Data Collection Survey on REDD+ for JICA Loan Projects in India

Final Report

September 2016

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

NIPPON KOEI CO., LTD.
JAPAN FOREST TECHNOLOGY ASSOCIATION

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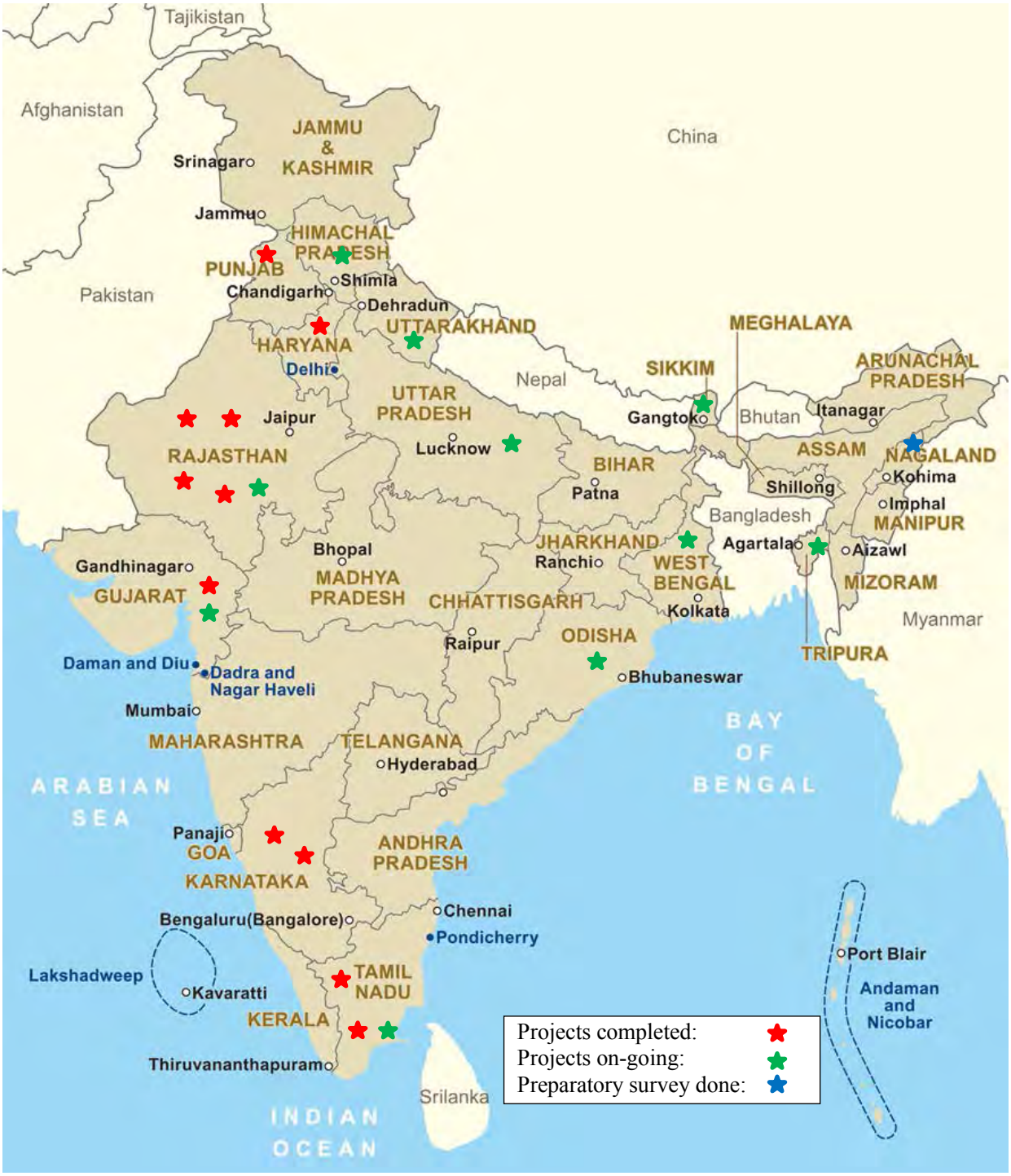
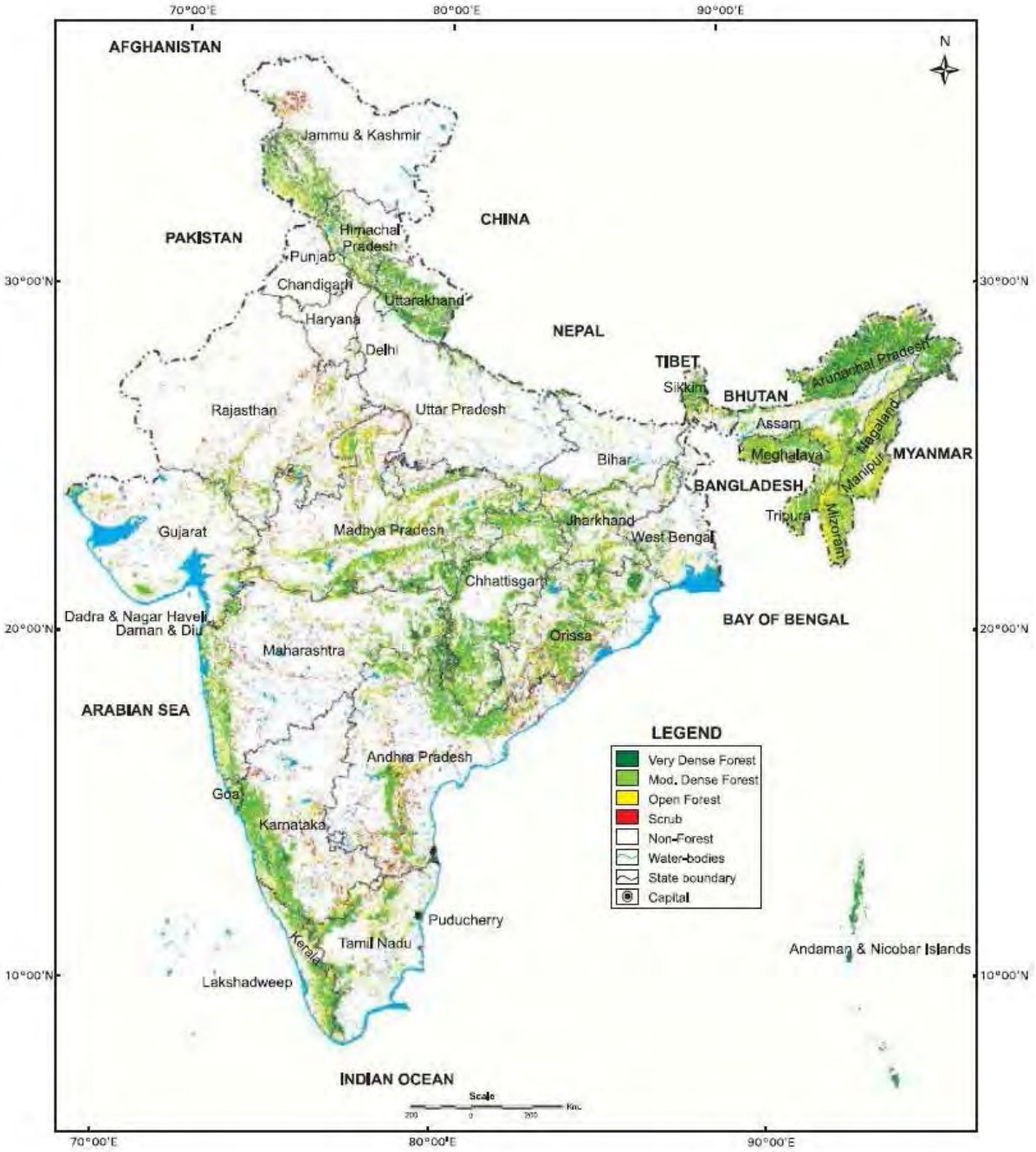
Currency
US$ 1.0 = ¥ 102.129; INR 1.0 = ¥ 1.5219 **(Monthly Exchange Rate of September 2016)** **Source: http://www.jica.go.jp/announce/manual/form/consul_g/ku57pq00000kzv7m-att/rate_201609.pdf**
US$ = United State Dollar
¥ = Japanese Yen
INR = Indian Rupee

Map 1: Status of JICA Forestry Sector Loan Projects and Preparatory Survey in India



Source: Japan International Cooperation Agency

Map 2: Forest Cover in India



Source: Forest Survey of India (2011). State of Forest 2011. P17.

Photographs

1st Field Survey (October 2015)

Meeting and data collection from UP Forest Dept – Lucknow (16th October 2015)

Discussion and data collection from UP Remote Sensing Application Centre (UPRSAC) – Lucknow (16th October 2015)

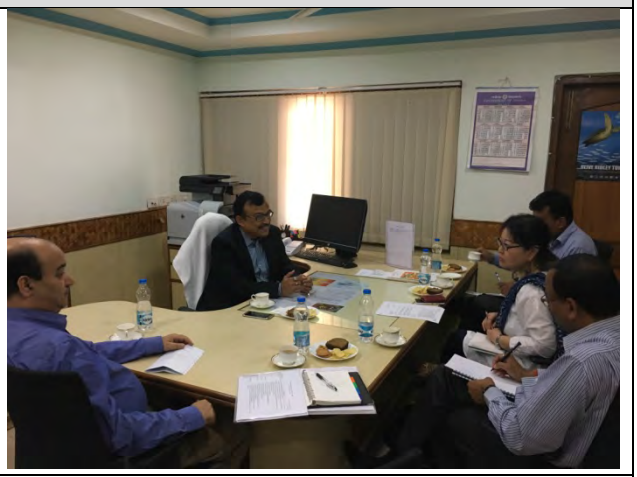
Visiting AR-CDM sites in Allahabad Forest Division – Meja Range of Allahabad (17th October, 2015)

Visiting AR-CDM sites in Allahabad Forest Division – Koraon Range of Allahabad (18th October, 2015)

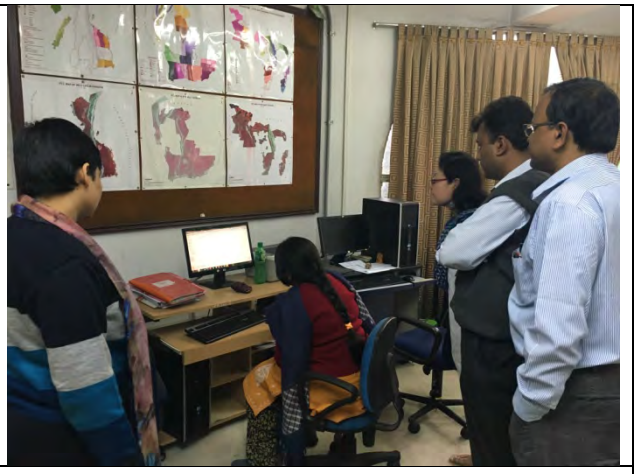
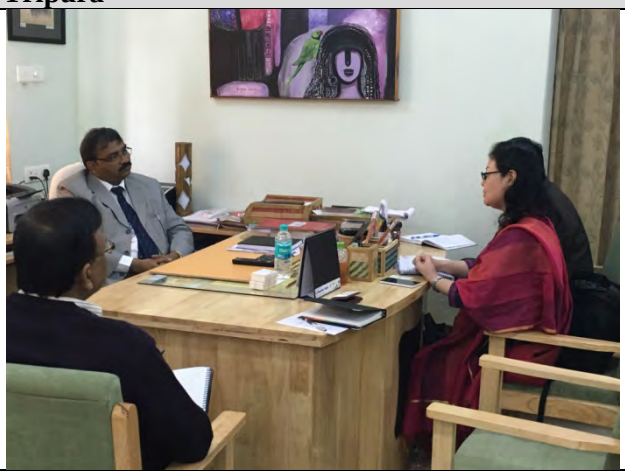
Wrap-up meeting with UPFD and UP-PFMPAP – Lucknow (19th October 2015)

Meetings and data collection from TERI – TERI office in Delhi (20th October 2015)

2nd Field Survey (January-March 2016)

Odisha	
	
Meeting and data collection from Odisha Forestry Sector Development Project (OFSDP) – Bhubaneshwar (18th Jan 2016)	Meeting and data collection from Odisha Forestry Sector Development Project (OFSDP) – Bhubaneshwar (19th Jan 2016)
	
Meeting and data collection from Working Plan Division – Bhubaneshwar (19th Jan 2016)	Meeting and data collection from Forest and Environment Department Government Of Odisha – Kolkata (20th Jan 2016)

West Bengal	
	
Meeting with Forest & Biodiversity Conservation Project/ PCCF & HoFF, WB – Kolkata (22nd Jan 2016)	Visiting Plantation sites of JICA project in West Bengal (23th Jan 2016)

	
Visiting Village forest site in West Bengal (23th Jan 2016)	Meeting and data collection from Department of Environment/ GIS －Kolkata (25th Jan 2016)
Tripura	
	
Meeting and data collection from Tripura JICA Project/ Government of Tripura -Agaltara (27th Jan 2016)	Visiting plantation area of TFIPAP– Agaltara (27th Jan 2016)
	
Visiting Tripura JICA Project/ Niharnagar JFMC (28th Jan 2016)	Visiting Tripura JICA Project/ Niharnagar JFMC (28th Jan 2016)

Sikkim	
	
Meeting and data collection from Sikkim Biodiversity Conservation & Forest Management Project/ Working Plan－Gangtok (1st Feb 2016)	Visiting Plant Conservatory of JICA project– Gangtok (2nd Feb 2016)
	
Visiting Plant Conservatory of JICA project – Gangtok (2nd Feb 2016)	Visiting Project site of Forest Plus in Sikkim (3rd Feb 2016)

Karnataka	
	
Meeting and data collection －Bengaluru (22nd Feb 2016)	Meeting and data collection from Forest Plus－Shimoga (23rd Feb 2016)

Himachal Pradesh	
	
Discussion with SHGs and Swan Women Federation members supported by Swan Integrated Watershed Management Project, Himachal Pradesh (13 February 2016)	Visit to village forest in Nakki supported by Swan River Integrated Watershed Management Project, Una District, Himachal Pradesh (13 February 2016)

Consultative Meeting on 18-19th Feb in Delhi	
	
Consultative Meeting – Delhi (19th Feb 2016)	Consultative Meeting – Delhi (19th Feb 2016)

3rd Field Survey (July – August 2016)

Odisha	
	
Discussion with directors and staff of OFSDP-I （27th July 2016）	VSS office constructed under OFSDP-I （Keonjhar Forest Division、23rd July 2016）
	
Transparency Board in a VSS office for sharing information on accounting and reforestation activities with the members (Keonjhar Forest Division、23rd July 2016)	Cattle grazing near VSS forest. Grazing is one of the drivers for forest degradation (Keonjhar Forest Division、23rd July 2016)
	
Mining development is one of the main drivers of deforestation in Odisha. Forest clearance and reforestation in mining sites have been done according to the plans approved by state government. （Keonjhar Forest Division、28th July 2016）	

Executive Summary

1. Introduction

Deforestation and forest degradation in developing countries are the major causes of CO_2 emissions after fossil fuels usage. They contribute to about 20% of global anthropogenic CO_2 emissions. In light of this, Reducing Emissions from Deforestation and Forest Degradation, the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) have been discussed under United Nations Framework Convention on Climate Change (UNFCCC) as an international framework and mechanism. The concept of REDD+ provides a way for the developing countries to obtain funding or credits by reducing emissions from deforestation and forest degradation as well as maintaining or enhancing carbon stock through sustainable forest management.

Japan International Cooperation Agency (JICA) has been actively assisting developing countries in securing and maintaining the balance between environment and development, including sustainable forest management, improvement of local communities' livelihoods, and biodiversity conservation. Recent JICA's assistances in forestry sector directly cover REDD+ related activities such as development of forest monitoring system, studies on carbon dynamics, development of REDD+ related documents. Especially, JICA's assistance in forestry sector in India has emphasized participatory forest management towards sustainable forest management and livelihoods improvement of the forest dependent communities with robust monitoring system. REDD+ is a way to further compliment the JICA's forestry sector interventions. Introducing REDD+ in the on-going and future projects in India has relevance.

With this background, JICA dispatched a survey team to undertake a preliminary survey to assess the potential for introducing REDD+ with on-going JICA assisted forestry sector projects in India. The survey work commenced in October 2015 and was completed by September 2016. It has the following objectives.

1) Gather information on a) REDD+ readiness at the central and state levels, b) status of the donor interventions, and c) status of forests
2) Assess the REDD+ potential and necessary interventions/needs for cooperation to fulfil REDD+ requirements
3) Make recommendations for the technical cooperation in REDD+ with on-going JICA loan assisted projects

The survey areas included Delhi, Dehradun, and eight survey states where the JICA loan assisted projects are being or have been implemented: namely Uttar Pradesh, Odisha, West Bengal, Tripura, Sikkim, Uttarakhand, Himachal Pradesh, and Karnataka.

The survey is structured around the requirements to be fulfilled in order to be considered as REDD+ projects. The status of the following are assessed at the central, state and JICA assisted loan project levels: 1) REDD+ policy and strategy/ REDD+ action plan; 2) FREL/ FEL; 3) National Forest Monitoring System; 4) safeguards information system; and 5) MRV system.

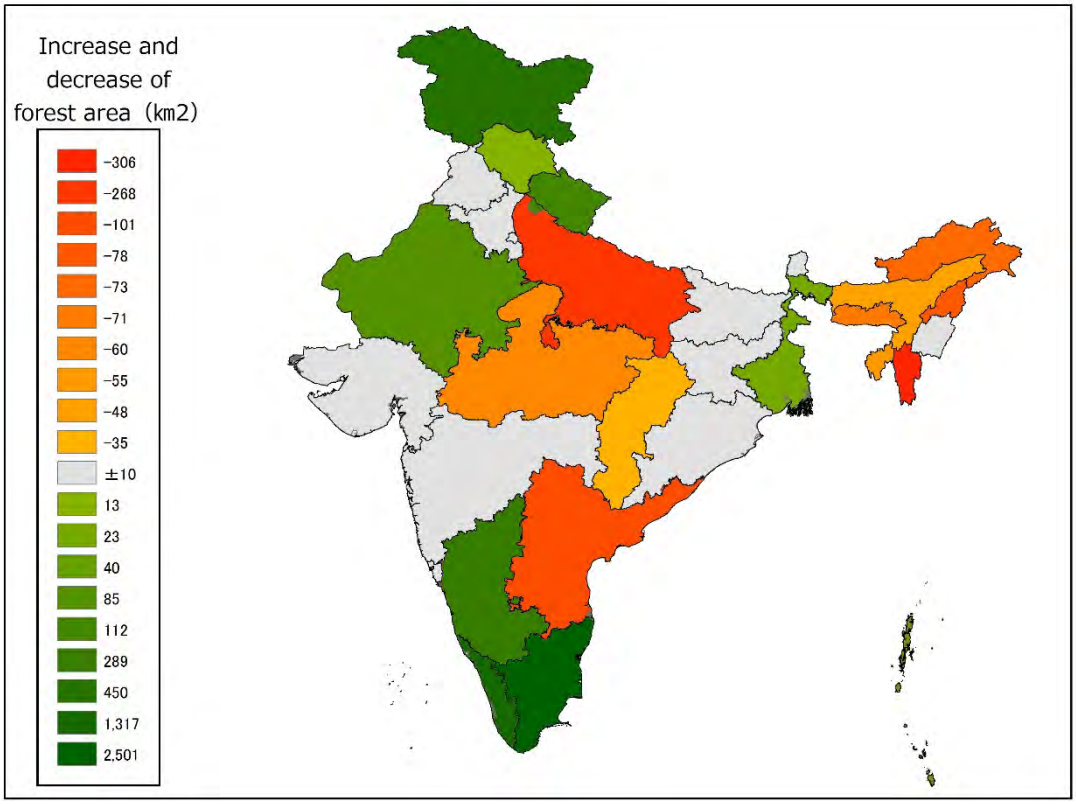
2. Status Forests in India

The total area of India is 3.29 million km^2 which is comprised of 14 physiographic types including eastern/ western Himalaya, north eastern hills and plains, central highland, and Eastern/ Western Ghats. India is one of the 17 most megadiverse countries of the world. In total, 16 major forest types are found in the country. The forest area having more than 10% of the canopy density covers 701,673 km^2 or 21.3% of the total area of India. Within the forest land, 44.9% is categorized as moderately dense forest and 42.8% is open forest having the forest density between 10- 40%.

Between 2013 and 2015, assessments reported in the India State of Forest Report 2015 observed some changes in the forest areas. Very dense forest area had slightly increased, while the moderately dense forest area had decreased by approximately 1,999 km^2 and the open forest area increased by approximately 3,371 km^2. This may be related to the deterioration of the quality of the forest.

The comparison by state of forest areas between 2013 and 2015 assessments indicate the decrease in the forest cover in Mizoram (-306 km^2), Uttarakhand (-268 km^2), and Telangana (-168 km^2). Arunachal Pradesh, Meghalaya, Nagaland, Tripura and Madhya Pradesh indicated a decrease in forest cover ranging between 55 and 73 km^2. In the case of Uttarakhand, Telangana, and Madhya Pradesh, the forest cover fluctuates due to the rotational/clear felling. Other drivers of forest degradation include shifting cultivation, grazing, and unsustainable harvesting of fodder/ fuelwood/ NTFPs, unlawful settlement, forest clearing for the development activities such as mining. Especially, grazing and harvesting of fuel woods have significant negative impacts on forests.

The survey team has undertaken the assessment of the gain and loss in the forests in India using FSI data and Hansen maps. The analysis undertaken using the FSI data shows intensive loss in the forest areas in Uttar Pradesh, Andhra Pradesh and Mizoram whereas the significant gain has been observed in Tamil Nadu, Kerala, Karnataka, Jammu & Kashmir, Rajasthan and Uttarakhand.

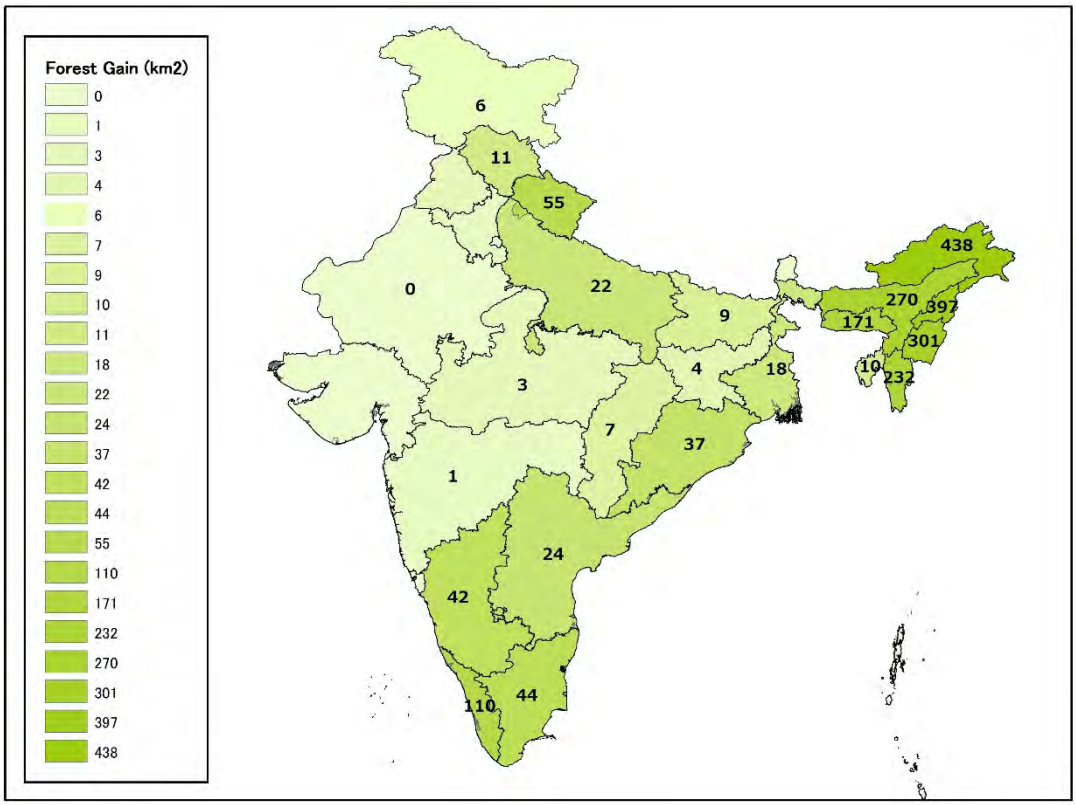


Source: State of Forest Report 2013, 2015; Administrative boundaries are based on the map provided by JICA.

Figure S-1 Gain and Loss of Forest Areas in each state between 2013 and 2015

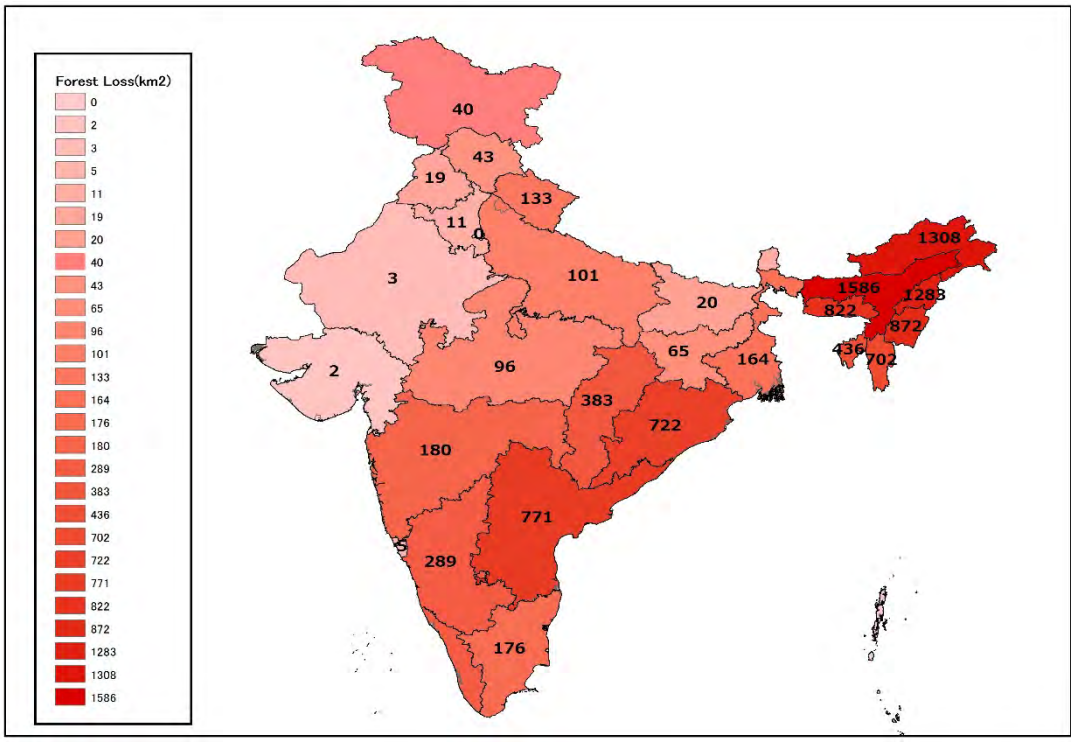
The results of the analysis based on the Hansen maps[1] also shows similar results.

[1] Hansen, M. C., P. V. Potapov, R. Moore, M. Hancher, S. A. Turubanova, A. Tyukavina, D. Thau, S. V. Stehman, S. J. Goetz, T. R. Loveland, A. Kommareddy, A. Egorov, L. Chini, C. O. Justice, and J. R. G. Townshend. 2013. "High-Resolution Global Maps of 21st-Century Forest Cover Change." Science 342 (15 November): 850–53. Data available on-line from: http://earthenginepartners.appspot.com/science-2013-global-forest.



Source: Hansen et al., Science 2013; Administrative boundaries are based on the map provided by JICA.

Figure S-2 Gain of forest area in each state from 2000 to 2014 by Hansen map.



Source: Hansen et al., Science *2013; Administrative boundaries are based on the map provided by JICA.*

Figure S-3 Loss of forest area in each state from 2000 to 2012 by Hansen map.

Figure S-3 shows that the high intensity of forest loss is mostly seen in the Eastern states; this is also indicated in the Figure S-1. However, the states where the forest cover is on the increase in Figure S-2

are different from those shown in Figure S-1[2]. Hansen Map is based on the calculation of decrease and increase in forest cover separately whereas FSI arrives at the forest cover changes as a composite of increase and decrease.

3. Assessment of REDD+ potential based on the Forest Condition

An attempt was made to assess REDD+ potential in the survey states using the changes in the density class wise forest areas. The assessment criteria are given in the table below.

Table S-1 Indicators in assessing REDD+ Potential by the Forest Condition

Forest Density Class	Indicators	Description
Dense forest	States where forest areas has decreased comparing 2007 with 2015.	High reduction of the dense forest area over a period of time indicates the degradation of the forest which requires intervention and thus, high potential for REDD+.
Moderately dense forest	States where forest areas has decreased comparing 2007 with 2015.	High reduction of the moderately dense forest areas suggests potential for enhancement of carbon stock for REDD+.
Open forest	States where forest area has increased comparing 2007 with 2015.	High increase in open forest area indicates the possibility for the vegetation recovery under the natural environment, which suggests effectively implementation of REDD+ interventions.

Source: JICA Survey Team (2016)

The changes in the forest areas under three forest density classes between 2007 and 2015 are given in the Table S-2. Where the cells are shaded in the table indicate the higher potential for REDD+ interventions for each density class according to the indicators shown in Table S-1.

Table S-2 Changes in the Forest Area between 2007 and 2015 by Forest Density Class (Unit: km^2)

States	Dense	Moderately dense	Open
Andhra Pradesh	68	1,048	-203
Arunachal Pradesh	-54	-255	204
Assam	-20	-290	241
Bihar	17	128	339
Chhattisgarh	-10	-192	-82
Delhi	-0	7	5
Goa	31	-44	86
Gujarat	0	-29	69
Haryana	0	-11	1
Himachal Pradesh	0	-2	30
Jammu & Kashmir	-237	-162	701
Jharkhand	-2	-236	822
Karnataka	4	-118	345
Kerala	80	-109	1,944
Madhya Pradesh	-18	-105	-115
Maharashtra	-27	-87	92
Manipur	26	451	-763
Meghalaya	39	83	-226
Mizoram	4	-393	-103
Nagaland	22	-202	-318
Odisha	-50	76	1,473
Punjab	0	2	105
Rajasthan	4	-24	155
Sikkim	0	-1	1
Tamil Nadu	67	253	2,687
Tripura	2	-161	-103

[2] This discrepancy between the results of analysis based on the FSI data and Hansen Maps might have partly derived from the limited capacity of remote sensing technique to capture the status of vegetation recovery, which has been reflected in the remote sensing data based Hansen Map. Furthermore, the data processing method might have also affected the results of analysis.

States	Dense	Moderately dense	Open
Uttar Pradesh	569	-503	54
Uttarakhand	-8	-563	316
West Bengal	-39	-472	4,345
Andaman & Nicobar	1,924	-1,720	-115
Chandigarh	0	4	1
Dadra & Nagar Haveli	0	-34	29
Daman & Diu	1	5	7
Lakshadweep	0	1	-0
Puducherry	0	17	-5

Source: JICA Survey Team (2016) based on State of Forest Reports 2007 and 2015 (FSI)

From the above results of analysis based on the changes in forest area, West Bengal and Orissa states among the survey states can be identified as high potential states of REDD. However, other relevant factors such as drivers of deforestation and forest degradation and land tenure should also be taken into consideration in addition to the results shown in this section, when finalising the assessment of the REDD+ potential.

4. Status of REDD+ Readiness at the Central Level

At the central level, National REDD+ strategy and policy has been drafted in 2014 though yet to be approved. Thus, the state forest departments have not prepared state level REDD+ action plan. FSI is also in the process of developing FREL and conducts biennial NFI (National Forest Inventory) which can also be considered as a part of MRV required for REDD+. Safeguards information system has not been established in India; however, relevant policies and laws are implemented, under which progress monitoring is undertaken at the central level.

Table S-3 Status of REDD+ Readiness at the Central Level

REDD+ Requirements/ Donor Intervention	Findings
National Strategy/ Action Plan	➢ National REDD Strategy and Policy (Zero Draft) prepared in 2014. The approval is awaited. ➢ Reference document for REDD+ in India has been prepared. ➢ REDD+ cell in the process of formulation under the Climate Change Division at MoEF&CC.
(Donor Intervention)	GIZ (developing NAMA strategy) TERI (Research/ Policy recommendation)
FREL/FRL	➢ FSI is in the process of establishing FREL.
(Donor Intervention)	USAID
National Forest Monitoring System	➢ FSI conduct NFI and publishes data on a biennial basis.
(Donor Intervention)	USAID
Safeguards Information System	➢ Relevant legal framework (i.e. FRA, PESA, etc) is already in place. ➢ Risk of reversals/ displacements are monitored through the National Forest Monitoring system. ➢ However, the safeguards information system is not yet established in a systematic manner with a defined indicators and data flow, and thus, the data is not yet systematically synthesised.
(Donor Intervention)	No evident intervention was identified.
MRV	➢ NFI is undertaken by FSI on a biannual basis.
(Donor Intervention)	USAID

Source: JICA Survey Team (2016)

5. Assistance on REDD+ by Donors and Other Institutions

USAID, GIZ and TERI are the main actors in REDD+ readiness interventions in India. The lessons learned from case studies suggested that there is a need to build capacity of the local stakeholders to make further progress in REDD+ along with the establishment and deployment of robust MRV system.

Donor	Projects
USAID	➢ **Forest PLUS** is implemented in Karnataka, Himachal Pradesh, Sikkim and Madhya Pradesh. Provides technical cooperation in developing tools, methodologies and techniques to enhance REDD+ readiness in these states. ➢ **Innovations for Forest Resources Management (InFoRM)** aims at tackling climate change mitigation and adaptation related challenges (clean energy and sustainable landscapes). Management system of the forest resources and livelihood improvements are the main component. ➢ **Partnerships for Enhanced Engagement in Research (PEER) Science** provides a grant to the researchers especially in forestry sector in India.
GIZ	GIZ provides policy advice to the MoEF&CC on REDD+ mechanism. ➢ Development of VCS REDD+ Methodology ➢ Forestry NAMA Feasibility Study ➢ REDD+ Himalayas (with ICIMOD) ➢ Incentives for Sustainable Management of Biodiversity and Ecosystem Services ➢ The Economics of Ecosystems and Biodiversity India initiative.
Institutions/ Organizations in India	➢ **TERI:** Provides policy advises and implements pilot projects on REDD+ ➢ **ICFRE/ Uttarakhand Forest Department:** Implementing REDD+ pilot project in Nainital ➢ **ICIMOD/ ICFRE:** Capacity Building in N.E. India under Trans-boundary REDD+ programme

Source: JICA Survey Team (2016)

6. Status of REDD+ Readiness in the Survey States and JICA Loan Assisted Projects

JICA Survey Team gave the following two criteria particular emphasis when selecting 8 states to visit.

a) Remaining implementation period of the JICA loan assisted projects (on-going or pipelined) in the state should be more than 3 years when JICA technical cooperation would commence (2017 onwards); and

b) Capacity of State Forest Department has already been developed to some extent through on-going assistance on REDD+ by other donors and institutions.

The list of eight states selected for Field Survey is given below.

Table S-4 States selected for Field Survey

Names of the States selected for the Field Survey	
➢ Uttar Pradesh	➢ Tripura
➢ Uttarakhand	➢ Odisha
➢ West Bengal	➢ Himachal Pradesh
➢ Sikkim	➢ Karnataka

When assessing the status of the REDD+ readiness in each survey state, the requirements of REDD+ as adopted for the assessment of the central level were used; these include: status of state level REDD+ policy/ action plan; FREL/ FRL; Forest Monitoring/ MRV and safeguards information system. The summary of the assessment is given below.

(1) Forest Reference Emission Level (FREL) and Forest Reference Level (FRL)

In Himachal Pradesh, Sikkim, and Karnataka where Forest PLUS is giving support for REDD+ readiness, FREL and FRL are under construction. In other states, state level FREL/ FRL is yet to be

constructed. In the case of Uttarakhand, the REDD+ pilot project in Nainital has established FREL/ FRL for the pilot project area.

(2) Forest Monitoring/ MRV

State level forest monitoring is undertaken based on the data of FSI and the data collected by the state departments by themselves. At the state level, monitoring guidelines are developed. However, the monitoring is largely done for the plantation operation which is implemented under the central and state funded schemes. Such monitoring data is also uploaded on the central government website and FSI is the nodal agency to do the monitoring and data quality checking. As per FSI as well as SFDs, initially lots of inconsistencies and data quality issues were noticed in the data being uploaded by the SFDs. Although now there is some improvement in the situation, but still lots of gaps are noticed in quality, and completeness of data as well as timely uploading of the information. Most of the SFDs rely on satellite based 'India State of Forest Report' and data produced by FSI although some states conduct forest cover mapping using high resolution satellite images as well. Some states informed that as of now there is no system in place for sharing of such data and to facilitate the synergy between FSI and state forest department in terms of field data collection, satellite data interpretation and ground verification.

In almost all JICA projects there is an inbuilt mechanism of community level monitoring. In most of the projects NGOs were also involved to assist in community mobilization and micro planning, etc. and assisted in establishing community level monitoring mechanism. In some cases there was a provision of having a village Animator, who was trained in record keeping at JFMC level as part of institution building and transparent monitoring mechanism. Also, there was a concept of third party monitoring as part of transparent mechanism of monitoring for survival assessment of plantations and quality assessment and usefulness of the assets created.

A summary of the status of the forest monitoring is given in the table below. Further details can be found in **Attachments 5.1 – 5.8.**

Table S-5 Status of Forest Monitoring in the Survey States and JICA Loan Assisted Projects

State	State Level	JICA Project
Uttar Pradesh	Done by the State Forest Department. Donor assistance: None	Done by the project. Donor assistance: JICA
Odisha	Done by the State Forest Department. Donor assistance: None	Done by the project. (Satellite based monitoring) Donor assistance:JICA
West Bengal	Done by the State Forest Department. Donor assistance: None	Done by the project (GIS/ MIS is being established.) Donor assistance: JICA
Tripura	Done by the State Forest Department. Donor assistance: None	Done by the project. (Satellite based monitoring) Donor assistance: JICA
Sikkim	Done by the State Forest Department. Donor assistance: None	Done by the project. (Being Established) Donor assistance: JICA
Uttarakhand	Done by the State Forest Department. Donor assistance: None	Done by the project (GIS/ MIS is being established.) Donor assistance: JICA
Himachal Pradesh	Done by the State Forest Department. Donor assistance: None	Done by the project. Donor assistance: JICA
Karnataka	Done by the State Forest Department. Donor assistance: None	Done by the project. Donor assistance: JICA

Source: JICA Survey Team (2016)

The status of MRV at the state forest departments and JICA loan assisted projects are summarised in the table below. In Sikkim, Himachal Pradesh and Karnataka, MRV system is being developed by Forest PLUS. In other states, MRV is considered to be partly established as part of the existing process

of planning and monitoring in the purview of working plan/ management plan operation. Further details can be found in **Attachments 5.1 – 5.8**.

Table S-6 Status of MRV at the State and JICA Loan Assisted Projects

State	State Level	JICA Project
Uttar Pradesh	➢ Partly established as part of the preparation of working plan and data collection for the same.	➢ AR-CDM projects are established in 10 forest divisions where the MRV system is placed, however, its operationalization is yet to be seen.
	Donor assistance: None	Donor assistance: JICA
Odisha	➢ Partly established as part of the preparation of working plan and data collection for the same.	None
	Donor assistance: None	Donor assistance: None
West Bengal	➢ Partly established as part of the preparation of working plan and data collection for the same. ➢ In 24 Parganas South District, SFD and IIRS conducted carbon assessment including sub-soil carbon.	None
	Donor assistance: None	Donor assistance: None
Tripura	➢ Partly established as part of the preparation of working plan and data collection for the same.	None
	Donor assistance: None	Donor assistance: None
Sikkim	➢ Partly established as part of the preparation of working plan and data collection for the same.	None
	➢ Presently being established under Forest PLUS	Donor assistance: None
Uttarakhand	➢ Partly established as part of the preparation of working plan and data collection for the same. ➢ MRV system would be developed under REDD+ Pilot	None
	Assisted by IIRS	Donor assistance: None
Himachal Pradesh	➢ Partly established as part of the preparation of working plan and data collection for the same.	None
	➢ Used in World Bank Funded MHWDP3 CDM project ➢ Would be developed under Forest PLUS (USAID) project	Donor assistance: None
Karnataka	➢ Partly established as part of the preparation of working plan and data collection for the same.	None
	➢ Is being developed under Forest PLUS (USAID) project None	Donor assistance: None

Source: JICA Survey Team (2016)

(3) Safeguards Information System (SIS)

In all states existing policy and legal framework are being reinforced and thus, the safeguards requirements are addressed. Establishment of SIS would facilitate efficient and effective data collection and reporting and further strengthening the safeguards for REDD+. The summary of the status in the survey states as per the 7 principles of safeguards is given below.

Table S-7 Overall Status of Safeguards and Safeguards Information System in the Survey States

Principles	Findings	Gaps
Consistency/ relevancy to the national and international policy/ program/ agreements	◆ In all survey states, REDD+ Strategy/ Policy has not been developed. ◆ In all survey states, carbon related issues are addressed under the forestry sector of State Action Plan on Climate Change.	◆ For the states to develop REDD+ strategy/ Policy, guidance and directions from the Central Government instruction are prerequisite. However, they are not yet

[3] Mid Himalayan Watershed Development Project

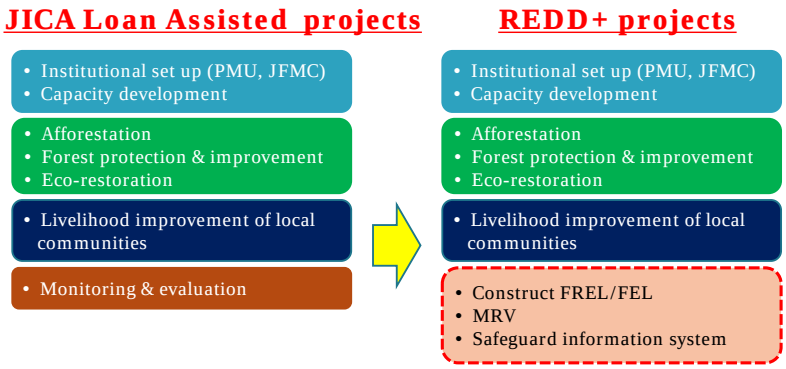
Principles	Findings	Gaps
		given to the state governments.
Effective national forest governance structure	◆ Forest Department has a fully functional institutional set up and from the state level to the field level. ◆ In all states, relevant legal framework is in place to provide for community based sustainable forest management.	◆ Nil
Respect for the knowledge and rights of indigenous peoples and local communities	◆ Progress of FRA implementation varies from state to state. In the case of Sikkim, little progress has been observed while in Odisha 3.49 lakh individual titles for 5.50 lakh acres and 5,004 community rights titles for 1.79 lakh acres have been distributed. ◆ PESA is implemented in Odisha and Himachal Pradesh. ◆ Part of Tripura is under Sixth Schedule. Tripura Tribal Area Autonomous District Council has been established the welfare of the tribal people. ◆ In Odisha, traditionally community has played an important role in forest management. Some of which is now linked with JFM. ◆ In Himachal Pradesh, Uttarakhand and Sikkim, rights and entitlements have been well recorded and recognized under different state laws and rules.	◆ In case of REDD+ project local knowledge and rights are to be well documented and monitoring. ◆ Data from other departments to be obtained and compiled.
Full and effective participation of the relevant stakeholders	◆ REDD+ cell has been constituted in Sikkim. In UP, Uttarakhand, Himachal Pradesh and Karnataka, nodal officers were appointed. ◆ In all JICA projects primacy is given on participatory planning and implementation. ◆ Multi-stakeholder committees are established to facilitate convergence of efforts and funds available with other Departments and Agencies.	◆ A multi-stakeholders' platform can be established at the state level.
Conservation of natural forests and biodiversity	◆ All the relevant national policy, laws and regulations are reinforced. ◆ Working plans/ management plans are prepared and implemented. ◆ Monitoring of the afforestation works is done by the state forest department. FSI monitors through its own institutional structure and the report is published on a biannual basis. ◆ Central and state funded schemes are implemented for the purpose. ◆ JFMCs/ EDCs undertake activities that contribute to the conservation of natural forest and biodiversity.	◆ Record keeping and reporting skills of the community level institutions need to be strengthened. ◆ Community Based monitoring tools can be developed for biodiversity conservation and other monitoring items required.
Actions to address risks of reversals	◆ No concrete actions are planned and implemented as REDD+ interventions. ◆ However, in all states, the forest monitoring is undertaken which can provide the necessary information to check the risks of reversals.	◆ At the State or Project level detailed actions including monitoring plans are to be developed. ◆ Detailed actions including monitoring plan need to be included in the Management Plans/ Micro Plans of the JFMCs/ EDCs/ VPs etc.
Actions to reduce displacement of emissions	◆ No concrete actions are planned and implemented as REDD+ interventions. ◆ However, in all states, the forest monitoring system will provide the necessary information to alert the displacement of emissions.	

