harvesting limits and evaluate ecosystem services. He discussed the concerns of the international community on biodiversity in the context of REDD+ at length and the need for appropriate safeguards to address these concerns. Dr Gokhale has reflected upon the policy and legal framework in India for enabling the safeguards of biodiversity conservation and identified the gap.

International REDD+ Architecture

The session began with a brief introduction by Dr JV Sharma on the history and evolution negotiations in forest-related International instruments. He mentioned that forests have been an issue of priority in international and national policy and a subject of much debate and discussion over the past 20 years. The 1992 United Nations Conference on Environment and Development (UNCED) saw the adoption of the "Forest Principles" as well as Chapter 11 of Agenda 21: Combating Deforestation. He further discussed that forest policy has progressed since UNCED and the key milestones achieved include consensus for international cooperation on the four Global Objectives on Forests.

This was followed by a presentation by Ms Ridhima Sud wherein she discussed in detail the REDD+ negotiations under the UNFCCC and synergies with negotiations on international forest policy. She further elaborated upon India's position on REDD+ in International negotiations, and how India stands to gain from a global agreement on REDD+. She concluded her presentation by emphasizing that REDD+ would not only contribute to emission reductions but also help in strengthen SFM at local and national levels. She further added that that REDD+ could be a "win-win" solution for communities to generate additional financial resources from trading of enhanced carbon while ensuring

continued delivery of the full range of goods and ecosystem services from maintenance and enhancement of carbon stocks.

Presentations by SFDs

Dr AK Raha, PCCF, West Bengal, made a presentation on forest and livelihood linkages with a case study of Sundarbans where the Forest Department has implemented a livelihood improvement programme for local communities. As a result, the communities have moved closer to the Forest Department and contributed in forest conservation, especially in rehabilitation of mangroves.

Presentation by ICFRE

Mr MP Singh, head Climate Change Division of ICFRE, made a presentation on programmes of ICFRE related to REDD+. He emphasized that we should learn from CDM projects where the procedure is quite complex and heavily dependent on experts and consultants. Therefore, REDD+ implementation mechanism should be simple as communities are important stakeholders and they should easily understand their role responsibilities and play an important role in MRV.

CHAPTER 4

POTENTIAL IMPACTS AND POLICY RESPONSE OPTIONS FOR REDD+ IN INDIA

The outcome of the objective of studying potential impacts and response options for REDD+ in India has been developed based on consultations, policy research, and the stakeholder workshop.

Developing Response Options

REDD+ and Its Relevance to India

There is need to build capacity of carbon assessment and project formulation under REDD+ at various levels, so that forest-dependent communities who are involved in the conservation of forests can be benefitted with finances generated from the trading of enhanced carbon.

- The state governments are requested to apprise forest officials down the line and JFMCs regarding the concept of REDD+. The MoEF should provide training to the forest officials and JFMCs on the concept of REDD+ as well as assessment of carbon and project formulation.
- There is an urgent need to have regular capacity-building workshops of stakeholders at national and regional levels on REDD+.
- A simple, easy, and systematic approach for implementation needs to be worked out for the application of REDD+ so that each stakeholder can easily understand his roles and responsibilities and thereby make an appropriate contribution.
- Developing REDD+ architecture and sound financing mechanism in the country with clear benefit-sharing arrangements.
- Focus on the biodiversity conservation, cultivation of medicinal plants and better management of MFPs will significantly strengthen REDD+ action.
- The role of other concerned ministries/ department/institutions and the private sector also needs to be worked out to supplement REDD+ implementation. There is a great scope of convergence of developmental programme in areas within forest and fringe forest areas from the point of view of rural development, tribal and social welfare, health and education, and power department for holistic development of forest-dependent communities.

Forest Governance

- The Gram Sabha will be a core centric body to constitute a committee for conservation, management and protection of forests with the benefit sharing from forests on the principle of sustainable harvest, as laid down in the management plan of the respective area within their jurisdiction.
- The Gram Sabha will constitute the JFMC or a committee for the conservation, protection, and management of forests in respective jurisdiction.
- The Forest Department will provide the technical guidance to the Gram Sabha, and monitor the implementation of the management plan.

- The implementation of forest legislations will be done by the Forest Department until authority is provided to the Gram Sabha.
- Since, states have diversity with respect to land tenure and social and cultural dependence on forests, state governments are requested to institutionalize Gram Sabha based forest governance.
- State governments need to evolve a Gram Sabha based forest governance model and bring appropriate legislative reforms or administrative orders to empower Gram Sabhas to initiate JFM.

Forest and Livelihood

- There is a need to quantify benefits derived by forest-dependent communities from forests.
- Forests, on their own, cannot sustain the load of unemployment of FDCs; hence, other sectors should be explored to divert the pressure.
- Employment for sustainable livelihood can be based on

o Forest resource and other natural resource only to the extent that does not exceed sustained yield; and

o non-natural resource based.