Principles	Findings	Gaps
Safeguards Information System	◆ No plan for establishing a Safeguards Information System was discussed as yet. ◆ In all JICA projects, GIS/ MIS cells have been established. Especially Odisha has developed a mobile data uploading system that can facilitate the data collection process. Tripura also establish an efficient and effective monitoring system that allows timely reporting and guidance to the field.	◆ An overall architecture of Safeguards Information System is not yet prepared. ◆ Indicators are not yet defined and thus, the means of verification/ data sources are not identified yet. ◆ Data availability, reliability of data, data management system may require a review to constitute a Safeguards Information System.

Source: JICA Survey Team (2016)

7. Recommendations for JICA Technical Cooperation in REDD+

JICA Loan Assisted Projects are mainly comprised of capacity development, afforestation/ eco restoration, livelihood improvement of the local communities and monitoring and evaluation as in Figure S-4. All the projects are designed to have sufficient GIS/ MIS system that can be devised to provide for MRV required for REDD+. Especially, Odisha and Tripura have developed a GIS/ MIS system which provides an effective and efficient monitoring. Furthermore, the project components are already in line with the aim of REDD+ to achieve sustainable forest management and sustainable livelihoods of the forest dependent communities and fulfils most of the REDD+ requirements. Thus, the Technical Cooperation at the state level could proceed while waiting for approval of the REDD+ Action Plan at the central level and can be planned for certain areas to reinforce the project interventions/ components. Those include the developing FREL/ FEL, and further aligning existing GIS/ MIS system to MRV and safeguards requirement. In this way, the efforts made by the Technical Cooperation could complement the efforts made by JICA projects and contributes to enhance their sustainability.



Source: JICA Survey Team (2016)

Figure S-4 Differences and Similarities between JICA Loan Assisted Projects and REDD+ Projects

Based on this overall framework of technical cooperation, suggested areas for technical cooperation projects are given below.

Table S-8 Recommended areas for JICA Technical Cooperation at Central and State Levels

Central Level	State Level
➢ Develop guidelines for the states to prepare their own REDD+ Action Plan ➢ Develop FRL and suggest options including guidelines and manuals ➢ Develop and introduce QA/ QC process in processing forestry data ➢ Promote improved coordination in data exchange between central and state level	➢ Develop state level FREL/ FRL ➢ Develop Regional Emission Factors for Improvement of FREL/ FRL ➢ Develop REDD+ compliant state forest information system ➢ Develop and deploy methods and tools for REDD+ MRV ➢ Enhance QA/ QC mechanisms ➢ Design and operationalize safeguards information system ➢ Conduct capacity enhancement activities associated in the above areas

8. Results of Third Field Survey

Based on the discussion with MoEF&CC during the second field survey, it was deemed relevant that, under the JICA technical cooperation scheme, support for sub-national level REDD+ Readiness to the selected states and sharing knowledge at the national level would be appropriate.

On the other hand, Odisha implemented the Odisha Forestry Sector Development Project (OFSDP-I) between 2005 and 2015 and its phase II (OFSDP-II) proposal was approved by the Central Government of India and listed in the rolling plan. Accordingly, JICA has been implementing the supplemental survey for OFSDIP-II since July 2016 for reviewing the project proposal.

JICA has also been considering how to synergise the REDD+ technical cooperation and loan project. Thus, further data collection in Odisha and discussion with the Odisha Forest Department (OFD) for the need for REDD+ technical cooperation and its conceptualisation were considered necessary. In this context, JICA decided to conduct the third field survey.

The third field survey was conducted between 25th July and 6th August 2016. During the survey, the survey team discussed the contents of the technical cooperation project with OFD.

A consensus was established with OFD on the needs of the project as follows: 1) a need to out-scale REDD+ to other states for achieving sustainable forest management, and 2) sharing of information and advancing understanding of REDD+ at the central government. Accordingly, the project purpose has been set and project outputs including networking were defined.

Table S-10: Draft Outline of the Technical Cooperation

Project Title:	Project for Development of REDD+ Implementation Mechanism for Sustainable Forest Management in Odisha, India.
Duration:	5 years
Project site / Implementing Agency	Odisha/ OFD
Overall Goal:	Odisha State Forest Department becomes a technical knowledge hub of sustainable management of forest including REDD+.
Project Purpose:	The Sustainable Forest Management Practices through REDD+ becomes an integral part of the Forest Management in Odisha.
Project Outputs:	1. State REDD+ policy and strategy are developed. 2. FRL for Odisha is established. 3. MRV system is put into practice. 4. Safeguards Information System for Odisha is put into practice. 5. A knowledge network on REDD+ for sustainable forest management is established.

Source: JICA Survey Team (2016)

The Project Design Matrix (PDM) revised during final discussion with OFD on 3rd August 2016 is provided in Attachment 7.5, which provided the basis for OFD to prepare the Application for Technical Cooperation Project. Subsequently, on 12th August 2016, OFD has submitted it to the central government.

The need for pilot project under technical cooperation was also deliberated upon with OFD. The pilot project under the technical cooperation is likely to be required for testing the operation of the system. In order to establish a compatible data exchange system between the state and project for effective and efficient monitoring, it would be better to implement pilot activities jointly by the technical cooperation project and OFSDP-II in the selected sites. Thus, no pilot project was proposed under the technical cooperation project.

On the other hand, to implement the state level technical cooperation for REDD+, policy and institutional arrangement for REDD+ at the central government should also provide an enabling environment. The involvement of and coordination with the central government is very important for the technical cooperation project. However, during the third field survey, the survey team was unable

to interact with the central government to understand the status and thus it is not reflected in PDM. Once confirmed, such factors will need to be incorporated into PDM.

Data Collection Survey on REDD+ for JICA Loan Projects in India

Final Report

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List of Acronyms

Acronym	Description
AD	Activity Data
AGB	Above Ground Biomass
ANR	Assisted or Aided Natural Regeneration
AR-CDM	Afforestation／Reforestation Clean Development Mechanism
BGB	Below Ground Biomass
BMUB	Building and Nuclear Safety
BUR	Biennial Updated Report
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
CAT	Catchment Area Treatment
CBDR-RC	Common but Differentiated Responsibilities and Respective Capabilities
CCB	Climate, Community and Biodiversity
CCBS	Climate Community Biodiversity Standards
CCF	Chief Conservator of Forest
CDCS	Country Development Cooperation Strategy
CDM	Clean Development Mechanism
Cr.	Crore (1 Cr. = 10 million)
CSD	Commission on Sustainable Development
DBH	Diameter at Breast Height
DF/R	Draft Final Report
DFO	Divisional Forest Officer
DMU	Divisional Management Units
DOM	Dead Organic Matter
EDC	Eco Development committee
EF	Emission Factor
EIA	Environmental impact assessment
ESCAP	Economic and Social Council for Asia and Pacific
F/R	Final Report
FAO	Food and Agriculture Organization of the United Nations
FCPF	Forest Carbon Partnership Facility
FDAs	Forest Development Agencies
FPIC	Free, Prior and Informed Consent
FRA	Forest Rights Act (Scheduled Tribes and Other Traditional Forest Dwellers Act 2006)
FREL	Forest Reference Emission Level
FRL	Forest Reference Level
FSI	Forest Survey of India
FUGs	Forest User Groups
GA	Geographical Area
GCCI	Global Climate Change Initiative
GEF	Global Environment Facility
GHG	Green House Gas
GIM	The National Mission for a Green India
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Society for International Cooperation)
GOI	Government of India
GPG	Good Practices Guidance
GS	Growing Stock
IBBI	India Business and Biodiversity Initiative
IC/R	Inception Report
ICFRE	Indian Council of Forestry Research and Education
ICIMOD	International Centre for Integrated Mountain Development
IDWH	Integrated Development of Wildlife Habitats
IFMS	Integrated Financial Management System
IFS	Indian Forest Services
IGA	Income Generation Activity

Acronym	Description
IGNFA	Indira Gandhi National Forest Academy
IIFM	Indian Institute of Forest Management
IIRS	Indian Institute of Remote Sensing
INDC	Intended Nationally Determined Contribution
InFoRM	Innovations for Forest Resources Management
Int/ R	Interim Report
IPCC	Intergovernmental Panel on Climate Change
ISFR	India State of Forest Report
IUCN	International Union for Conservation of Nature
IWMP	Integrated Watershed Management Programme
JCM	Joint Crediting Mechanism
JFM	Joint Forest Management
JFMC	Joint Forest Management Committee
JICA	Japan International Cooperation Agency
LULUCF	Land use, Land use Change and Forestry
MGNREGA	Mahatma Gandhi National Rural Employment Generation Act
MIS	Management Information System
MMU	Minimum Mapping Unit
MOEF	Ministry of Environment and Forests
MoEF&CC	Ministry of Environment, Forest and Climate Change
MRV	Monitoring, Reporting, Verification
NABARD	National Bank for Agriculture and Rural Development
NAMA	Nationally Appropriate Mitigation Strategy
NAP	National Afforestation Programme
NAPCC	National Action Plan for Climate Change
NBA	National Biodiversity Authority
NBM	National Bamboo Mission
NFI	National Forest Inventory
NFMS	National Forest Monitoring System
NGO	Non-Government Organisation
NRAP	National REDD+ Action Plan (in Vietnam)
NRS	National REDD Strategy
NRSC	National Remote Sensing Centre
NSF	National Science Foundation
NTFP	Non Timber Forest Produces
ODA	Official Development Assistance
OFSDP	Odisha Forestry Sector Development Project
OTFDs	Other Traditional Forest Dwellers
PDDs	Project Design Documents
PEER	Partnerships for Enhanced Engagement in Research
PES	Payment for Environmental/ Ecosystem Services
PESA	The Provisions of the Panchayat (Extension to Scheduled Areas) Act
PKR	Phenstunyu, Khenyu, and Rumeisinyu villages in Kohima Forest Division
PRAP	Provincial REDD+ Action Plan (in Vietnam)
QA/QC	Quality Assurance and Quality Control
RAD-GRK	Regional Action Plan for Green House Reduction (in Indonesia)
RAN-GRK	National Action Plan for Green House Reduction (in Indonesia)
REDD	Reducing Emission from Deforestation and forest Degradation
REL	Reference Emission Level
RL	Reference Level
RS	Remote Sensing
SAARC	South Asian Association for Regional Co-operation
SACEP	South Asia Co-operative Environment Program
SAPCC	State Action Plan on Climate Change
SC	Scheduled Castes
SEPC	Social and Environmental Principles and Criteria
SES	Social and Environmental Standard adopted by Care International, NGOs and other

Acronym	Description
	private organisations
SFDs	State Forest Departments
SGVSY	*Samnavit Gram Vanikaran Samridhi Yojana* (Universal Rural Employment Programme)
SHGs	Self-Help Groups
SIS	Safeguards Information System
SNC	Second National Communication
SOI	Survey of India
SRS	State REDD Strategy
SRSAC	State Remote Sensing Application Centre
ST	Scheduled Tribes
TC	Technical Cooperation
TEEB	The Economics of Ecosystems and Biodiversity
TERI	The Energy Research Institute
TFDPC	Tripura Forest Development Plantation Corporation
UKFD	Uttarakhand Forest Division
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UN-REDD	United Nations Reduction of Emission from Deforestation and Forest Degradation
UPPFMPAP	Uttar Pradesh Participatory Forest Management and Poverty Alleviation Project
USAID	United States Agency for International Development
USG	US Government
VCS	Voluntary Carbon Standard
VP	*Van Panchayat* (Village Forest Committee in Uttarakhand)
VSS	*Vana Samrakshana Samiti* (Village Forest Committee)
WII	Wildlife Institute of India

Chapter 1 Introduction

1.1 Background of the Survey

Deforestation and forest degradation in developing countries are the major causes of CO_2 emissions after fossil fuels usage. They contribute to about 20% of global anthropogenic CO_2 emissions. In light of this, Reducing Emissions from Deforestation and Forest Degradation, the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) have been discussed under United Nations Framework Convention on Climate Change (UNFCCC) as an international framework and mechanism. The concept of REDD+ provides a way for the developing countries to obtain funding or credits by reducing emissions from deforestation and forest degradation as well as maintaining or enhancing carbon stock through sustainable forest management.

Japan International Cooperation Agency (JICA) has been actively assisting developing countries in securing and maintaining the balance between environment and development, including sustainable forest management, improvement of local communities' livelihoods, and biodiversity conservation. Recent JICA's assistances in forestry sector directly cover REDD+ related activities such as development of forest monitoring system, studies on carbon dynamics, development of REDD+ related documents.

JICA has been a major contributor to the forestry sector of India since 1991. Up to 2015, 22 forestry sector projects have been implemented in 13 states of India. These projects have achieved plantation and forest regeneration in 2 million ha and more than 16,000 Joint Forest Management Committees (JFMCs) and 24,000 Self-Help Groups (SHGs) have been supported for sustainable forest management and livelihood enhancement. During the course of interventions, JICA's projects have experienced a shift in approach from Forest Department led plantation and afforestation to sustainable forest management through Joint Forest Management and enhancement of sustainable livelihood. REDD+ is a way to further compliment the JICA's forestry sector interventions. Introducing REDD+ in the on-going and future projects in India has relevance.[1]

With this background, JICA dispatched a survey team to undertake a preliminary survey to assess the potential for introducing REDD+ with on-going JICA loan assisted forestry sector projects in India. The survey work commenced in October 2015 and was completed by September 2016.

1.2 The Objectives and Scope of the Survey

The "Data Collection Survey on REDD+ for JICA Loan Assisted Projects in India" (hereinafter referred to as the "survey".) intends to achieve the following objectives in order to explore the possibilities to formulate technical cooperation for on-going JICA loan assisted projects.

1) Gather information on a) REDD+ readiness at the central and state levels, b) status of the donor interventions, and c) status of forests
2) Assess the REDD+ potential and necessary interventions/ needs for cooperation to fulfil REDD+ requirements
3) Make recommendations for the technical cooperation in REDD+ with on-going JICA loan assisted projects

[1] Source of the information quoted in this paragraph: Sarin, Vineet. (2015) Presentation given at "Sustainable Forest Management through Community Partnership – 7th Annual Forestry Workshop at Lucknow April 2015"

The survey areas included Delhi, Dehradun, and eight survey states where the JICA loan assisted projects are being or have been implemented, namely Uttar Pradesh, Odisha, West Bengal, Tripura, Sikkim, Uttarakhand, Himachal Pradesh, and Karnataka.

The agencies concerned include Ministry of Environment, Forest and Climate Change (MoEF&CC), Forest Survey India (FSI), Indira Gandhi National Forest Academy (IGNFA) and the state forest departments of the survey states.

JICA has supported Joint Forest Management (JFM) approach in India for many years and REDD+ could further enhance the sustainability of the project achievements. However, the preliminary understanding of the REDD+ readiness at different levels of India suggests a further requirement for technical cooperation in order to operationalise REDD+. With an eye to such requirements especially at the state and project levels, a preliminary conceptual framework of a technical cooperation for REDD+ linkage with JICA loan assisted projects is visualised as shown in Table 1.1.

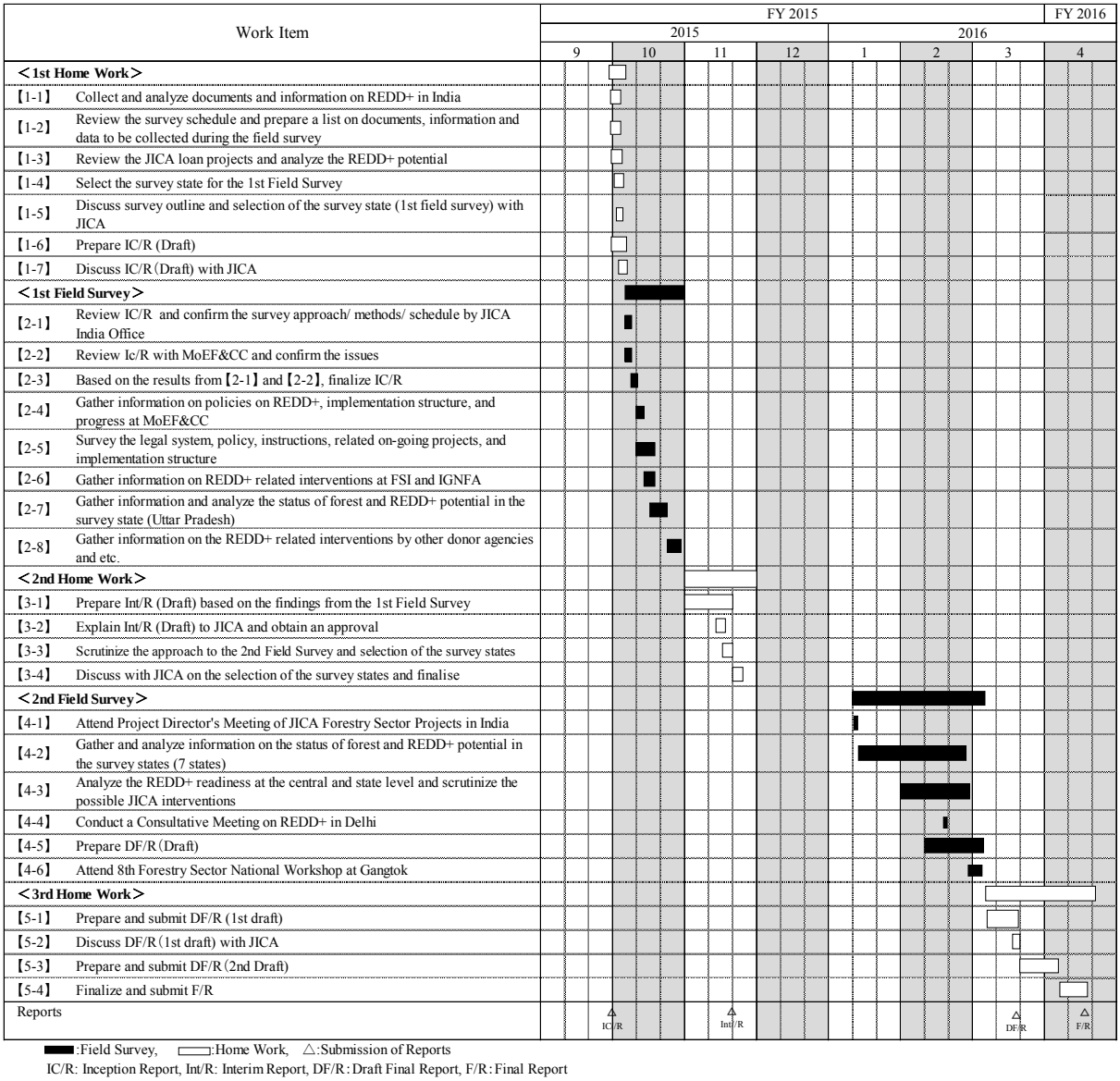
Table 1.2.1 Possible Linkage between the Forest Sector Loan Project and REDD+ Technical Assistance Project

Activities of Forest Sector Loan Project	Potential Activities of the REDD+ Technical Assistance Project
1. Preparation (Selection of sites, preparation of manual/ guidelines, establishment of implementing organisation and etc.) 2. Organisational strengthening (capacity building for the project and staff of the forest department) 3. Facilitate the formation of community organisations and their capacity development 4. JFM activities (plantation, maintenance, management and etc.) 5. Biodiversity conservation and management activities 6. Livelihood improvement activities for community organisations 7. <u>REDD+ pilot project (including activity 3, 4, 5, 6 above)</u> 8. Survey and research activities 9. Publicity and awareness raising 10. Monitoring and evaluation [The activities 3, 4, 5 and 6 will be implemented in the selected sites (villages). REDD+ pilot projects will be linked to REDD+ Technical Assistance Project.]	【State forest department and concerned offices of the central government are envisaged as beneficiaries.】 ◆ Support for the REDD+ action plan preparation ◆ Support for capacity development in REDD+ (safeguard, setting FREL, forest monitoring, MRV and etc.) [In view of REDD+ implementation at the sub-national level, enhancement of the REDD+ readiness at relevant agencies at the state level will be supported.] 【Intended for the Loan Project】 ◆ Support for the capacity development of the project staff (through participation in the workshops implemented for the state forest department and etc.) ◆ Support for the capacity development of the community organizations (Free, Prior and Informed Consent/ FPIC process implementation, monitoring and etc.)

Source: JICA Survey Team (2016)

1.3 Work Plan

The work plan of the survey is shown in the figure below. The survey team carried out 1st field survey from 6th to 30th October 2015 and 2nd field survey from 10th January to 4th March 2016. List of personnel met during the survey is listed in Attachment 1.1.



Source: JICA Survey Team (2016)

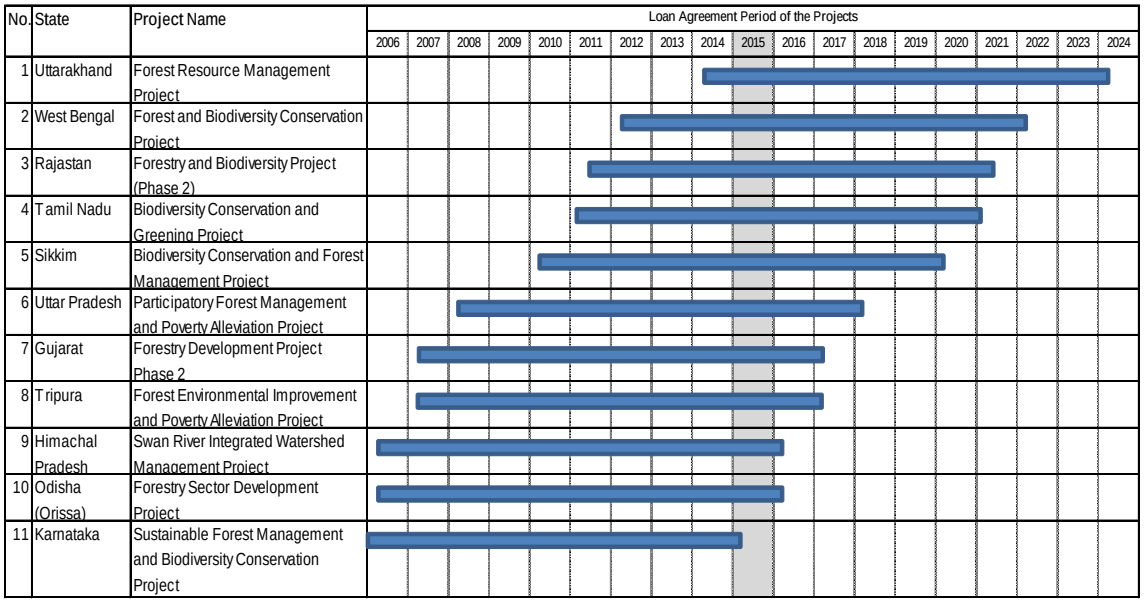
Figure 1.3.1: Work Plan

1.4 JICA Loan Assisted Projects in Forestry Sector and Relevance of REDD+

As of March 2016, 10 JICA loan assisted projects in the forestry sector are being implemented in India. The JICA loan assisted projects are normally implemented for 8-10 years duration. All the projects essentially have at least six components of forest management activities through Joint Forest Management approach, community and livelihood development activities for the forest dependent communities in the project areas, institutional strengthening, monitoring and evaluation, and capacity building. In some cases, biodiversity conservation and eco-tourism are also included.

Under the JFM component, a village forest area is allocated to each JFMC to manage during and after the project based on the micro plan that each JFMC prepares for every 5 years. At the same time, the projects help the forest dependent communities to access alternative means of livelihoods through SHGs. The activities can be forest based or non-forest based. This, in return, helps to reduce the pressure on the forest resources, and thus would contribute to rejuvenation and sustainable use of the

forest resources. The projects ensure a transparent benefit sharing mechanism with the JFMCs. In some cases, research/ development and training on value addition of NTFPs and sustainable harvesting technologies are done as part of the project activities. AR-CDM projects have also been developed by Uttar Pradesh Participatory Forest Management and Poverty Alleviation Project under its research component.



Source: JICA Survey Team (2016)

Figure 1.4.1: JICA Loan Assisted Projects in Forestry Sector

As seen in the above table, 5 out of 11 JICA loan assisted projects will come to an end by 2017. Despite the phase-out activities inbuilt in the project implementation period, JFMCs will face challenges (often financial and technical) to sustain their forest management activities.

Under the framework of REDD+, these JFMCs may receive economic benefits if they become eligible. On the other hand, REDD+ requires a certain system to be established, which requires further research and piloting in the field. When such a process is completed, out-scaling and up-scaling of REDD+ can become feasible.

This survey provides an opportunity to assess the gaps in REDD+ readiness of the selected JICA projects and propose possible technical cooperation projects of JICA that can be embedded in the on-going JICA forestry sector loan projects.

1.5 Relevance of Climate Change Policy of Japan and REDD+

(1) Joint Credit Mechanism (JCM) proposed by Japanese Government

The Japanese Government has proposed the Joint Credit Mechanism (JCM) to UNFCCC in order to mitigate climate change and to help developing countries achieve low-carbon growth by mobilizing technology, markets and finance. JCM also contributes to the ultimate objective of the UNFCCC by facilitating global actions for reducing emissions or enhancing removals of Green House Gas (GHG), complementing the clean development mechanism (CDM) under the Kyoto protocol.

Under JCM, Japan and each partner country will exchange an agreement for reduction of the GHG emission through joint efforts. Japan will provide technical assistance in development and diffusion of the appropriate low carbon technologies, products, systems, services, and infrastructure of the partner country to advance the GHG emission reduction/ removal and thus to achieve sustainable development. The GHG emission reduction or removals achieved through such efforts will be scientifically measured by deploying appropriate measurement, reporting and verification (MRV) methodologies and reflected as part of the Japanese contributions to GHG emission reductions or removals. Under this mechanism, the partner countries can also promote Nationally Appropriate Mitigation Actions (NAMAs).

Japan has held consultations for the JCM with developing countries since 2011 and signed the bilateral documents for the JCM with 16 countries (as of February 2016). India hasn't become a signatory country yet; however, the JCM Feasibility Studies (FS) have been conducted to seek potential projects in India. 29 FS have been carried out in India so far. The table below shows example of surveys.

Table 1.5.1: JCM Feasibility Studies (FS) in India

Year of implementation	Title of the studies
2015	Feasibility study for JCM projects through introduction of Energy-Saving Technology into India's Steel Industry
2014	The feasibility study to promote Low Carbon Technology application in India (Gujarat, Maharashtra, Punjab)
2013	Energy Efficient Air Conditioners
2012	Bagasse-based Power Generation including Waste Heat Utilisation
2011	New Mechanism Feasibility Study for Energy Savings by Utilising LED Lights at Office Buildings in India
2010	Introduction of energy efficient technologies at iron and steel plant

Source: New Mechanisms Information Platform (http://www.mmechanisms.org/e/index.html Retrieved in November 2015).

(2) JCM and REDD+

In the forestry sector, the investment required for reducing the GHG emission is less than that for the energy sector (Stern Review 2006), while the amount of emission reductions deriving from the forest conservation, sustainable forest management and so on are much bigger than other sectors. As the Stern Review (The Economics of Climate Change) states, curbing deforestation is a highly cost-effective way of reducing greenhouse gas emissions.

As for REDD+, one can expect not only emission reductions to mitigate climate change, but also conservation of biodiversity and contribution to improvement of livelihood of local communities. However, actual implementation of REDD+ has some issues to be resolved. One of the issues of REDD+ is finding a buyer of the credit. In addition, the price of carbon credit traded in the market has been very low since the Lehman crisis in 2008. These are some of the factors that deterred the promotion of the enforcement of REDD+ by stakeholders. Under such situation, JCM could provide an opportunity for a country to promote REDD+ when a buyer of the credit is guaranteed while the required technical assistance and infrastructure can be provided by Japan. About 40 JCM Feasibility Studies (FS) related to REDD+ have been implemented since 2010 in Indonesia, Lao PDR and Cambodia. Out of these studies, two JCM REDD+ Model Projects were adopted in 2015 as shown in the table below.

Table 1.5.2: REDD+ Model Project

Country	Year	Title
Indonesia	2015	REDD+ project in Boalemo District
Lao PDR	2015	REDD+ project in Luang Prabang Province through controlling slash-and-burn

Source: New Mechanisms Information Platform (http://www.mmechanisms.org/e/index.html Retrieved in November 2015)

1.6 Consultative Meeting on the Survey held on 19th February 2016

The survey team organised a Consultative Meeting on 19th February 2016 in Delhi to share the preliminary survey findings with the representatives of 11 states where JICA supported forestry sector projects are currently implemented or in the pipeline. Two representatives from JICA Tokyo office as well as representatives from donors and MoEF&CC including forest research institutions in Dehradun were among those who participated. The total number of participants was 44. The participants raised concerns over fluctuating carbon prices and funding sources for implementation of the REDD+ interventions and indicated the need for simple MRV methods that can be adopted. The meeting ended with a broad consensus that the national level policy is to be finalised at the earliest time to give a push to the overall REDD+ interventions and to initiate REDD+ interventions when/where possible. The notes on the points discussed during the meeting are attached to this report as Attachment 1.2.

Chapter 2 Status and Issues of Forestry Sector in India

2.1 Status of Forests

The total area of India is 3.29 million km^2 which comprised of 14 physiographic types including eastern/ western Himalaya, north eastern hills and plains, central highland, and Eastern/ Western Ghats. India is one of the 17 most megadiverse countries of the world. In total, 16 major forest types are found in the country. The forest area having more than 10% of the canopy density is 701,673 km^2 or the 21.3% of the total area of India. Within the forest land, 44.9% is categorized as moderately dense forest and 42.8% is open forest having the forest density between 10- 40%. The summary of the forest statistics is shown in the table below.

Table 2.1.1 Forest Cover in India

Forest Class		Area (km^2)	% to the Total Area of India (%)	% to the Total Forest Area (%)
Very Dense	Canopy density 70% <	85,904	2.6%	12.2%
Moderately Dense	Canopy density 40- 70%	315,374	9.6%	44.9%
Open Forest	Canopy density 10- 40%	300,395	9.1%	42.8%
	Total of Forest Cover	701,673	21.3%	100.0%
Scrub	Canopy density 10% >	41,362	1.3%	
Non Forest	Non forest land	2,544,228	77.4%	
	Total of India	3,287,263	100.0%	

Source : India State of Forest Report 2015, Forest Survey of India (FSI).

Between 2013 and 2015 assessments reported in the India State of Forest Report 2015, observed some changes in the forest areas. Very dense forest area increased slightly, while the moderately dense forest area decreased by approximately 1,999 km^2 and the open forest area increased by approximately 3,371 km^2. This may reflect the deterioration of the quality of the forest.

The comparison by state of forest areas between 2013 and 2015 assessments indicates a decrease in the forest cover in Mizoram (-306 km^2), Uttarakhand (-268km^2), and Telangana (-168km^2). Arunachal Pradesh, Meghalaya, Nagaland, Tripura and Madhya Pradesh indicated the decrease in forest cover ranging between 55 - 73 km^2. In the case of Uttarakhand, Telangana, and Madhya Pradesh, the forest cover fluctuates due to the rotational/ clear felling. Some other drivers of forest degradation include shifting cultivation, grazing, and unsustainable harvesting of fodder/ fuelwood/ NTFPs, unlawful settlement, forest clearing for the development activities such as mining. Especially, grazing and harvesting of the fuel woods have significant negative impacts on the forest.

2.2 Forest Category and Forest Administration

Forest in India is comprised of reserved forest, protected forest and other forests. The reserved forest and protected forest are managed by the forest department in each state in accordance with the Indian Forest Act. Approximately, 83% of the total forest area in India is categorised as the reserved forest or protected forest. The management of these forests is undertaken by the state forest department based on the working plan which is generally prepared for every 10 years.

Table 2.2.1 Forest Area by Forest Category

Forest Category	km^2	%
Reserved Forest	424,985	55.1%
Protected Forest	209,440	27.1%
Unclassified Forest	130,141	16.9%
Total	771,821	100.0%

Source : Indian State of Forest Report 2015, FSI

Under the state forest department, circle, division, and range are established where the respective officers in charge are placed for implementation of the forest management works. The management of the national park, protected area, and community reserved forest is undertaken by the wildlife divisions under the state forest department.

2.3 Policy and Laws concerning Forest in India

The policies and laws relevant to the forest management in India are listed in Box 2.3.1. Guidelines on Joint Forest Management, the "Scheduled Tribes and Other Traditional Forest Dwellers [Recognition of Forest Rights] Act (2006)" and "Panchayat Raj Act of 1996 are some of the relevant policies and laws in the context of REDD+. As for the northeastern states, a large part of the forest areas belongs to the community and is managed according to the locally specific rules. Thus, the implication of the local forest governance on REDD+ should be clarified during the Field Survey as such need arises. Furthermore, regulations on harvesting and trading of the NTFPs are state specific, which will also be surveyed where relevant.

Box 2.3.1 Policy and Laws concerning Forest in India

- Indian Forest Act 1927; Forest (Conservation) Act 1980; Wildlife (Protection) Act 1972; Biological Diversity Act 2002
- National Forest Policy 1988
- JFM Circular by MOEF 1990
- Guidelines on Joint Forest Management (JFM) 2000 and 2002
- National Policy on Climate Change 2006
- National Action Plan on Climate Change 2008
- Scheduled Tribes and Other Traditional Forest Dwellers [Recognition of Forest Rights] Act 2006 (commonly known as FRA)
- Provisions of Panchayat (Extension to Scheduled Areas) Act 1996

2.4 Issues concerning Joint Forest Management/ Sustainable Forest Management

The lessons learned from previous JICA loan assisted forestry sector projects, have been identified following issues in Joint Forest Management/ Sustainable Forest Management.

Box 2.4.1 Issues in Joint Forest Management

1. Governance: Efforts under some of the Projects are inadequate to empower the JFMCs to manage forest and regulate the use of forest produces. Micro plans are not always prepared with sufficient participation of the forest users and do not fully reflect on their preferences (i.e. Selection of the species to be planted in the forest, selection of plantation or afforestation models, activities for livelihood enhancement, activities for village development etc.) and the participation of JFMCs in implementation of project activities, in some cases, found to be inadequate. The FRA is not fully implemented in some cases.

2. Sustainability of Joint Forest Management Committee (JFMC): After the completion of the projects, many JFMCs face difficulties in finding funds to continue activities. The micro plans are not always renewed after the project completion. There is a need for further enhancement of the capacities of JFMCs in group management and forest management and also to establish funding mechanism to sustain the JFMCs established during the project implementation.

3. Equitable Benefit Sharing: The benefits earned from the JFM areas are to be shared between the JFMCs and the forest department as per the agreement. However, such agreement is not always implemented as anticipated. In some states, the NTFP species that can be harvested or traded by the forest users are limited. This also limits their profits that they can earn from the NTFPs.

4. Pressure on the Forest Resource: The access to alternative means of livelihood and alternative energy sources is limited. This has further aggravated the excessive or inappropriate harvesting of the fuel woods, fodder, construction material, and NTFPs and increased the pressure on the forest resources.

Source: JICA Survey Team (2016)

In order to deal with the above identified issues, implementing a package of interventions including capacity development of the forest department officers, staff and forest users, while improving the access to alternative means of livelihoods and energy sources, extension of the sustainable harvesting methods for NTFPs and improvement of value addition and marketing of NTFPs. Adoption of REDD+ in the forestry projects could further enhance the quality of forest and sustainability of joint forest management. The strategy of utmost importance is to empower the JFMCs to plan and implement various activities.

2.5 Analysis by State of Deforestation, Forest Degradation, & Biomass Stock[2]

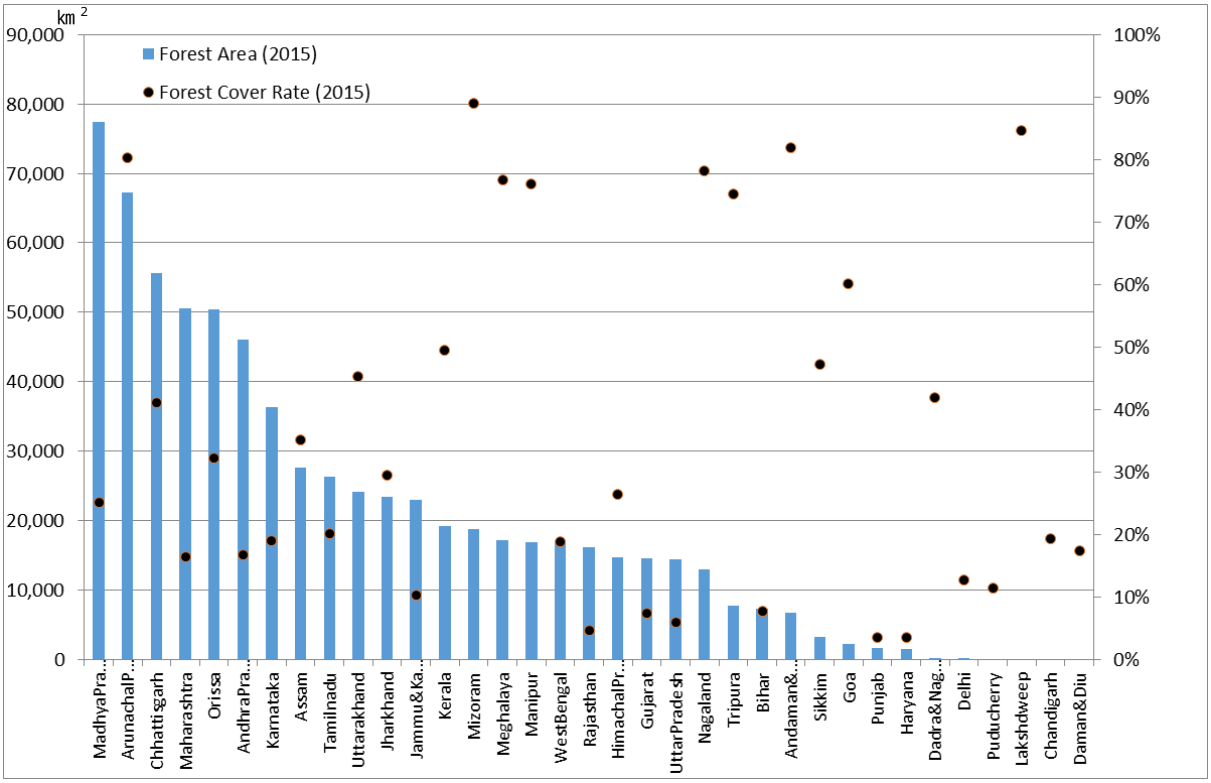
2.5.1 Analysis of forest dynamics using FSI data

(1) Data for the analysis

Forest Survey India (FSI) reports forest resource information in every other year. In this section, forest dynamics are analyzed based on the available FSI data.

(2) Forest dynamics of all states

Figure 2.5.1 shows the area under forest cover (in km^2) and the proportion or rate of forest cover in the total geographical area of each state in the assessment of India State of Forest 2015.



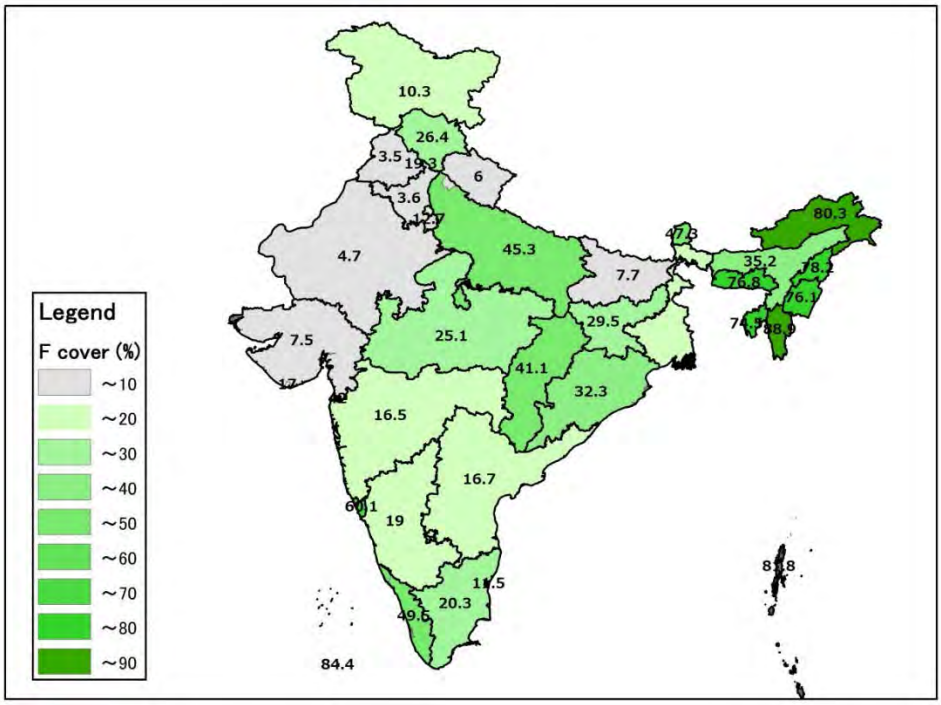
Source: Prepared by JICA Survey Team (2016) based on" India State of Forest Report 2015"

Figure 2.5.1 Areas under Forest Cover and Forest Cover Rate in 2015

The states with a large forest cover are Madhya Pradesh, Arunachal Pradesh, and Chhattisgarh. Since the area of each state varies, it is not appropriate to compare state level forest conditions based on the

[2] An attempt was made by the Survey Team to undertake an analysis using the data from Woods Hole Institute. However, the Survey Team was unable to complete the analysis due to the following reasons: 1) the data of northern India was missing in the data sets of Woods Hole Institute; 2) the data sets of Woods Hole Institute was available only for a single point and thus, the changes in forest cover over a time period could not be undertaken; 3) The data of FSI is based on the standing stock conversion but the Woods Hole seems to be deriving the data from the remote sensing data which could not be confirmed during the survey. Therefore, the survey team arrived at a conclusion that the comparison of these two data sets would not yield meaningful results and the analysis was done on the basis of Hansen map only. .

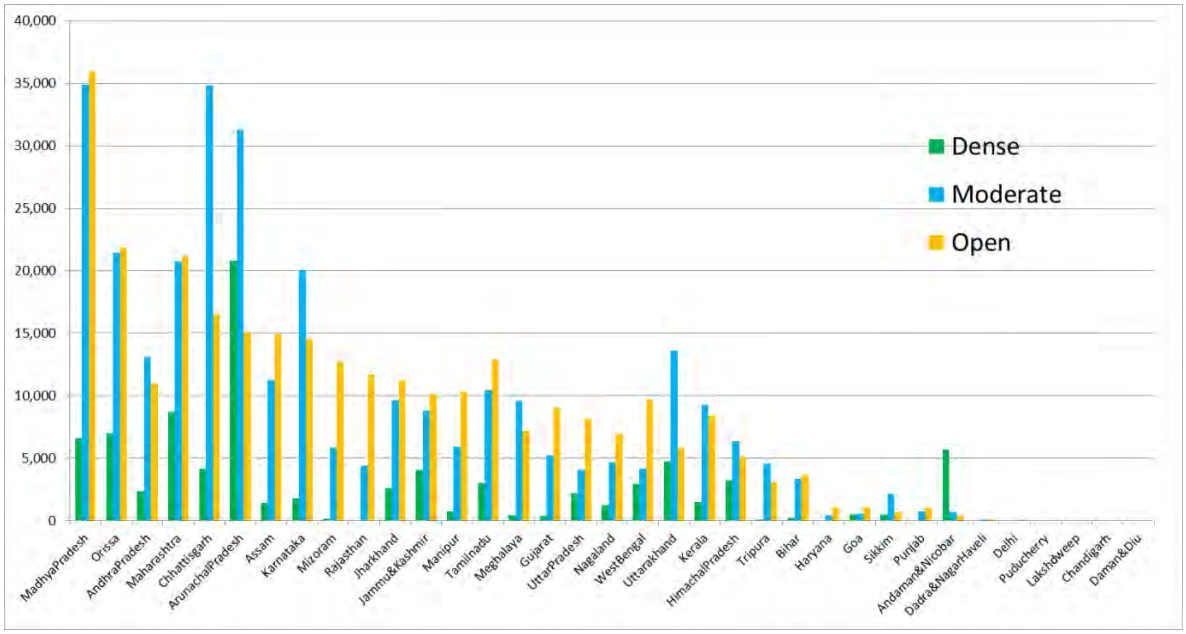
area under the forest cover. Therefore, forest cover rates by state are also added in the figure. For example, while Madhya Pradesh state having the largest forest area has around 20% of forest cover rate, Arunachal Pradesh state having the second largest forest area has approximately 80% of forest cover rate.



Source: Prepared by JICA Survey Team (2016) based on "India State of Forest Report 2015"

Figure 2.5.2 Forest Cover Rate based on India State of Forest Report (2015)

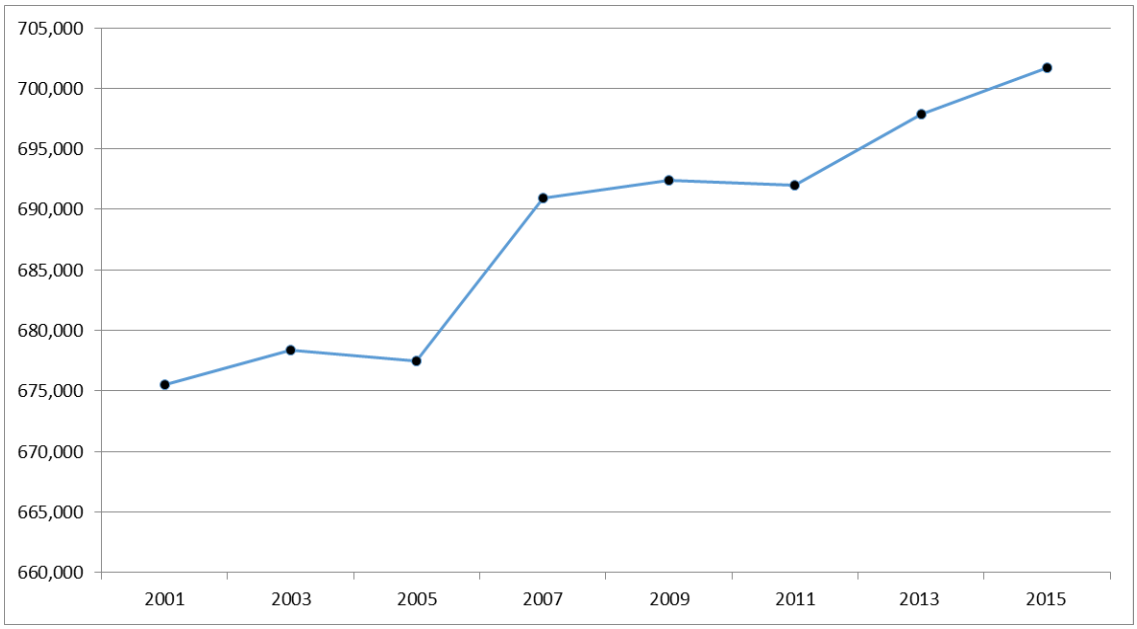
Figure 2.5.3 shows forest area in the order of having larger forest area in three forest canopy density classes (dense, moderately dense, and open forests) in each state.



Source: Prepared by JICA Survey Team (2016) based on "India State of Forest Report 2015"

Figure 2.5.3 Forest Areas based on Three Density Classes of Forests including Dense, Moderately Dense, and Open Forests in 2015（Unit: km^2)

Forest dynamics are analyzed by comparing forest area changes based on published India State of Forest Reports. Forest area change from 2001 to 2015 is shown in Figure 2.5.4.

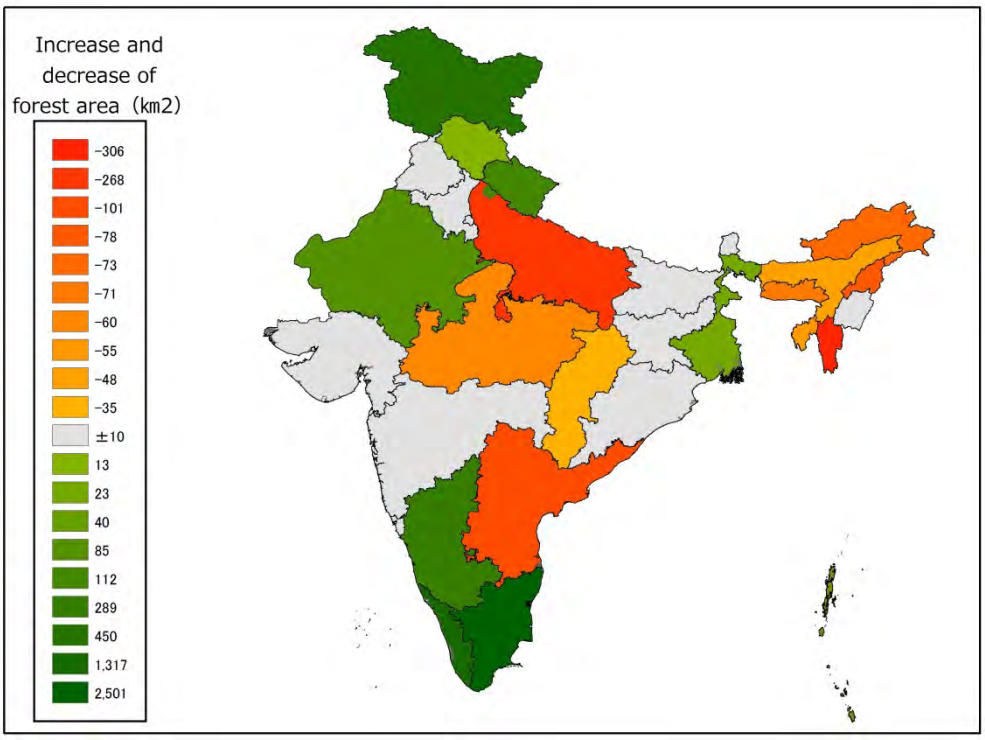


Source: Prepared by JICA Survey Team (2016) based on I2ndia State of Forest Report (2001 – 2015)

Figure 2.5.4 Total Forest Area Change in India from 2001 to 2015 (Unit: km²)

Total forest area of 675,538 km^2 in 2001 increased to 701,673 km^2 in 2015 with average annual increase of 1,860 km^2.

Figure 2.5.5 shows the gain and loss of forest area in km^2 in states between 2013 and 2015.



Source: Prepared by JICA Survey Team based on "India State of Forest Report (2013, 2015)"

Figure 2.5.5 Gain and Loss of Forest areas in each state between 2013 and 2015

It is clear that states in the eastern part of India show decrease in forest area while forest areas of southern part have increased.

Additionally, as per FSI reports, the areas of all density classes in India have significantly increased from 2005 to 2007. It was not possible to identify reason of this trend during the survey; however, such difference has occurred possibly be due to the differences in the methodologies used for analysis as it is often as a significant implication on the results of analysis. In the table below, data from 2007 to 2015 was used for the analysis of forest dynamics.

Table 2.5.1 Forest Dynamics of Dense Forest (unit: km^2)

States	2007	2009	2011	2013	2015	Gain-Loss
Arunachal Pradesh	20,858	20,873	20,868	20,828	20,804	-54
Maharashtra	8,739	8,739	8,736	8,720	8,712	-27
Orissa	7,073	7,073	7,060	7,042	7,023	-50
Madhya Pradesh	6,647	6,647	6,640	6,632	6,629	-18
Andaman & Nicobar	3,762	3,762	3,761	3,754	5,686	1,924
Uttarakhand	4,762	4,762	4,762	4,785	4,754	-8
Chhattisgarh	4,162	4,163	4,163	4,153	4,152	-10
Jammu & Kashmir	4,298	4,140	4,140	4,140	4,061	-237
Himachal Pradesh	3,224	3,224	3,224	3,224	3,224	0
Tamil Nadu	2,926	2,926	2,948	2,948	2,993	67
West Bengal	2,987	2,987	2,984	2,971	2,948	-39
Jharkhand	2,590	2,590	2,590	2,587	2,588	-2
Uttar Pradesh	1,626	1,626	1,626	1,623	2,195	569
Karnataka	1,777	1,777	1,777	1,777	1,781	4
Kerala	1,443	1,443	1,442	1,529	1,523	80
Assam	1,461	1,461	1,444	1,444	1,441	-20
Nagaland	1,274	1,274	1,293	1,298	1,296	22
Andhra Pradesh	820	850	850	850	888	68
Manipur	701	701	730	728	727	26

Source: Data compiled by JICA Survey Team (2016) based on "India State of Forest Report (2007-2015)

Table 2.5.1 shows top 20 states with large dense forests areas in 2015. It also shows the gain or loss of dense forest area between 2007 and 2015. Negative figures in the column of 'Gain-Loss' mean the loss of forest area, while positive figures mean the gain of the forest area. The data can be interpreted as follows:

i) Dense forest areas in the states are in general stable. However, the areas vary from state to state.
ii) There are remarkable changes in the dense forest area in some states in 2015, i.e., increase of 1,924 km^{2}and 569 km^2 in Andaman & Nicobar and Uttar Pradesh states, respectively.

The table below shows changes in areas of moderately dense forests.

Table 2.5.2 Forest Dynamics of Moderately Dense Forest (unit: km^2)

States	2007	2009	2011	2013	2015	Gain-Loss
Madhya Pradesh	35,007	35,007	34,986	34,921	34,902	-105
Chhattisgarh	35,038	34,911	34,911	34,865	34,846	-192
Arunachal Pradesh	31,556	31,574	31,519	31,414	31,301	-255
Andhra Pradesh	24,757	26,377	26,242	26,079	25,805	1,048
Orissa	21,394	21,394	21,366	21,298	21,470	76
Maharashtra	20,834	20,834	20,815	20,770	20,747	-87
Karnataka	20,181	20,181	20,179	20,179	20,063	-118
Uttarakhand	14,165	14,165	14,167	14,111	13,602	-563
Assam	11,558	11,558	11,404	11,345	11,268	-290
Tamil Nadu	10,216	10,343	10,321	10,199	10,469	253

States	2007	2009	2011	2013	2015	Gain-Loss
Jharkhand	9,899	9,899	9,917	9,667	9,663	-236
Meghalaya	9,501	9,501	9,775	9,689	9,584	83
Kerala	9,410	9,410	9,394	9,401	9,301	-109
Jammu & Kashmir	8,977	8,760	8,760	8,760	8,815	-162
Himachal Pradesh	6,383	6,383	6,381	6,381	6,381	-2
Manipur	5,474	5,474	6,151	6,094	5,925	451
Mizoram	6,251	6,149	6,086	5,900	5,858	-393
Gujarat	5,249	5,249	5,231	5,220	5,220	-29
Nagaland	4,897	4,897	4,931	4,736	4,695	-202
Tripura	4,770	4,702	4,686	4,641	4,609	-161

Source: Data compiled by JICA Survey Team (2016) based on "India State of Forest Report (2007-2015)

The area of moderately dense forest decreased in most of the states between 2007 and 2015.

Table 2.5.3 shows changes in the area of open forest.

Table 2.5.3 Forest Dynamics of Open Forest (unit: km^2)

State	2007	2009	2011	2013	2015	Gain-Loss
Madhya Pradesh	36,046	36,046	36,074	35,969	35,931	-115
Orissa	20,388	20,388	20,477	22,007	21,861	1,473
Maharashtra	21,077	21,077	21,095	21,142	21,169	92
Chhattisgarh	16,670	16,604	16,600	16,603	16,588	-82
Arunachal Pradesh	14,939	15,037	15,023	15,079	15,143	204
Assam	14,673	14,673	14,825	14,882	14,914	241
Karnataka	14,232	14,232	14,238	14,176	14,577	345
Tamil Nadu	10,196	10,282	10,356	10,697	12,883	2,687
Mizoram	12,855	12,900	12,897	13,016	12,752	-103
Rajasthan	11,514	11,514	11,567	11,590	11,669	155
Jharkhand	10,405	10,405	10,470	11,219	11,227	822
Andhra Pradesh	19,525	19,443	19,297	19,187	19,322	-203
Manipur	11,105	11,105	10,209	10,168	10,342	-763
Jammu & Kashmir	9,411	9,637	9,639	9,638	10,112	701
West Bengal	5,363	5,363	5,365	9,688	9,708	4,345
Gujarat	8,995	8,995	9,012	9,057	9,064	69
Kerala	6,471	6,471	6,464	6,992	8,415	1,944
Uttar Pradesh	8,152	8,152	8,153	8,176	8,206	54
Meghalaya	7,410	7,410	7,067	7,150	7,184	-226
Nagaland	7,293	7,293	7,094	7,010	6,975	-318

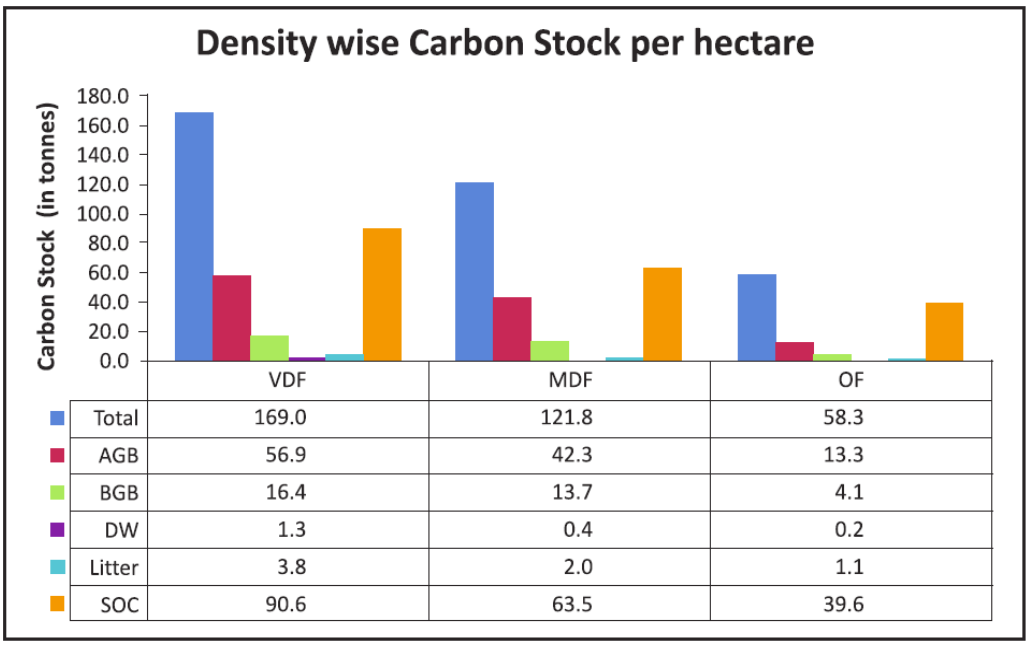
Source: Data compiled by JICA Survey Team (2016) based on "India State of Forest Report (2007-2015)

In general, the area of open forest shows increasing trend. Rather drastic changes in the area are observed between 2013 - 2015. Some states show significant increase of open forest from 2007 to 2015, namely Tamil Nadu, West Bengal and Kerala. On the other hand, the areas in Madhya Pradesh, Chhattisgarh, Mizoram, Manipur, Meghalaya, and Nagaland decreased.

In order to analyze the quantity of biomass or carbon stock from the viewpoint of REDD, forest areas were converted into biomass stocks using the formula used by IPCC below.

Carbon stock = *Activity data (Forest area) x Emission factor*

Emission factors for Above Ground Biomass (AGB) for three forest density classes was derived from the data published by FSI. Carbon stock per hectare in five different carbon pool was calculated for three density classes of forest as shown below.



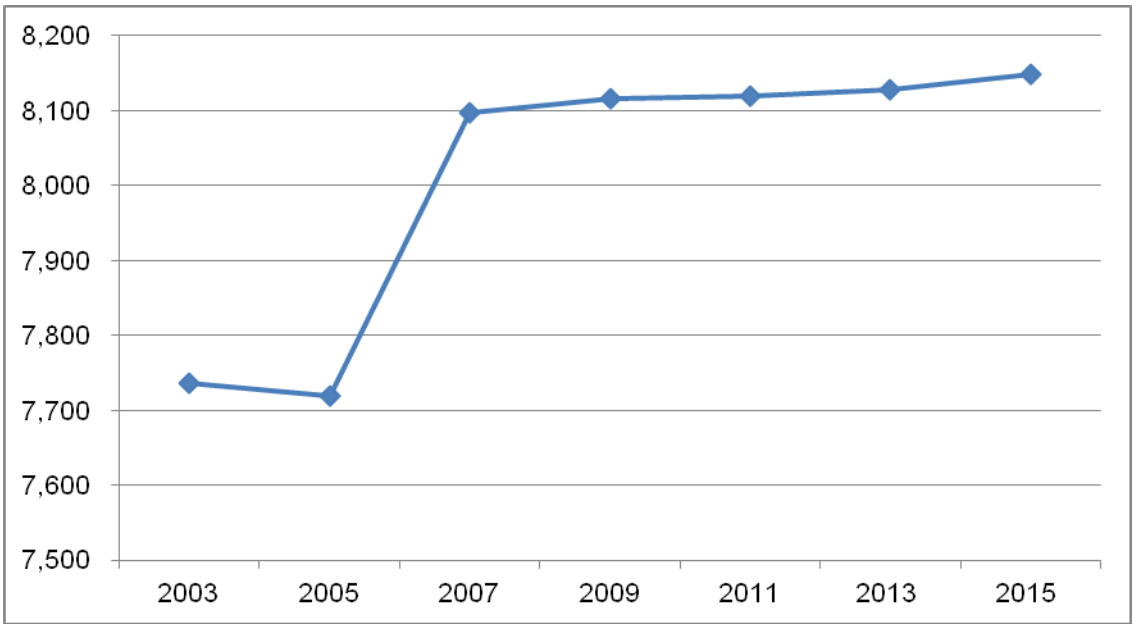
	VDF	MDF	OF
Total	169.0	121.8	58.3
AGB	56.9	42.3	13.3
BGB	16.4	13.7	4.1
DW	1.3	0.4	0.2
Litter	3.8	2.0	1.1
SOC	90.6	63.5	39.6

Source: The chart was prepared by JICA Survey Team (2016) using data in "Carbon in India's Forests" (FSI), Chapter4 Page35.

※VDF : Very Dense Forest, MDF: Moderately Dense Forest, OF: Open Forest
AGB: Above Ground Biomass, BGB: Below Ground Biomass, DW: Dead Wood, SOC: Soil Organic Matter

Figure2.5.6 Density Class Wise Carbon Stock in 2015

The figure above shows carbon stocks per hectare in five different carbon pools. Among the five carbon pools, AGB was used for analysis of chronological carbon stock change because AGB would be significantly affected by gain or reduction in the forest area. Therefore, the emission factor of AGB is employed to arrive at the carbon stock of AGB as follows: 56.9 t/ha for VDF, 42.3 t/ha for MDF, and 13.3 t/ha for OF.

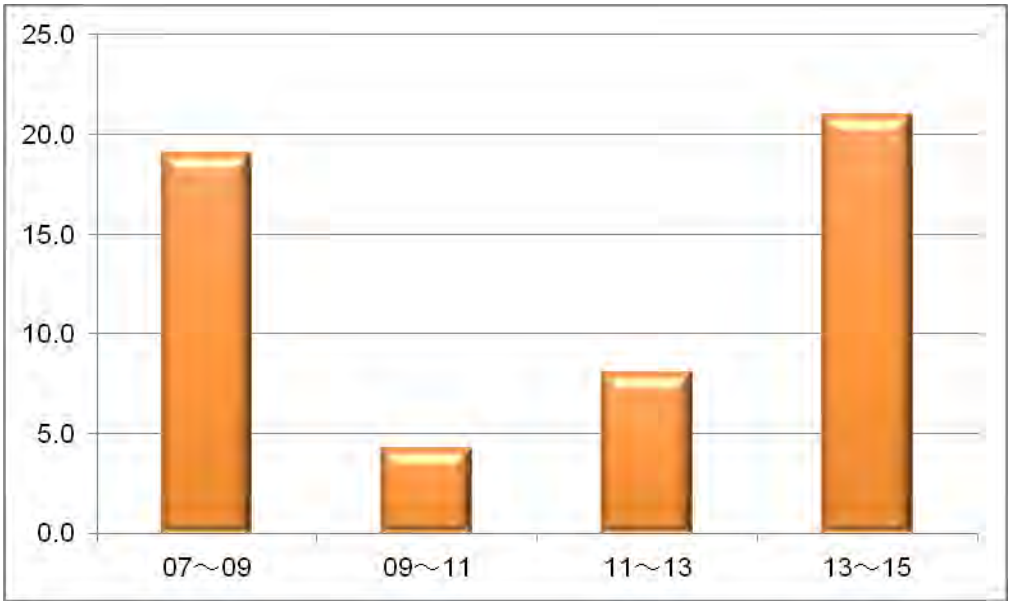


Source: Prepared by JICA Survey Team based on "India State of Forest Reports (2007- 2015)

Figure 2.5.7 Total Carbon Stocks Change from 2003 to 2015 (Unit: million tCO2-e)

The figure above shows that there is a drastic carbon stock change between 2005 and 2007. However, the carbon stock after 2007 is relatively stable and shows slight increase.

The carbon stock changes after 2007 were calculated in order to obtain baseline data for reference levels.

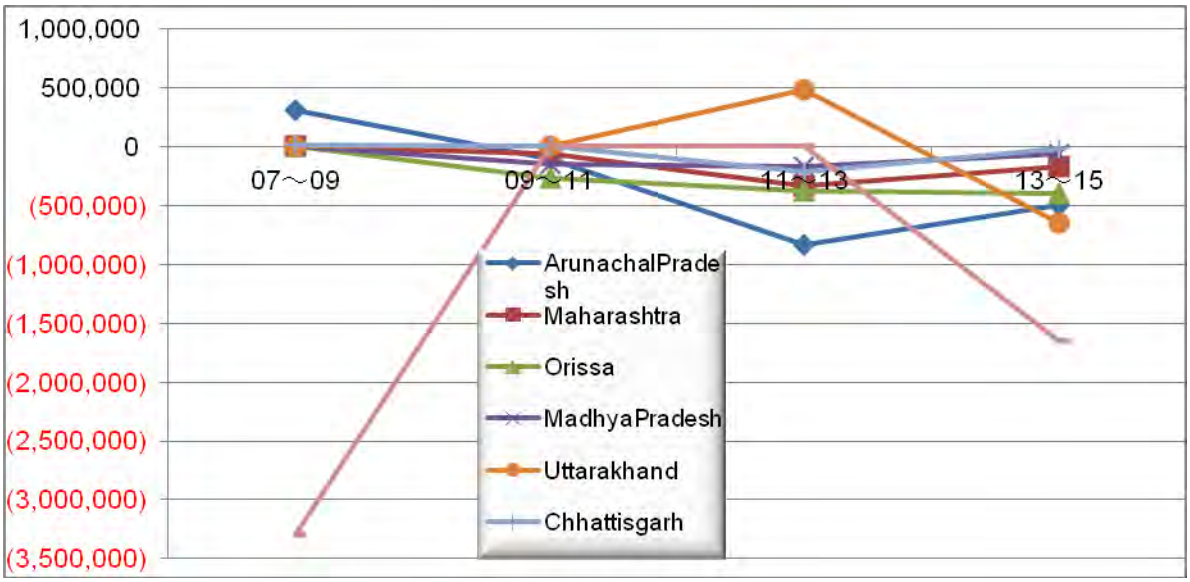


Source: Prepared by JICA Survey Team (2016) based on India State of Forest Report (2007- 2015)

Figure 2.5.8 Carbon Stock Change and its Average in Every Other Year after 2007 (Unit: million tCO2-e)

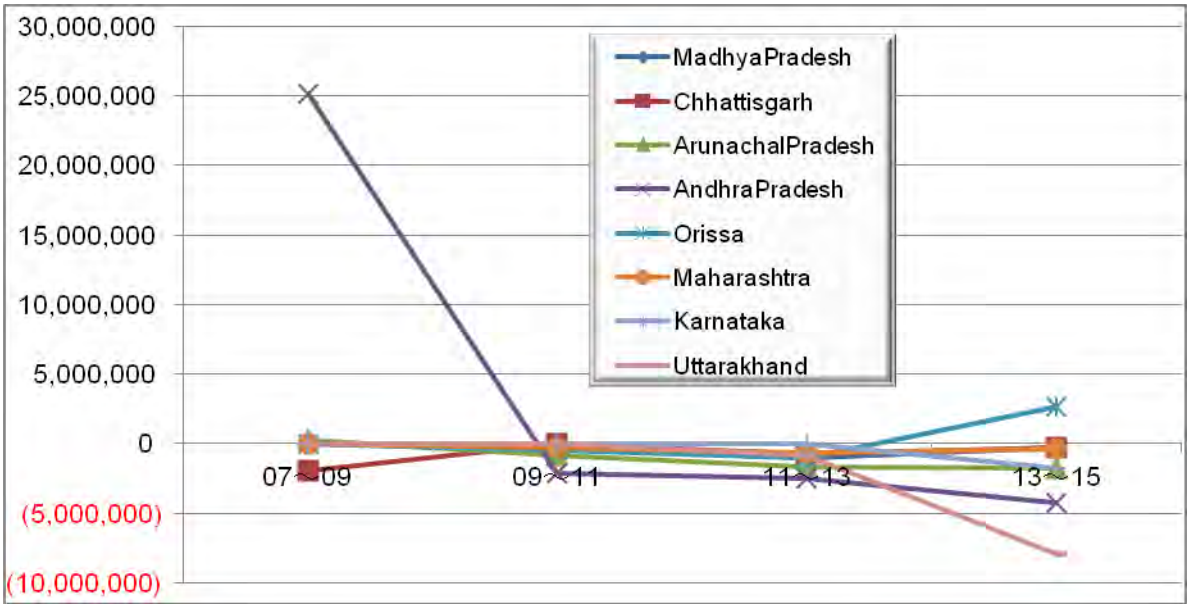
It is not possible to divide carbon dynamics into carbon emission and absorption using the currently available data. However, the results of total carbon stock change calculation suggest that the increasing trend of carbon stocks is likely to continue.

Even though total carbon stock change has increasing trend, it is still not clear that if the three forest density classes would have the same trend. Figures below show the carbon stock changes in three density classes of forests in the seven states having the largest areas of each forest density class.



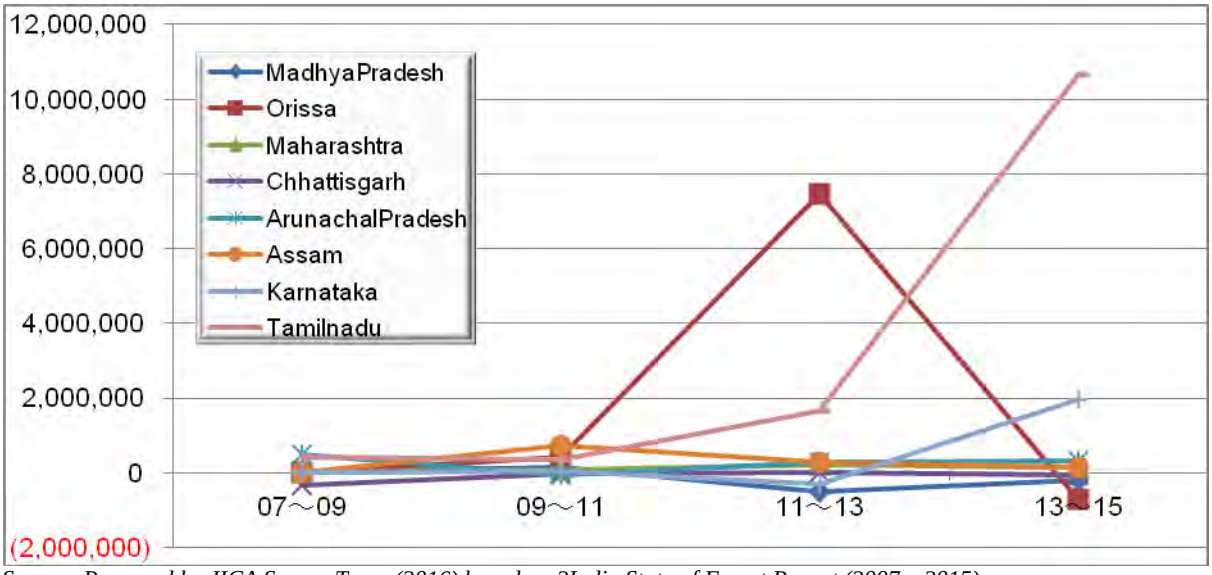
Source: Prepared by JICA Survey Team (2016) based on "India State of Forest Report (2007- 2015)"

Figure 2.5.9 Carbon Stock Dynamics in Dense Forest in Every Other Year after 2007 (Unit: tCO2-e)



Source: Prepared by JICA Survey Team (2016) based on "India State of Forest Report (2007-2015)

Figure 2.5.10 Carbon Stock Dynamics in Moderately Dense Forest in Every Other Year after 2007 (Unit: tCO2-e)



Source: Prepared by JICA Survey Team (2016) based on 2India State of Forest Report (2007 – 2015)

Figure 2.5.11 Carbon Stock Dynamics in Open Forest in Every Other Year after 2007. (Unit: tCO2-e)

Figure 2.5.9 shows the carbon stock in the dense forest. It indicates a slightly declining trend in all states. Based-on this figure, most of dense forest have been decreasing and this means the reference level can be considered as Forest Reference Emission Level (FREL).In this context, it is possible to state that REDD activities would gain approval by appropriate forest protection to restrain from further deforestation and forest degradation since the trend of carbon stocks in the high quality natural forest has decreased.

In the case of moderately dense forest as shown in Figure 2.5.10, a flat to declining trend is seen whereas open forest shows a flat trend in some states (Figure 2.5.11). This means Business As Usual (BAU) and reference level starts as zero (no emission and no sequestration).While forest dynamics of

moderately dense and open forests vary, activities to enhance carbon stock including afforestation and protection would be required.

2.5.2 Deforestation and forest degradation analysis using Hansen maps

(1) Data set and analytical Method

In this section, alternative data sets from Hansen maps published by University of Maryland, are used for analyzing the deforestation and forest degradation in the survey states and the results are used for the comparison of the same analysis based on the FSI data. Hansen maps[3]capture deforestation and forest degradation in the world. Seven types of data sets are made available for public use, for which descriptions are given below.

(a) Tree canopy cover for year 2000 (tree cover 2000): "Tree cover in the year 2000" is defined as canopy closure for all vegetation taller than 5m in height and encoded as a percentage per output grid cell between the range of 0 and 100.

(b) Global forest cover loss 2000–2014: "Forest loss between the period 2000 and 2014" is defined as a stand-replacement disturbance, or a change from a forest to non-forest and encoded as either 1 (loss) or 0 (no loss).

(c) Global forest cover gain 2000–2012: "Forest gain during the period of 2000–2012" is defined as the inverse of loss, or a non-forest to forest change entirely within the study period and encoded as either 1 (gain) or 0 (no gain).

(d) Year of gross forest cover loss event (loss year): A disaggregation of total forest loss to annual time scales and encoded as either 0 (no loss) or else a value in the range 1–13, representing loss detected primarily between 2001 and 2014.

(e) Data mask: Data mask is that three values representing areas of no data (0), mapped land surface (1), and permanent water bodies (2).

(f) Circa year 2000 Landsat 7 cloud-free image composite (first): It is a reference multispectral imagery from the first available year, which is typically 2000. If no cloud-free observations are available for the year 2000, imagery would be taken from the cloud-free data of the closest year within the range 1999–2012.

(g) Circa year 2014 Landsat cloud-free image composite (last): It is a reference multispectral imagery from the last available year, which is typically 2014. If no cloud-free observations are available for the year 2014, imagery would be taken from the cloud-free data of the closest year between the 2010 and 2012.Ver1.4 has been released so far. Since ver1.0, the following points were improved.

- Detection accuracy of broad leaf forest loss due to forest fires has been improved
- Detection accuracy of forest loss due to small scale shifting cultivation improved.
- Detection accuracy of selecting cutting has been improved
- Detection accuracy of forest loss due to short rotation

Hansen has been deployed to identify forest dynamics by state level in Indonesia and Democratic Republic of Congo. Although the data may have limitation in undertaking the micro level analysis, the maps are considered to have enough accuracy for analyzing the forest dynamics at state level in India. The advantage of using Hansen Maps is that the area of deforestation is visible on a map.

In this analysis, each forest area was observed by using the data of Gain (from 2000 to 2014) and Loss (from 2000 to 2012) from above mentioned seven data in order to identify potential REDD project sites.

[3] Hansen, M. C., P. V. Potapov, R. Moore, M. Hancher, S. A. Turubanova, A. Tyukavina, D. Thau, S. V. Stehman, S. J. Goetz, T. R. Loveland, A. Kommareddy, A. Egorov, L. Chini, C. O. Justice, and J. R. G. Townshend. 2013. "High-Resolution Global Maps of 21st-Century Forest Cover Change." Science 342 (15 November): 850–53. Data available on-line from: http://earthenginepartners.appspot.com/science-2013-global-forest.

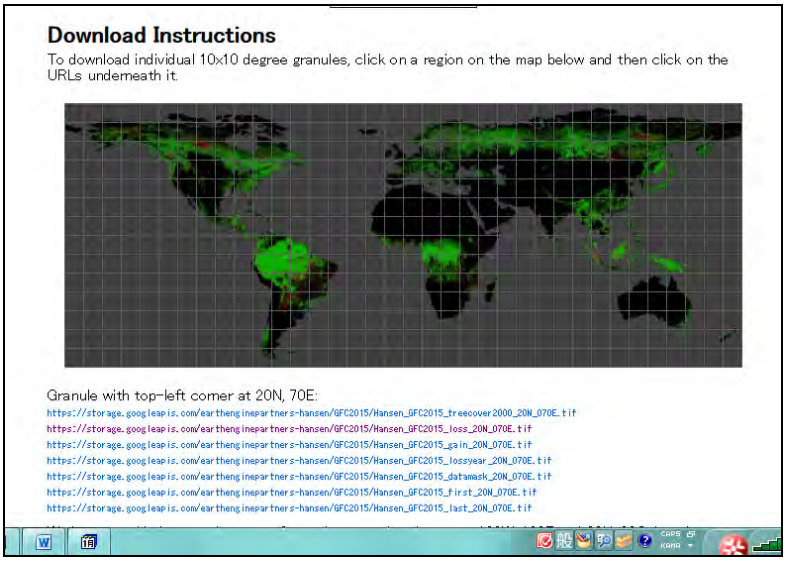
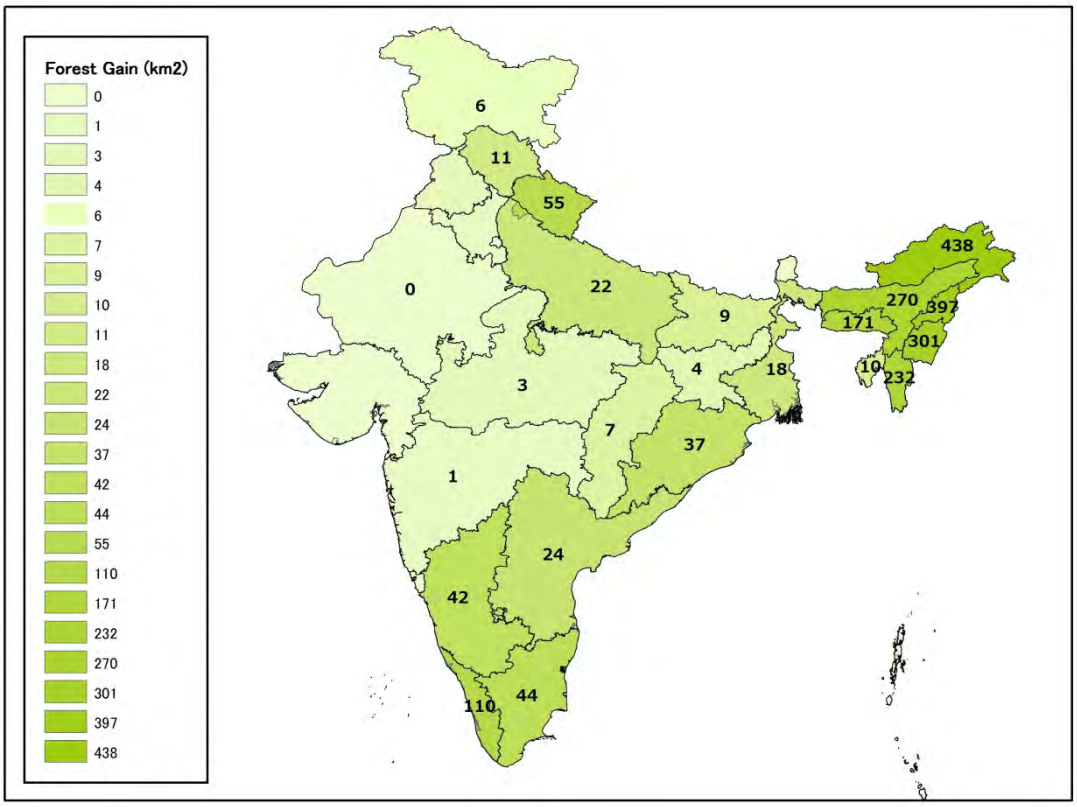


Figure 2. 5.12 Website of University of Maryland[4]

Data is downloadable with the tile unit of each 10 degrees. For this analysis, images with the range of N10～N40 and E70～E90 were obtained from the website.

(2) Result of analysis

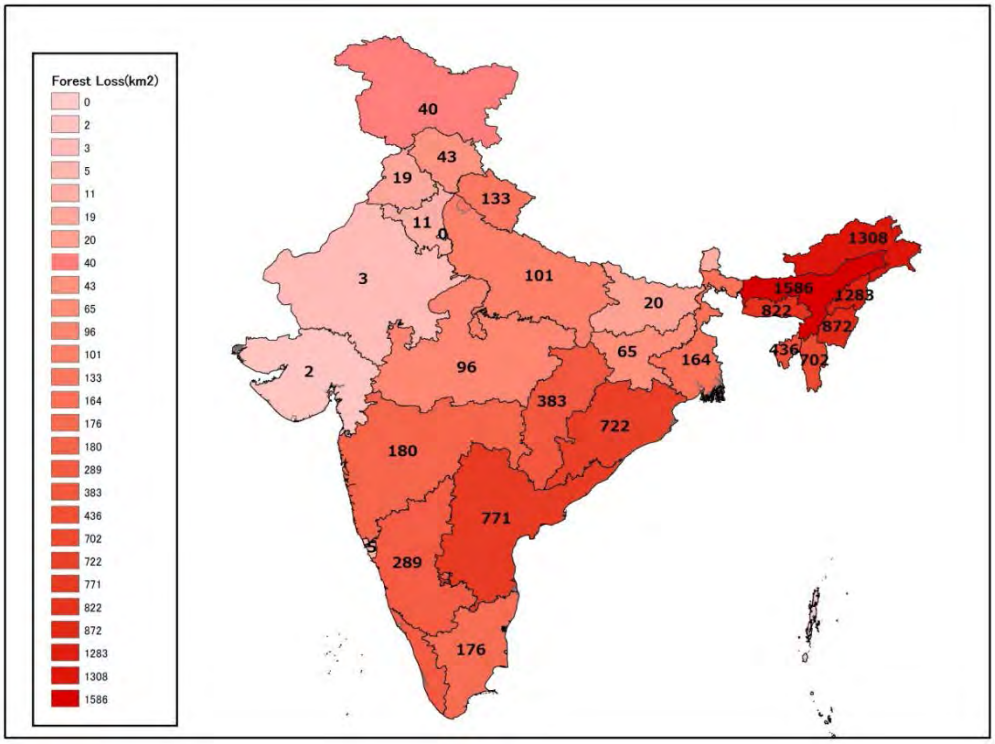
The results of analysis are as follows:



Source: Hansen et al., Science 2013

Figure2.5.13 Gain of Forest Area in Each State from 2000 to 2014 by Hansen Map.

[4] http://earthenginepartners.appspot.com/science-2013-global-forest/download_v1.2.html

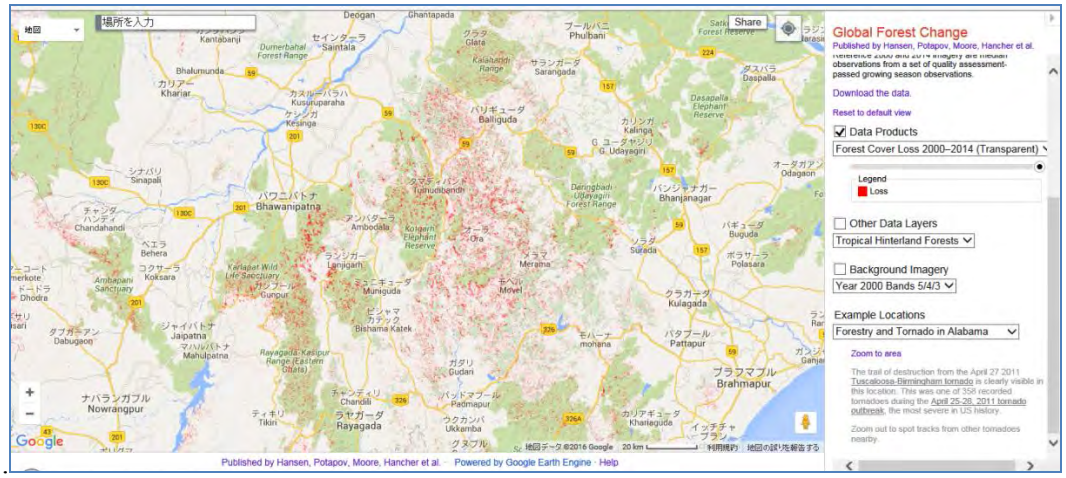


Source: Hansen et al., Science *2013*

Figure 2.5.14 Loss of Forest Area in Each State from 2000 to 2012 by Hansen Map

Figure 2.5.14 shows that the high intensity of forest loss is mostly seen in the Eastern states which is also indicated in the Figure 2.5.5. However, the states where the forest cover is on the increase in Figure 2.5.14 is different from those shown in Figure 2.5.5. This discrepancy between the results of analysis based on the FSI data and Hansen Maps might have partly derived from the limited capacity of remote sensing technique to capture the status of vegetation recovery, which has been reflected in the remote sensing data based Hansen Map. Furthermore, the data processing method might have also affected the results of analysis. Hansen Map is based on the calculation of decrease and increase in forest cover separately whereas FSI arrives at the forest cover changes as a composite figure of increase and decrease.

The advantage of Hansen map based analysis is that it provides images of forest loss and gain separately with geographical distribution. Fig 2.5.15 shows example of intense forest loss area in Orissa state. These information is quite valuable under stage of preliminary survey even though it is a general geographical map.



Source: http://earthenginepartners.appspot.com/science-2013-global-forest

Figure2.5.15 Forest Decreasing Area in Odisha published by Hansen Map

2.5.3 Comparative Analysis of REDD+ Potential in States

(1) Methodology

Several factors are to be considered when evaluating the potential of REDD+ projects. For example, these factors include potential to reduce GHG emission and robustness of implementation in a state. In this section, the potential of REDD+ implementation is evaluated by assessing forest dynamics over a period of time and current forest condition.

Firstly, it is important to clarify criteria in identifying a potential REDD+ project. Earlier, when the concept of REDD was introduced to the international platform, deforestation and forest degradation were the only elements to be considered. Based on these criteria, the area where the deforestation and forest degradation occurred in high frequency historically was considered as high potential area for REDD intervention. As the international discussion evolves, the scope of REDD+ interventions has widened to include enhancement of forest carbon stocks through the afforestation and sustainable forest management.

Under the current framework of REDD, five activities are regarded as REDD activities.

By the inclusion of afforestation as part of the REDD intervention, non-forest area, where afforestation can be undertaken, can now be REDD potential area while the current forest area as protection area under REDD. Thus, area of any forest condition at present and having any forest dynamics trends in the past can be REDD potential area.

Based on above discussion, following indicator for each forest density class has been drawn in selecting the REDD+ potential area.

Table 2.5.4 Definition of Indicators by Canopy Density Class

Forest Density Class	Indicators	Description
Dense forest	States where forest areas has decreased comparing 2007 with 2015.	High reduction of the dense forest area over a period of time indicates the degradation of the forest which requires intervention and thus, high potential for REDD+.
Moderately dense forest	States where forest areas has decreased comparing 2007 with 2015.	High reduction of the moderately dense forest areas suggests potential for enhancement of carbon stock for REDD+.
Open forest	States where forest area has increased comparing 2007 with 2015.	High increase in open forest area indicates the possibility for the vegetation recovery under the natural environment, which suggests effectively implementation of REDD+ interventions.