Methodology for Carbon Assessment

- Village Forests, Community Forest Resource, Forest Area assigned to JFM and areas of similar nature may be under taken as a unit for a implementing the project under REDD+
- The base line year may be taken 1990, depending upon availability of data.
- The carbon will be assessed by adding above-ground and below-ground carbon. Above as well as below-ground biomass will be calculated according to IPCC guideline.
- Since there is no mechanism to transfer the money generated from carbon trading to the community, it would be appropriate to have small areas as project area for REDD+.
- There is a need to organize capacity-building programmes at national, sub-national/state levels on methodologies of carbon assessment to ensure minimal transaction cost for the preparation of REDD+ projects.

Forest Management and Working Plans

- There is a need to address mechanisms for sustainable harvest and methods for regeneration of MFP including scientific and traditional knowledge in the working plans to avoid the extinction of species.
- Since there is loss of biodiversity in forest areas, it is important to inventorize the species and its regeneration status.
- A separate chapter in the working plans for monitoring of the plant species at the time of preparation of working plan is needed to know the status of the species in the area. Status of implementation of silvicultural practices should also be reflected in the working plans.
- Training programmes of forest officials is also required for familiarizing them with the concept of REDD+.

Biodiversity Conservation and REDD+

- There is need to maintain habitat for wildlife and wetlands for biodiversity conservation and ecosystem services. REDD+ could be an opportunity for the conservation of forest biodiversity.
- Biodiversity should not be sacrificed for carbon and there should be adequate safeguards for the implementation of REDD+.
- There is a need to make efforts to protect the species by sustainable harvest practices and traditional regeneration techniques and REDD+ is again an opportunity to do so.

- Traditional knowledge is the key for the sustainable management of forest biodiversity. It is to be documented and should be made part of the management plan.

International REDD+ Architecture

- Government of India should fund at least one pilot study on REDD+ in each state of the country.
- Although, international policies with respect to REDD+ are still in the negotiation stage, India has to prepare itself for implementation of REDD+ projects and make use of the funds available through carbon trading. Few voluntary mechanisms and FCPF are the windows available for carbon trading and preparedness for REDD+. India has not joined this facility yet. The MoEF should make effort to join the FCPF.
- Since there is no regulatory market operational for REDD+, Government of India should avail the funding from voluntary markets for preparedness activities including undertaking research and pilot projects.

Potential Impacts

The potential impacts due to such activities are multifold and need to be followed at the three levels, i.e., at international, national, and local scales. At every scale, there will be a variety of issues, which are expected to be addressed at the respective scales and have been summarised in the subsequent sections.

International Scale

At this scale, it is expected that there is perfect clarity in terms of the funding mechanisms as well as the role of carbon markets. Also, greater focus on the pilot-scale projects is required. Such inputs would strengthen the process of negotiations to provide clarity of issues of dynamic or static baseline year for carbon assessment, international mechanism for assessing the impacts of the projects, and institutionalizing the funding process associated with the carbon markets. Another expected impact is to highlight the inadequacy of financial resources for operating funds for sustainable management of forests, particularly in developing countries including India.

National Scale

At the national level, the development of relevant policy and institutional paradigm would be an important potential impact and it would be possible by generating a detailed review of existing mechanisms, along with an assessment of aligning the national and international structures for MRV. There could also be a need for developing a working relationship with the local-scale actors in the context of developing the REDD+ projects, assessing the policy improvisation at the meso-scale, which would help at the local level. The policy interventions are developed on forest governance, livelihood of forest-dependent communities, methodology for carbon assessment, biodiversity conservation, and institutional mechanism for REDD+ in India, which could be used by the state governments for the implementation of REDD+. The national government is mandated to organize state-level workshops to build their capacity and state governments are required to organize stakeholder workshops for district and village levels. State Forest Departments would be facilitating village-level institutions for the preparation of REDD+ projects. The national government would also designate an independent agency for the monitoring and verification of REDD+ projects in India. The Government of India may provide funds for the capacity building of stakeholders from the Green India Mission, and explore the funds for the readiness and preparedness for REDD+ from the FCPF. The policy briefs generated out of a national-level consultation are forest governance and implementation of REDD+ in India, conservation

of biodiversity and ecosystem services by the REDD+ project in India, livelihood of local communities and forest degradation in india, methodology for assessing carbon stock for REDD+ project in India as well as international REDD+ architecture and its relevance to India. These policy briefs have played a critical role in strengthening the policy and institutional framework for the implementation of REDD+ in India. The methodology has been devised for flow of funds to the community generated out of enhanced carbon stock. The policy brief on forest governance provides three model options for people-oriented forest governance. The policy brief on biodiversity conservation and ecosystem services emphasized that the balance has to be maintained between carbon sequestration and other ecosystem services. The policy brief on methodology for assessing carbon stock give direction for the small projects at JFMC level and reference baseline year 1990 or later. The policy brief on livelihood gives the linkages of forest degradation and livelihood if it is because of unsustainable harvest. It also emphasizes that forests alone cannot bear the sole burden of employment of more than 300 million people living in and around forest in the country. The five pilot sites are also giving the fragrance of five different forest ecosystems and dependence of people on forests differently.

Local Scale

At the local level, there would be expansion in the scope of forestry operations by developing policy integration and dovetailing of programmes in order to address the issues of silvicultural practices, livelihood of forest-dependent communities, and conservation of biodiversity.

Thus, at the three scales, there will be number of potential impacts expected and the present report is a step to contribute to the process.

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