Source: JICA Survey Team (2016)

Deploying the above indicators, potential for REDD+ interventions has been assessed. The results of analysis are given in the following section.

(2) The result of evaluation

The changes in the forest areas under three forest density classes between 2007 and 2015 are given in the Table 2.5.5. The cells with shades in the table shows higher potential for REDD+ interventions for each density class according to the indicators shown in Table 2.5.4.

Table 2.5.5 Changes in the Forest Area between 2007 and 2015 by Forest Density Class (Unit: km^2)

States	Dense	Moderately dense	Open
Andhra Pradesh	68	1,048	-203
Arunachal Pradesh	-54	-255	204
Assam	-20	-290	241
Bihar	17	128	339
Chhattisgarh	-10	-192	-82
Delhi	-0	7	5
Goa	31	-44	86
Gujarat	0	-29	69
Haryana	0	-11	1
Himachal Pradesh	0	-2	30
Jammu & Kashmir	-237	-162	701
Jharkhand	-2	-236	822
Karnataka	4	-118	345
Kerala	80	-109	1,944
Madhya Pradesh	-18	-105	-115
Maharashtra	-27	-87	92
Manipur	26	451	-763
Meghalaya	39	83	-226
Mizoram	4	-393	-103
Nagaland	22	-202	-318
Orissa	-50	76	1,473
Punjab	0	2	105
Rajasthan	4	-24	155
Sikkim	0	-1	1
Tamil Nadu	67	253	2,687
Tripura	2	-161	-103
Uttar Pradesh	569	-503	54
Uttarakhand	-8	-563	316
West Bengal	-39	-472	4,345
Andaman & Nicobar	1,924	-1,720	-115
Chandigarh	0	4	1
Dadra & Nagar Haveli	0	-34	29
Daman & Diu	1	5	7
Lakshadweep	0	1	-0
Puducherry	0	17	-5

Source: Prepared by JICA Survey Team (2016) based on India State of Forest Reports 2007 and 2015 (FSI)

From the above results of analysis based on the changes in forest area, West Bengal and Orissa states among the survey states can be identified as high potential states of REDD. However, other relevant factors such as drivers of deforestation and forest degradation and land tenure should also be taken into consideration in addition to the results shown in this section, when finalising the assessment of the REDD+ potential.

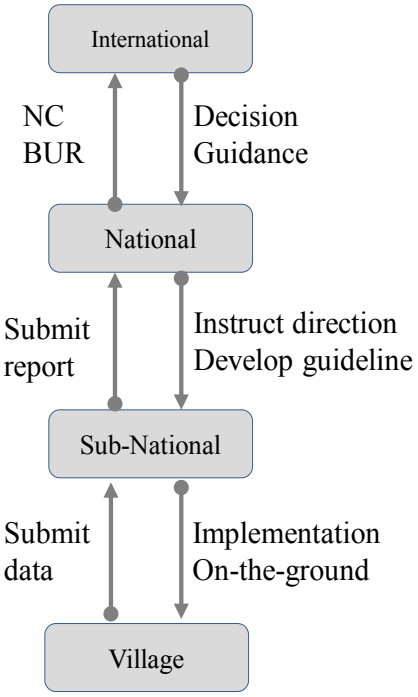
Chapter 3 Status of REDD+ in India

3.1 Requirements of REDD+ and Basic Understanding

3.1.1 Requirements for REDD+

At the implementation stage of REDD+, developing country Parties must fulfil relevant guidelines and/or UNFCCC decisions. In principal, the essence of REDD+ is no more than a set of guidelines on how to report on forest resources and forest management strategies and their results in terms of reducing emissions and enhancing removals of greenhouse gases with transparent manner.

In addition, relevant activities such as developing national action plan or securing safeguards need to be implemented. The following elements indicate major requirements for REDD+.



Source: JICA Survey Team (2016)

Figure 3.1.1 Interaction between Different Levels of REDD+ Domain

(1) Policies and measures

The literature of REDD+ repeatedly indicate the requirement of national "policies and measures" which is a set of legal, regulatory and administrative instruments that Parties develop and implement to achieve the objective of the REDD+. These policies can be specific to climate change mitigation or adaptation with impacts on greenhouse gas emissions and removals.

Many of Parties in the UNFCCC have by now established climate change strategies and response measures. The UNFCCC decisions call on countries to make an assessment of these drivers and to base the policies and measures on this assessment, such that the policies and measures can be directed to where the impact is the greatest.

(2) Forest Reference Emission Level (FREL)/ Forest Reference Level (FRL)

FREL and FRL serve as benchmark for assessing performance of implementation of REDD+ in countries. FREL will be employed for a country which undertakes to avoid deforestation and forest degradation. On the other hand, FRL will be applied for the country that undertakes to increase removals by increased carbon sequestration.

The main elements in the construction of FRL and FREL include

- Transparency
- Completeness
- Conservativeness
- Consistency

FREL/FRL shall be developed in national level but also be developed in sub-national scale and project level when it is necessary.

(3) National Forest Monitoring System (NFMS) and Measurement, Report and Verification (MRV)

In Decision 2/CP.15, developing countries are requested to develop National Forest Monitoring Systems and this is the key component in the management of information for national REDD+

programmes. NFMS has the functions of measurement, report and verification of actions and/or achievements of the REDD+ activities' implementation.

UNFCCC decisions encourage Parties towards employing both a combination of remote sensing and ground-based observations for measurements. Remote sensing is particularly suitable for the assessment of forest areas and stratification of different forest types. Ground-based observations include forest surveys to measure the carbon pools by field plot survey.

It is crucial to develop forest monitoring systems reported by states and/or a field ground level and reporting format clear under domestic institutions. These results are used for the data source of reports at international levels.

(4) Safeguards Information System

The Cancun agreement in 2010 lists seven safeguards in accordance with which REDD+ activities are to be undertaken, and which are to be promoted and supported.

The Subsidiary Body for Scientific and Technical Advice (SBSTA) under UNFCCC has been given the tasks towards providing guidance on systems for information on how REDD safeguards are being addressed and respected throughout the implementation of REDD+.

It is important that the guidance focuses not only on how information will be provided, but also in developing a clear framework on what kind of information is provided, and how it is monitored so that it is comparable at international level.

3.1.2 Scales of REDD+

The implementation of REDD+ is divided into four geographical scales. These are international, national, sub-national, and project levels.

The international level is the highest scale including UNFCCC and other international frameworks. Under the international level, is the national level. Its main functions are to design systems to monitor forests and to address international reports. The Sub-National level is located under the national level. Although, it has not yet been defined, it can be indicated as a state or an aggregation of villages by and large. The lowest level is a project. Although it has not also made its definitions yet, the projects of REDD+ indicated by VCS and administrative units including villages are generally applied. Each scale is interlinked by the relationship of "direction and report".

3.1.3 Results of COP21 and Paris Agreement

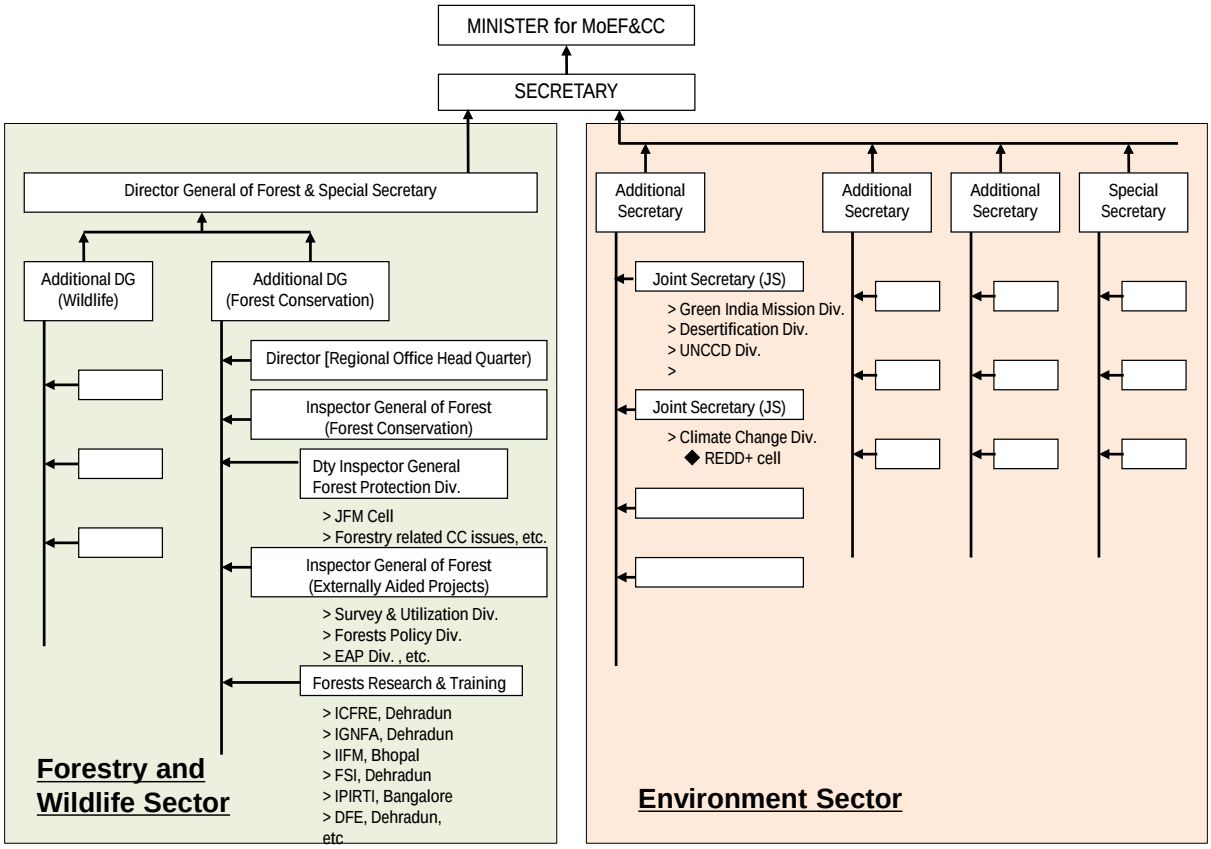
The Paris Agreement in 2015 includes an Article (Article 5) that focuses on the conservation and enhancement of forests, which are sinks and reservoirs of greenhouse gases. It encourages Parties to implement and support, including through results-based payments, existing frameworks for forest management that have been agreed under the Convention. This includes policy approaches and positive incentives for REDD+ activities. Parties are also urged to support and implement alternative policy approaches, such as joint mitigation and adaptation approaches, that promote forest management. In addition, the Agreement highlights the importance of incentivizing non-carbon benefits associated with such approaches. It urges building modern skills and technologies in forest management and forest resource use, among other sectors. There is also a focus on fostering global, regional, national and sub-national cooperation which can potentially strengthen bilateral cooperation on technology development, MRV and capacity building in the field of forestry.

3.2 Central Institutions and Their Roles in REDD+

3.2.1 Ministry of Environment, Forest and Climate Change (MoEF&CC)

MoEF&CC is comprised of two wings: Forestry and Environment. It is the responsible agency for planning, promotion, policy, management and project implementation of environment, forests and climate change as well as wildlife protection, forest management and conservation, pollution, environmental protection, and etc. Relevant research institutions providing support to the ministry include Indian Council of Forestry Research and Education (ICFRE), Indira Gandhi National Forest Academy (IGNFA), Wildlife Institute of India (WII), Indian Institute of Forest Management (IIFM)

and several other agriculture research institutes that extend training programmes on the forestry related subjects.



Source: http://envfor.nic.in/about-ministry/chart1-environment-wing

Figure 3.2.1 Organizational Structure of MoEF&CC

MoEF&CC also acts as a nodal agency for various international initiatives including United Nations Environment Program (UNEP), South Asia Co-operative Environment Program (SACEP), and International Centre for Integrated Mountain Development (ICIMOD), and United Nations Conference on Environment and Development (UNCED). It also serves as a coordinating organisation of the Commission on Sustainable Development (CSD), Global Environment Facility (GEF), Economic and Social Council for Asia and Pacific (ESCAP) and South Asian Association for Regional Co-operation (SAARC) on environmental issues.

As per the draft national REDD+ Policy, the major roles designated for MoEF&CC in REDD+ include the following[5]:

- Provide overall guidance and supervision to the REDD+ Cell
- Provide capacity building support at both national and sub-national levels and organize nationwide campaigns to support REDD+
- Designation of centres of excellence to support both national as well as state REDD+ Cells to provide capacity building support and execute other tasks required under the overall coordination of FSI and ICFRE.
- Provide guidance to FSI and other technical organizations like ICFRE, IISc, IIFM, etc. to develop accurate and cost effective forest carbon MRV. MoEF&CC, with the help of FSI, may nominate agencies at state level for MRV including additionality and leakages.

[5] Reference Document for REDD+ in India (2014)

- Constitute Monitoring Committee (s) to supervise and oversee the timely and accurate implementation of the REDD+ Reference Document.
- Facilitation of nationwide coordination for intra-sectoral as well as inter-sectoral cooperation.
- Effective implementation of REDD+ at national, sub-national and village levels.
- Work with NITI Aayog for enhancing REDD+ mechanism, through effective coordination between various ministries and departments for an integrated action.
- Development of strategy to mobilize requisite financial and technical support.
- Coordination of national communication to UNFCCC

(1) The REDD+ Cell

The establishment of REDD+ Cell was discussed during the launch of Green India Mission in 2010 under the NAPCC and is central to the implementation of REDD+ as per the REDD+ reference document and Draft Policy. Both document lay out clear role and responsibilities of this Cell. As per India's First Biennial Update Report to UNFCCC, recently submitted, the REDD+ Cell has been established under the MoEF&CC.

In National REDD+ Policy and Strategy document, the Government plans to establish National REDD+ Authority in the MoEF&CC, under a National Steering Committee on REDD+ assisted by REDD+ Cell.

As per the Reference Document for REDD+ the REDD+ Cell will play major role in REDD+ implementation at National and sub-national level. In the document other roles and responsibilities designated for REDD+ Cell are:

- Coordinate and guide REDD+ implementation activities across the country
- Assist MoEF&CC and other agencies in developing appropriate policies related to REDD+ implementation in India with the agreed international practices
- In collaboration with SFDs, identify REDD+ opportunities including projects
- Collaborate with the proposed State REDD+ Cell in managing and collecting all relevant information/data for REDD+
- Formulating appropriate guidance for ensuring resource mobilization and incentive distribution
- Active collaboration and engagement with Centre of Excellence in the country for providing technical guidance to support the States, SFDs and village institutions for REDD+ implementation.

The Reference Document for REDD+ has also proposed establishment of State REDD+ Cell to coordinate with National REDD+ Cell for REDD+ implementation at the State level. The proposed roles and responsibilities have also been defined in the document. The document has also listed major players involved in sub-national and local/district level.

The REDD+ cell is currently at an early stage of development under the Climate Change Division at MoEF&CC while some states have designated operational REDD+ cells. It is expected that once the REDD+ policy is approved, the process of development of the national REDD+ cell will be furthered with higher urgency.

(2) Climate Change Division

The Climate Change Division under MoEF&CC is the nodal agency for implementing climate change related mitigation and adaptation policies, programmes and projects in India. The division is responsible for climate change cooperation and global negotiations. It is also the nodal point for coordinating NAPCC. It chairs all work streams related to programmes and projects for climate change

mitigation and adaptation and also coordinates with the government on adaptation and mitigation work. It leads the development, monitoring and evaluation of emission reductions actions in all climate change sectors of India. It also lead the reporting of National Communication related to GHG emission from relevant sectors to UNFCCC.

(3) Green India Mission

The National Mission for a Green India (GIM) is one of the eight missions formulated under the National Action Plan on Climate Change (NAPCC) which was launched in 2008. The objectives of the mission are to protect, restore and enhance the decreasing forest cover of India. The mission will adopt the combination of adaptation and mitigation measures to enhance country's carbon sink. The implementation period for the plan is 10 years of 12th (2012 – 2017) and 13th (2017 – 2022) five year plan periods.

The sub-targets of the mission are as stated below:

- Improve forest/tree cover by 5 million ha on forest or non-forest land.
- Improve quality of forest/tree cover by another 5 million ha.
- Improve ecosystem services through treatment of an area of 10 m ha
- Increase livelihood of 3 million forest dependent households.
- Enhance annual CO_2 sequestration by 50-60 million tonnes by the year 2020.

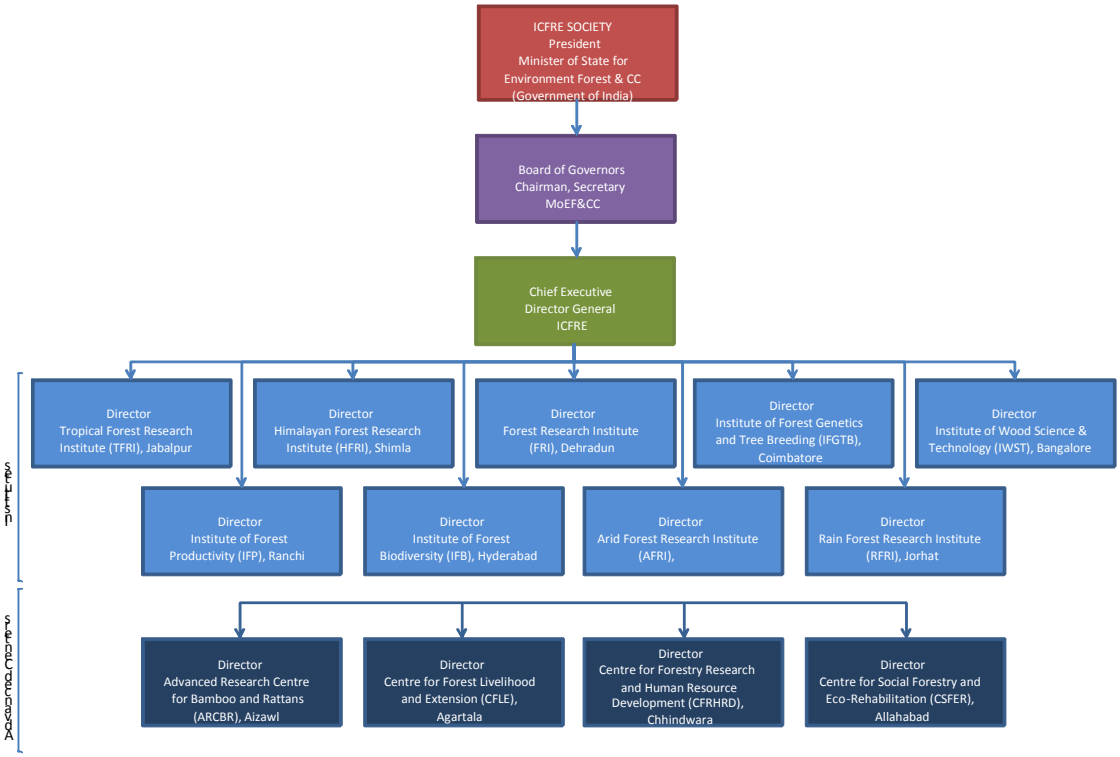
The total mission cost has been estimated to be Rs. 460 Billion. At present funding of over Rs. 13 billion (MoEF&CC, 2014) has been approved for various activities for implementation under the project. The mission relies on convergence of various schemes/funds like Mahatma Gandhi National Rural Employment Generation Act (MGNREGA), National Afforestation Programme (NAP), 14th Finance Commission, Integrated Forest Management Schemes, and etc.

The achievements so far include[6]: 1) preparatory activities underway in 27 states; 2) finalized implementation guidelines with extensive consultations; and 3) 11 states have submitted perspective plan covering 33 landscapes over working area of 85,000 ha.

3.2.2 Indian Council of Forestry Research and Education /Forest Research Institute (ICFRE/FRI)

Indian Council of Forestry Research and Education (ICFRE), an apex body in the national forestry research system, has been undertaking the holistic development of forestry research through need-based planning, promoting, conducting and coordinating research, education and extension covering all aspects of forestry. The Council deals with the solution based forestry research in tune with the emerging issues in the sector, including global concerns such as climate change, conservation of biological diversity, combating desertification and sustainable management and development of resources. ICFRE has nine Regional Research Institutes and four Research Centres located in different bio-geographical regions of the country to cater the forestry research needs of the nation. The mandate of the council is mainly catered on three directorates: namely, (1) Directorates of Research, (2) Directorate of Education and (3) Directorate of Extension.

[6] Source: India's Progress in Combating Climate Change, (MoEF&CC, 2014) .http://envfor.nic.in/sites/default/files/press-releases/Indian_Country_Paper_Low_Res.pdf



Source: JICA Survey Team (2016)

Figure 3.2.2 Organisational Structure of ICFRE/ FRI

(1) Directorate of Research

The Directorate of Research of ICFRE, through its Forests and Climate Change Division, is coordinating research pertaining to global warming and role of forestry sector in India. ICFRE has been granted the status of an observer organization in the United Nations Framework Convention on Climate Change (UNFCCC). The Directorate of research is involved in formulating policy on climate issues leading to international negotiations under the Convention. The Forests and Climate Change Division is also providing advisory role in conceptualizing, implementing, monitoring and evaluating the Clean Development Mechanism (CDM) and Reduced Emissions from Deforestation and Degradation (REDD+) projects in the country.

The specific mandate of the Forests and Climate Change Division is to carry out and coordinating research on following aspects of climate change in India:

- Vulnerability and adaptations of forest ecosystems
- Mitigation of climate change through forestry activities
- Greenhouse gas inventories in Forestry sector
- Socio-economic influences of climate change on forest-based communities
- Policy research on UNFCCC and Kyoto processes and their implications for India
- Potential of CDM and REDD+ in the country

(2) Directorate of Education

The mandate of Directorate of Education of ICFRE is to promote forestry education in Universities by providing financial support to them. In all, there are 26 Universities in India to which grant-in-aid is provided by the Directorate.

This Directorate also undertakes the Human Resource Development Programme such as organizing training on Basic Forestry Management Practices for scientists at the entry level and other training programmes for middle level senior scientists on "Research Methodologies" and "Research Management & Administration" with an objective to sharpen research skills and knowledge enhancement. In addition to these, recently two new thrust areas have been assigned to the Directorate of Education, namely, "Policy Research" and the "Disaster Management". Policy Research in arena of Forests, Wildlife and Environment is one of the important mandate of ICFRE. Recent events such as cyclone, tsunami etc. have triggered research interest in the field of disaster management to explore their mitigatory role in event of occurrence of such disaster, generate information & create awareness on the same.

(3) Directorate of Extension

The mandate of the directorate of extension is to develop forestry extension programmes and its propagation, environmental impact assessment (EIA) and allied activities and to collect, validate and disseminate statistics pertaining to the forestry sector of India.

3.2.3 Forest Survey of India (FSI)

Forest Survey of India (FSI), situated in Dehradun, is a premier organization under MoEF&CC, Government of India. The mandate of the organization is to conduct survey and assessment of forest resources in the country.

The major thrust areas of FSI covers Forest Cover mapping, Forest Type Mapping, Estimation of Growing Stock, Monitoring activity, and Training on GPS survey.

(1) Forest Cover Mapping

Since 1987 (assessment year), FSI is doing the country level satellite-based assessment of forest cover along with sample field assessment on biennial basis.

Over the years FSI has refined the methodology due to changes in the technology and the resolution of the satellite images. The details of India State of Forest Report (ISFR) are shown in Table 3.2.1

Table 3.2.1 Details of Satellite Imageries and Analytical Methods Used in India State of Forest Reports

Cycle of Assessment	Year	Satellite Data Period	Sensor	Spatial Resolution (meters)	Scale	Minimum mapping unit (ha)	Mode of interpretation/ Methodology of Change analysis
I	1987	1981-83	LANDSAT-MSS	80	1:1 million	400	Visual
II	1989	1995-87	LANDSAT-TM	30	1:250,000	25	Visual
III	1991	1987-89	LANDSAT-TM	30	1:250,000	25	Visual
IV	1993	1989-91	LANDSAT-TM	30	1:250,000	25	Visual
V	1995	1991-93	IRS-1B-LISSII	36.25	1:250,000	25	Visual & Digital
VI	1997	1993-95	IRS-1B-LISSII	36.25	1:250,000	25	Visual & Digital
VII	1999	1996-98	IRS-1C/1D-LISSIII	23.5	1:250,000	25	Visual & Digital
VIII	2001	2000	IRS-1C/1D-LISSIII	23.5	1:50,000	1	Digital
IX	2003	2002	IRS-1D-LISSIII	23.5	1:50,000	1	Digital
X	2005	2004	IRS-1D-LISSIII	23.5	1:50,000	1	Digital
XI	2009[7]	2006	IRS-P6-LISSIII	23.5	1:50,000	1	Digital/ Change Polygon[8]
XII	2011	2008-09	IRS-P6-LISSIII & IRS-P6 AWiFS	23.5 m 56 m	1:50,000	1	Digital/ Change Polygon
XIII	2013	2010-12	IRS-P6-LISSIII & IRS-Resourcesat2-LISS III	23.5	1:50,000	1	Digital/ Change Polygon

Source: India State of Forest Report-2013 and 2009

7 In 2009 cycle of SFR

8 Change Polygon in the forest cover map of previous cycle using current satellite data.

(2) Monitoring

FSI had been assigned the task of monitoring of area coverage and species wise survival percentage of plantations/Afforestation under FDAs [9]. Similarly under Compensatory Afforestation Fund Management and Planning Authority (CAMPA), plantation sites are being surveyed and the geo coded polygons are being uploaded by the State Forest Departments on web based e-Green Watch and FSI has a mandate to check the data quality, accuracy and completeness of the attribute information. FSI analyses the data on Google Earth and regularly send their reports to the MoEF&CC. Under Green India Mission (GIM), FSI is likely to be assigned the task of monitoring of plantations that would be taken up under the program.

1) Real time monitoring of Forest Fire[10]

From 2004 to 2011, FSI was monitoring forest fire incidences through remote sensing and GIS based Technology. FSI was doing near real time monitoring of forest fire through which alerts were sent to State Forest Department through SMS using a remote sensing based system developed by University of Maryland

From 2012 onwards FSI in collaboration with National Remote Sensing Centre (NRSC) has initiated a Realtime Monitoring of Forest Fire wherein the forest fire alerts from active fire locations are being generated as KML file which is Google compatible format. The alerts are sent to registered users via Emails and SMS. KML alert would be up to state level where as SMS alert would be up to District level. The Time lag of the information is less than 2 hours from the pass of satellite.

2) Carbon Assessment

FSI has been assigned the job of measuring, reporting and verification of carbon assessment for the relevant REDD+ components. Forest Carbon Accounting at national level has been institutionalized by making FSI the lead institution, which will have a networking approach involving other national level institutions. FSI has been one of the major contributors on Forest biomass estimation and carbon stock change.

3.2.4 Indira Gandhi National Forest Academy (IGNFA)

(1) Overview

The formation of present day IGNFA began with the Indian Forest College established in 1938 for the training of the forest officers. In 1987, it became a staff training institution of Indian Forest Services (IFS) and renamed as IGNFA. The aims of IGNFA include: 1) to prepare the IFS officers in the forest resource management; and 2) to enhance and upgrade the knowledge and skills of the IFS officers who are already in service. In addition to the training programmes for the IFS officers, IGNFA also provides capacity development programmes for other All India Service officers. Annually nearly 400 Indian Forest Service Officers are trained by IGNFA. An overview of the types of training programmes is given below.

Table 3.2.2 Training Programmes offered at IGNFA

Trainee Category	Trainees	Objectives
Professional Forestry Training (20 months training in the academy)	➢ New recruits of IFS	Train new IFS recruits in forest and forest resource management
In-Service Training for IFS Officers – Mid Career training (8 weeks and 4 weeks) and Workshops/ Seminars	➢ Mid-Career Training: IFS officers serving 7-9 years, 16-18 years, 26-28 years. ➢ Workshops/ Seminar: Senior Foresters, who have completed 25th, 30th, 35th and 50th years of service	Upgrade the skills of the IFS officers already serving
Sensitisation Programme for Officers from other Services (Starting from 3-5 days to one week programmes)	➢ Officers of All India Service (Administration, Police, Revenue, Railway Traffic, Judiciary)	Enhance district/ state level coordination between different services

Source: IGNFA

[9] National Afforestation Programme (NAP) Scheme: At A Glance
[10] http://www.fsi.nic.in/

In order to reinforce the knowledge base of the academy with the current issues in natural resource management and climate change, IGNFA has established four academic cells for REDD+, technology based monitoring of forest to introduce transparency, forest biodiversity, and sustainable livelihood and poverty alleviation.

(2) REDD+ Cell at IGNFA

IGNFA appointed an officer in charge of REDD+. The REDD+ cell discusses and informs the training programmes of IGNFA in the following aspects of REDD+: 1) international REDD+ framework; 2) modalities, procedures and current debate on negotiations; 3) national REDD+ framework; 4) construction of national forest reference level; 5) forest governance and implementation of REDD+ in India; 6) assessment of carbon stocks and MRV issues; 7) capacity building of stakeholders in REDD+ implementation; 8) REDD+ financing possibilities; and 9) other issues relevant to REDD+. Two Committees are constituted to facilitate the smooth functioning of the REDD+ cell. One is the Apex Academic Committee which plays an advisory role for the REDD+ cell. The other is the Core Academic Committee that looks after its day to day functions.

Box 3.2.1 Members of the Committees to support REDD+ cell constituted at IGNFA

- Apex Academic Committee on REDD-plus in relation to Global Warming and Climate change: MoEF&CC, FSI, ICFRE, WII, IIRS and other experts in the field of forests and climate change
- Core Academic Committee on REDD+ in relation to Global Warming and Climate Change: experts drawn from forestry institutions located in Dehradun and MoEF&CC.

Source: 2015 Future of REDD-plus. (IGNFA, 2015).

(3) REDD+ in the IGNFA Training Programme

Climate change aspects were incorporated in the course curriculum 5 years ago and REDD+ in particular became a subject area in the training programmes since 2012. At present the IFS probationers receive about 30 hours of input over a period of 20 days on Climate Change and REDD+. The trainees will learn the data collection methods and prepare a management plan/ working plan using the data collected. For this exercise, IGNFA has set up an REDD+ pilot site of 10,000ha comprising of a forest range (Timli Range of Kalsi Soil and Water Conservation Division, Uttarakhand). The exercises include the classification of the forest areas in the pilot site into three density classes at 1998, 2008, 2014 and estimate the degraded areas. In addition, enumeration of the growing stock by stratified random sampling and socio economic survey in the surrounding 21 villages to identify drivers of degradation are also undertaken.

For in-service training of Forest Officers, the course modules and materials on climate change and REDD+ have been finalised. The academy has developed modules and materials on payment of ecosystem services to be dealt in subjective specific workshops.

(4) Donor Assistance in IGNFA

USAID supported Forest PLUS Project has been discussing with IGNFA for its support in capacity development. They have a plan to develop course curriculum and reading materials jointly. Support from other donor organisations has not been much. The Academy has received some support from IUCN on NTFP and from UNDP on coastal biodiversity. Efforts of the Academy for outreach programmes are limited and it also faces difficulties in sourcing short term and long term resource persons to conduct various training programmes and workshops.

3.2.5 TERI

TERI is a leading research institute in the fields of energy, environment and sustainable development. It is one of the members in Prime Minister's Council on Climate Change, advising the council on NAPCC as well as GIM. TERI plays an important role in formulating institutional framework, implementation strategies, convergence of schemes, etc. for forestry projects under GIM in India.

REDD+ has been one of their main research area and published a number of documents. TERI also has 5 pilot sites where they undertake REDD+ pilot projects. Their expertise has informed the designing

process of the national REDD+ Policy and Strategy, architecture and institutional framework for India and will continue to play a key role in further out-scaling and up-scaling of REDD+ in India.

3.3 Acts and Policies related to REDD+

3.3.1 Existing Acts and Policies relevant to REDD+

India has a sound set of policies and legal frameworks for sustainable management and protection of forests, and safeguards of forest dependent communities. Also, the subject "Forestry" falls in the concurrent list of Schedule-VII of the Constitution of India that empowers both central and state governments to maintain and protect the forests.

Table 3.3.1 Existing Acts and Policies relevant to REDD+

Act/ Policy	Description
The Indian Forest Act, 1927	Enacted to manage forest resources of India[11]. The act relates to forest resource management, regulate movement and transit of timber and other forest produce and the duty that can be levied on these articles. Also, this act defines three categories of forests i.e. reserve forest, protected forest and village forest[12], as well as details of forest management in different situations, including actions to be taken in case of legal violations (Ministry of Law, 1927). However, the Act lacks in providing any definition of forest.
Forest (Conservation) Act, 1980	Enacted in 1980 to conserve the country's forests. The Act restricts use of forest land for non-forest purposes without prior approval from the Central Government (MoEF&CC, 2015).
National Forest Policy, 1988	The policy aims at maintaining environmental sustainability through preservation, restoration of ecologically disturbed areas, conserving the natural forest, soil and water conservation, checking desertification and increasing forest cover through afforestation and reforestation of degraded and unproductive land, with meeting the requirement of forest dependent communities and increasing the productivity of forests. The policy aims to bring at least 33% of total land area of the country under the forest cover (MoEF&CC, 1988).
The Indian Wildlife (Protection) Act, 1972	The act provides legal provisions on hunting and restrictions for protection of wild life, prohibition on picking, uprooting and damaging specified floral species, their purchase and procurement, etc. as well as prohibition of hunting and damages to be restricted and penalties to be imposed upon. The act also gives power to the central government to declare areas as sanctuaries or national parks[13].
The Scheduled Tribes and Other Traditional Forest Dwellers (recognition of forest rights) Act, 2006 (Forest Rights Act/ FRA, 2006)	The act recognizes the rights of forest dependent schedule tribes and other traditional groups who are dependent on forests since generations. The act provides rules and frameworks to ensure that these groups right are protected and the eligible forest dwellers are benefitted. The responsibility of implementation of this act lies with the state and union territories governments. The act aims to strengthen the forest conservation while safeguarding the forest dependent communities and their livelihood[14].
National Environmental Policy, 2006	Policy aims to guide the nation's response to the country's commitment to a clean environment, stated in the Constitution in Articles 21, 48 A and 51 A (g). The policy also encourages participation of different stakeholders in maintaining sustainable environment. The policy clearly states that for secure livelihood and well-being of human society, conservation of environmental resources are of utmost importance. The policy emphasizes on conservation and management of forest areas[15].

Source: Compilation by JICA Survey Team based on the relevant legal and policy documents (2016)

[11] http://envfor.nic.in/legis/forest/forest4.html
[12] http://beed.nic.in/htmldocs/pdf/Forest-act-1927.pdf
[13] http://envfor.nic.in/legis/wildlife/wildlife1c4.html
[14] http://tribal.nic.in/content/forestrightactotherlinks.aspx
[15] http://envfor.nic.in/sites/default/files/introduction-nep2006e.pdf

3.3.2 National Working Plan Code 2014

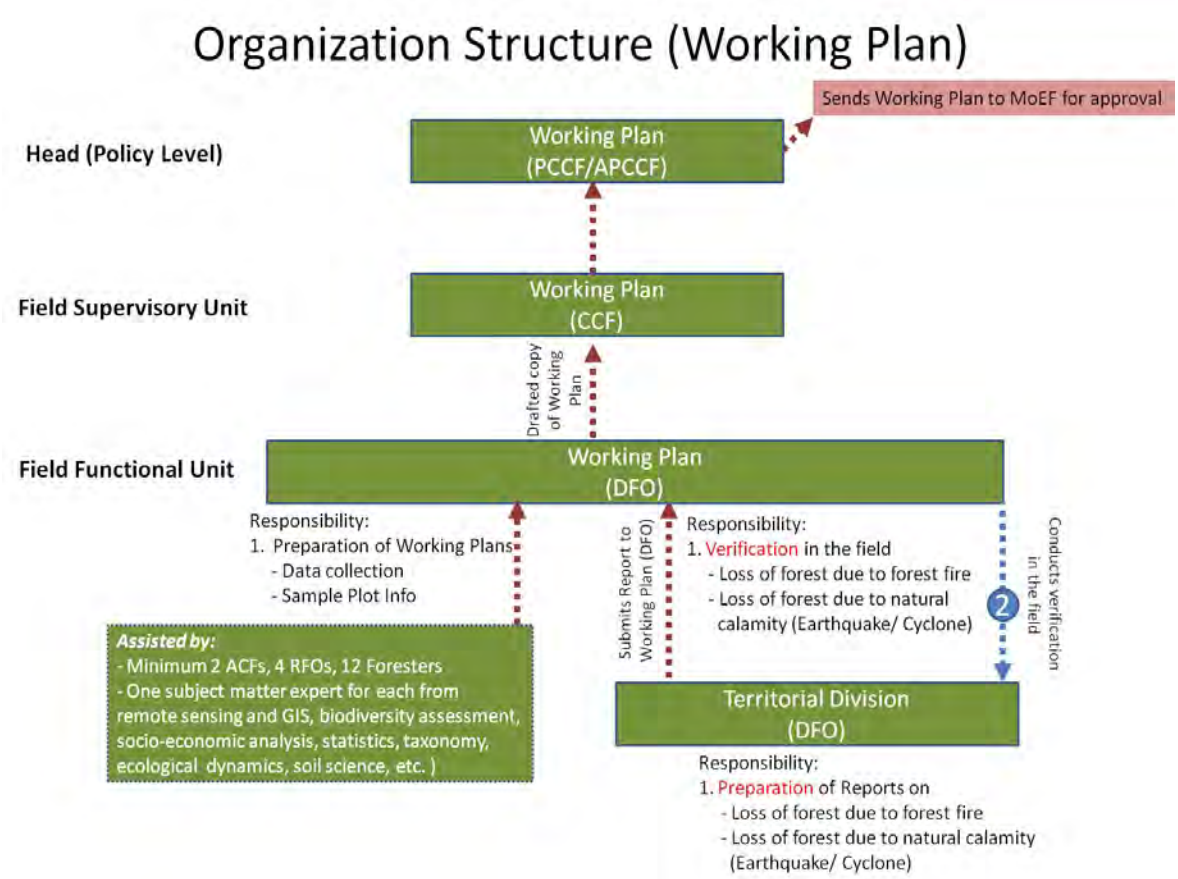
Working Plan has been the main instrument of forest planning (or more exactly forest working) in the country for scientific management of forests. It is a very useful document for evaluating the status of forests and biodiversity resources of a forest division, assessing the impact of past management practices and deciding about suitable management interventions for future. National Working Plan Code 2014 is the outcome of the project, 'Revision of National Working Plan Code 2004' assigned to the Forest Research Institute (FRI), Dehradun by the Ministry of Environment and Forests, Government of India. The Code was developed over a five-year period by involving as many organisations and individuals as possible.

The National Forest Policy clearly states "No forest should be permitted to be worked without an approved working plan by the competent authority". It is the duty of the manager or owner of the forest area to ensure the preparation of the working plan / scheme. The authority as designated by the MoEF&CC, will approve the working plan and ensure its implementation. Even working schemes have all major elements of a working plan and these schemes also need the sanction of the competent authority.

National Working Plan Code-2014 was framed for scientific management of forest for present day requirements. Under the new code, the concept of sustainability in forest management will include not only the sustainability of productive functions but also environmental functions (soil & water conservation, carbon sequestration etc.), and socio-economic benefits (meeting livelihood and basic needs) to forest dwellers and other forest dependent communities.

In recent times, involvement of forest fringe communities in the protection and management of forest resources through micro-plans and eco-development plans has become imperative. And therefore, provisions have been made to integrate aspects of forest management, which are considered important for assessing sustainability, accompanied by a set of related quantitative, qualitative or descriptive attributes.

Under the new system, more usage of new technological advancements like remote sensing, GIS, GPS, computational and analytical systems available for realtime monitoring of forest dynamics are advocated during working plan preparations. Also, random sampling technique for survey and assessment was replaced by systematic grid based sampling design with the aim of having qualitative and quantitative information at district level which may be integrated and up scaled to state and national level. REDD+, carbon sequestration and climate change along with importance of carbon measurement/assessment in monitoring changes is also stressed and incorporated.



Source: JICA Survey Team (2016)

Figure 3.3.1 Organisational Structure of Working Plan Division/Wing at State Level

3.3.3 National Action Plan for Climate Change (NAPCC)

In 2008, the National Action Plan for Climate Change (NAPCC) was released. The plan aims at creating awareness amongst the policy makers, public and private bodies and other stakeholders on the negative consequences of climate change in India and providing an overarching policy and financial framework to promote climate change related interventions. NAPCC recognizes that climate change can alter the distribution and quality of natural resources and impact adversely the poor of society by destroying sources of their livelihood.

NAPCC is guided by India's need to balance its economic growth with conservation of its natural resources and mitigating the impacts of climate change. Further, NAPCC is driven by India's strong view on a global vision of common but differentiated responsibilities and respective capabilities in addressing climate change (CBDR-RC). The actions laid out in NAPCC are guided by the following principles:

- Protecting the poor and vulnerable sections of society through an inclusive and sustainable development strategy, sensitive to climate change;
- Achieving national growth through ecological sustainability;
- Devising efficient and cost-effective strategies for end-use demand-side management;
- Deploying appropriate technologies for both adaptation and mitigation of greenhouse gases emissions;
- Engineering new and innovative forms of market, regulatory and voluntary mechanisms to promote sustainable development;

- Effecting implementation of programmes by including civil society and local government institutions and through public- private partnership; and
- Welcoming international cooperation for research, development, sharing and transfer of technologies.

There are eight core Missions of NAPCC. Objectives of each mission are stated in the table below. In addition, four missions are established recently including wind energy, human health, coastal resources, and waste-to-energy.

Table 3.3.2 Eight Core Missions of NAPCC

Mission	Objectives
Jawaharlal Nehru National Solar Mission	Aims to promote the development and use of solar energy for power generation and other uses with the ultimate objective of making solar competitive with fossil-based energy options.
National Mission for Enhanced Energy Efficiency	The mission aims to develop cost effective and energy efficient technologies.
National Mission on Sustainable Habitat	Aims to promote energy efficiency as a core component of urban planning
National Water Mission	Aims 20% improvement in water use efficiency through pricing and other measures and minimize wastage of water and ensure its equitable sharing across and within states
National Mission for Sustainable Agriculture	Aims to support climate adaptation in agriculture through the development of climate-resilient crops, agricultural practices and expansion of weather insurance mechanisms
National Mission for Sustaining the Himalayan Ecosystem	Aims to conserve Himalayan glaciers and mountains, maintain their biodiversity, forest cover, and other ecological values in the Himalayan region.
National Mission for a Green India	Aims to use both adaptation and mitigation measures to enhance carbon sink by sustainably managing forests and other ecosystems
National Mission for Strategic Knowledge	Aims to identify the gaps and challenges in climate change research and development work, gain a better understanding of climate science and ensuring high quality and intensive research in various sectors of climate change.

Source: JICA Survey Team (2016)

Other national and sub national programs under NAPCC are:

- National Clean Energy Fund
- State Action Plan on Climate Change
- NABARD: Progressing Adaptation Actions
- Auto Fuel Vision and Policy 2025
- Indian Network for Climate Change Assessment
- Expert Group on Low Carbon Strategies for Inclusive Growth
- Bilateral Cooperation on Environment and Clean Technology

The missions are progressing, some at a slow pace due to budgetary constraints.[16] GoI is in the process of adding more missions to the NAPCC to tackle issues related to waste management, promote wind energy and health issues in relation to climate change.

[16] http://envfor.nic.in/sites/default/files/press-releases/Indian_Country_Paper_Low_Res.pdf

3.3.4 State Action Plan on Climate Change (SAPCC)

In 2009, GoI directed all states to prepare their respective SAPCC, which should be consistent with the NAPCC strategies. SAPCC have been developed following a common framework and includes both mitigation and adaptation components to address climate change issues. As of 2015, 30 states and UTs prepared their SAPCCs[17]. Out of 30, SAPCCs of 19 states and UTs have been endorsed by the National Steering Committee on Climate Change[18]. Three SAPCCs are under consideration by the Expert Committee on Climate Change[19]. The actions prescribed in SAPCCs are to be funded by additional finance from the central government along with the states own budgets. The central government has setup a National Adaptation Fund for Climate Change which is currently accepting proposals to be funded[20].

3.3.5 Intended Nationally Determined Contribution (INDC) submitted in September 2015

India submitted its Intended Nationally Determined Contributions (INDC) to the UNFCCC on 1st October 2015. India has declared INDC on mitigation, adaptation, finance, technology and capacity building. As per its communication, India intends to reduce emission intensity of its GDP by 33% to 35% by 2030 taking 2005 as a baseline year. India has also communicated that it will create additional carbon sink of 2.5 to 3 billion tonnes of CO_2 through additional forest and tree cover by 2030. The document also indicated to take initiative towards full implementation of Green India Mission, Green Highways Policy, and Financial Incentives for forests, Plantation along Rivers, REDD+ and Compensatory Afforestation Fund Management and Planning Authority (CAMPA)[21].

The preliminary estimate in INDC shows that for implementing adaptation actions in agriculture, forestry, fisheries infrastructure, water resources and ecosystems, India would need around USD 206 billion (at 2014-15 prices) between 2015 and 2030. The document also communicates that India should quickly build capacity and create domestic framework for fast dissemination of cutting edge and innovative climate technology.

3.3.6 14th Finance Commission of India

14th Finance Commission, that determines the financial relationship between the central government and the states, made a change in fiscal transfer system to influence the forest management and protection system at the local level. The commission has assigned 7.5% weighting to forest cover in the allocation of revenue to states. This scheme will give forest protection and afforestation a significant lift by providing around USD 6.9 billion of transfers to the states based on their forest cover. It is anticipated that the amount may increase up to USD 12 billion by 2019-20. [22]

3.3.7 National REDD+ Policy and Strategy (Zero Draft)

India published the National REDD+ Policy and Strategy (Draft) in 2014. The policy aims to provide a strategic roadmap for effective and efficient implementation of REDD+ projects and programmes in India. The policy along with a follow on strategy will guide and help India achieve REDD+ readiness. The strategies developed will help gain benefit from REDD+ towards financial incentives for local communities. The document provides a brief summary of the historical development of REDD+ in India and its relevance for the country, how the current forest policy framework in India pans out for REDD+, essential element and framework for REDD+ in India, safeguard provision and strengthening stakeholder participation. Objectives of the Policy include the following:

[17] http://envfor.nic.in/sites/default/files/press-releases/Indian_Country_Paper_Low_Res.pdf
[18] http://envfor.nic.in/ccd-sapcc
[19] http://envfor.nic.in/ccd-sapcc
[20] http://pib.nic.in/newsite/PrintRelease.aspx?relid=124326
[21]http://www4.unfccc.int/submissions/INDC/Published%20Documents/India/1/INDIA%20INDC%20TO%20UNFCCC.pdf
22http://www4.unfccc.int/submissions/INDC/Published%20Documents/India/1/INDIA%20INDC%20TO%20UNFCCC.pdf

- Creation of REDD+ architecture at national and sub-national level
- Managing forest beyond carbon benefits
- Improving quality of forest and enhancement of forest
- Developing robust MRV mechanism for all ecosystem services and institutionalization of capacity building at national and sub-national level
- Construction of National Forest Reference Level
- Creation of institutional framework and governance structure for proper implementation of REDD+
- Safeguards of rights of the forest dependent communities and equal and effective participation of all the stakeholders in a transparent manner
- Creation of appropriate mechanism for channelizing fund flow to the communities in equal, fair and transparent manner
- Strengthening REDD+ Cell and establishing REDD+ authority at MoEF&CC

The Draft REDD+ Policy of India emphasizes protection of safeguards and livelihood of forest dependent communities. The policy targets that India should realize and take seriously in planning and policies of forest conservation and protection of India. Among other things, the draft REDD+ Policy aims to strengthen the REDD+ Cell in MoEF&CC, and create REDD+ architecture at National and Sub-National level. Roles and responsibilities of various institutions are indicated in the suggested framework.

3.3.8 Reference Document for REDD+ in India

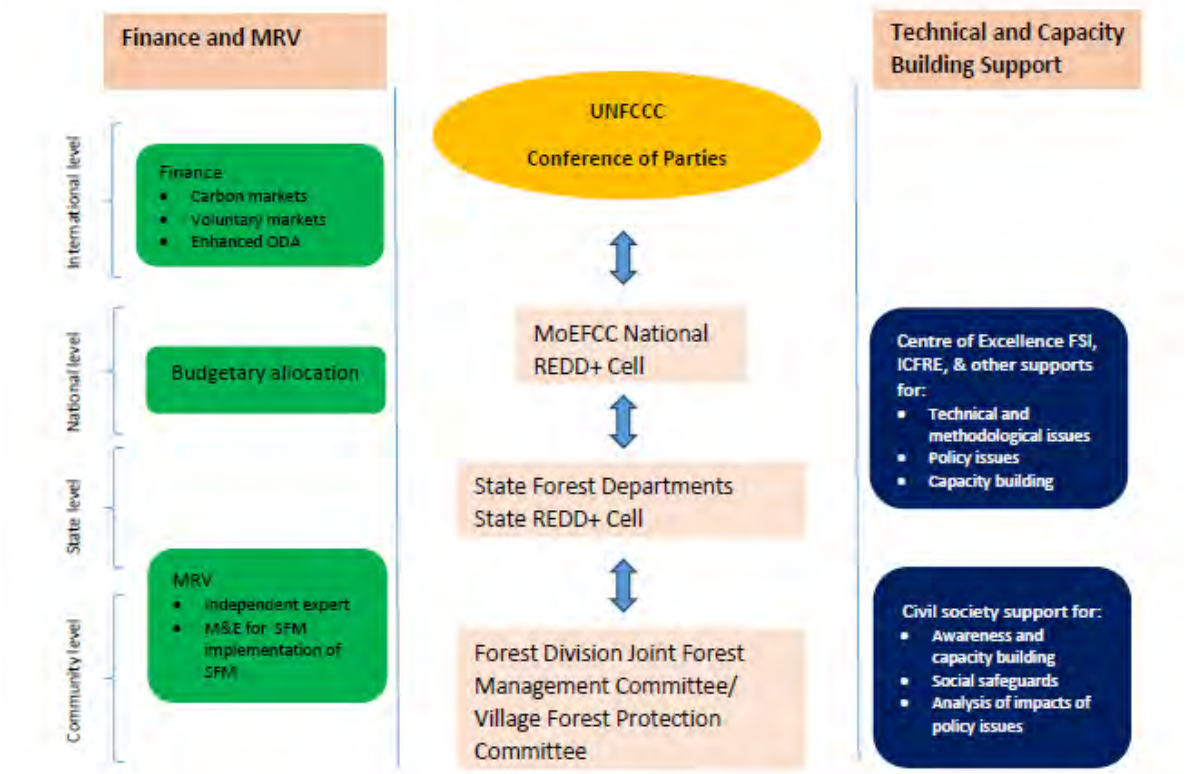
The Reference Document for REDD+ in India was released by the Central Government of India in December 2014. The reference document has a comprehensive outline on essential elements of REDD+ in the Indian context. This includes policy, processes, methodologies, roles and responsibilities, institutional arrangements and governance.

Box 3.3.1 Chapters in the Reference Document for REDD+ in India

1. Introduction and Overview: National and International Status of REDD+
2. National Policy Framework for REDD+ Implementation
3. Definitions: REDD+ in the Indian Context
4. Status of Current Forest Management Regime: Strengthening it to Support REDD+ Implementation
5. Construction of National Forest Reference Level
6. Implementation of REDD+: Institutions, Governance and Safeguards; Roles and Responsibilities; Financial Arrangements and Drivers of Deforestation and Forest Degradation
7. MRV Mechanism and Capacity Building for MRV
8. Capacity Building
9. Research and Knowledge Gaps in the Context of REDD+ in India

Source: Reference Document for REDD+ in India

The document provides broad overview on the national and international perspectives of REDD+. It provides strategies for effective and efficient of REDD+ implementation in India. Governance, institutional arrangements and capacity building requirement for REDD+ implementation in India have been explicitly explained. The document also provides guidelines when developing MRV, NFRL and safeguard information systems. The document assigns roles and responsibilities to all the stakeholders including MoEF&CC. It also describes the research and development need for REDD+ Readiness and implementation in India.



Source: Reference Document for REDD+ in India. Section 6. .

Figure 3.3.2 Institutional arrangement of REDD+ (adapted from Draft National REDD+ Policy)

3.3.9 Analysis of the Review of the relevant Policy documents related to REDD+

The following points emerged from the review presented in the preceding section. They throw insights on the policy environment surrounding REDD+ in India, which need to be kept in mind when designing a REDD+ related intervention.

- All the mechanisms have been developed with a view to source adequate financial and technical resources and adequate capacity in order to develop low emission and carbon sequestration programs and projects in the country.
- All measures and actions should be integrated together to achieve INDC or voluntary Nationally Appropriate Mitigation Action (NAMA) goals of the country.
- In context of forestry sector, all the mechanisms and policies aim at enhancing carbon sink and conserving the natural ecosystem and biodiversity of the country, addressing drivers of deforestation and forest degradation and REDD+.
- They all support rights of forest dependent communities and their livelihood.

3.4 National Forest Management System (NFMS) and Monitoring/ Reporting/ Verification (MRV)

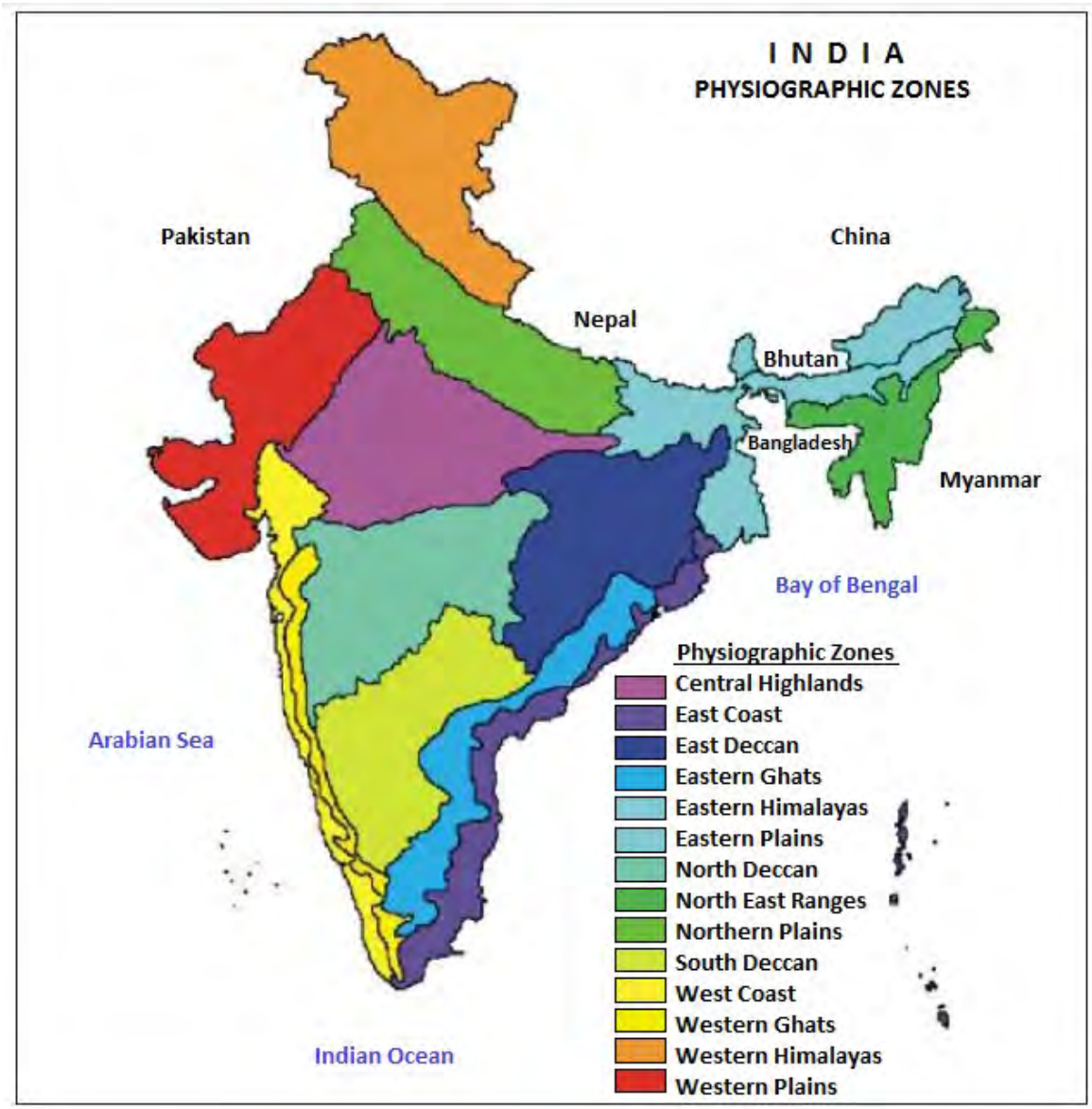
3.4.1 Current Methodology of National Forest Inventory (NFI)

The estimation of wood volume of forests, generally termed Growing Stock (GS), has always been an integral part of the Working Plan preparation of any forest division to estimate the annual yield. In the recent past, the precise information on growing stock has assumed a significant importance due to its role in estimation of biomass and carbon stock in the country's forests. In addition, the detailed and time series information on growing stock has become essential for implementation of REDD+ strategy in the country. As per the FAO and UNFCCC guidelines for implementation of REDD+ strategy, every country should have a National Forest Monitoring System (NFMS) under which three essential

components are satellite based land monitoring system, national forest inventories and Green House Gas (GHG) inventory.

FSI is following a two stage sampling design for national forest inventory. Under stage-1, the country is stratified into 14 homogeneous physiographic zones based on the physiography, climate and vegetation, where districts form the sampling unit. The 14 physiographic zones are listed in the table below:

1.	Western Himalayas (WH)	8.	North Deccan (ND)
2.	Eastern Himalayas (EH)	9.	East Deccan (ED)
3.	North East (NE)	10.	South Deccan (SD)
4.	Northern Plains (NP)	11.	Western Ghats (WG)
5.	Eastern Plains (EP)	12.	Eastern Ghats (EG)
6.	Western Plains (WP)	13.	West Coast (WC)
7.	Central Highlands (CH)	14.	East Coast (EC)



Source: Manual for National Forest Inventory of India', Forest Survey of India, MOEF, Dehradun, 2010

Figure 3.3.3 Physiographic Zones of India

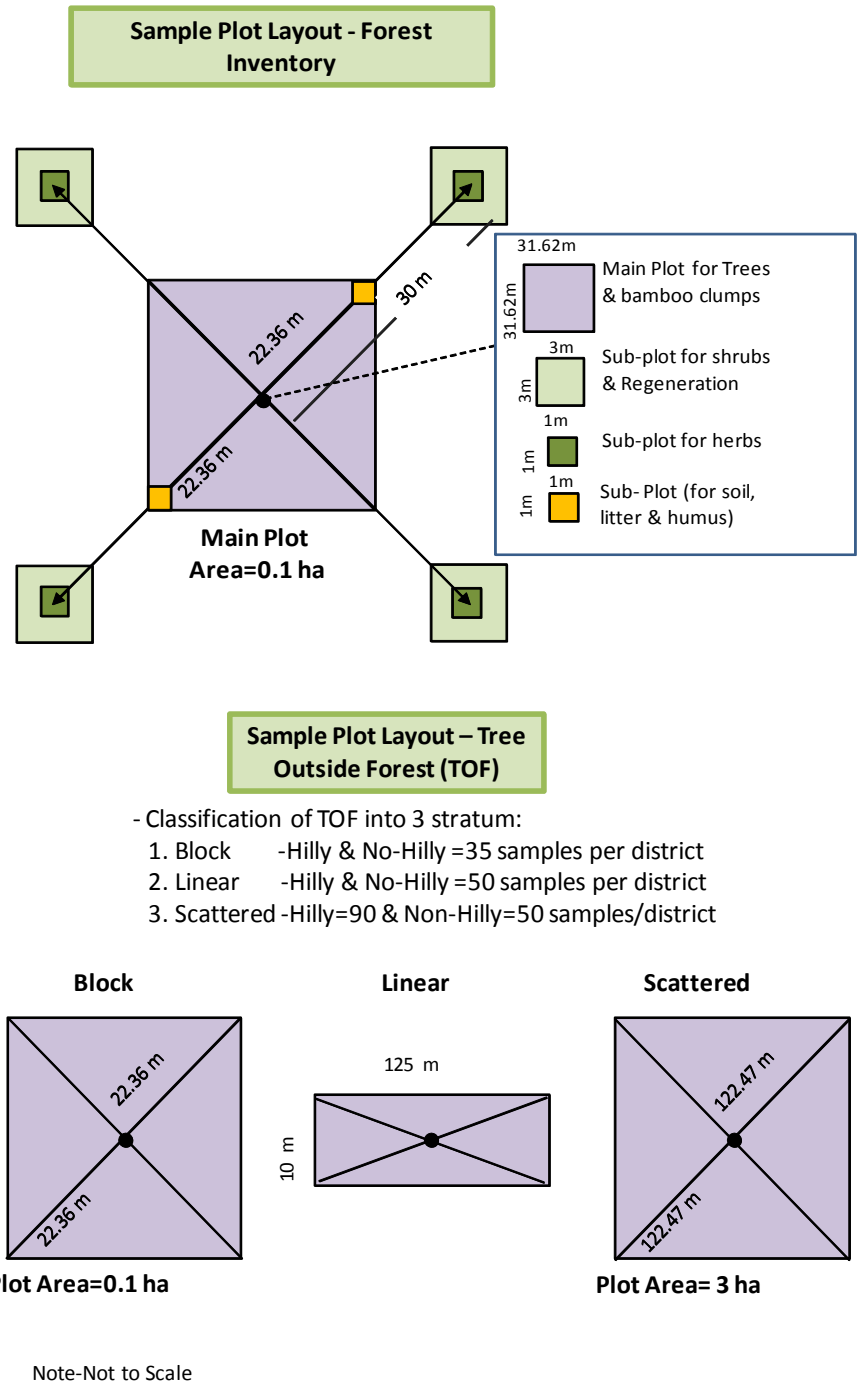
In total, a sample size of 10% districts (approximately 60 districts) distributed over all the physiographic zones in proportion to their size are randomly selected for detailed inventory of forest in a cycle of 2 years.

Under stage-2, the selected districts are divided into grids of latitude and longitude which form the second stage sampling unit.

For each selected district, Survey of India (SOI) topo sheets of 1:50,000 scale (15 minutes latitude and 15 minutes longitude) is divided into 36 grids of $2^1/_2$' x $2^1/_2$' which is further divided into sub-grids of $1^1/_4$' x $1^1/_4$' making a total of 144 sub-grids on each 1:50,000 topo sheet, thus forming the basic sampling frame. Each sub-grid is identified by the coordinate of SW corner point and a codification system is followed. For codification, south-west corner of each topo sheet is numbered as 0000, where first two digits depict 00 on X-axis (Longitude) and last two digits depict 00 on Y-axis (Latitude). Thus on both X-axis and Y-axis there would be 11 points in each axis, depicting SW corner of each sub-grid. Similarly codification system for coding SOI topo sheet (1:50,000 scale) is being used following a 6 digit code (e.g. 73A/9 is codified as 730109).

In total around 3500 geo coded sample plots from 60 districts covering all 14 physiographic zones are biennially covered. Since 2010, under NFI following information is being collected from each sample site:

- **Tree Information**
- **Shrubs and Herbs**
- **Intensity of regeneration**
- **Incidence of Fire**
- **Forest area under different land use**
- **Injuries to crops**
- **Grazing**
- **Presence of weeds and grasses**
- **Soil Information**
- **Humus**
- **Rockiness**
- **Bamboo Information**
- **Plantation Potential**
- **Biotic Influence**



Source: JICA Survey Team (2016)

Figure 3.3.4 Sample Plot Layout

3.4.2 NFMS & MRV

(1) Status of NFI

In 2002, FSI revised its methodology of national forest inventory (NFI) so as to have national level estimates of growing stock for both inside and outside the forest areas at an interval of two years and has been publishing this information in its biennial reports since 2003.

Data of percentage carbon content of most of the tree species have been obtained from different published literature by FSI. For few species, percentage carbon content was ascertained by

experimentation and for remaining an average of all other species was used. Standard formulae were used to calculate biomass and carbon content of each tree. The estimates of bamboo biomass and carbon stock are also calculated from NFI data.

(2) Status of Activity Data (AD) and Emission Factors (EF)

FSI conducted a study 'Greenhouse Gas Inventory in Forest Land Remaining Forest Land & Land Converted into Forest Land for the period 1994 to 2004 under Land use, Land use Change and Forestry (LULUCF)'.

The calculation of Green House Gas (GHG) inventories require:

- Information on extent of area (in case of LULUCF) of an emission/removal category termed as 'Activity data' and
- Emission or removal of GHG per unit area (removal of CO_2 per ha of added forest area) termed as 'Emission factors'

i) Methodology for estimation of Activity Data

To assess the extent of area (Activity data) under 'Forest land remaining forest' and 'Non-forest land converted to forest', FSI used a hybrid approach combining automated digital classification techniques with visual interpretation. For this purpose, satellite data pertaining to year 1994 had to be brought to compatible format vis-a-vis 2004 with regard to the scale and the technique of interpretation.

A) Forest Cover Mapping

The country level forest cover data is available with FSI on a two year cycle since 1984, although over the period there has been a significant change in the interpretation techniques and its scale, particularly since 2001. Prior to 2001, the satellite interpretation technique used by FSI was manual/visual and scale of mapping was 1:250,000 with a minimum mappable area of 25 ha. Since 2001, fully digital interpretation technique was adopted, and the scale of mapping was 1:50,000 with minimum mappable unit of 1 ha. Therefore in order to make the data of 1994 comparable with 2004, FSI redid the 1994 national forest cover assessment using freely available digital Landsat TM data of 1994 using digital interpretation technique at a scale of 1:50,000 using 3 forest density classes (Very dense-more than 70% density, Moderately dense- 40%-70% density, and Open- 10%-40% density) instead of 2 classes (dense and open) used earlier.

B) Forest Type Mapping

Recently, FSI has done mapping of forest types of India, according to Champion & Seth classification (1968) on 1:50,000 scale covering 200 types described in the classification. For the study various GIS data layers like soil, rainfall, temperature, remote sensing data, details from the working plans, thematic maps of FSI, inventory information etc. were used and supplemented with extensive ground truthing. Using the forest type maps, distribution of forest cover in different forest types has been determined for the country. After regrouping type groups, 14 forest type group classes and one plantation group were considered for Second National Communication (SNC).

C) Stratification of Activity Data

Since, carbon stored in the vegetation primarily depends upon canopy density and forest type, the two datasets were used by FSI as stratification variables, where canopy density wise spatial information was made available from 'forest cover mapping' and forest type wise information was generated under the national forest type mapping project by FSI. This resulted in 3 canopy density classes and 15 type group classes, and made 45 classes in total.

Table 3.4.1 Name of Forest Type Groups

Code	Forest Type Groups Name
1	Tropical Wet Evergreen Forests – North East
2	Tropical Wet Evergreen Forests – Western Ghats
3	Tropical Semi Evergreen Forests – North East

Code	Forest Type Groups Name
4	Tropical Semi Evergreen Forests – Eastern Deccan
5	Tropical Semi Evergreen Forests – Western Ghats
6	Tropical Moist Deciduous Forests
7	Littoral and Swamp Forests
8	Tropical Dry Deciduous Forests
9	Tropical Thorn Forests
10	Tropical, Sub Tropical Dry Evergreen & Broadleaved Hill Forests
11	Subtropical Pine Forests
12	Mountain & Moist Temperate Forests
13	Sub Alpine & Dry Temperate Forests
14	Alpine Scrub
15	Plantations/ TOF

ii) Methodology for estimation of Emission Factors

To measure exchange of GHGs between forest eco-system and the atmosphere which is eventually the change in carbon stocks over time, FSI has used Stock-Difference method (inventory based approach or periodic accounting) for estimating various emissions factors as recommended by Good Practices Guidance (GPG) developed by Intergovernmental Panel on Climate Change (IPCC). Not all the itemized emission factors are available for the years 1994 and 2004. However, the same have been estimated partly by using the NFI data collected during 2002-2008 and partly by conducting a special study between 2008 and 2010. The same factors have been used for both the year viz. 1994 and 2004.

The methodologies followed in deriving these factors include the following:

A) Above Ground Biomass (AGB) of Trees having DBH >=10 cm

Under NFI, at each sample plot all trees of diameter 10 cm and above were measured and trees less than 10 cm dbh are ignored. The woody volume of trees for each sample plot was calculated using volume equations developed by FSI for various species. As per the design, data from about 21,000 sample plots (0.1 ha size) had been collected between 2002 and 2008. Data of specific gravity and percentage carbon content of most of the tree species have been obtained from different published literature and for some species the carbon content is ascertained by experimentation and for others average of all other species was used.

B) Above Ground Biomass (AGB) of Branches, Foliage of Trees having DBH>=10 cm

Under NFI, trees with <10 cm diameter and small branches <5 cm diameter, foliage, fruits and twigs were not considered in volume estimation. In order to account for carbon stock contribution from these components, FSI undertook a special study during 2002-2008 to develop biomass equations of small wood and foliage for each such species by using a non-destructive method lopping-off of few branches of few trees. For this purpose, 20 important species were identified from each physiographic zone using a dbh class ranging from 10 to 90 cm. In the methodology biomass equations were developed taking dbh as independent variable and biomass of these components (woody branches <=5 cm, twigs, leaves, fruits and flowers) as dependent variable.

For biomass calculation, one normal tree of each diameter class of each species is selected and a 1 sq.m window in all four directions is opened in the crown until woody branches up to 5 cm diameter is reached. From such windows all woody branches up to 5 cm diameter, twigs, leaves, fruits and flowers are felled. Biomasses of all such parameters were separately recorded in the prescribed format.

C) Above Ground Biomass of Trees having DBH <10 cm

As stated above, under the special study during 2002-2008, for each of the identified 20 species from each physiographic zone, 3 trees of diameters 1-9 cm (at 1.37 m height) were felled. From the felled trees, separate biomass was calculated and recorded for wood, twigs and leaves in the prescribed format. Taking the dry biomass of wood/ foliage as dependent variable and dbh as independent variable, biomass equations were developed for each species.

D) Above Ground Biomass of Shrubs, Herbs, Climbers and Biomass of Dead Organic Matter (Dead wood and Litter)

As per the forest inventory study conducted during 2002-2008, it was revealed that about 15 clusters of 2 sample plots for each combination of forest density and forest type would suffice for estimating biomass/carbon factors for these components with 30% permissible error. For this purpose optimum numbers of sample points were visited and three concentric plots of size 5x5m plot (for collection of al dead wood >5cm diameter), 3x3m plot (for collection of (1) all woody litter <5 cm diameter and (2) uprooting of all shrubs & climbers along with weighing and recording separately) and 1x1m plots (for uprooting of all herbs, weighing and recording) were laid out at a distance of 30 ms from the sample point. Based on the data collected, carbon factors were developed for each forest type and density strata.

E) Organic Matter in Soil and Forest Floor

The data on forest floor (non-woody litter and humus) and soil carbon was also collected from each sample plot. For collecting data on humus and soil carbon, two sub-plots of 1x1m were laid out within the main plot. The forest floor from both the sub-plots was first swept and material so collected was weighed and a portion of the same was kept for carbon analysis. Further at the centre of these sub-plots, a pit of 30x30x30cm was dug and 200 gm of composite sample of soil was kept for organic carbon analysis. Samples of soil and humus were analysed using Walkley-Black method and were used for calculation of carbon factors.

F) Below Ground Biomass

Below ground biomass is not measured in NFI. It is being included using a relationship to above ground biomass which has been established by various researchers. On similar grounds, default ratios for six major global forest types, are provided in Good Practices Guidance (GPG).

3.4.3 National Level Carbon Estimates

In GIS environment, forest type map of 2004 was intersected with forest cover map of 1994 and 2004 individually, resulting in two maps having 45 strata, corresponding to each year. The resulting map of 1994 (with 45 strata) was overlaid on the map of 2004 (with 45 strata) to estimate forest type canopy by density (by strata):

- area of forest land remaining forest, and
- non-forest land converted to forest land

The geo coded point data layer of sample plots of NFI was overlaid on the resultant map with 45 strata. The NFI points falling on each stratum were identified. For each stratum, the plot wise information on all the parameters of each carbon pool, were then aggregated to have generalized factors for each stratum. Biomass and carbon factors were specifically developed for shrubs, herbs, climbers, dead wood and woody litter individually for each stratum. Multiplying activity data with these factors, different parameter wise total carbon for all the 45 strata were arrived at. This information was arranged into five carbon pools as follows: (1) Above Ground Biomass, (2) Below Ground biomass, (3) Dead wood, (4) Litter, (5) Soil. The aggregation of carbon content in five carbon pools resulted in National carbon estimates for 1994 and 2004. The difference between pool wise carbon estimates gave the net removal of carbon.

3.4.4 Coordination with State Governments

As per new working plan code, there has to be synergy with the data collection mechanisms between FSI and SFDs. FSI has taken SFDs on board to utilize the sampling design and formats developed by FSI under National Forest Inventory (NFI) in working plan preparations. Presently, state government forest departments are not being involved in the creation of four products generated by FSI.

3.4.5 QA/QC process

The quality assurance is the process that surveying/assessing institutions put in place to assure the quality of product/outputs prior to implementation of work, that covers defining objective along with terms and concepts, work plan, working manuals, capacity building of staff and officials, testing of all

procedures and methodologies before finalization, equations, indices, factors (carbon content, wood density, etc). The carbon stock estimation carried out by FSI uses four products:

1. Forest Cover maps
2. Forest Type maps
3. NFI data sets
4. Results of biomass study

All the products have been generated following the strict quality assurance processes specifically developed for each of the programme.

The quality control under processing that surveying/assessing institutions put in place for controlling the errors which may arise during the implementation of work, viz. data acquisition, data recording, coding, data entry, data processing, interpretation of results etc. As per FSI, the forest cover classification has an accuracy of 92%, the forest type classification which is used for carbon stock estimation has an accuracy of 88%, and the standard error percentage of the estimate of growing stock at national level arising from NFI is about 2%. The standard error percentage of the estimates of carbon contents of dead wood, woody litter and shrubs, climbers, herbs and grasses at national level arising from special biomass study is about 30% since 2010 these aspects are made part of regular NFI.

3.5 Forest Reference Emission Level (FREL) and Forest Reference Level (FRL)

Para 71 of decision 1/CP 16 (See Attachment 3.2.1) requests developing country parties to establish national FREL and/ or FRL. Alternatively, sub-national FREL and/or FRL may be established as an interim measure. In this case, the national circumstances, provisions contained in decision 4/CP 15 (See Attachment 3.2.2), and any further elaboration of those provisions adopted by the Conference of the Parties are required to be complied with. The national or sub-national FREL and/or FRL should contain robust forest monitoring system and provide required information on how the safeguards referred to in Appendix I to decision 1/CP 16 (See Attachment 3.2.3) are being addressed and respected throughout the project/program implementation.

3.5.1 Definition of REL/RL

REL and RL according to the agreement reached at COP 17 (Durban) are defined below.

Table 3.5.1 Definition of REL/ RL

REL/ RL	Definition
REL	Refers to emissions from deforestation and forest degradation and hence serve as a baseline for assessing country's performance in reducing emission from forests.
RL	Refers to conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon stocks i.e. the "+" part, hence serves as a baseline to assess country's performance in increasing sequestration in forests.

Source: COP 17 (Durban)

The REDD national FRL (REL and RL) can be prepared by measuring deforestation and forest degradation by spatial/remote sensing analysis, while for the "+" part, non-spatial analysis is required. The combination of spatial and non-spatial historic data projection can be done to assess the current as well as on future rate of deforestation and forest degradation.

3.5.2 Methods of Estimating National Forest Reference Level (NFRL = REL and RL)

Two types of methods for the preparation of reference levels for REDD+ are described below:

Historical Method: Based on the historical data where historical RL will be an average of past trends. For this method a defined start date is required. FSI in India has been monitoring forest change since 1987; however digitally interpreted RS data is available only from 2000. Hence 2000 can be taken as the start date. This could be the option best suited for India for estimation of its NFRL.

Projected/Modelling: Projected baseline will depict how deforestation or forest degradation rate in future can be changed. For this method econometric models are used, which use different data like socio-economic, policy and institutional factors which derives from forest change. However, it requires huge data collection, and hence is a more time and money consuming method.

3.5.3 Data Need for Establishment of National Forest Reference Level (REL and RL)

Since 1986, FSI has been publishing "State of Forests Report" on a two year cycle, which contains its findings on forest inventories. FSI uses two different methods of estimating carbon stock: 1) Activity Data, and 2) Emission Factor.

Table 3.5.2 Methods of Estimating Carbon Stock used by FSI

Type of Data	Descriptions
Activity Data	Definition: "Activity data, according to the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, are defined as data on the magnitude of human activity resulting in emissions or removals taking place during a given period of time"[23]. Methods for Estimating Activity Data: Forest Cover Mapping: This is done by Wall to Wall mapping using remote sensing data. Since 2001 digital interpretation of on a scale of 1:50,000 of Minimum Mapping Unit (MMU) 1 ha. Forest Type Mapping: FSI estimates forest cover by forest type, using GIS and remote sensing data and the mapping is based on Champion and Seth Classification (1968). The scale of mapping is 1:50,000. The method involves extensive ground truthing work. Through this method FSI has prepared district wise map of entire country. Stratification Activity Data: To get precision in the assessment of stratification is the best method. In this method FSI has selected strata based on relatively homogenous variables. The two stratification variables considered by FSI are "Canopy Density" and "Forest Type"
Emission Factor	Definition: "An emission factor is defined as the average emission rate of a given GHG for a given source, relative to units of activity"[24]. Methods for Estimating Emission Factor: FSI has used carbon-stock difference method for estimating various EF as recommended by LULUCF GPG. Above Ground Biomass (AGB) of trees having DBH ≥ 10 cm and bamboo AGB of branches, foliage, and trees having DBH ≥ 10 cm AGB of trees having DBH >10 cm AGB of shrubs, herbs, climbers and biomass of dead organic matter (DOM: dead wood and litter) Organic matter in soil and forest floor Below ground biomass (BGB)

Source: JICA Survey Team (2016)

The following table shows the model/ method that can be used for data establishing NFRL in India.

Table 3.5.3 Other Model/ Methods for NFRL

Model/ Methods	Description
GEOMOD	➢ Predict change between two land categories ➢ Used to analyse baseline scenarios of deforestation for carbon offset projects ➢ GIS-based land-use change model Parameters required: Beginning time, ending time, an image of the beginning time for two land cover types, suitability map that has already been created or driver maps

[23] http://unfccc.int/ghg_data/online_help/definitions/items/3817.php
[24] http://unfccc.int/ghg_data/online_help/definitions/items/3817.php

	Statistics: Non-linear multiple-regression Applicable Region/ Country: Continental :Africa, Asia and Latin America Country :Costa Rica and India Local :India, Egypt, United States and several countries in Latin America Applicability type: Avoided Unplanned Deforestation, Mosaic and Landscape-scale REDD Projects Relation to Indian data sets: FSI- LISSI and III, LANDSAT-MSS data
Chapman Richards Model	➢ Suitable for quantifying a growth phenomenon that exhibits a sigmoid pattern over time ➢ Employed in forest growth and yield modelling for long time. Parameters required: Stand description Statistics: Algometric parameter, Non- linear regression Applicable in Region/country: Tropical forest Applicability type: Improved Forest Management Relation to Indian data sets: NFI
CO2FIZ(CO2-fixation)	➢ Calculates the carbon balance with a time-step of one year ➢ Divided in six main modules: 1) Biomass Module; 2) Soil Module; 3) Products Module; 4) Bio-energy Module; 5) Financial Module; 6) Carbon accounting module Parameters required: Stand description Statistics: Regression Applicable in Region/country: Temperate and Boreal Forests Applicability type: Improved Forest Management Relation to Indian data sets: NFI

Source: JICA Survey Team (2016)

3.5.4 Methodology for Establishing FREL/ REL and Implications for India

The Draft National REDD+ Policy and Strategy indicates the methodology for establishing NFRL. The table below provides a review of the suggested methods with reference to the available data sets and technical capacity in India.

Table 3.5.4 Methodology for the preparation of reference levels for REDD+ in India based on the Draft National REDD+ Policy and Strategy for India and the Implications for India

Step	Implications for India
Define the pools and gases included in the reference level with a justification for their inclusion	Above-ground (including litter, herbs and shrubs), below-ground and soil carbon are the critical pools.
Specify the definition of forest used	India has defined forests for AR-CDM under UNFCCC. However, a separate definition will be required for REDD+ in order to maintain the consistency with the national definition followed by FSI for estimating forest cover.
Establish the historic time period within which emissions and removals will be estimated	2000-2012. The digital interpretation of remotely sensed (RS) data by FSI was initiated and the scale was refined to 1:50,000 in 2000.
Start of historical baseline period	2000. This is to coincide with the digital interpretation of RS data.
Describe the methods used to estimate forest carbon stocks for the selected time period	FSI has been monitoring and reporting forest area and has also initiated estimation of forest carbon stocks. FSI has adopted the stock change method for calculating forest carbon stocks, which is appropriate keeping in view the expertise, availability of historical data, and regularity of assessments. However, preparation of full national forest inventory on a repetitive basis at agreed (under UNFCCC) time intervals will be required by enhancing the capacity and infrastructure of FSI.
Estimate the area of forest annually converted to different land uses	Land use change matrix is being prepared by National Remote Sensing Centre (NRSC) periodically, which can be adapted for the purpose.

Step	Implications for India
Document past trends in forest conversion	This can be generated from NRSC and FSI maps and data.
Estimate the area of forest deforestation by each driver	This will be a challenge in India. No readily available data exists. NRSC could generate this. However, the changes may not be observed in the form of physical changes of forest such as changes in the stocks. The method adopted by FSI would take into account the resultant change in forest carbon stocks due to any reasons including deforestation and/or forest degradation.
Describe the methods used to estimate emission factors for deforestation	FSI has initiated the estimation of forest carbon stocks. Expansion factors and ratios to correlate different pools of forest carbon for different tree species or forest types, which are adopted by FSI, will be more appropriate than emission factors. However, expansion factors correlating different carbon pools for all species or forest types are not currently available. FSI and ICFRE will need to collaborate to develop more expansion factors and ratios for important tree species and forest types.

Source: JICA Survey Team (2016)

3.6 Safeguards Information System

3.6.1 Chronology of the Safeguards discussions at UNFCCC

REDD+ requires adequate safeguards for the governance and conservation of natural forest and biodiversity, as well as rights of local forest dwellers and forest dependent communities over forest resources. The chronology of the discussions on safeguard information system is given in the table below.

Table 3.6.1 Chronology of the Safeguards discussions at UNFCCC

UNFCCC COP	Decisions taken/ Discussions held
COP 16 (2010), Cancun	Seven (7) areas safeguard to be adopted at all phases of REDD+ (preparation, pilot, and implementation) projects in developing countries.
COP 17 (2011), Durban	Decisions were made on: 1) safeguard information system is to be established; and 2) the summary data on the safeguard is to be submitted.
COP 19 (2013), Warsaw	The timing and frequency of submission of the safeguard summary data was decided.
SBSTA 42 (2015), Bonn	These points were agreed upon and will be forwarded to the COP 23 to be held in Paris in 2015 for further review and recommendation. ➢ Seven (7) safeguard areas are to be explained taking into consideration of the country specificity. ➢ The safeguard system and process needs to be explained. ➢ The safeguard information in the developing countries needs to be improved on a step-wise manner.

Source: Midori-no-Chikyu (2015). Issue No 111. Japan International Forestry Promotion & Cooperation Centre.

3.6.2 UNFCCC safeguards for REDD+

The seven (7) areas to be safeguarded in REDD+ as agreed at COP16 are given below.

Table 3.6.2 UNFCCC safeguards

	UNFCCC Safeguards for REDD+
a)	The actions complement or are consistent with the objectives of national forest programmes and relevant international conventions and agreements
b)	Transparent and effective national forest governance structures, taking into account national legislation and sovereignty
c)	Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United National General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples

d)	The full and effective participation of relevant stakeholders ,in particular indigenous peoples and local communities, in the actions referred to in paragraphs 70 and 72 of this decision
e)	Actions are consistent with the conservation of natural forests and biological diversity, ensuring that actions referred to in paragraph 70 of this decision are not used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits
f)	Actions to address the risks of reversals
g)	Actions to reduce displacement of emissions

Source: Cancun Safeguard, UNFCCC (2010)

3.6.3 A Brief Review of the Available Safeguard Standards

Based on the UNFCCC safeguards for REDD, various actors in REDD+ have developed the safeguard standards. This section provides a brief review of safeguard standards that may be applicable to the REDD+ projects in India.

1) UN-REDD (Social and Environmental Principles and Criteria/ SEPC)

UN-REDD/ SEPC was developed based on the Cancun safeguards and shared and has been discussed in the UN-REDD Programme Policy Board Meeting in Asuncion, Paraguay. The objectives of the Principles and Criteria are:

- To address social and environmental issues in UN-REDD National Programmes and other UN-REDD Programme funded activities.
- To support counties in developing the national approaches to REDD+ safeguards in line with the UNFCCC.

Table 3.6.3 UN-REDD Social and Environmental Principles and Criteria

Description of Principles	
Principle 1	Apply norms of democratic governance, as reflected in national commitments and multilateral agreements
Principle 2	Respect and protect stakeholder rights in accordance with international obligations
Principle 3	Promote sustainable livelihoods and poverty reduction
Principle 4	Contribute to low-carbon, climate-resilient sustainable development policy, consistent with national development strategies, national forest programmes and commitments under international conventions and agreements
Principle 5	Protect natural forest from degradation and/ or conversion
Principle 6	Maintain and enhance multiple functions of forest including conservation of biodiversity conservation and provision of ecosystem services
Principle 7	Avoid or minimise adverse impacts (direct and indirect) on non-forest ecosystem services and biodiversity

Source: UN-REDD Programme Social and Environmental Principles and Criteria, 25-26 March 2012, Asuncion Paraguay

2) Forest Carbon Partnership Facility (FCPF/ World Bank)

FCPF is comprised of Readiness Fund to support countries to improve REDD+ readiness and Carbon Fund to provide payments for the verified emission reductions from the countries that have made significant progress in REDD+ readiness. The participants to the Readiness Fund agreed to adopt a common approach to the environment and social safeguards comprised of social and environmental safeguard, stakeholder engagement, disclosure of information and grievance redressal mechanism at the national level and etc. The participants to the Carbon Fund observe the World Bank Safeguard Policies and Procedures and have not developed its separate guideline.

3) REDD+ SES (REDD+ Social and Environmental Standard)

REDD+ SES gives emphasis on the rights of the indigenous peoples and local communities including free, prior and informed consent (FPIC), effective participation of women and vulnerable and marginalised groups, equitable benefit sharing and enhancing biodiversity and ecosystem service. The standard is comprised of seven principles which are further specified as criteria and indicators.

Table 3.6.4 Definition of Principles, Criteria and Indicators of REDD+SES

	Definition
Principles	Provide the key objectives for high social and environmental performance of REDD+ strategies and activities
Criteria	Define the conditions to be met related to processes, impacts and policies in order to deliver the principles
Indicators	Define quantitative or qualitative information needed to show progress achieving a criterion

Source: http://www.redd-standards.org/process-for-using-redd-ses (Retrieved on 5th Nov 2015)

The country specific interpretation to the indicators can be incorporated through stakeholder consultation. REDD+SES guidelines are developed indicating the 10 steps to apply the REDD+ SES.

Table 3.6.5 REDD+ SES Principles

Principle	Description
1	The REDD+ Program recognises and respects rights to lands, territories and resources.
2	The benefits of the REDD+ program are shared equitably among all relevant rights holders and stakeholders.
3	The REDD+ program improves long-term livelihood security and well-being of Indigenous Peoples and local communities with special attention to women and the most marginalized and/ or vulnerable.
4	The REDD+ program contributes to good governance, to broader sustainable development and to social justice.
5	The REDD+ program maintains and enhances biodiversity and ecosystem services.
6	All relevant rights holders and stakeholders participate fully and effectively in the REDD+ program.
7	The REDD+ program complies with applicable local and national laws and international treaties, conventions and other instruments.

Source: http://www.redd-standards.org/process-for-using-redd-ses (retrieved on 5th Nov 2015)

4) Climate Community Biodiversity Standards (CCBS)

CCBS is a standard that can be applied at project level REDD+. The indicators overlap with the REDD+ SES except the national forest governance structure. It gives more emphasis to respect for the rights and generation of benefits for the communities affected by the projects and impacts on the biodiversity. Validation and verification of the project design documents (PDDs) and implementation reports are undertaken by the independent auditors as per "Rules for the user of the CCB Standards". Once it is verified, CCB label can be added to the Markit VCS registry and APZ VCS registry.

The assessment report will be comprised of four sections: general, climate, community and biodiversity. The climate section is not required for projects that have met the requirements of a recognised GHG programme.

3.6.4 Policies and Laws in India relevant to REDD+ Safeguards

India has a comprehensive policy and legal framework for governance of forest resources. The following documents guide the governance of the forest, forest produces and biodiversity: The National Forest Policy, 1988, Indian Forest Act, 1927, State Forest Acts (Amendments to the Indian Forest Act 1927), Wildlife Protection Act, 1972, Forest Conservation Act, 1980, Biological Diversity Act, 2002 and Forest Rights Act, 2006.

A strong foundation exists in the country for conservation of natural forest and participatory forest management. The Government of India has issued Joint Forest Management Circulars and Guidelines, and implements National Afforestation Programme and Green India Mission, which promote sustainable forest management with the participation of local forest dependent communities. These efforts have facilitated establishment of several models of participatory forest management in the country. The Provisions of Panchayat (Extension to the Scheduled Areas) Act, 1996 (known as PESA)

empowers the Gram Sabhas and Panchayats in Fifth Schedule Areas[25] to govern and manage local natural resources including forest and minor forest produces. The country has several other social safeguards under different provisions of the Constitution of India and other legislations for the Scheduled Tribes (ST) and Scheduled Castes (SC). STs hold the major constituency of the forest dwellers in India. The Constitution of India provides social, economic and political guarantees to the STs and SCs under different articles of Indian Constitutions [Art. 14, 16, 46, 275 (1) 342, 338, 339 (1) etc.]

An overview of the relevant laws and policies is given in the table below.

Table 3.6.6 Description of important policies, laws, rules, programmes relevant for ensuring UNFCCC safeguards for REDD+

	Policy/Laws/Rules/ Government Orders	Important provisions/ features/ safeguards
1	National Forest Policy 1988	➢ The National Forest Policy brought a radical departure from the conventional forestry governance to a decentralized forestry governance involving communities living in and around forest. It provided a primacy for ecological role of forest. Some salient features are: ◆ High priority to environment and basic needs and economic benefits become last priority ◆ Needs of tribal and local communities first charge on forests ◆ Ban on clear felling of natural forests ◆ Restrictions on introduction of exotic species in forest ◆ No Mining leases without sufficient safeguards in place ◆ No subsidy to industries and industry to depend on farmers for raw materials
2	Indian Forest Act 1927	➢ The act consolidates the law for forest and forest product management, transit of forest produces, duty to be levied on forest produces etc. It empowers the forest officials to protect and manage forest. ➢ Section 28 provides for declaration/ formation of village forest and management of forest involving the local communities.
3	Forest (Conservation) Act, 1980 (with amendment till date)	➢ The Act provides a central oversight and regulations for forestland diversion for non-forestry purposes. Prior clearance is required from relevant authorities under the Forest (Conservation) Act, 1980 for diversion of any forestland for non-forestry purposes. The State Governments can't de-reserve any forestland or authorize its use for any non-forest purposes without prior approval from the Central government.
4	Biological Diversity Act 2002	➢ The Act provides for institutional mechanisms and functions for biodiversity conservation in the country. The Act provides for constitution of the National Biodiversity Authority (NBA), State Biodiversity Boards and Biodiversity Management Committees at the local level to ensure biodiversity conservation and disapprove any activity that is detrimental to protection of biodiversity. ➢ The Biodiversity Management Committees constituted at the local level are expected to work for preservation of habitats, conservation of land resources, folk varieties and cultivars, domesticated stocks and breeds of animals and microorganisms. The Act provides for the mandatory environmental clearance of the projects that may be detrimental to the biological diversity of an area. ➢ NBA has powers to decide the intellectual property rights and no person is allowed to obtain intellectual property rights except with the prior permission of the NBA. It decides the benefit sharing mechanism between communities and may grant joint ownership of intellectual property to the communities.

[25] Fifth Scheduled Areas are the areas declared under the 5th Schedule of the Constitution of India. These areas are in Andhra Pradesh, Bihar, Gujarat, Himachal Pradesh, Madhya Pradesh, Maharashtra, Orissa and Rajasthan.

	Policy/Laws/Rules/ Government Orders	Important provisions/ features/ safeguards
5	The Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006	➢ The Act recognizes and vests forest rights and occupation on forest land in forest dwellings to scheduled tribes and other traditional forest dwellers who have been residing in such forests for generations but whose rights could not have been recorded. The Act provides for a framework for recording the forest rights so vested and the nature of evidence required for such recognition and vesting in respect of forest land. ➢ As on May 2015, 4.36 million forest rights claims have been received by the Government, which include 4.25 million individual claims, 107,182 community claims and 4,814 Community Forest Resource claims. 80.57% of claims have been disposed of. 1.65 million titles have been distributed including 1.617 million individual titles, 35,267 community titles and 2,148 community forest resource rights.[26]
6	The Provisions of the Panchayat (Extension to Scheduled Areas) Act (PESA)	➢ PESA, 1996 is a historic move by the Union Government to empower Scheduled Tribes for local self-governance in Scheduled Areas. It empowers the Gram Sabha for approving and sanctioning all matters affecting tribal society, economy and polity, to have its own representative system of governance. It has also far reaching ecological consequences as it restores the primary control of Gram Sabha over natural resources. It clearly endows the Gram Sabha ownership right over Minor Forest Produces, which is the major source of livelihood for millions of tribal people in the Scheduled Areas.
7	Environment (Protection) Act, 1986	➢ This Act is the umbrella legislation, which provides a holistic framework for the protection and improvement of environment by preparation of manuals, codes or guides for prevention, control and abatement of environment pollution.
8	The National Environment Policy, 2006	➢ The main concerns of the Policy are the conversion of wetlands and forest land into agricultural land; adverse impacts from intensive agriculture, the adverse impacts of use of chemical fertilizers and pesticides. It seeks to fill a gap that still exists; it does not displace, but builds on the earlier policy.
9	Joint Forest Management Circulars and Guidelines	
	JFM Circular June 1990 (MOEF)	➢ After the promulgation of National Forest Policy, the state controlled degraded forests were opened to regeneration, protection and management in collaboration with the local village communities. In June 1990, the Ministry of Environment and Forest, Government of India, issued a circular to all the states asking them to initiate process for joint management of forest along with the local communities to protect and manage degraded forest.
	JFM Guidelines, Feb 2000 (MOEF) JFM Guidelines, December 2002 (MOEF)	➢ Revised JFM guidelines were issued by the MOEF in 2000 and 2002 to strengthen JFM in the country. JFM Guidelines of 2000 urged for extension of JFM in good forest areas; clarified the membership and mandated the participation of women; suggested for legal back up of the JFMCs. It also emphasized the preparation of micro plan for JFM areas and inclusion of JFM overlapping circle in the new Working Plans. ➢ JFM Guidelines 2002 emphasized the signing of MOU between JFMCs and Forest Dept.; management of NTFPs; collaborations with Gram Panchayats; capacity building of JFMCs to manage forest and forest products.
	Resolutions and Rules on JFMC by different states	➢ Following these guidelines there were 112,816 committees (as on March 2010) protecting around 24.64 million ha of forest in the country. Each state has come out with its own government order to deal with JFM (28 states). Some states have also come up with their own JFMC rules.

[26] Source: http://tribal.nic.in/WriteReadData/CMS/Documents/201508100959332745375MPRfortheMonthofMay2015.pdf (25 Oct, 2015).

	Policy/Laws/Rules/ Government Orders	Important provisions/ features/ safeguards
10	National Afforestation Programme (NAP)	➢ NAP started during 2002 by up-scaling of Samnavit Gram Vanikaran Samridhi Yojana (SGVSY), which aimed at synthesizing the four different but similar afforestation and reforestation interventions implemented by the MoEF. The programme devises JFM committees (JFMCs) and Forest Development Agencies (FDAs) at the division level which functions as a federation of JFMCs. During 2010-11, State Forest Development Agencies were created in 28 states. From the inception to the end of 2014-15, Rs. 3.5billion was spent to treat an area of 2.09 million ha.
11	Green India Mission	➢ The National Mission for Green India (GIM) is one of the eight Missions outlined under the National Action Plan on Climate Change (NAPCC), which aims to protect, restore and enhance the diminishing forest cover and respond to climate change by a combination of adaptation and mitigation measures. The Mission Goals are: ◆ To increase forest/tree cover to the extent of 5 million ha and improve quality of forest/tree cover on another 5 million ha of forest/non-forest lands; ◆ To improve/enhance eco-system services like carbon sequestration and storage (in forests and other ecosystems), hydrological services and biodiversity; along with provisioning services like fuel, fodder, and timber and non-timber forest produces (NTFPs); and ◆ To increase forest based livelihood income of about 3 million households. ➢ Preparatory activities such as institutional strengthening, training, selection of landscape, preparation of perspective plans are underway in the states. 11 states have submitted their perspective plans. Guidelines for implementation of GIM was finalised in November 2014. ➢ In May 2015, Annual Plan of Operations and Perspective Plans of 6 states (Andhra Pradesh, Chhattisgarh, Karnataka, Odisha, Punjab and Uttarakhand) were approved. The approval for 2015-16 includes implementation of various activities on 34,928 ha and to provide alternative fuel source to 19,893 households in the project area with a financial implication of Rs.1.4 billion.
12	Some provisions of Constitution of India	➢ The Indian Constitution clearly imposes duty on every citizen to protect environment. ➢ Article 51-A (g) - "It shall be duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures." ➢ Article 48 -A of the constitution says that "the state shall endeavour to protect and improve the environment and to safeguard the forests and wild life of the count. ➢ The Constitution of India under part III guarantees fundamental rights which are essential for the development of every individual and to which a person is inherently entitled by virtue of being human alone. Right to environment is also a right without which development of individual and realisation of his or her full potential shall not be possible. Articles 21, 14 and 19 of this part have been used for environmental protection.

Source: Compiled by JICA Survey Team (2016)

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

This Act popularly known as Forest Rights Act (FRA) along with its rules framed in 2008 and 2012 is an important safeguard for the forest dwellers/ forest dependent communities in India. If implemented effectively, this legislation has the potential to address the social, institutional, environmental and governance related safeguard issues in REDD+. This act recognizes rights of forest dwellers (ST and other Traditional Forest Dwellers) on forest land and forest resources. The forest dwellers can claim for individual entitlement over forestland cultivated by them as well as for community forest rights. Important provisions of The Forest Right Act 2006 are given below:

- To recognize and vest the forest rights and occupation in forestland in forest dwelling Scheduled Tribes and other traditional forest dwellers (FDSTs and OTFDs) who have been residing in such forests for generations but whose rights could not be recorded; and
- To provide for a framework for recording the forest rights so vested.

The recognized rights of the forest dwellers include the responsibilities and authority for sustainable use, conservation of bio diversity and maintenance of ecological balance, and thereby, strengthening the conservation regime of the forests while ensuring livelihood and food security of the forest dwellers. The forest rights on ancestral lands and their habitat were not adequately recognized in the consolidation of state forests during the colonial period as well as in independent India resulting in historical injustice to the forest dwellers who are integral to the very survival and sustainability of the forest ecosystems. It has become necessary to address the long standing insecurity of tenurial and access rights of forest dwellers including those who were forced to relocate their dwelling due to state development interventions.

3.6.6 Current Efforts for Developing Safeguard Information System for REDD+ in India

The Reference Document published by the MOEF & CC on REDD+ clearly presents the legal and institutional framework for REDD+ but the Central Government has yet to prepare the detailed guidelines for adherence to UNFCCC safeguards. The document clarifies,

> *"There is no dedicated mechanism to ensure adherence to UNFCCC safeguard for upholding the rights of the local communities on forest resource, and for biodiversity conservation in natural forests. Guidance would need to be provided in shape of simple guidelines detailing roles, responsibilities and actions on part of stakeholders including FD, local communities, Panchayats and Gram Sabhas." (Reference Document for REDD+, Executive Summary, paragraph 7.4. MoEF&CC.)*

The Reference Document highlights the need for developing guidelines by the Central Government to ensure transparent and appropriate mechanisms for flow of REDD+ incentives from the Central Government to the State Government and from State Government to the local communities.

REDD+ pilots are being implemented by several organisations/ institutions in India but they are yet to develop detailed guidelines for ensuring safeguards as well as setting up safeguard information system.

Table 3.6.7 Safeguard Information System in the On-Going REDD+ pilot projects in India

Implementing Agency	Pilot Project Sites	Status of the Pilot Project and Safeguard Information System
ICFRE/ Uttarakhand Forest Department	Nainital Forest Division	➢ Currently developing the baseline. ➢ Reference level, institutional arrangements, and safeguard information system still yet to be established.
TERI with the support of Government of India and Norwegian Government (Framework agreement of Norwegian Government)	Uttar Pradesh, Uttarakhand, Madhya Pradesh, Odisha and West Bengal	➢ Implemented at the individual JFMC level. ➢ TERI has ensured that the provisions of Forest Rights Act are utilized by these JFMCs to get individual entitlements over forestland. ➢ Safeguard Information System is yet to be established.
Forest Plus/ USAID	Karnataka, Sikkim, Himachal Pradesh and Madhya Pradesh	➢ The Project Design Document for Karnataka is being prepared. ➢ Forest Plus adopts the Climate, Community and Biodiversity Standard (CCBS). However, it is yet to be operationalised.

Source: JICA Survey Team (2016)

India, by identifying, monitoring and reporting multiple benefits will help building a sustainable approach for implementing REDD+. Currently India through its National Forest Inventory (NFI) is measuring some of the co-benefits of forest ecosystem and also assessing the local dependency on

forest for resources like fuel wood and fodder, percentage of employment, etc[27]. These inputs might be used in the design of the eventual Safeguards Information System.

3.7 The Status of REDD+ Readiness at the Central Level

Based on the interviews with FSI, FRI/ ICFRE and IGNFA and findings from the available literature on REDD+, the status of the REDD+ in India can be summed up with reference to the REDD+ requirements as shown in the table below.

Table 3.7.1 Status of REDD+ Readiness at the Central Level

REDD+ Requirements/ Donor Intervention	Findings
National Strategy/ Action Plan	➢ National REDD Strategy and Policy (Zero Draft) prepared in 2014. The approval is awaited. ➢ Reference document for REDD+ in India has been prepared. ➢ REDD+ cell in the process of formulation under the Climate Change Division at MoEF&CC.
(Donor Intervention)	GIZ (developing NAMA strategy) TERI (Research/ Policy recommendation)
FREL/FRL	➢ FSI is in the process of establishing FREL.
(Donor Intervention)	USAID
National Forest Monitoring System	➢ FSI conducts NFI and publishes data on a biennial basis.
(Donor Intervention)	USAID
Safeguards Information System	➢ Relevant legal framework (i.e. FRA, PESA and etc) is already in place. ➢ Risk of reversals/ displacements are monitored through the National Forest Monitoring system. ➢ However, the safeguards information system is not yet established in a systematic manner with a defined indicators and data flow, and thus, the data is not yet systematically synthesised.
(Donor Intervention)	No evident intervention was identified.
MRV	➢ NFI is undertaken by FSI on a biannual basis.
(Donor Intervention)	USAID

Source: JICA Survey Team (2016)

27 Brief on National Forest Inventory NFI, FAO, 2007 http://www.fao.org/docrep/016/ap185e/ap185e.pdf

Chapter 4 Assistances on REDD+ by Donors and Other Institutions

4.1 United State Agency for International Development (USAID)

Under the 2012 – 2017 strategy of USAID, the agency is working with government, public and private sectors of India on multiple initiatives related to health, food security, education and climate change challenges. Forestry sector has been one of the areas that USAID has supported especially in the 1980s and 1990s in Madhya Pradesh, Himachal Pradesh and Uttar Pradesh. With a decade of break, USAID has resumed its assistance in the forestry sector in India in the past few years.

(1) Forest PLUS (India Partnership for Land Use Sciences)

Forest PLUS aims to reduce emissions from deforestation and forest degradation and enhance sequestration through afforestation, conservation, and sustainable management of forests in India by creating an enabling environment for the implementation of REDD+. The project activities include development and deployment of the scientific tools, techniques and methodologies (TTM) for improved ecosystem management and conservation, carbon sequestration and help in providing better incentives to the forest dependent communities and enhancing REDD+ institutional capacity. The total project cost is USD 14 million. Forest PLUS works closely with the MoEF&CC and Forest Departments in the pilot states.

The Program is developing four pilot REDD+ project at four different Indian landscapes viz. Karnataka, Madhya Pradesh, Himachal Pradesh and Sikkim. The pilot REDD+ project will address barriers to adopt REDD+ and develop REDD+ strategy and action plan which can be replicated for scaling up REDD+ in India.

(2) Innovations for Forest Resources Management (InFoRM)

USAID implements InFoRM project under its Global Climate Change Initiative (GCCI) which aims at tackling climate change mitigation and adaptation related challenges (clean energy and sustainable landscapes). The total budget of the Program is USD 4 million. The overall objective of the Program is to reduce pressure on Indian forests. Under this Program USAID India has partnered with four Indian organizations to develop innovative solutions for addressing forestry concerns in India and also help in improving lives of forest dependent communities.

Three major areas taken to address the forestry issues are (1) supporting innovations for fuel wood management; (2) strengthening systems for forest resources management; and (3) increasing income of forest dependent communities. The program will provide cutting edge innovations and practices in forest resources management where climate change, forest degradation and low-income, forest-dependent communities overlap. This approach will contribute to achieving the Country Development Cooperation Strategy (CDCS). InFoRM Program also aims to support GIM under the NAPCC.

(3) Partnerships for Enhanced Engagement in Research (PEER) Science

A partnership between USAID and the National Science Foundation (NSF) has been designed to address development challenges through international research collaboration. For this USAID has joined several US Government (USG) supported agencies. It is a competitive grant Program that offers developing countries scientists, partnered with USG supported collaborators to provide financial support to their research and capacity building activities. Under the PEER Program, USAID India aims to support Indian researchers who focus on forestry sector and climate change issues in India.

(4) Lessons Learnt from the Interview with USAID

- Collaboration with local government bodies/agencies, stakeholders, public and private organization is essential for successful implementation of REDD+.

- Implementation of REDD+ program should include the contemporary climate change practices to enable innovative techniques in achieving objectives in efficient and effective manner.
- Robust MRV techniques to measure carbon as well as non-carbon component of REDD+ need to be developed.
- Target regions/geographies should be mapped for greater feasibility and increased output of the program.
- India requires campaign and awareness programs for capacity building.
- Guidance is required for building REDD+ institutional framework development at national and sub-national level.
- Learn from other ongoing and completed successful sustainable forest management and REDD+ programs/projects in other countries would inform the stakeholders in India.

4.2 GIZ

GIZ has been extending its cooperation to India for more than 50 years with the goal to support India to achieve inclusive growth. Forestry is one of current focus area of GIZ. GIZ provides policy advice to the MoEF&CC on REDD+ mechanism. Some of the major initiatives taken by GIZ for REDD+ are described below:

(1) VCS REDD+ Methodology

GIZ is developing VCS REDD+ Methodology which will address India specific drivers of forest change. This REDD+ methodology which will analyse the diverse factors affecting the carbon stock including the forest types, drivers and agents and the best suited framework that can be piloted and deployed in India and in other landscapes with similar characteristics.

(2) Forestry NAMA Feasibility Study

GIZ has identified forestry Nationally Appropriate Mitigation Action (NAMA) options for India using a set of criteria and indicators. The study also has a section on how REDD+ and NAMA are interconnected and can be jointly implemented.

(3) REDD+ Himalayas

The project has been commissioned by German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) to International Centre for Integrated Mountain Development (ICIMOD). The project is implemented in Nepal, Bhutan, Myanmar and India. The project focuses on capacity building and training program in these countries and prepares them for implementation and promotion of REDD+.

(4) Incentives for Sustainable Management of Biodiversity and Ecosystem Services

The project has been commissioned by German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) with MOEF&CC as a lead executing agency. Under this program GIZ is working with its partners on two important initiatives.

(5) The Economics of Ecosystems and Biodiversity (TEEB) India initiative

The purpose of the initiative is to assess the valuation of ecosystem services and biodiversity. The valuation done as a result of this initiative can be then taken into consideration during development of policy planning and decision making. The initiative focuses on three ecosystem types: forests, inland wetlands, and coastal and marine ecosystems.

(6) India Business and Biodiversity Initiative (IBBI)

The initiative will serve as a platform for sharing businesses and their learning in relation to biodiversity conservation and dependency, which will ultimately lead to mainstreaming sustainable management of biological diversity by business.

(7) Lessons Learnt from the Interview with GIZ

- All ecosystem services are equally important; be it carbon or non-carbon benefits.
- The MoEF&CC should be supported by donor agencies for REDD+ readiness.
- Exchange of views through consultations, round tables, workshops, etc. should be maintained in order to keep updated with the contemporary climate change practices, to enable innovative techniques in achieving objectives in an efficient and effective manner.
- Focus should be put on setting up small initiatives and slowly building them to make a larger impact at policy and planning level
- The implementation of REDD+ program should include the contemporary climate change practices to enable innovative techniques in achieving objectives in efficient and effective manner.
- Collaboration with local government bodies/agencies, stakeholders, public and private organization is essential for successful implementation of REDD+
- Robust MRV techniques should be built to measure carbon as well as non-carbon components of REDD+.

4.3 The Energy and Resource Institute (TERI)

(1) Contribution of TERI to REDD+ in India

TERI is a research based organization which has always been in forefront of designing REDD+ architecture, policies and practices in India. In collaboration with MOEF&CC and Norwegian Ministry of Foreign Affairs in 2012 organized National level workshop on International Architecture on REDD+ and its relevance to India. The workshop analysed various issues regarding financial and institutional mechanism of REDD+, carbon market and MRV of REDD+. The national level REDD+ architecture and design was also discussed in the workshop. In 2012, TERI again organized a national level consultation on Readiness for REDD+ in India. The objective of the consultation was to seek views of all the states how REDD+ can be included in current forest management practices. Issues like forest governance, methodologies for carbon assessment, conservation of biodiversity and maintenance of ecosystem services, livelihood and market for carbon trading were discussed. TERI has also organized different regional level workshop REDD+ design, issues and challenges in India which provided a clearer vision for Indian policy maker in designing a feasible REDD+ design for the country[28].

Along with organizing several workshops on REDD+ in India, TERI has published several policy briefs and books related to REDD+ and sustainable management of forest in India. The publications contain details from REDD+ history to the current REDD+ architecture at international level and its relevance to India. The publication gives overview about how undertaking REDD+ can provide carbon to non-carbon services benefits to India. The publications made significant contribution in designing the REDD+ architecture and institutional framework for India.

(2) Lessons Learnt from the Interview with TERI

- Early and frequent engagement with local stakeholders for maintaining transparency which will ease REDD+ development and implementation.
- Country needs to develop project management capacity.

4.4 ICFRE/UKFD - REDD+ pilot in Nainital

A REDD+ pilot project has been formulated in Nainital Forest Division jointly by the Uttarakhand Forest Department and ICFRE. Efforts were initiated in 2014 and the state has provided funds under CAMPA. The Kalsa Gola Watershed area has been identified as the pilot project area. The Project area is 61194 ha, leakage area is 69167 ha and the reference area is 423532 ha. The pilot project is being executed in consultation with the local Van Panchayats. Due to the absence of REDD+ cell in the state,

[28] http://www.teriin.org/projects/nfa/cc2bwp2.php

the project is being implemented with support from the Uttarakhand Forest Department, where DFO, Nainital Division, has been appointed as the nodal officer.

The main objective of the project is to study carbon sink by the efforts of the community and how the community gets benefit out of that. The methodology adopted for the study is based on Voluntary Carbon Standard (VCS) 006. Also, under the study the Climate, Community and Biodiversity (CCB) standards are adopted to incorporate safeguards aspect. Presently socio-economic survey and field work are in progress. The project would establish reference levels using field and satellite based data and would try to identify the drivers of deforestation and degradation. Based on the analysis of the drivers, the study would prescribe the mechanism to address drivers and forecast carbon levels by suggesting interventions in the pilot area.

4.5 ICIMOD/ ICFRE- Capacity Building in N.E India under Trans-boundary REDD+ project

International Centre for Integrated Mountain Development (ICIMOD) is a regional research and knowledge centre for Hindu Kush Himalayan Countries (Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan). ICIMOD undertakes research on sustainable ecosystem and livelihood improvement in the region. With ICIMOD, ICFRE is implementing the Capacity building on REDD+ in North-Eastern states, which is supported by German Government. The project area of Trans-boundary project covers India, Nepal, Bhutan and Myanmar. Under the project, capacity building of the communities and the state forest departments of the North-Eastern states of India on various aspects of REDD+ would be taken up. A pilot study on REDD+ will be carried out in Mizoram. The project started in 2015 and two workshops were held for kickoff and planning.

Chapter 5 REDD+ in the Survey States

5.1 Selection of Survey States

In selecting the survey states, the survey team considered the suggestions by MoEF&CC, the status of the JICA loan assisted projects, and status of donor interventions and selected eight states for the survey.

The following two criteria are given particular emphasis:

a) Remaining implementation period of the JICA loan assisted projects (on-going or in - pipeline) in the state should be more than 3 years when JICA technical cooperation would commence (2017 onwards); and

b) Capacity of State Forest Department has already been developed to some extent through on-going assistance on REDD+ by other donors and institutions.

The list of eight states selected for Field Survey is given below.

Table 5.1.1 States selected for Field Survey

Names of the States selected for the Field Survey	
➢ Uttar Pradesh	➢ Tripura
➢ Uttarakhand	➢ Odisha
➢ West Bengal	➢ Himachal Pradesh
➢ Sikkim	➢ Karnataka

5.2 Accomplishment of JICA Loan Assisted Projects in 8 States

JICA has been assisting forestry sector projects in India since 1991 and playing a key role in promoting sustainable forest management through community participation in the country. JICA forestry sector projects are known for their holistic approach in addressing the forest degradation by combining the afforestation/ reforestation interventions and providing alternative means of livelihoods for the forest dependents communities. With the strong recognition of community participation being the key to the sustainable forest management, JICA projects adopt community mobilisation, and participatory planning and implementation processes. All the projects are equipped with well-established MIS/ GIS system for the effective and efficient monitoring of the project outputs as well as the outcomes. The table below provides an overview of the JICA projects in the survey states. The detailed project profile can be found in Attachment 5.1~5.8 to this report.

Table 5.2.1 Overview of the JICA Loan Assisted Forestry Projects in the Survey States

States	Salient Features			
UP	Project Period :	2008-09 to 2015-16 (Extended up to 2017)	Project Cost:	Rs. 5,750 million
	➢ 2020 forest divisions in 14 districts. ➢ 800 JFMCs with 100,400 ha of village forest covered under the project. 140 EDCs formed in the fringe area of wild life areas. 2,680 SHGs are to be formed to undertake different livelihood activities. Smokeless chullas are promoted to minimise the usage of fuelwood. ➢ Departmental forest area 20,200 ha, JFM area 60,300 has to be treated. ➢ 10 AR-CDM projects are formulated. ➢ GIS/ MIS ssystem operational. Web-based MIS is to be extended up to range level.			
Odisha	Project Period :	2006/07 – 2012/13 (extended up to 2014/15)	Project Cost:	Rs. 8,023 million.
	➢ Restoration of degraded forests 210, 405 ha and coastal plantation 2,920 ha. 7 eco-tourism sites developed and 2 community reserves and 13 sacred groves established. ➢ Odisha has a strong tradition of community forestry. JFM mode of operation has given them legitimate role to their traditions. Livelihood improvement including health and education related interventions was also given an emphasis through EPAs and income generation			

States	Salient Features			
	activities. ➢ The state government is financing Ama Jangala Yojana to strengthen 7,000 VSSs by incorporating the lessons learned from the OFSDP. ➢ GIS/ MIS fully operational. Mobile application based monitoring system is operational.			
West Bengal	Project Period :	2012/ 13 – 2019/20 (8 years)	Project Cost:	Rs. 4,060 million
	➢ The project objective is to improve forest ecosystem, conserve biodiversity and improve means of livelihoods through afforestation, regeneration, wildlife management and income generation activities. Adopts Joint Forest Management approach (Activities will be implemented through 550 JFMCs and 50 EDCs) ➢ Afforestation in 30 Forest Divisions and Biodiversity Conservation in 17 Divisions/ 8 Protected Areas ➢ 280 FPCs were selected from 22 DMUs and now undertaking micro planning. MIS/ GIS system is about to start operation. Production of quality planting material through centralised nurseries is also given emphasis.			
Tripura	Project Period :	2007/8 – 20014/15 (currently on extension phase)	Project Cost:	Rs. 3,660 million (approx.)
	➢ 7 Districts (7 Forest Divisions of 40 Ranges/ 1 Wildlife sanctuary) ➢ Agro forestry plantation was established on patta lands and was promoted in 8,522.82 ha. The total afforestation area was 61,297 ha including the above agroforestry plantation. As for the enrichment plantation, broom grass, black cardamom, gandhaki and black pepper were planted for the benefit of JFMCs. ➢ 463 JFMCs/ EDCs formed (35,593 families/ 79,538ha of forest land). The project has given strong emphasis on livelihood improvement of the forest dependent communities. ➢ Established vocational training centre cum office building and multi utility centres. ➢ NTFP centre for Excellence has been established to especially work on the development, harvesting and value addition techniques and marketing of NTFPs. ➢ Common facility centres have been established at 7 places to process bamboo and other NTFPs. Mini Community Common Facility Centres have been set up at cluster of JFMC level to add value to NTFPs and other local produces. ➢ GIS/ MIS cell established and provides timely feedback to the field.			
Sikkim	Project Period :	2010-2020	Project Cost:	JPY 6,347 million* (Approximately Rs. 3,306 million)
	➢ The project has given emphasis on biodiversity conservation and eco-tourism development. 1,535 ha of 90 JFMC plantation 500 ha plantation in religious areas, and 8 ha for JFM nurseries implemented. Boundaries of JFMCs were realigned with the Gram Panchayat boundaries. ➢ Income generation activities with 240 SHGs promoted through convergence with National Rural Livelihood Mission.			
Uttarakhand	Project Period :	2014/15 – 2021/22	Project Cost:	JPY 11,390million* (Loan Agreement)
	➢ 9 districts (13 Forest Divisions) in Uttarakhand ➢ The project aims at contributing towards eco-restoration and enhancement of forest resources, expansion of livelihood opportunities & income generation of the forest dependent communities and mitigate the risks of sediment disasters. The components include eco restoration and community development-livelihood along with supporting component. ➢ The project is still at the early stage of implementation. The total number of villages to be selected is 750. 150 villages were selected and microplanning is in progress ➢ The project indicated keen interest in REDD+ ready.			
Himachal Pradesh	Project Period :	2006/7 – 2015/16	Project Cost:	Rs. 2,273 million
	➢ 96 Panchayats in Una District, Himachal Pradesh (22 sub-watersheds of 619 km^2 out of 42 sub-watersheds of Swan River with a total catchment area of 1,204km^2) ➢ Project components included afforestation, soil and water management works, soil protection/ land reclamation, livelihood improvement and institutional building. The works are undertaken both private and government land. Multiple use of the water harvesting/ soil water conservation structures were encouraged to diversify income sources of the			

States	Salient Features			
	beneficiaries. ➢ GIS established.			
Karnataka	Project Period :	2005 – 2014	Project Cost:	JPY 16,099 million (Approximately Rs. 8,385 million)
	➢ 1,870km^2 of degraded forests in Karnataka State (Covering all 30 districts in the states/ 1,222 villages within the 2 km of forest fringe area.) 1,222 VFCs and 73 EDCs established. ➢ Afforestation with 285,000ha undertaken. Farm forestry has been promoted with 2,165ha demonstration plots. Under the biodiversity component, fire line treatment and habitat improvement. 6,066SHGs were established and undertaking various livelihood activities. GIS/ MIS established.			

Remarks: The figures for project cost are based on the documents provided by the projects and not converted at the current exchange rate.

Source: Compilation by JICA Survey Team (2016) based on the various reports provided by the projects.

5.3 REDD+ Readiness in 8 States

REDD+ readiness of the survey states and JICA loan assisted projects has been assessed with reference to each analytical framework of this survey.

5.3.1 REDD+ Policies and Measures

None of the states have prepared the State REDD+ Action Plan. However, under the State Action Plan on Climate Change (SAPCC), the forestry sector interventions were defined, which reflect the broad direction of the states towards forest conservation and sustainable forest management. However, when it comes to implementation, progress seems to be slow. Climate Change Cell has been established at the state level either in the Department of Environment, Department of Forest and Environment or in Department of Science and Technology. The role of the cell is to prepare climate change action plan, coordinate and monitor its implementation.

SAPCCs are developed for different priority sectors and thus, respective Line Department will implement the planned actions. There has been high expectations of the State Governments to receive funds from the Central Government to implement SAPCC but the fund flow for implementation of SAPCC was very limited. Some funding opportunities are available through Climate Change Cell (i.e. Green Climate Fund of NABARD).

In all SAPCCs, the emphasis of the forestry sector was to be developed for enhancing carbon sinks. The key intervention areas of forestry sector stated in SAPCC of the survey states are summarised in the table below.

Table 5.3.1 Key Intervention Areas of Forestry Sector in SAPCC

State	Key points from the State Action Plan on Climate Change
UP (2014)	➢ Assessment of GHG inventory estimated for all the IPCC sectors excluding LULUCF conducted. ➢ 10 priority areas are identified for the forestry sector including increase in the forest cover; plantation along canals embankments and road sides; enhancement of plantation through agro-forestry; and conversion of moderately dense, open forest, and scrub into very dense forest; expansion of plantation through agro forestry; interventions in scrub forest encouraging private plantation; and reduction of fuelwood consumption and CO2 emission. ➢ Community participation through JFMCs has been noted as an important implementation approach. ➢ The total budget for 2014-18 for Green UP Mission was proposed to be Rs. 8,480.5 Cr.
Odisha (2010-2015)	➢ GHG inventory has been undertaken. Mitigation potential is estimated as 456 million tonnes reduction of CO2 emissions during 2010-2020 through forestry interventions. Net annual emission was estimated to be 37.64 million tonnes. ➢ Priority areas are reforestation and afforestation in the degraded forest areas; protecting existing forest stocks; increasing planting on non-forest land; assessing fire management strategies: integrating forestry into watershed/ water resource management; establishing new system to support community users; capacity building

State	Key points from the State Action Plan on Climate Change
	for PRI / communities/ JFM institutions for climate change adaptation; and monitoring carbon stock and biodiversity. ➢ In the case of Odisha, progress report on SAPCC has been published in 2015. Progress monitoring, which requires collaboration with other Line Departments, is going on well.
Uttarakhand (2014)	➢ SAPCC clearly mentions that the efforts towards generating benefits through REDD+, CDM and other carbon market mechanisms will be made by the Forest Department. The need to carry out studies has been emphasized on impact of global change on the carbon mitigating capacity of forests; climate response strategy incorporating community perspectives (catering their needs from the forest); effective forest fire control; and formulation of REDD+ projects.
West Bengal (2012)	➢ Forestry sector priorities include: spring recharge/ ground water recharge in the forest areas; enhance forest quality; linking protected areas; mitigation of natural calamities; effective fire management; prevention of man animal conflict; promotion of renewable energy; protection of livelihoods of forest dependents and etc. In future, carbon related projects may be developed. ➢ Progress monitoring is at the initial stage. The challenge before the Climate Change Cell is to collect data from different Line Departments.
Sikkim (2012-2030)	➢ Ground water recharge through IWMP, CAT and MGNREGA; enhancing quality of forest; linking protected areas; disaster risk reduction and management; preventing man animal conflict; conservation of high altitude wetlands; improving the environment; developing renewable energy technology; protecting livelihoods dependent on the forest produces. ➢ Climate Change Cell is yet to start monitoring.
Tripura	➢ In the case of Tripura, shifting cultivation has been a main driver of the forest degradation. Key priorities include forest dependent communities to adopt climate change adaptation and mitigation action; promotion of urban forestry; promotion of agro forestry and social forestry for carbon sinks; rehabilitation of shifting cultivators and restoration of shifting cultivation area; valuation of forest wealth; improvement of canopy cover; promotion of alternative household energy sources and energy saving tools; livelihood enhancement through biomass and NTFPs, GIS monitoring; forest fire management and etc. Afforestation activities are also proposed to be undertaken from the profit earned from CDM and voluntary market. The potential for REDD+ for TFDPC rubber plantation of 11,000ha was indicated in the plan. ➢ Climate Change Cell has been established but yet to monitor the implementation of SAPCC.
Himachal Pradesh (2012)	➢ The forestry sector interventions include preparation of climate change and forestry action plan under the National Green India Mission, assessment of impacts of climate change on forests, and socio-economic aspects of forests and forestry. GHG emissions were estimated in the SAPCC amounting 10,083 million tons of CO2 equivalent in 2009. In terms of forest land, 2,917.17 million tons of CO2 was sequestrated whereas, the extraction of fuel woods created 1,318.41 million tons of emission.
Karnataka (2013)	➢ The forestry sector interventions in SAPCC include prevention of encroachment for enhancement of carbon stock; creation of electronic database of forest land records; developing strategies for identifying market linked carbon sinks which would contribute to the betterment of the local communities; interventions to minimise GHG emissions; promotion of urban forestry; obtain carbon credits for forest conservation projects, preparation of plans for participatory forest management and development of agro-forestry models etc.

Source: Compilation by JICA Survey Team (2016) based on SAPCCs.

5.3.2 Forest Reference Emission Level (FREL) and Forest Reference Level (FRL)

In Himachal Pradesh, Sikkim, and Karnataka where Forest PLUS is giving support for REDD+ readiness, FREL and FRL are under construction. In other states, state level FREL/ FRL is yet to be constructed. In the case of Uttarakhand, the REDD+ pilot project in Nainital has established FREL/ FRL for the pilot project area.

5.3.3 Forest Monitoring/ MRV

State level forest monitoring is undertaken based on the data of FSI and the data collected by the state departments by themselves. At the state level, monitoring guidelines are developed. However, the monitoring is largely done for plantation operation which is implemented under the central and state funded schemes. Such monitoring data is also uploaded on the central government website and FSI is the nodal agency to do the monitoring and data quality checking. As per FSI as well as SFDs, initially lots of inconsistencies and data quality issues were noticed in the data being uploaded by the SFDs. Although now there is some improvement in the situation but still lots of gaps are noticed in quality, and completeness of data as well as timely uploading of the information. Most of the SFDs rely on satellite based 'India State of Forest Report' and data produced by FSI although some states conduct forest cover mapping using high resolution satellite images as well. As of now there is no system in place for sharing of such data and to facilitate the synergy between FSI and state forest department in terms of field data collection, satellite data interpretation and ground verification.

In almost all JICA projects there is an inbuilt mechanism of community level monitoring. In most of the projects, NGOs were also involved to assist in community mobilization and micro planning, etc. and assisted in establishing community level monitoring mechanism. In some cases there was a provision of having a village Animator, who was trained in record keeping at JFMC level as part of institution building and transparent monitoring mechanism. Also, there was a concept of third-party monitoring as part of transparent mechanism of monitoring for survival assessment of plantations and quality assessment and usefulness of the assets created.

A summary of the status of the forest monitoring is given in the table below. Further details can be found in Attachment 5.1 – 5.8.

Table 5.3.2 Status of Forest Monitoring in the Survey States and JICA Loan Assisted Projects

State	State Level	JICA Project
Uttar Pradesh	Done by the State Forest Department. Donor assistance: None	Done by the project. Donor assistance: JICA
Odisha	Done by the State Forest Department. Donor assistance: None	Done by the project. (Satellite based monitoring) Donor assistance:JICA
West Bengal	Done by the State Forest Department. Donor assistance: None	Done by the project (GIS/ MIS is being established.) Donor assistance: JICA
Tripura	Done by the State Forest Department. Donor assistance: None	Done by the project. (Satellite based monitoring) Donor assistance: JICA
Sikkim	Done by the State Forest Department. Donor assistance: None	Done by the project (Being Established) Donor assistance: JICA
Uttarakhand	Done by the State Forest Department. Donor assistance: None	Done by the project (GIS/ MIS is being established.) Donor assistance: JICA
Himachal Pradesh	Done by the State Forest Department. Donor assistance: None	Done by the project. Donor assistance: JICA
Karnataka	Done by the State Forest Department. Donor assistance: None	Done by the project. Donor assistance: JICA

Source: JICA Survey Team (2016)

The status of MRV at the state forest departments and JICA loan assisted projects are summarised in the table below. In Sikkim, Himachal Pradesh and Karnataka, MRV system is being developed by Forest PLUS. In other states, MRV is considered to be partly established as part of the existing process of planning and monitoring in the purview of working plan/ management plan operation. Further details can be found in Attachments 5.1 – 5.8.

Table 5.3.3 Status of MRV at the State and JICA Loan Assisted Projects

State	State Level	JICA Project
Uttar Pradesh	➢ Partly established as part of the preparation of working plan and data collection for the same.	➢ AR-CDM projects are established in 10 forest divisions where the MRV system is placed, however, its operationalization is yet to be seen.
	Donor assistance: None	Donor assistance:JICA
Odisha	➢ Partly established as part of the preparation of working plan and data collection for the same.	None
	Donor assistance: None	Donor assistance: None
West Bengal	➢ Partly established as part of the preparation of working plan and data collection for the same. ➢ In 24 Parganas South District, SFD and IIRS conducted carbon assessment including sub-soil carbon.	None
	Donor assistance: None	Donor assistance: None
Tripura	➢ Partly established as part of the preparation of working plan and data collection for the same.	None
	Donor assistance: None	Donor assistance: None
Sikkim	➢ Partly established as part of the preparation of working plan and data collection for the same.	None
	➢ Presently being established under Forest PLUS	Donor Assistance: None
Uttarakhand	➢ Partly established as part of the preparation of working plan and data collection for the same. ➢ MRV system would be developed under REDD+ Pilot	None
	Assisted by IIRS	Donor assistance: None
Himachal Pradesh	➢ Partly established as part of the preparation of working plan and data collection for the same.	None
	➢ Used in World Bank Funded MHWDP29 CDM project ➢ Would be developed under Forest PLUS (USAID) project	Donor assistance: None
Karnataka	➢ Partly established as part of the preparation of working plan and data collection for the same.	None
	➢ Is being developed under Forest PLUS (USAID) project.	Donor assistance: None

Source: JICA Survey Team (2016)

5.3.4 Safeguards Information System (SIS)

In assessing the readiness of safeguards information system in the survey states and JICA loan assisted projects, seven Cancun principles as reviewed in section 3.6.3 are adopted. None of the states have safeguards information system as such. However, the existing policy and legal framework are being reinforced and thus, the safeguards are being addressed. The states receiving assistance from Forest PLUS (Sikkim, Himachal Pradesh and Karnataka) may have the road map to establish safeguards information system in the PDDs but these documents are yet to be available for review. The summary of the status as per the 7 principles of safeguards is given in the table below.

[29] Mid Himalayan Watershed Development Project

Table 5.3.4 Overall Status of Safeguards and Safeguards Information System in the Survey States

Principles	Findings	Gaps
Consistency/ relevancy to the national and international policy/ programme/ agreements	◆ In all survey states, REDD+ Strategy/ Policy has not been developed. ◆ In all survey states, carbon related issues are addressed under the forestry sector of State Action Plan on Climate Change.	◆ For the states to develop REDD+ strategy/ Policy, guidance and directions from the Central Government instruction are prerequisite. However, they are not yet given to the state governments.
Effective national forest governance structure	◆ Forest Department has a fully functional institutional set up and from the state level to the field level. ◆ In all states, relevant legal framework is in place to provide for community based sustainable forest management (JFM Rules/ Government Orders/ Participatory Forest Management Resolution/ Van Panchayat Rules etc.)	◆ Nil
Respect for the knowledge and rights of indigenous peoples and local communities	◆ FRA and PESA are implemented in the states where applicable. However, the progress of the FRA implementation varies from state to state. In the case of Sikkim, little progress has been observed while in Odisha 3.49 lakh individual titles for 5.50 lakh acres and 5,004 community rights titles for 1.79 lakh acres have been distributed. ◆ PESA is implemented in Odisha and Himachal Pradesh. ◆ Part of Tripura is under Sixth Schedule and there is a Tripura Tribal Area Autonomous District Council, which has powers to formulate rules for the protection and benefits of tribal people. ◆ In Odisha, traditionally community has played an important role in forest management. Some of these community efforts are now institutionalized through JFM. ◆ In some of the states (Himachal Pradesh, Uttarakhand and Sikkim) rights and entitlements have been well recorded and recognized under different state laws and rules.	◆ In case of REDD+ project local knowledge and rights are to be well documented and monitoring. ◆ Data from other departments to be obtained and compiled.
Full and effective participation of the relevant stakeholders	◆ REDD+ cell has been constituted in Sikkim. In UP, Uttarakhand, Himachal Pradesh and Karnataka, nodal officers were appointed. Once the REDD+ cell is established, the stakeholder involvement can be facilitated. ◆ In all JICA projects primacy is given on participatory planning and implementation. A lot of emphasis is given on community mobilization and empowerment. Convergence of efforts and funds available with other Departments and Agencies is a priority. Multi-stakeholders committees are formed at the state as well as sub-state level	◆ A multi-stakeholders' platform can be established at the state level.

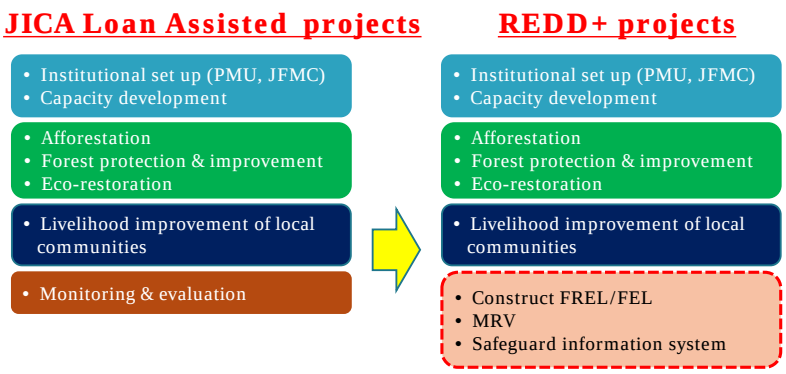
Principles	Findings	Gaps
	to advise the Project in planning and implementation.	
Conservation of natural forests and biodiversity	◆ All the relevant national policy, laws and regulations are reinforced. ◆ Working plans/ management plans are prepared and implemented. ◆ Monitoring of the afforestation works is done by the state forest department. FSI monitors through its own institutional structure and the report is published on a biannual basis. ◆ Central and state funded schemes are implemented for the purpose (CAMPA, NAP, GIM, IFMS, IDWH, NBM etc.) ◆ JFMCs/ EDCs undertake activities that contribute to the conservation of natural forest and biodiversity (i.e. IGAs to reduce the dependency on forest resources, patrolling, keeping records of extractions/ felling, adopt alternative household energy to reduce the consumption of the fuel wood and etc.)	◆ Record keeping and reporting skills of the community level institutions need to be strengthened. ◆ Community Based monitoring tools can be developed for biodiversity conservation and other monitoring items required.
Actions to address risks of reversals	◆ No concrete actions are planned as REDD+ interventions have not been fully planned and implemented. ◆ However, in all states, the forest monitoring is undertaken which can provide the necessary information to check the risks of reversals. ◆ Forest PLUS pilots and Project Design Documents may help articulating a framework for devising concrete actions in this regard.	◆ At the State or Project level detailed actions including monitoring plans are to be developed. ◆ Detailed actions including monitoring plan need to be included in the Management Plans/ Micro Plans of the JFMCs/ EDCs/ VPs etc.
Actions to reduce displacement of emissions	◆ No concrete actions are planned as REDD+ interventions have not been fully planned and implemented. ◆ However, in all states, the forest monitoring system will provide the necessary information to alert the displacement of emissions. ◆ Forest PLUS pilots and Project Design Documents may help articulating a framework for devising concrete actions in this regard.	
Safeguards Information System	◆ No plan for establishing a Safeguard Information System was discussed as yet. Data availability, reliability of data, data management system may require a review to constitute a Safeguards Information System. ◆ In all JICA projects, GIS/ MIS cells have been established. Especially Odisha has developed a mobile data uploading system that can facilitate the data collection process. Tripura also establish an efficient and effective monitoring system that allows timely reporting and guidance to the field.	◆ An overall architecture of Safeguards Information System is not yet prepared. ◆ Indicators are not yet defined and thus, the means of verification/ data sources are not identified yet. ◆ Data availability, reliability of data, data management system may require a review to constitute a Safeguards Information System.

Source: JICA Survey Team (2016)

Chapter 6 Recommendations for JICA Technical Cooperation in REDD+

6.1 Coordination between JICA Loan Assisted Project and JICA TC Projects at State Level

As shown in Figure 6.1.1, the components of JICA loan assisted projects are similar to those components constitute REDD+ projects. The only difference is the monitoring and evaluation component. As for JICA Loan Projects to be transformed into REDD+ projects, FREL/ FEL, MRV and Safeguards Information System need to be established by strengthening the existing monitoring and evaluation system.



Source: JICA Survey Team (2016)

Figure 6.1.1 Differences and Similarities between JICA Loan Assisted Projects and REDD+ Projects

Thus, the technical cooperation can be planned for certain areas to reinforce the project interventions/ components. Those include the developing FREL/ FEL, and further aligning existing GIS/ MIS system to MRV and safeguards requirements. In this way, the efforts made by the Technical Cooperation could complement the efforts made by JICA projects and contributes to enhance their sustainability.

Based on this overall framework of technical cooperation, options for different projects are presented in the subsequent sections.

6.2 Recommendations for JICA TC at Central Level

6.2.1 Development of Guidelines for State REDD+ Action Plan

The formulation of national and state level policies and of schemes at the field level are important factors to make climate change strategy a reality through the implementation process of REDD+.

The Government of Indonesia, for instance, formulated national level action plan for climate change strategy, called as RAN-GRK, and they made Local Action Plan for Green House Gas Emission Reduction (RAD-GRK) under the RAN-GRK as provincial level strategy. Furthermore, they made SRAP REDD+（Strategy and Action Plan for REDD+）as a provincial level action plan, and the plan particularly shows the identification of drivers, development of reference level, and methodology of MRV.

In addition, the Government of Vietnam made National REDD+ Action Plan (NRAP) and the plan requires to set up Provincial REDD+ Action Plan (PRAP) as provincial level strategy. Moreover, the central government made a guideline for PRAP. While NRAP indicates holistic action plan at national level, PRAP presents explicit REDD activities and emission reduction targets.

From the experiences of these two countries, there are two lessons learnt;

- It is difficult to address REDD+ activities at provincial levels in case there is only a national level strategy, and a road map to reach to a target would be ambiguous.
- Therefore, a provincial level action plan is vital for achieving a national level target.

In India, National REDD+ Policy and Strategy has been drafted but is yet to be approved. Once it is approved, each state will be required to prepare the state level REDD+ action plan. The central government will be required to provide guideline to support preparation of the state level action plans.

A technical cooperation project could support central government in developing such guidelines that depict the contents and methods/ processes to be adopted in developing the state level action plans.

6.2.2 Development and Suggest Options for FRL

The process of reviewing reference level in national level for submitting to UNFCCC is at the final phase in India. According to the interviews with the concerned officials, the base year is likely to be set as 2000 by using the data accumulated by FSI (see section 3.5).

The forest cover in Viet Nam shows an increasing trend as in India. While developing its reference level, Viet Nam has considered the reforestation/ afforestation policy as a National Cicrcumstance and made the conservative outlook towards its future forest dynamics.

From the experience of Vietnam, it is effective for India to consider national circumstances in order to maximize national benefits. Moreover, it is worthy to examine several methods to forecast on the future emission and absorption quantities.

In undertaking these activities, technical cooperation could facilitate the process in establishing working groups including FSI and NRSC and support them undertaking the activities as above using existing data.

There is also a necessity to improve the accuracy of emission factors at the national level in order to develop highly transparent and robust reference level. In addition to researches including field sampling done by research institutes and the government, field study is suggested to be conducted focusing on dominant species and major forest types. Since such field works are time consuming and takes lot of efforts, a plan for accuracy improvement should be made, which can be followed step by step. The results of these studies should be analysed by the central institutions but also by the state level institutions. The appropriate mechanisms to gather and analyse data needs to be developed. JICA has accumulated experience and knowledge including the development of emission factors and the improvement of their accuracy. Thus, JICA can support these activities and develop guidelines through a technical cooperation project.

6.2.3 Develop and Introduce QA/QC process in processing Forestry Data

The international discussions on REDD+ suggest that high transparency and robustness of methodology and information employed are essential in REDD+. In particular, since the forest information provides baseline data to calculate the quantity of emission reduction, periodic Quality Assurance and Quality Control (QA/QC) for the information needs to be conducted to increase its reliability. This is very important not only for addressing the requirements of REDD+ but also for sustainable forest management

The QA/QC has already been implemented in various forms in India. Project activities to systematically reorganize QA/QC concepts in India and to address the areas which require further strengthening may also be included under the technical cooperation. Preparation of necessary guidelines on verification functions as a part of MRV of REDD+ can be one of such activities.

6.2.4 Promote Improved Coordination in Data Exchange between Central and State Levels

Forest information is collected by different methods at national, state, and field levels. When there are no concrete methodology and coherence and compatibility of data available at different levels, forest baseline data used for forest management planning would vary. Nonetheless, since REDD+ requires the consistency of the data, this issue should be addressed by enhancing coordination in data collection between central and state or other lower administrative units. Building data sharing mechanism between the data collected by FSI and other data collected by state level could also be supported by technical cooperation.

6.3 Recommendations for JICA TC at State Level

6.3.1 Develop Detailed State REDD+ Action Plan

As mentioned in section 6.2.1, formulation of REDD+ action plan at a state level is necessary for concretizing national climate change strategy and thus, to achieve its objectives. The state level REDD+ action plan should be prepared under the leadership of REDD+ cell that should be established in each state.

From the experiences of other countries, REDD+ action plan should include the contents listed below.

- Objectives including reference level settings;
- Implementation body and responsibility;
- Analysis of socio-economic condition and identification of drivers;
- Study related to policies and synergy effects;
- Clarification of REDD activities;
- Clarification of forest monitoring;
- Addressing safeguards;
- Clarification of necessary budgets;
- Plan of capacity building.

6.3.2 Develop State Level FREL/FRL

The process of establishing state level FREL/FRL has been initiated in several states. Having state level FREL/ FRL is a requirement under REDD+ scheme at state level. India having diverse natural and socio environments, FREL/FRL would also need to reflect them. In the process of FREL/FRL development would include the calculation of different models with different base year and the development of adjustment factors with the consideration of state level circumstances. Technical cooperation could assist in developing the technical manual for establishing FREL/ FRL while the process can be undertaken jointly by the experts dispatched under the technical cooperation and by the counterpart personnel.

6.3.3 Develop Regional Emission Factor for Improvement of FREL/FRL

As discussed in section 6.2.2, the accuracy of emission factors should be improved continuously. At the same time, the improvement of the same at state level implementation is also vital since India has a large geographical area and diversity of forest ecosystems. The technical cooperation would focus on development of manuals and capacity development in this respect rather than undertaking actual forest data collection for emission factor development.

6.3.4 Develop REDD+ Compliant State Forest Information System

India envisages in promoting REDD+ at the sub-national or state level. Thus, the forest information system required for REDD+ would mobilise data from the sub-national level which would be reported to national level thereafter. In order to operationalise such system, forest information system is required to be established at state level. JICA Technical Cooperation could help the state forest department to develop the REDD+ compliant forest information system.

Some of the requirements for the state level forest monitoring system include the following;

The forest data collection system should be transparent and coherent.

- The forest data collection system should be transparent and coherent. (The data collection and accumulation mechanism should be defined from the field to the state.)
- Regular update of the forest information is carried out.
- Sufficient arrangements for budget and human resources are made for sustainability.

- The system is adopted as part of the overall administrative system of state forest department, not as one of many projects.
- The system is to be developed by taking advantage of the existing systems and fulfils basic requirements.
- The system should have the linkage with National Forest Monitoring System.

6.3.5 Deploy Methods and Tools for REDD+ MRV

MRV system is an essential element in REDD+ scheme. The system should be user friendly while ensuring the efficient and effective data collection at the field level that can be processed in a timely manner for reporting. Especially in forest monitoring, introducing mobile devices for data collection is recommended. In JICA's loan projects, activities using mobile tools have been implemented. The experiences and knowledge from these projects can be effectively incorporated into the activities of a technical cooperation project.

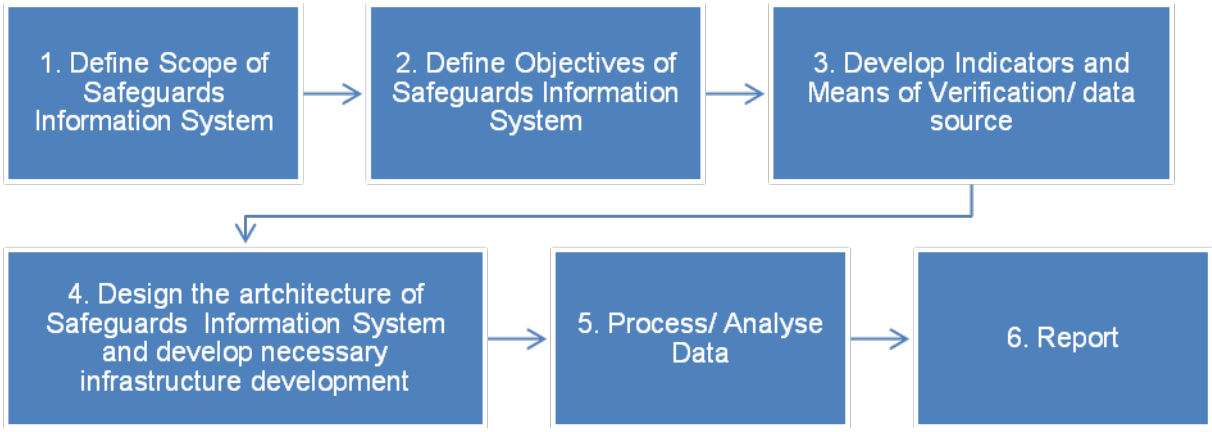
6.3.6 Enhancement of QA/QC Mechanisms

As mentioned in section 6.2.3, the enhancement of QA/QC mechanisms is an important activity while establishing robust MRV. The survey team learned that some of states already incorporated QA/QC activities in the forest monitoring process. Therefore, in a technical cooperation project, these QA/QC mechanisms can be organised into a systematic action and additional QA/QC process can also be incorporated for reinforcing the existing system.

6.3.7 Design and Operationalise Safeguards Information System

As the safeguards information system is concerned, India as a country has relevant legal and operative framework for law enforcement, establishment of sustainable forest management, forest information systems, and community based forest management. Required data for monitoring of the risks of reversals and displacement of carbon stocks are available through FSI, State Forest Departments and JICA supported forestry projects. What is missing is the information system that can allow the data from different sources to flow into one common pool where such data is synthesised and assessed for reporting. JICA's Technical cooperation can provide assistance in developing the information system including the development of infrastructure at the project as well as at the state level.

The process of establishing safeguards information system roughly involves the following steps. In developing the system, stakeholder consultations will take place for defining scope and objectives of the safeguard information system and developing indicators/ means of verification and data source. It is also important to have a consensus among the stakeholders to supply the required data to the system in a timely manner. An appropriate government order from the state government can be issued to facilitate the inter-departmental data sharing and management. If at all the software infrastructure is to be established, such investment will be made. In case of the project level, such requirements can be accommodated into the project MIS system, and thus, the financial investment will be minimal.



Source: JICA Survey Team (2016)

Figure 6.3.1 An Indicative Process of establishing Safeguards Information System

The criteria and indicators are to be defined through the stakeholder consultation. Thus, the survey team is not in the position to suggest the indicators as such. However, an attempt is made below to provide the description of possible criteria and indicative data sources for further discussions.

Table 6.3.1 Indicative interpretation of principles in the context of JICA loan assisted projects

UNFCCC Safeguards principles for REDD+	Indicative interpretation of principles	Possible Data Source/ Data requirement
a) The actions complement or are consistent with the objectives of national forest programmes and relevant international conventions and agreements	➢ Whether the project design is in line with the relevant laws and policies.	➢ Project document ➢ Project Monitoring reports
b) Transparent and effective national forest governance structures, taking into account national legislation and sovereignty	➢ Whether the project implementation structure is transparent and effective.	➢ Project document ➢ Project Monitoring/ Audit reports
c) Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United National General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples	➢ Status of FRA Rights Given (Individual/ Community Rights) in the Project Area	➢ Tribal Welfare Department/ Social Welfare Department
	➢ Whether the rights and entitlements are properly documented ➢ How the traditional knowledge is incorporated into the project interventions	➢ Project Documents ➢ Records of the Forest Dept.
d) The full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities, in the actions referred to in paragraphs 70 and 72 of this decision	➢ Whether the project has a process of stakeholder consultation/ involvement ➢ Whether the project has the investments in institutional development/ livelihood enhancement and other well-being of tribal and other forest dwellers.	➢ Project Guideline ➢ Number of meetings held during community mobilisation ➢ Record of discussion/ Resolution passed ➢ Project MIS
e) Actions are consistent with the conservation of natural forests and biological diversity, ensuring that actions referred to in paragraph 70 of this decision are not used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits	➢ Impact of the project interventions on the biodiversity ➢ Benefit sharing mechanism has been clearly defined and adopted.	➢ Project Document ➢ Micro Plan ➢ Project Monitoring Reports ➢ Project documents ➢ Biodiversity database including people's biodiversity register/ biodiversity inventory (This can be prepared by the project or use the data from State Biodiversity Board or Forest and Wildlife Department) Results of the community biodiversity assessment ➢ JFMC records

UNFCCC Safeguards principles for REDD+	Indicative interpretation of principles	Possible Data Source/ Data requirement
f) Actions to address the risks of reversals	➢ Whether the negative changes in the forest quality has been observed	➢ Satellite imageries of the project ➢ Results of community based monitoring ➢ Project MIS (Records of JFMCs) ➢ Records of Gram Sabha (PESA area)
g) Actions to reduce displacement of emissions	➢ Changes in the forest area and quality	➢ Satellite imageries of the project ➢ Results of the community based monitoring

Source: JICA Survey Team (2016)

6.3.8 Develop Relevant Methods and Tools for Collection and Management of Safeguard Data and Capacity Development for the Stakeholders

JICA Technical Cooperation can contribute in designing an overall architecture of the Safeguards Information System and design appropriate data collection formats, conducting training for data collection as well as the data processing and analysis. Furthermore, it is also recommended that the JICA Technical Cooperation may develop the tools for community based monitoring such as community based biodiversity assessment, forest dependency, carbon pool assessment and forest cover monitoring.

Capacity building for the PRIs and other concerned departments can also be designed and conducted as part of the Technical Cooperation for efficient record keeping, data processing and establishing or adjusting the existing system to be more cohesive to SIS.

Chapter 7 Results of Third Field Survey

7.1 Background and Outline of the Third Field Survey

Based on the discussion with MoEF&CC during the second field survey, it was deemed relevant that, under the JICA technical cooperation scheme, support for sub-national level REDD+ Readiness to the selected states and sharing knowledge at the national level would be appropriate.

On the other hand, Odisha implemented the Odisha Forestry Sector Development Project (OFSDP-I) between 2005 and 2015 and its phase II (OFSDP-II) proposal was approved by the Central Government of India and listed in the rolling plan. Accordingly, JICA has been implementing the supplemental survey for OFSDIP-II since July 2016 for reviewing the project proposal.

JICA has also been considering how to synergise the REDD+ technical cooperation and loan project. Thus, further data collection in Odisha and discussion with the Odisha Forest Department (OFD) for the need for REDD+ technical cooperation and its conceptualisation were considered necessary. In this context, JICA decided to conduct the third field survey.

The third field survey was conducted between 25th July and 6th August 2016. During the survey, the survey team discussed the contents of the technical cooperation project with OFD. The schedule, minutes of meeting, list of personnel met are given in Attachments 7.1 – 7.3.

7.2 Relevance of Technical Assistance

7.2.1 REDD+-related activities of the Central Government

REDD+-related activities of the Central Government include preparation for submission of reference level materials to the UNFCCC, issuance of REDD+ Reference Document, preparation of national REDD+ policy and strategy (draft), and preparation for its approval. However, these activities are not progressing steadily. One concern is that the "REDD cell" in the MoEF&CC is not functioning adequately although it is established.

Under the circumstances, the Central Government has committed to forest-related climate change policies such as the INCD (Intended Nationally Determined Contribution) and GIM (Green India Mission).

These existing policies announced by the Central Government are summarized in the analysis of their implications together with how it perceives REDD+.

(1) INDC

Section 6 of Chapter 1 "Mitigation Strategies" of INDC identifies the forestation plan. It aims at afforestation of five million ha and forest quality improvement of five million ha through a program such as GIM. It is expected to help increase carbon stock of 100 million CO_2 tons. Linked with the goal, it also plans to implement afforestation with CAMPA funds and other policies like the National Afforestation Programme (NAP), REDD-Plus policy, and Joint Forest Management (JFM).

The targets in forestry sector in INDC are as follows:

a) To achieve additional carbon stock of 2.5 to 3.0 billion tons of CO_2 by increasing forest cover by 2030.

b) To prioritize full implementation of the GIM and other afforestation programs to achieve the above.

(2) GIM

GIM is regarded as a specific policy to achieve INDC. It has been implemented under the policy framework of the National Action Plan on Climate Change (NAPCC).

GIM identifies four mission objectives and two of them listed below are closely related to the REDD+.

a) To achieve the forest and tree cover area in forest and non-forest land being five million ha and improve the forest quality of additional five million ha (10 million ha in total).

b) To achieve 50 million to 60 million tons of annual carbon sequestration by 2020.

Objective a) is the goal in of INDC and objective b) is an addition to it to secure annual carbon stock of 50 to 60 million tons of CO_2 by 2020.

(3) Relationship between climate change measures and REDD+ of the Central Government

Climate change measures of the Central Government consist of INDC with ambitious goals and policy programs such as NAPCC and GIM to realize them.

A series of policy documents are written with the focus on afforestation rather than reduction of deforestation and forest degradation. This means that India's state strategy is to contribute to the ultimate goal of INDC by implementing specific afforestation activities with focus on "+" of the REDD+ mechanism. This is consistent with India's claim of proposing the inclusion of the "+" concept in the REDD mechanism that was originally discussed in the international community.

In other words, REDD+ in India has implications that promotion of afforestation projects that also contain elements such as local community' participation and improvement of their livelihood, which are different from typical countries subject to REDD+ where deforestation and forest degradation is in progress.

7.2.2 REDD+ activities in Odisha State and Assistance Needs

(1) Capacity of the Forest and Environment Department

Linked with the action of the Central Government summarized above, the state government has started formulating SAPCC. The state's Forest Department is responsible for implementing GIM and other existing programs. In addition, there is an urgent need to formulate a working plan (WP) in the responsible area in accordance with the National Working Plan Code 2014 that was promulgated in 2014. The new WP code requires carbon stock assessment and the state government is required to prepare the new WP by March 2017. However officers of the state Forest and Environment Department in charge of WP preparation are not equipped with knowledge of carbon stock assessment. Thus, there is an urgent need to enhance the capacity of the officers to be engaged in the WP formulation.

(2) REDD policy

SAPCC of the state government crystallizes climate change measures in the form of specific strategies. The STATE REDD+ POLICY and STRATEGY (SRPS) needs to be formulated at the state level under the guidance of NRPS. However, the state does not recognize urgency of preparing SRPS partly because NRPS has yet to be approved by the Central Government. It is desired that a policy framework that includes afforestation activities at the state level with GIM and CAMPA funds and loan projects be formed while watching the actions of the Central Government.

(3) FRL

Odisha State's Forest and Environment Department has little awareness of the need for formulation of state FRL partly because of the lack of expertise knowledge on the REDD+ mechanism. In other words, the preparation of FRL is currently not an urgent issue. However, the formulation of FRL is essential for state's participation in REDD+ as FRL is an important standard to measure results of REDD+ activity if the state gets access to the GCF, FCPF and other external funds.

(4) MRV

MRV (Monitoring, Reporting, Verification) that is used as a technical term related to REDD+ is essential for forest planning and the state's Forest Department should handle it regardless of whether there is REDD+ or not. In other words, technical assistance could be given to such areas as capacity

enhancement of the officers in terms of measurement and development of a system for data integration since the needs for the development of MRV mechanism in the department is very high. It is necessary to respond to the needs of the state department by rewording the technical terms related to REDD+ in the existing forest management and plan.

(5) Safeguards Information System (SIS)

The institutional arrangements for safeguards have already been established and the data has been collected. However, such data is located in different government offices and not ready to be monitored from one place. In addition, the available data does not necessarily cover all the variables required for the REDD+ SIS. Thus, there is a need to establish a SIS that allows efficient and effective data collection and monitoring of safeguards related information, in which the indicators should also be revisited taking into account of the conditions specific to Odisha and through the stakeholder consultation. The capacity enhancement of the stakeholders for operationalising SIS is also essential to ensure the sustainability of SIS.

7.2.3 Field Visit in JICA Loan Project (Phase 1) sites

As described above, REDD+ in India can be regarded as implementing a variety of reforestation policies focusing on afforestation in order to contribute to targets committed in INDC. The survey team conducted the field survey to grasp the current situation and readiness of Odisha State on REDD+. The records of the field survey are as provided in Attachment 7.4.

Forest management activities involving local communities are carried out in accordance with the JFM rules in the loan project sites (OFSDP Phase 1). The Project Management Unit (PMU) accumulates boundary data of the project sites and maintains the database of plot survey information set for each point. PMU also has satellite data of forest cover transition before and after project implementation and quantitative data of project impacts. Hence it is fair to say that PMU has collected and managed quality information from the MRV perspective.

Local people have a great sense of ownership for the activities of livelihood improvement carried out under the project and thus it is fair to say that adequate measures are taken in terms of safeguards. India is advanced with respect to safeguards because it has a legal system represented by the Forest Right Act. Also, it is the basic approach of JICA loan forest project to formulate forest management and livelihood improvement plans (micro plan) with participation of local communities and formation of SHGs (Self Help Groups) that aims at women's economic empowerment.

It was confirmed that JICA loan project in forestry sector has already implemented field activities required for REDD+. This means that the project can be regarded as REDD+ by reorganizing the activities, collecting supplemental data and information required for MRV and safeguards.

7.3 Draft Outline of the Technical Cooperation Project

During the third survey, a series of discussions were held with OFD, and the synopsis of the discussion is given in this section. A consensus was established on the needs of the project as follows: 1) a need to out-scale REDD+ to other states for achieving sustainable forest management, and 2) sharing of information and advancing understanding of REDD+ at the central government. Accordingly, the project purpose has been set and project outputs including networking were defined.

Table 7.3.1: Draft Outline of the Technical Cooperation

Project Title:	Project for Development of REDD+ Implementation Mechanism for Sustainable Forest Management in Odisha, India.
Duration:	5 years
Project site / Implementing Agency	Odisha/ OFD
Overall Goal:	Odisha State Forest Department becomes a technical knowledge hub of sustainable management of forest including REDD+.
Project Purpose:	The Sustainable Forest Management Practices through REDD+

	becomes an integral part of the Forest Management in Odisha.
Project Outputs:	1. State REDD+ policy and strategy are developed. 2. FRL for Odisha is established. 3. MRV system is put into practice. 4. Safeguards Information System for Odisha is put into practice. 5. A knowledge network on REDD+ for sustainable forest management is established.

Source: JICA Survey Team (2016)

The Project Design Matrix (PDM) revised during final discussion with OFD on 3rd August 2016 is provided in Attachment 7.5, which provided the basis for OFD to prepare the Application for Technical Cooperation Project. Subsequently, on 12th August 2016, OFD has submitted it to the central government.

The need for pilot project under technical cooperation was also deliberated upon with OFD. The pilot project under the technical cooperation is likely to be required for testing the operation of the system. In order to establish a compatible data exchange system between the state and project for effective and efficient monitoring, it would be better to implement pilot activities jointly by the technical cooperation project and OFSDP-II in the selected sites. Thus, no pilot project was proposed under the technical cooperation project.

On the other hand, to implement the state level technical cooperation for REDD+, policy and institutional arrangement for REDD+ at the central government should also provide an enabling environment. The involvement of and coordination with the central government is very important for the technical cooperation project. However, during the third field survey, the survey team was unable to interact with the central government to understand the status and thus it is not reflected in PDM. Once confirmed, such factors will need to be incorporated into PDM.

7.4 Synergy between OFSDP-II and Technical Cooperation Project

Technical cooperation would provide assistances to OFD in establishing the state level framework for REDD+. This includes preparation of guidelines for MRV and SIS. Monitoring indicators will also be reviewed for the state. The supplemental survey for OFSDP (Phase II) starting in August 2016 will design the REDD+ related activities keeping possible assistance by the technical cooperation in mind. Mechanisms to ensure synergy between the technical cooperation and OFSDP-II shall also be embedded in the implementation process.

7.5 Assistance from Other Donors and their Implications for JICA Projects

Two projects to be launched by the FAO are discussed below as those are likely to require collaboration with JICA projects.

(1) Strengthening National Forest Inventory (NFI) and Monitoring Protocols and Capacities in India

This is a technical assistance project for FSI and central and local government officers. The following activities are planned:

- Review existing NFI and designing new NFI
- Design of framework and procedures for enhancement of collaboration between central and local governments

Odisha State requires to grasp the carbon stock volume in the state based on the latest National WP code (2014). The forest type map and ground survey data are required for it and data of NFI implemented by FSI is likely to be used. New NFI to be designed by FAO project might have significant impacts on the activities in Odisha State.

Regarding MRV, the state government needs to submit integrated forest information to the Central Government. UNFCCC requires “ensuring consistency of information” as a REDD+ requirements and collaboration of information in India is a key to it. Thus, the “measures to enhance collaboration

between central and state governments" that FAO plans to assist is likely to be closely related to JICA projects.

It is essential for Odisha State to actively collaborate with FAO projects through inputs in the design phase, on-site trials and working-group-based exchange of information in cooperation with JICA.

(2) Green agriculture: Transforming Indian agriculture to promote global conservation benefits

It is a cross-sectoral program with GEF funds for securing environmental benefits and food safety and improving livelihood. It mainly consists of two components and aims to promote biodiversity conservation, measures against land degradation, and sustainable forest management through enhancement of governance and transformational changes in agricultural practices.

Odisha State is designated as one of the five target states and two or more districts in the state will be selected for implementing activities related to biodiversity and sustainable forest management.

Both technical cooperation projects and OFSDP-II that are under deliberations are likely to enhance project efficiency if handled in collaboration with such activities and adequate information sharing is made.

Attachments

Attachment 1.1: List of Personnel Met During the Survey

1st Field Survey

States	Institute/ Department/ Agency	Name	Designation
	MOEF&CC	Dr. Rekha Pai	Inspector Generals of Forest
		Mr. Subhash Chandra	Deputy Inspector Generals of Forest
		Mr. E.Vikram	Assistant Inspector Generals of Forest
	IORA	Mr. Swapan Mehra	CEO
		Mr. Ashwin A S	Manager-Forestry
		Mr. Akhilesh Singh	Senior Manager
	GIZ	Mr. Kudan Burnwal	Technical Advisor
	IFS	Mr. Arun Kumar Bansal	Former ADG Forests, MOEF&CC
	FRI / ICFRE	Dr. Ashwani Kumar	Chancellor FRI Univ.Director General ICFRE
		Dr. T.P.Singh, IFS	Assistant Director-General ICFRE
		V.R.S. (Vijay) Rawat	Scientist 'E' / ICFRE
		Dr. Savita	Deputy DG of Education
	IGNFA	Mr. Vinod Kumar	Director
		Dr. S.Senthil Kumar, IFS	Additional Professor
		Dr. Mohit Gera, IFS	Professor & Member Secretary, REDD+ Cell
	FSI	Dr. Anmol Kumar, IFS	Director General FSI
	GIZ	Mr. Enrico Rubertus	Project Director
		Mr. Kudan Burnwal	Technical Advisor
	TERI	Mr. Suresh Chauhan	Fellow
		Ph.D. Yogesh Gokhale	Fellow
	USAID -India	Mr. Varghese Paul	Senior Forest Advisor
	Forest-PLUS	Christopher Kernan, PhD	Chief of Party
	NEDO	Mr. Hiroharu Kudo	Representative
		Mr. Dheeraj Kumar	Representative
Uttar Pradesh	≪Officers attended meeting on 19 Oct 2015 at Parrijat Meeting Hall regarding REDD+≫	Mr. Umendra Sharma	Proncipal Chief Conservator of Forests, U.P
		Sri Iqbal Singh	MD, U.P forest Corporation
		Sri S.K. Upadhyay	PCCF, Wild Life/CPD. U.P.P.F.M&P.A.Project
		Sri. S.K.Sharma	PCCF, Working Plan
		Mr. Amit Tripathi	S.E
		Mr. Pawan Kamor Sherux	CCF(PAAC)
		Mr. A.V Singh	DPD(CO), JICA Project, Lucknow
		Mr. Arand Kumar	Dy CWLW
		Mr Ajit Sharma	DCF(PCCF officer)
		Mr. V.M. Arora	Project Director (UP JICA project)
		Mr. B.C.Tiwari	P.D(M&E) JICA
		Mr. A.K Singh	DPD(Admin)
		Mr. V.K.Sinha	AICCF
		Mr. Ajay Kumar	CCF(CAMPA)
		Mr. Vikash Verma	S.E
		Mr. Rajev Kumar Singh	DPD
		Mr. M.S. Bhuppal	C.C.F
	Remote sensing application centre, U.P	Mr. Amit Sinha	Technical Secretary to Director
		Dr. P.KUNWAR	Scientist 'SD' & In-charge
		Mr. Sushil Chandra	Head, C.I.P. & D.M. Division
		Mr. Alok Mathur	Head, Soil Resource Division
		Mr. Kumar Maurya	GIS officer (JICA) project

2nd Field Survey

States	Institute/Department/Agency	Name	Designation
Odisha	Odisha Forestry Sector Development Project (OFSDP)	Mr. Lalit Kumar Tewari	Chief Conservator of Forests, Additional Project Director
		Mr. Santosh Kumar	Dy. Project Director(IME)
		Mr. Devasis Biswal	Deputy project director (P&A)
		Mr. Chandan Jani	Deputy project director(Forest Technology & training)
		Mr. Pratap Behera	Dy. Project Director(Admin & Finance)
		Mr. Amiya Parida	Dy. Project Director(LLI)
		Mr. P. C. Mishra	Joint PD (IME)
		Mr. Pradeep Raj	Joint PD
		Dr. (Mrs.) M Biswal	APD (AJY)
		Dr. Ajit Kumar Pattnaik	Principal Chief Conservator of Forests (Projects) , Project Director
	Forest Department, Odisha, Bhubaneswar	Mr. J.D. Sharma	PCCF - Head of Forest force
		Mr. Siddhanta Das, IFS	Addl. PCCF, Forest Diversion& Nodal Officer, FC Act
	Conservator of forests cum state silviculturist Odisha	Sri Abhimanyu Behera, IFS	State Silviculturist
	Working Plan Division	Mr. E.L. Yanger Aier	Working Plan Officer, Bhubaneswar
	Forest and Environment Department Govoernment Of Odisha	Dr. Pramode Kumar Prusty	Senior Scientist, Climate Change Cell
	ST&SC Development, Minorities&Backward Classes Welfare Department	Mr. R.Raghu Prasad	Director, Tribal Welfare-cum-Additional Secretary
West Bengal	West Bengal Forest & Biodiversity Conservation Project	Mr. Siddhartha Barari	Additional Principal Chief Conservator of Forests & Chief Project Director
		Mr. Soumitra Dasgupta	Additional Principal Chief Conservator of Forests & Project Director, Finance
		Mr. Saurabh Chaudhuri	Chief Conservator of Forests & Project Director, Monitoring&Evaluation
		Mr. Prasanta Kumar Pandit	Chief Conservator of Forests & Additional Project Director (Implementation)
	PCCF/ Government of West Bengal	Mr. Azam Zaidi	PCCF & HoFF
		Mr. S. Dhaundyal	Managing Director of WBFDC
		Mr. N.K.Pandey	PCCF - General
		Mr. N.V Raja Shekar	PCCF
		Dr. R.P. Saini	Addl. PCCF/ Finance
		Mr. V.K. Sood	GM HQ WBFDC
		Mr. Surendra Prasad Yadav	CCF SE Circle
		Mr. Subhamay Chanda	CCF/ Monitoring&Evaluation
		Mr. P.K. Pandit	PD (M&E) WBFBCP
		Dr. Anupama	CF/WP & GIS
	Department of Environment	Dr. Dipanjana Maulik	Conservator of Forests, Working Plan and GIS Circle, West Bengal Forest Department
Tripura	Tripura JICA Project / Government of Tripura	Mr. G.S Raju	Additional Principal Chief Conservator of Forests, Chief Executive Office & Project
	Tripura JICA Project (TFIPAP)	Mr. Pranajit Bhowmik	Addl. Director
	Tripura Forest Department/ Government of Tripura	Mr. K.S. Sethi	Chief Conservator of Forests, Planning
	PCCF/ Government of Tripura	Shri S.Talukdar	Principal Chief Conservator of Forests & HoFF
	Dept. of Science, Technology & Environment/ Government of Tripura	Mr. Debashis Chakraborty	Spl. Secretary & Director
	Government of Tripura	Mr. Harsha Kumar. V.C	DFO South Tripura
		Mr. Kush Roy	Wildlife Warden Trishna WLS
	Tripura Forest Development and Plantation Corporation Limited	Mr. C.L. Das	Executive Director
		Mr. Rameshwar Das	Managing Director
	Working Plan No2	Mr. Budhi Debbarma	Deputy Conservator of Forest
	Government of Tripura	Mr. L.H. Darlong, IAS	Secretary to the Government of Tripura
	Tribal Welfare	Mr. Rabindra Reang	Joint Director
	Tripura Rehabilitation Plantation Corporation Limited	Mr. Sushil Debbarma	Managing Director
		Mr. Abhijit Ray	company secretary

States	Institute/Department/Agency	Name	Designation
Sikkim	Sikkim Biodiversity Conservation & Forest Management Project/	Mr. C.S RAO, IFS	
	Sikkim Biodiversity Conservation & Forest Management Project/ Department of Forest, Environment & Wildlife Mgmt./ Government of Sikkim	Mr. Karma Legshey D., IFS	Additional Project Director(I)
	JICA Sikkim Biodiversity Conservation & Forest Management	Mr. Ganesh Yadav	Deputy Team Leder/Joint Forest Management Specialist (Project Management Consultant)
	JICA Sikkim Biodiversity Consevation & Forest Management Project	Mr. Udai Gurung, IFS	Addl. PD-II
		Aram Basnet (Ms.)	ACF(Ecotourism & JFM)
		Ms. Deunen Cachingpa	DFO (Biodiversity Conservation)
		Mr. N.Taswant	DFO (Ecotourism)
	Forest Department, Sikkim, Gangtok	Mr. B.P. Pradhan	CF (WP)
		Ms. Yangchen Bhutia	ACF (WP)
		Mr. S.Elamuru Ganwan	TA to PCCF/ DFO (WP)
		Mr. Sunil Kumar	ACF (WP)
	DST & Climate Change , Sikkim	Mr. D.G. Shrestha	
	Social Justice & Welfare Department	Mr. Dushyant Pariyar	Joint Secretary
	Forest PLUS	Mr. Basant Kr. Sharma	Regional Community Outreach & Communication Specialist
		Mr. Sanjeeb Pradhan	Regional Coordinator
Uttarakhand	Forest Department, Uttarakhand **(Nainital)**	Dr. Parag Madhukar Dhakate	Nodal officer/Climate Change & REDD+
	Uttarakhand Forest Resource Management Project (UKFRMP) **(Dehradun)**	Mr. Anup Malik	Chief Project Director
		Mr. Joshi	Project Director
		Mr. S.K. Singh	-
	Directorate of Tribal Welfare **(Dehradun)**	Mr. Yogendra Rawat	Joint Director
	Uttarakhand Forest Department **(Dehradun)**	Mr. Amulya Ratan Sinha	APCCF Working Plan
		Mr. R. N. Jha	CCF Monitoring & Evaluation/ Nodal Officer for Climate Change Cell
		Mr. Dharm Singh Meena	IT&GIS Cell
Himachal Pradesh	Swan River Integrated Watershed Management Project (SRIWMP) PMU, Una	Dr. Suresh Kumar Mr. R. K. Dogra Mr. K. K. Gupta Dr. Kuldeep Kumar Mr. Krishnan Lal	CPD Dy Director and DFO Dy Director Dy Director Superintendent
	Swan River Integrated Watershed Management Project (SRIWMP) PMC	Ms. Suman Mahajan Dr. Sunjeev Kumar Bhal Dr. Pankaj Bhalla Dr. Manoj Joshi Mr. Amar Singh	Admin Social Development Training Env. Education Forester
	Field Visit	PMU and PMC	
	Himachal Pradesh FD	Mr. S. P.Vasudeva	PCCF & HOFF, Himachal Pradesh
	Himachal Pradesh FD	Mr. Sanjeeva Pandey	PCCF- Participatory Forest Management; in charge of REDD+/ Climate Change
		Ms. Archana Sharma	CCF
	Himachal Pradesh FD	Mr. Surinder Kumar	APCCF, Admin
		Mr. Vinod K. Tiwari	CCF, HRD
	Mid-Himalayan Watershed Development Project	Mr. Sanjeev Kumar	ACF
	Department of Environment, Science & Technology, Government of Himachal Pradesh, Shimla	Dr. Suresh C. Attri	Principal Scientific Officer

States	Institute/Department/Agency	Name	Designation
Karnataka	JICA Forestry Project/ SFD, Bengaluru	Mr. C Jayaram	APCCF, JICA Project
		Mr. Smt. Seema Garg	Addl. Principal Chief Conservator of Forests (Legal Cell)
		Mr. Krishna D. Udapudi	Chief Conservator of Forests (Projects)
		Mr. Range Gowda	CCF Shimoga
		Mr. Brijesh Kumar	CCF- Information Communication Technology
	Karnataka Forest Department	Ms. Meenakshi Negi	APCCF (WP)
	ICTC, Karnataka Forest Department	Mr. Brijesh Kumar	CCF- Information Communication Technology
		Mr. K.Mohiyddin	RFO
		Mr. K.Eregowda	DRFOCS
		Mr. Palakshaiah K.S	GIS
	Forest PLUS	Ms. Poshini B T	Communication Specialist
		Mr. Arun Poojary	Regional Coordinator,
		Mr. Boraiah, K.T	RFO, Agumbe Range Megarovalli
		Mr. Lakshiminaraymna	Regional Training associate
		Mr. B. Mukunda Chandra	ACF, Shivamogga

Attachment 1.2: List of Data and Documents Collected

Sr.	Document Title	Document source/ Issuing Institution	Form	Type					Category	Remark
				Collected	Prepared by JICA Experts	Prepared by JICA	Text	Others		
1	The Final Report of the Expert Group on Low Carbon Strategies for Inclusive Growth	Planning Commission GOI	Soft copy	1					JR · CR( ) · SC	
2	National Action Plan on Climate Change	Prime Minister's Council on Climate Change	Soft copy	1					JR · CR( ) · SC	
3	India First Biennial Update Report to the United Nations Framework Convention on Climate Change	Ministry of Environment, Forest and Climate Change	Soft copy	1					JR · CR( ) · SC	
4	NATIONAL REDD+ POLICY& STRATEGY – Zero Draft	Ministry of Environment, Forest and Climate Change	Soft copy	1					JR · CR( ) · SC	
5	High Conservation Value Forests – an instrument for effective forest fiscal federalism in India	Indian Institute of Forest Management (IIFM), Bhopal	Soft copy	1					JR · CR( ) · SC	
6	IMPLEMENTING NON-LEGALLY BINDING INSTRUMENT ON FORESTS IN INDIA	Indian Institute of Forest Management (IIFM), Bhopal	Soft copy	1					JR · CR( ) · SC	
7	INDIA'S INTENDED NATIONALLY DETERMINED CONTRIBUTION: WORKING TOWARDS CLIMATE JUSTICE	Government of India	Soft copy	1					JR · CR( ) · SC	
8	National Working Plan Code - 2014 (For Sustainable Management of Forests and Biodiversity in India)	Ministry of Environment, Forest and Climate Change	Soft copy	1					JR · CR( ) · SC	
9	Reference Document for REDD+ in India (Power Point presentation)	Ministry of Environment, Forest and Climate Change	Soft copy	1					JR · CR( ) · SC	
10	India's Intended Nationally Determined Contributions – Towards Climate Justice	Ministry of Environment, Forest and Climate Change	Soft copy	1					JR · CR( ) · SC	
11	India State of Forest Report 2015	Forest Survey of India	Soft copy	1					JR · CR( ) · SC	
12	REDD+ Manual for Practitioners	Indian Institute of Forest Management (IIFM), Bhopal	Soft copy	1					JR · CR( ) · SC	
13	Feasibility Study Forestry NAMA in India	GIZ India	Soft copy	1					JR · CR( ) · SC	
14	METHODOLOGY FOR IMPLEMENTATION OF REDD ACTIVITIES IN LANDSCAPES AFFECTED BY MOSAIC DEFORESTATION AND DEGRADATION	GIZ India	Soft copy	1					JR · CR( ) · SC	
15	Forest-PLUS SHIVAMOGGA LANDSCAPE	USAID	Soft copy	1					JR · CR( ) · SC	

Sr.	Document Title	Document source/ Issuing Institution	Form	Type					Category	Remark
				Collected	Prepared by JICA Experts	Prepared by JICA	Text	Others		
16	PARTNERSHIP FOR LAND USE SCIENCE (Forest-PLUS) PROGRAM Strategy paper on Sustainable Forest/Ecosystem Management	USAID	Soft copy	1					JR · CR( ) · SC	
17	REDD+ MEASUREMENT, REPORTING AND VERIFICATION (MRV) MANUAL VERSION 2.0: FOREST CARBON, MARKETS AND COMMUNITIES (FCMC) PROGRAM	USAID	Soft copy	1					JR · CR( ) · SC	
18	AR-CDM and REDD+ (Power Point presentation done by TERI in UP)	TERI	Soft copy	1					JR · CR( ) · SC	
19	Assessment for Designing REDD Plus Projects in India	CWC, Ministry of Water Resources, GOI	Soft copy	1					JR · CR( ) · SC	
20	Project Completion Report of JICA assisted Karnataka Sustainable Forest Management & Bio-diversity Conservation (KSFMBC) Project	Forest Department of Karnataka	Soft copy	1					JR · CR( ) · SC	
21	REDD plus pilot project in the Van Panchayat (Village Community Forests) of Uttarakhand	Forest Department of Uttarkhand	Soft copy	1					JR · CR( ) · SC	
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Attachment 1.3: Points of Discussion at the Consultative Meeting on REDD+ for JICA Loan Projects held on 19th February 2016

1. Programme

Date: 18th – 19th February 2016
Venue: Hotel Eros, Nehru Place, New Delhi
Day 1: **18th February 2016**

Time	Event	Remarks
15:00 ~ -	Arrival and Registration of Participants	Those participants who are from 11 states.
19:00 ~ 21:00	Welcome Reception	All participants are invited for the welcome reception.

Day 2: **19th February 2016**

Time	Event	Reporters
9:30 ~ 10:00	Registration	
10:00 ~ 10:10	Address by JICA	Mr. Jinnai, JICA Tokyo
10:10 ~ 10:20	Address by MoEF&CC	Dr. Rekha Pai, Inspector General, MoEF&CC
10:20 ~ 10:30	Presentation (1): Survey Background and Objectives	Mr. Sasaki, Team Leader/ JICA survey team
10:30 ~ 10:55	Presentation (2): Status of REDD+ in India	Mr. Suzuki, JICA survey team
10:55 ~ 11:10	Tea/ Coffee Break	-
11:10 ~ 11:30	Presentation (3): Status of Safeguards	Dr. Ebato, JICA survey team
11:30 ~ 12:00	Presentation (4): Proposals for JICA Technical Cooperation on REDD+ in India	Mr. Sasaki, Team Leader/ JICA survey team
12:00 ~ 13:30	Question and Answer session	
13:30	**Lunch**	
15:00	**Check out from the Hotel/ Departure**	

2. Points Discussed during the Consultative Meeting

i) General

- A lot work still remains to be done for REDD+. Efforts are being made for the national policies and strategies; a number of pilots are also being implemented but there is a need for R&D on socio-economic aspects, as well as on technical aspects. We want people to restrain from harvesting of trees and protect forest. There has to be alternatives as well as incentive mechanisms to ensure people do that.

ii) MRV:

- There is a need for a simpler methods for MRV. The existing system of M&E by the states should be considered as MRV and JICA should help the states to have REDD+ interventions. There are already methodologies available for baseline in many states. Efforts should be made to improve the quality of the forest. Although there is no deforestation in many states but forests are in state of degradation.
- In case of Odisha Forestry Sector Development Project data input procedures have been standardised and analysis of changes in vegetation is being carried out on a regular basis

centrally at PMU. The process of field data collection and mapping using mobile application has now trickled down to the community level. Development of mobile based app and forest monitoring was evolved over a long period of time. A lot of consistent efforts have gone into it. The challenge is to build the capacity of people in usage of mobile application at different levels.

- As it is understood that the FRL and MRV are to be set up at the National Level then how the states have to work on FRL and MRV. Funding for REDD+ has to be approached through the Central Government.
- Some countries allow construction of FRL and MRV both at the national and sub-national levels, some countries have only national level FRL and MRV. It all depends on the policies of the Government. In the case of India, as mentioned in the REDD+ Reference Document, FREL/FRL can be set both at the national and sub-national levels.

iii) Fluctuating Carbon Market

- A participant raised an issue of fluctuations in the carbon market, which is not encouraging. However, one should not focus only on carbon benefits and most important aspect is achieving the sustainable management of forest through REDD+ interventions. From the point of view of carbon market there are challenges and one can't have high expectations from the sale of carbon credits. Benefits from multiple functions of the forest needs to be evaluated and appreciated. Alternatively, one may need to approach various types of financial sources/ buyers.

iv) Mechanisms for monitoring the Tree outside of recorded forest

- JICA Tamil Nadu project works on tree planting outside the forest area i.e. on the fallow land of the farmers. The farmers of the state in huge number have come forward to have afforestation activities on their land. The recent FSI report clearly speaks of expansion of tree and forest cover in the state which is 2,502km^2. There has to be some mechanisms to cover these areas under REDD+. Different mechanisms for benchmark, MRV etc. are to be worked out. There is a strong need for incentives for these farmers. Clear mechanism need to be evolved regarding the amount of expected incentives and the cost to be incurred to be REDD ready by investing in PDD preparation, developing tools and techniques and the monitoring system.

v) INDC Target and How to Achieve

- The issues of lack of finance to work on reduction of CO2 emission was raised by a participant. An ambitious target has been set by the Government of India in INDC to UNFCCC. The basis for the figure needs to be clarified. Furthermore, to achieve such an ambitious target, finance is required. It will be difficult to be met only by ODA, but need to approach other sources such as Green Climate Fund and other funding mechanisms.
- A participant raised a query how much area has to be covered under afforestation to achieve the INDC target. An attempt was made by TERI to estimate which indicated the requirement of 14,000 crores (140 billion) seedlings to be planted to achieve the target, considering 60% survival in 5 years and 40% survival in 10 years, which requires an additional funding of USD 1 billion annually. However, a concern is the lack of capacity at the State Forest Departments and the shortage of staff.

vi) REDD+ Pilot Projects

- ICFRE is involved in 2 REDD+ Projects. Capacity building of the community and the ground staff is very much required in order to successfully implement REDD+ and requested JICA to adopt an integrated approach and provide support to project executing agencies.

vii) Response on the Preliminary Survey Findings

- Participants requested that the state wise analysis should have been presented for better understanding of survey findings.
- Participants also indicated that they would like to know the next course of action – whether each state would formulate some actions or wait for instructions from JICA or MoEF&CC. How to take out funds from the ongoing JICA project for REDD+ specific interventions where the amount is allocated component wise with specific physical and financial targets.

viii) Cut-off date for REDD+ Project

A participant wanted to know if there is any cut-off date for REDD+ project as there is a cut-off date for CDM. Whether REDD+ projects can be considered for completed JICA projects.

The responses were given by the Survey Team that while waiting for the national policy and strategies to come, the states can work on good monitoring systems, safeguards information systems etc., which would help them to contribute to achieve INDC, Forestry NAMA.

ix) Donor Interventions

- Forest PLUS has been working in four states (Sikkim, Karnataka, Himachal Pradesh and Madhya Pradesh) and developing FRL/FREL and MRV tools and techniques. They can be adopted by JICA projects since they are already available.
- In order to institutionalise REDD+ all prescriptions are to be fully included in working plan. As REDD+ requires involvement of different departments mechanisms are to be created at the state level for coordinated efforts. In Sikkim, a steering committee for REDD+ has been constituted under the leadership of the Chief Secretary to pool resources from various departments.
- It has been a challenge to work with the community level institutions as they are diverse. The implementation approach needs to be inclusive including monitoring and benefit sharing. More efforts are required to build the capacity of the community for monitoring.
- Efforts are being made by Forest PLUS to scale up the current M&E system to MRV. The use of remote sensing for forestry planning is there in the states but continual monitoring of carbon pool is not being done. The states have to maintain a lot of data sets on forestry as well as on socio-economic aspects as per the requirements under VCS. From the point of view of governance, security of community rights, benefit sharing etc. India has robust system unlike many African countries. Under Forest PLUS the state level project document is being prepared in Sikkim and it will be the first Jurisdictional REDD+ Project in Asia. Karnataka, where Circle level jurisdictional approach is being adopted, will be the first state sponsored REDD+ project in India.
- GIZ has prepared a methodology for VCS to suit to the Indian context. First validation has already been done and GIZ is waiting for the second validation. He emphasized the importance of community monitoring. As per the existing VCS methodology the reference area of a project should be of 250000 ha and it does not speak of community monitoring. The VCS methodology developed by GIZ can be used for small areas and community monitoring has been given priority.

x) Debates on cost and benefit ratio of REDD+:

- Numbers of questions were raised by participants from West Bengal and Tamil Nadu on the cost of preparation project documents and other REDD+ action and how these costs are to be met; what is guarantee that the carbon markets would provide the benefits in future?
- TERI has worked out a cost estimate for preparation of project documents and validation etc. It comes out to be USD 3 per CER unit.
- IORA Solutions have worked out tentative costs for REDD+ project – investment is required to the tune of USD 0.1 million to 1.5 million for projects having area of 50,000 ha to 100,000 ha. Project area of 50,000 ha will have 50,000 to 60,000 credits per year. The cost can be recovered soon if the area is large. Already SFD's are using satellite data for monitoring purpose and lay down plots and collect socio-economic data, so no additional cost would be incurred, thus cost would further be reduced. For smaller areas definitely it would take 10-15 years to get the cost recovered. The current size of voluntary carbon market is 1 billion USD. Amazon, Google and Yahoo are buying the credits for offsetting their emissions. Efforts are on for domestic carbon market, which would definitely help benefiting the REDD+ projects.
- Participants were reminded that the total benefits (carbon as well as non-carbon benefits) from REDD+ projects/ interventions should be taken into consideration rather than looking at only the carbon benefits.

3. List of Participants

	Office	Name	Designation	Welcome Reception 18 Feb. '16	Consultative Meeting 19 Feb '16
1	MoEF&CC	**Dr. Rekha Pai**	Inspector General	×	○
		Mr.E.Vicram	AIG	×	○
2	FSI **(Dehradun)**	**Mr.Mukul Trivedi**	FSI/Joint Director	○	○
3	ICFRE **(Dehradun)**	**Dr N.S. Bisht**	Director (International Cooperation)	○	○
		Dr. T.P. Singh	Assistant Director-General, Biodiversity and Climate Change	○	○
4	PMU JICA forestry project/ SFD, **Uttarakhand**	**Mr Anup Malik**	Chief Project Director	○	○
		Mr. SM Joshi	Project Director	×	○
		Mr. Mayank Shekhar	Dy. Project Director	×	○
		Mr.Shubhadarshi Mishra	GIS Specialist	○	○
5	PMU JICA forestry project/ SFD, **West Bengal**	**Mr.Soumitra Dasgupta**	Project Director, Finance	○	○
		Mr.Saurabh Choudhuri	Project Director, Monitoring & Evaluation	×	○
		Mr.N V Raja Shekar	APCCF	○	○
6	PMU JICA forestry project/ SFD, **Rajasthan**	**Mr.Akshay Singh**	Joint Project Director (Admin)	○	○
7	PMU JICA forestry project/ SFD, **Tamil Nadu**	**Mr. Sanjay K Srivastava**	APCCF&PD	○	○
8	PMU JICA forestry project/ SFD, **Sikkim**	**Ms Yangchen Bhutia**	ACF (Utilization)	○	○
		Ms Angel O. Chettri	ACF (Dam & Biodiv Conv)	○	○
9	PMU JICA forestry project/ SFD, **Uttar Pradesh**	**Dr Prabhaker Dubey**	CCF/ Project Director (A & F)	×	○
10	PMU JICA forestry project/ SFD, **Gujarat**	**Shri. Anil Johri**	APCCF	○	○
		Shri. Ram Kumar	CCF, Vadodara Circle	○	○
		Shri. B. F. Sindhi	CF, (SF), PMU	○	○
11	PMU JICA forestry project/ SFD, **Himachal Pradesh**	**Dr. Suresh Kumar**	Chief Project Director	○	○
		Sr. Raj Kumar Dogra	Deputy Director	○	○
12	PMU JICA forestry project/ SFD, **Odisha**	**Dr. Ajit Kumar Pattnaik**	PCCF (Projects) cum Project Director	○	○
		Shri Lalit Kumar Tewari	CCF cum Additional Project Director	○	○
13	PMU JICA forestry project/ SFD, **Karnataka**	**Mr. Krishna D. Udapudi**	CCF (Projects)	○	○
14	GIZ	**Mr. Kundan Burnwal**	Technical Advisor	×	○
		Ms. Schneider	-	×	○
15	USAID - India	**Mr. Varghese Paul**	Senior Forest Advisor	○	○
16	USAID Forest Plus	**Mr. Ashish Raj**	M&E expert	×	○
17	TERI	**Dr. J.V. Sharma**	Senior Fellow	○	○
18	IORA	**Mr.Ashwin A.S**	Manager	○	×
		Mr. Akhlesh Singh	Manager	○	×
		Mr.Marimuthukam M	-	×	○
19	JICA Tokyo	**Mr.Kei Jinnai**	Director, Natural Environment Team 1	○	○
		Mr.Yuki Okada	Assistant Director, Natural Environment Team 1	○	○
20	JICA India Office	**Ms. Sachiko Imoto**	Senior representative	○	○
		Ms. Ai Tachikawa	Representative	○	○
		Mr.Vineet Sarin	Principal Development Specialist	×	○
		Mr.Anurag Sinha	Lead Development Specialist	×	○
21	JICA Survey Team	**Mr. Akihiko Sasaki**	Team Leader/ REDD+	○	○
		Mr. Kei Suzuki	MRV	○	○
		Dr. Michiko Ebato	Safeguards	○	○
		Mr. Shalabh.P. Bharadwaj	Forest Monitoring	○	○
		Dr. Manoj Pattnaik	JFM/Safeguards	○	○
		Ms. Tamao Tada	Climate Change/ Coordinator	○	○
		Mr. Swapan Mehra	REDD+	○	○
			TOTAL	**34**	**44**

Attachment 5.1: Status of REDD+ Readiness in Uttar Pradesh

1. Forests in Uttar Pradesh

Uttar Pradesh is the most populous State of India with a population of 199.81 million. The state has borders with Haryana, Delhi and Rajasthan in the West; Madhya Pradesh in the South; Bihar in the East; and Uttarakhand and Nepal in North. The geographical area of Uttar Pradesh is 240,928 km^2, which is 7.3% of total area of the country. It has 75 districts falling in two main physiographic zones i.e. the Northern Plains or the vast Gangetic Plains and the Central Highlands. The main forest types in the state are Tropical Dry Deciduous (50.66%) and Tropical Moist Deciduous (19.68%). There are small amount of Tropical Thorn (4.61%), Littoral and Swamp forests (2.35%) and Tropical Semi Evergreen forest (0.21%) in the state.

The efforts for forest conservation in Uttar Pradesh dates back to 1800 when forest areas in Kumaon, Dehra Dun and Terai came under the British Rule. Felling of sal was prohibited in some areas in 1826. Large scale felling of sal took place during 1855 to 1861 to provide timber for railway sleepers. Major Ramsey, Commissioner of Kumaon, after appointed as the first Conservator of Forests, introduced several management practices including rotational working and further in 1867, he introduced fire protection in the sal forests. The sal forests in Gorakhpur were worked to provide timber to the ship building industry. Afforestation in Uttar Pradesh began in 1879 after the visit of Dr. Brandis to the ravine area of Etawah district. The first Working Plan Division was created in 1884 and the Working Plan Circle was constituted in 1920. A Research Division was created in 1918.

Status of Forest in Uttar Pradesh

Geographical Area (GA)	240,928 km^2
Recorded Forest Area	16,583 km^2
% of recorded forest area to the GA	6.88
Actual Forest Cover	14,349 km^2
Actual Tree Cover outside the forest	6,895 km^2
Total Forest and Tree Cover	21,244 km^2
% of total Forest and Tree Cover to GA	8.82
Very Dense Forest	1,623 km^2
Moderately Dense Forest	4,550 km^2
Open Forest	8,176 km^2
Reserve Forest	11,660 km^2
Protected Forest	1,420 km^2
Unclassed Forest	3,503 km^2
Protected areas (One National Park and 24 Sanctuaries	5,714 km^2 & 7 km of the River Ganges
Area notified as Gram Van (Village Forest) and managed by JFMCs (JICA Forestry Project)	1004.74 km^2
Forest Revenue during 11th Five Year Plan period	INR 13,940 million
Forest Revenue during 2012-13	INR 3,313.10 million
Important Forest Products of the State	Timber, Bamboo, Tendu Leaf, Medicinal plant/ NTFPs
Plantations undertaken during 2011-12	74,182 ha
Compensatory Afforestation cumulative till 2011-12	43,967 ha

Note: Compiled from State of Forest Report, 2013, FSI, Dehradun; UP Forest Statistics, Website of UP Forest Department; Reports of UP Participatory Forest Management and Poverty Alleviation Project.

2. Forest Administration

The UP Forest Department is principal institution to govern the forest resources in the state. There are 30 circles (16 territorial and 14 functional), 82 forest divisions (79 territorial and 3 functional), 494 Ranges (441 territorial and 53 functional) and 3,198 beats (3,108 territorial and 90 functional) to protect, manage and conserve the forest resources. The forests are managed under Indian Forest (UP amendment) Act, 1965 and other rules framed under this act. The state has UP Private Forest Act 1948 and Rules 1950 for management of private forest. The UP Protection of Trees Act 1976 regulates the felling of trees on the private land. The Village Forest Joint Management Rules 2002 and 2010 (amendment) have been framed to promote joint forest management. Following the National Forest Policy 1988, the state promulgated a Forest Policy in 1998 with a mandate of having a minimum of 33% of the total geographical area under forest/tree cover. According to the State of Forest Report 2013, the state has 5.96% of State's geographic area under forest cover and 2.86% of area under tree cover.

The State has one National Park (Dudhwa National Park – part of Dudhwa Tiger Reserve), 24 Wildlife Sanctuaries and two zoos covering an area of 5714 Km2. The development of these areas is primarily

done through the three Centrally Sponsored Schemes i.e. Project Tiger, Project Elephant and Integrated Development of Wildlife Habitats. For the conservation and development of wetlands the state is implementing National Plan for Conservation of Aquatic Eco-System with financial support from the Government of India. A Lion breeding centre and a safari have been set up at Etawah (outskirt of the city) with an area of 400 ha with the funding from the state. UP Forest Corporation has provided some financial help to set up this safari.

3. Forest Monitoring

In the state of Uttar Pradesh, the State Forest Department (SFD) has a dedicated Chief Conservator of Forest (CCF) for Planning and Evaluation. The officer looks after the regular monitoring and evaluation of plantations and other associated activities on annual basis. Some of the key activities include:

a) Regular field inspections at Field office level, DFO level, CCF level as part of regular monitoring.

b) Annually evaluation of 3 year old plantations and annual advance soil work. Selection of 20-25% sites will be done randomly by making sure all Forest Ranges and all schemes are covered/ represented. One nursery from each forest range would also be surveyed.

c) For transparency, evaluation/ survey of departmental plantations and advance soil work team of every unit must evaluate/ survey at least two sites of other unit.

d) During the evaluation survey, failure mounds and pits need to be properly counted and recorded.

Some other initiatives taken by SFD include:

a) SFD is having its own plot level forest inventory data.

b) The legal forest boundaries are being digitized (37 forest divisions already completed), SFD calculates forest situation within forest boundary and outside forest boundary unlike FSI that uses SOI greenwash (which is not so accurate) as reference for Forest Cover and outside as TOF.

c) Working Plan division of SFD is getting the working plans revised as per new working plan code in association with State Remote Sensing Application Centre (SRSAC).

d) GIS Cell of JICA project and SFD has prepared forest cover map using IRS LISS-III and LISS-IV satellite images and supplemented it with ground truthing.

e) Plantation sites under the JICA project are being surveyed using GPS.

4. Safeguards and Safeguards Information System

The status of safeguards was assessed as per the UNFCCC principles of safeguards. The results is given in the table below.

Status of Safeguards and Safeguards Information System in Uttar Pradesh

Items	Findings
Consistency/ relevancy to the national and international policy/ programme/ agreements	◆ REDD+ Strategy/ Policy has not been developed. ◆ State climate change action plan prepared (2014). ◆ Vision 2025 for forestry sector has been prepared.
Effective State forest governance structure	◆ Forest Department has a fully functional institutional set up and from the state level to the field level. ◆ JFM Rule 2002 enacted. ◆ Under UPPFMPAP, JFMCs/ EDCs have been constituted. The project also has a functional institutional set up which runs parallel to the existing structure of forest Department.
Respect for the knowledge and rights of	◆ FRA is implemented. ◆ Based on the JFM Rule 2002, communities are involved in the forest

Items	Findings
indigenous peoples and local communities	management.
Full and effective participation of the relevant stakeholders	◆ REDD+ cell has not been constituted. ◆ A nodal officer has been identified. ◆ In the case of JICA UPPFMPAP, the project explained about the project objectives, interventions and possible implication to their livelihoods and forest and etc. during the formation of JFMCs/ EDCs. JFMCs/ EDCs are constituted in revenue villages for sustainable forest management. At the district level, concerned line departments are involved for better livelihoods of the forest dependent communities through convergence.
Conservation of natural forests and biodiversity	◆ All the relevant national laws and regulations are reinforced. ◆ Working plans/ management plans are prepared and implemented. ◆ Monitoring of the works and the changes in the forest cover are undertaken at the state level. FSI monitors through its own institutional structure and the report is published on a biannual basis. ◆ Central and state funded schemes are implemented for the purpose (CAMPA, FDA and etc.) ◆ Under UPPMPAP, JFMCs/ EDCs undertake activities that contribute to the conservation of natural forest and biodiversity (i.e. IGAs to reduce the dependency on forest resources, patrolling, keeping records of extractions/ felling, adopt alternative household energy to reduce the consumption of the fuel wood and etc.)
Actions to address risks of reversals	◆ No concrete actions are planned as REDD+ interventions have not been fully planned and implemented. ◆ FSI monitors through its own institutional structure and the report is published on a biannual basis. ◆ By adopting the Working Plan Code (2014), the base line for the carbon stock can be established, which enables the Forest Department to assess the risks of reversals. ◆ UPPFMPAP has the digitized boundary data of village forests and satellite imageries for the project area. MIS system is also operational. The project monitors the work progress as well as the changes in the forest condition. 10 AR-CDM sites have been established. Such initiatives can help reduce displacement of emissions.
Actions to reduce displacement of emissions	◆ No concrete actions are planned as REDD+ interventions have not been fully planned and implemented.
Safeguards Information System	◆ No plan for establishing a Safeguard Information System was discussed as yet. Data availability, reliability of data, data management system may require a review to constitute a Safeguards Information System. ◆ UPPFMPAP has GIS and MIS which are fully operational.

Source: JICA Survey Team (2016)

5. Efforts for Forest Protection, Management and Conservation

The State Government has been implementing several forest and wildlife conservation programmes including afforestation and reforestation in forest as well as areas outside the forest. Some of them have been mentioned in the table below.

Implementation of important Laws, Programmes and Schemes related to forest management

Law/ Programmes/ Schemes	Activities/ Interventions
Forest Rights Act	➢ FRA is being implemented in the state of Uttar Pradesh. 1,107 Forest Rights Committees were constituted at the Gram Panchayat level to receive claims and verify them and recommend them to the Sub Divisional Level Committees. There are 43 Sub Divisional Level Committees and 17 District Level Committee to implement the FRA. A total of 93,644 claims (92,520 individual claims and 1,124 community claims) were received. As on January 2016, 18,555 titles were

Law/ Programmes/ Schemes	Activities/ Interventions
	distributed involving a forest area of 139,625.46 acres. These titles included 843 community claims and the rests were individual titles.
Joint Forest Management	➢ Undivided Uttar Pradesh (including present Uttarakhand) has a long history of community based forest management, which dates back to 1920s. The Van Panchayat Regulation was introduced long back in 1931 to govern the Van Panchayats/ Forest Councils under the erstwhile District Scheduled Act of 1874. Van Panchayats were constituted to protect, manage and conserve forest resources and said to be the oldest form of partnership between the Government and local communities in decentralised forest management. All the Van Panchayats are now in Uttarakhand. Prior to formation of Uttarakhand, the major amendments to the Kumaon Panchayat Forest Rules (Van Panchayat Rules) 1931 were done in 1972 and 1976. ➢ Joint Forest Management in the present form was started in 1997. The UP Government formulated Village Forest Joint Management Rules, 1997. The World Bank supported the UP Government to implement a JFM Programme for a period of 5 years from February 1998. ➢ Village Forest Joint Management Rules were amended in 2002 and 2010. The State Government has empowered the DFO to notify forest areas as Gram Van (Village Forest) under Section 28 of Indian Forest Act 1927 (UP amendment in 1965) and hand it over to Joint Forest Management Committees for its protection and management. 100,474 ha areas have been notified as Gram Van and it being managed by 800 JFMCs, who are being supported under JICA assisted UP Participatory Forest Management and Poverty Alleviation Project. ➢ As on March 2010, there were 3,014 JFMCs in Uttar Pradesh and protecting and managing an area of 724,600 ha (Forestry Statistics India-2011, ICFRE)
CAMPA	➢ CAMPA in the state was registered on 12-08-2010 under Societies Registration Act 1860. Against the target of 16,887.71 ha of compensatory afforestation the state has achieved afforestation on 10,253.8 ha. The total fund released during last three years is Rs. 1199.1184 million.
National Afforestation Programme	➢ NAP is a 100% centrally sponsored scheme and funds are provided to the State Government for afforestation activities through Joint Forest Management Committees. Forest Development Agencies (FDAs) are constituted at the Forest Division level to plan and implement NAP in collaboration with the JFMCs. In Uttar Pradesh 72 FDAs have been formed at the Forest Division level to implement National Afforestation Programme. ➢ During 2010-11, State Forest Development Agency was constituted to implement the programme through FDAs and provide funds to the FDAs. ➢ During 2011-12 to 2014-15 (till Feb 2015) a sum of Rs. 736.50 million was provided to UP for undertaking afforestation on 30,143 ha. During 2014-15, Rs. 120 million was provided to the state for implementation of the programme in 8,548 ha.
Green India Mission	➢ UP was provided with Rs. 11.95 million during 2011-12 for preparatory activities under GIM. It was basically for training and institutional strengthening, selection of landscape and preparation of perspective plan etc. ➢ The perspective plan is yet to be submitted to MOEF&CC. During 2011-12 to 2013-14 the Government has spent Rs. 7.425 million on the preparatory activities of GIM.
Intensification of Forest Management Scheme	➢ MOEF&CC provides funds to the State supplementing its efforts for forest protection, management and preservation. The funds are used for patrolling of the forests, establishment of camps, building, watch towers for detection and monitoring of forest fires, creation and maintenance of fire lines, survey and demarcation of forest areas and strengthening forest infrastructure etc. ➢ During 2012-13 to 2014-15, Uttar Pradesh received a sum of Rs. 89.149 million, against which the expenditure was Rs. 53.467 million.
Social Forestry	➢ Plantations is carried out on various type of community land, canals, rail, and on

Law/ Programmes/ Schemes	Activities/ Interventions
(State sponsored scheme)	land available on road side to ensure the availability of timber, fuel wood, fodder, small forest produce etc., in rural areas of all the districts. ➢ Social forestry activities are undertaken using funds available under special component sub plan and tribal sub plan in SC abundant and ST abundant areas respectively.
Social forestry in Urban Areas	➢ In this scheme ornamental and shady trees are planted on the unused land alongside the roads and parks for environment protection and beautification in urban areas.
Green Belt Development	➢ Green belt development is an innovative programme launched by the UP Government in 75 districts during 2013-14 through financing from Forest Corporation. In each district 3-4 sites shall be developed a green belt.
Total Forest Cover Scheme	➢ Total forest Cover Scheme 2014-15 is being launched to ensure complete greenery in Districts Mainpuri, Etawah, Lucknow, Unnao, Kannauj and Badaun. In the proposed project, advanced soil treatment and plantation will be done in the wastelands and fencing of rail tracks/canals/roads through plantation of trees will be done.
Forest Cover Enrichment Scheme	➢ With the objective of Enrichment of forest cover in the open forest areas and degenerating forest regions, a four year scheme with collaboration of NABARD has been proposed for 18 districts (Agra, Aligarh, Bareilly, Meerut, Saharanpur, Muradabad, Jhansi, Banda, Kanpur Nagar, Lucknow, Faizabad, Gonda, Varanasi, Mirzapur, Allahabad, Gorakhpur, Basti and Azamgarh).

Source: Compiled by JICA Survey Team from reports of MOEF&CC, website of UP Forest Department, reports of Ministry of Tribal Affairs, GOI etc.

(1) UP Forest Department Vision 2025

The state came out with Vision 2025 on forestry sector, which provides the commitment of the state as mentioned below:

- We endeavour nurturing forests through world-class forest management practices for conservation of biodiversity, accrual of sustained goods and services and large-scale plantations for green cover extension, to provide a clean and green environment to society at large.
- We aspire to adopt innovative approaches for inculcating conservation ethics in the minds of the people.
- We aim to have personnel trained in the best modern technologies and exposed to the latest global research.
- We strive relentlessly in pursuit of excellence to set world-class standards in global forestry

(2) Drivers of forest degradation in UP

As mentioned above the total forest cover including tree cover (outside the forest) is 21,244 km^2, which is only 8.82% of the geographical area of the state. The forest area is quite low in comparison to the population and their dependence on forest for fuel, fodder and timber. The major challenge in forest protection and conservation is the increasing biotic pressure. More than 50 per cent of the recorded forest area is open forest with a low productivity of timber, fuel wood and fodder. The forests have been degraded for long because of the biotic pressure. Still a large amount of livestock depend on the forest for grazing/ fodder. Out of the total livestock population of 58.92 million, 17 per cent depend on forest for fodder (*India State of Forest Report 2011, Ch. 7*).

While annual estimated production of wood from the forest is 0.425 million m^3 and from Tree outside Forest is 5.082 million m^3, the current demand of timber for house construction, furniture and agriculture implements is 61.38 million cum per annum. There is already a deficit of 55.873 million m^3 of timber in the state. Same is the case with fuel wood demand and supply. The annual estimated production of fuel wood from forest is 0.008 million tonnes and from tree outside the forest is 2.253 million tonnes. The annual fuel wood consumption is 19.063 million tonnes. 10.495 million people are

using fuel wood from the forest with an annual use of fuel wood from the forest is 1.294 million (*India State of Forest Report 2011, Ch. 7*).

Manifestation of the Drivers of Forest Degradation in UP – Case Study from the TERI Pilot Project in Gardarwa village in Renukoot Forest Division

TERI is conducting a pilot for REDD+ in Uttar Pradesh i.e. Gardarwa village in Gardarwa forest block in Renukoot Forest Division. The village has 89 households and all of them are dependent on 77 ha of forest area for forest produces for their own use as well as for sale to make some cash income. A Joint Forest Management Committee has been constituted in the village. From the resource assessment it was identified that the forest has been degraded because of unsustainable harvesting of different forest products including fuel, fodder and NTFP by the villagers. Since all the households are in BPL category and their sources of livelihood from agriculture and wage employment are limited, they depend on harvesting of different forest produces. The current fodder extraction including grazing from the forest is 320 tonnes per annum whereas the sustainable extraction limit of the forest is 117 tonnes. Similarly the annual fuel wood extraction is 146 tonnes against the sustainable limit of 77 tonnes (*Assessment for Designing REDD+ Projects in India, Teri, 2014*). This clearly depicts the pressure on the forest. This may not represent the scenario in the whole state but there is no denying fact that the existing forest resources can't bear the increasing biotic pressure.

Source: JICA Survey Team (2015) based on Assessment for Designing REDD+ Projects in India (TERI, 2014).

6. Status of Uttar Pradesh Participatory Forest Management and Poverty Alleviation Project (UPPFMPAP)

(1) Salient Features of UPPFMPAP

In order to address the forest degradation- poverty nexus, the Uttar Pradesh Participatory Forest Management and Poverty Alleviation Project was formulated with the financial support of JICA and commenced its implementation in FY 2008-09 for 8 years. The project covers 20 forest divisions in 14 districts in the northern and southern regions of UP, namely Terai, Bundelkhand, and Vindhyan regions. The project works with 800 Joint Forest Management Committees and 140 Eco Development Committees for sustainable forest management and poverty reduction.

The project objectives are: 1) to restore degraded forests and to augment forest resource; 2) to improve livelihood for and empower local people dependent on forest by promoting sustainable forest management including JFM plantation and community development; and 3) subsequent improvement of the environment and poverty alleviation among the forest dependent communities. The profile of the project area and activities are summarised in the table below.

Project Profile

Particular	Description
Project Cost	5.75billion Rs.
Project Area	20 forest divisions (Pilibhit, Bahraich, Katerniaghat WLD, North Kheri, South Kheri, Dudhwa Tiger Reserve, sravasti, Lalitpur, Mahoba, Hamirpur, Mirzapur, Kaimur WLD, Sonbhadra, Obra, Renukoot, Kashi WLD, Allahabad, Sohelwa WLD, Jhansi, Chitrakoot) in 14 districts *In UP, many of the tribal groups have been notified as Scheduled Caste (SC) and included in the category of Dalits (depressed classes), who would be recognised as "Other Traditional Forest Dwellers" under the Forest Rights Act. However, there was no FRA area covered under the project area.
Project Duration	2008-09 to 2015-16 (Extended up to 2017)
Project Components and Outlines	i) Preparatory works ii) Institutional strengthening of PMU/ DMUs/ FMUs iii) Capacity building of NGOs/ JFMCs/EDCs/ SHGs ➢ 800 JFMCs formed (800 villages) in the project area ➢ Village Forest Area notified: 100,400 ha approx. ➢ 140 EDCs formed in the Wild Life Divisions iv) Wildlife conservation and management – management of protected areas, eco-tourism development, biodiversity hotspots outside PA, EDC fuel wood/ fodder community plantation v) JFMC/ EDC community development and livelihood security enhancement

Particular	Description
	➢ 2,680 SHGs/ Micro Enterprises are to be formed. vi) Departmental forest area development and management ➢ 20,200 ha to be treated vii) JFM forest area development and management ➢ 60,300 ha to be treated viii) Survey and research ix) Communication and publication x) Chidlren's Forest Programme xi) AR-CDM xii) Monitoring and Evaluation ➢ GIS development (Image based maps have been completed for all 20 divisions land use in all forest division have been finalised in 2013 and sent to the respective divisions.) ➢ MIS: 10 modules are developed in-house including financial management module and rolled out. ➢ Social audit is to be undertaken once a year. ➢ All physical activities will be evaluated on GIS based platform for pre-project and end-term (spatial and temporal level) including forest type stratification and growing stock estimation. ➢ All villages will be covered with MIS and GIS linkages. ➢ In the first state the web based MIS is under development to be used at the division level. The system to be used at the range level will be developed once the division level system is tested and established. xiii) Phase-out/ Phase-in works xiv) Consulting Services

Source: UPPFMPAP. Annual General Meeting Presentation 2013-14.

(2) Status of the Project

1) Forest Management

In UPPFMPAP, forest management components are executed by the Forest Department and by the JFMCs constituted by the project. In the case of the former, the activities are planned by the Forest Department for the forest areas where the Forest Department is directly responsible for management.

The forestry works to be done under the JFM component, the work is planned by the JFMCs. At first, the community mobilisation takes place in order to form JFMCs and the importance of sustainable forest management and the community's roles and responsibilities are discussed. One JFMC was formed in each revenue village located in the project forest divisions. These JFMCs are formed on the basis of the Uttar Pradesh Village Forests Joint Management Rules 2002, in which composition of the committee, function, and benefit sharing are defined.

Each JFMC is given a forest area to manage out of the reserved forest, which is demarcated and notified by the DFO of the respective forest division.

For the management of village forest area, JFMCs prepare a micro plan for the duration of 5 years. A micro plan is prepared adopting participatory tools and techniques with the full participation of the FUG members. Livelihood activities are included as part of the micro plan.

Under the project, 100,400 ha have been notified as village forest. The activities undertaken under different components are given in the table below.

Forest Management Activities in UPPFMPAP

Mode of Implementation	Description of the Works
Departmental Mode (20,200 ha)	➢ 20,200 ha treatment completed by 2011-12. Maintenance works to be continued till 2013-14. ➢ The works are done for three density classes – forest improvement works for very dense forest (general improvement works/ ANR for Sal Forest), moderately

Mode of Implementation	Description of the Works
	dense forest (Gap Plantation including NWFP, ANR for SAL forest, Enrichment Planting cum stand improvement, Bamboo cultivation operation/ plantation), and degraded and scrub forest areas (Block plantation including NWFP, plantation cum stand improvement, bamboo cultural operation/ plantation). ➢ Plantation, drainage line treatment, fire protection, nursery development, producing planting stocks at FD nurseries
JFM Mode (60,300 ha)	➢ Cumulative area treated as of 2013-14: 46,689.92ha ➢ Plantation, drainage line treatment, Fire protection ➢ Decentralised nursery and planting stock production ➢ Forest improvement of three density classes: ➢ Very dense: General improvement operation ➢ Moderately Dense: gap plantation including NWFP, enrichment planting cum stand improvement, bamboo plantation ➢ Degraded and scrub forest: block plantation including NWFP, plantation cum stand improvement, bamboo plantation/ cultural operation

Source: UPPFMPAP. Annual General Meeting Presentation 2013-14 and Annual Implementation Plans.

2) **Livelihood Support Activities**

Under the project, livelihood support activities through SHGs formed by the members of FUGs of JFMCs were implemented in order to achieve one of the project objectives: to provide alternative livelihoods for the poverty stricken forest dependent communities. UPPFMPAP, thus, focused on the women and other marginalized segments of the community whose options for means of livelihoods were limited and they were given priorities for participating to the SHG activities.

Status of SHGs formed under UPPFMPAP

- Internal saving and book keeping
- Financial support of 1.1 lakh (1 lakh seed fund and 10,000 support fund to each SHG)
- Till 2013-14
- 2,400 SHGs have been formed
- 1,680SHGs undertaking internal savings
- 1,213 SHGs have been funded by the project till date against the target of 1,875 SHGs.

Source: UPPFMPAP. Annual General Meeting Presentation 2013-14.

On an average, 10-15 members formed a group and started savings among the members. Each member will save a small sum of money, 10-20 Rs. to begin, with on a regular basis, which will provide them a common fund that they can use as a loan to its members when a need arises or as the initial capital when starting an income generation activities of their choice. The project has supported the SHGs to develop a business plan of their chosen income generation activities. Preferred activities included goat rearing, poultry, NTFP collection and value addition, lac cultivation, tasar cultivation, incense stick making, vegetable production, handicrafts making and etc.

Other support for the livelihood has been done through convergence with other departments. The convergence has been coordinated by the District Advisory Committee constituted with the representatives of concerned line departments at the district level, in which DFO interacts and solicits the support for the project areas. One of the commonly organised events through convergence is the health camp in the villages.

3) **AR-CDM**

UPPFMPAP has introduced AR-CDM activity in order to enhance the sustainable forest management practices by the JFMCs by earning additional revenue deriving from the carbon sink created by the project activities. For this purpose, TERI has been engaged to undertake the feasibility assessment and provide assistance to the project to prepare a Project Design Document (PDD).

110 villages/ JFMCs across 10 Forest Divisions have been assessed eligible for AR-CDM. Each forest division, as a project proprietor, prepared a PDD and submitted to UFCCC through MoEF&CC. Five (5) PDDs out of 10 have been approved by National CDM Authority (MoEF&CC)[1].

AR-CDM Projects under UPPFMPAP

Name of the Forest Division	No of Villages/ No of JFMCs	Village Forest Area (ha)	AR-CDM project area (ha)	Estimated annual Emission Reduction (tons)
Allahabad	11	1,470.80	506.63	4,008
Lalitpur	14	1,260.35	416.09	5,376
Chitrakoot	10	1,030	287.32	3,682
Jhansi	9	861.94	268.87	3,570
Khasi	10	1,433	320.51	4,962
Mahoba	13	1,181.81	265.46	4,267
Mirzapur	15	2,529.29	763.79	13,234
Obra	10	2,228.70	326.72	5,457
Renukoot	8	2,551	284.04	7,611
Sonbhadra	10	2,260	337.35	8,618
Total	110	16,806.89	3,776.78	60,785

Source: Compiled by JICA Survey Team based on the Project Details of AR-CDM Projects under UPPFMPAP. (http://www.uppfmpap.org/uppfmpap/master/ARCDM.aspx . accessed on 26th October 2015).

The survey team has visited two villages included in the AR-CDM project of Allahabad Division during the field survey. The village forests are growing well. The villagers indicated very clear sense of ownership of the forest and stated that they will protect the forest as long as they earn tangible profit from it.

7. REDD+ Readiness in Uttar Pradesh State and UPPFMPAP and Areas for Further Development

The REDD+ preparedness of UP project has been assessed with reference to the analytical framework of this survey. The detailed assessment on Safeguards is attached in the Section 5.

REDD+ Readiness Status of Uttar Pradesh State and UPPFMPAP

REDD+ Requirements	Uttar Pradesh State	UPPFMPAP
State Action Plan	➢ SAPCC is prepared, which includes forestry sector. ➢ REDD+ action plan has not been developed.	-
(Donor Intervention)	None	None
FREL/FRL	➢ Not set.	➢ Not set.
(Donor Intervention)	None	None
State/ Project Forest Monitoring System	➢ Done by the State Forest Department.	➢ Done by the project.
(Donor Intervention)	None	JICA
Safeguard Information System	➢ Existing laws and policies are followed.	➢ UPPFMPAP has its own process of FPIC, grievance redressal mechanism through social audit. ➢ Potential reversals are addressed through the community capacity enhancement in sustainable forest resource management and providing alternative means of livelihoods.

[1] *Source: UPPFMPAP. Annual General Meeting Presentation 2013-14 and Annual Implementation Plans.*

REDD+ Requirements	Uttar Pradesh State	UPPFMPAP
		➢ However, it is not fully established to satisfy the REDD+ safeguard.
(Donor Intervention)	None	JICA
MRV	➢ Partly established as part of the preparation of working plan and data collection for the same.	➢ AR-CDM projects are established in 10 forest divisions where the MRV system is placed, however, its operationalization is yet to be seen.
(Donor Intervention)		JICA

Source: JICA Survey Team (2015)

Based on the findings above, following areas can be suggested to enhance REDD+ readiness in Uttar Pradesh and UPPFMPAP.

Suggested Areas for Further Development– Uttar Pradesh

Areas for Further Development
➢ State Action Plan on REDD+ needs to be developed to set a roadmap for the state. ➢ FREL/ REL needs to be developed. ➢ MRV needs to be further strengthened to align with the UNFCCC requirement. ➢ For the adoption of REDD+ the objectives of safeguards, criteria and indicators are to be defined and existing mode of data management may need to be adjusted to align with the UNFCCC requirement. ➢ Overall architecture of Safeguards Information System needs to be developed. ➢ Consensus between stakeholders/ line departments for data sharing needs to be established. ➢ Once the indicators are finalized, the means of verification and sources of data needs to be developed and operationalized. ➢ Safeguards technical reference materials (guidelines, manuals and etc.) and capacity development of the stakeholders for data management and reporting are required. ➢ Some pilot sites (JFMCs promoted by UPPFMRAP) may be adopted for implementation of REDD+.

Source: JICA Survey Team (2016)

8. Field Visit Report

8.1 Meeting with Sinkikala JFMC, Range – Koraon, Allahabad Forest Division on 17th Oct 2015

(1) Introduction:

A meeting was held with the JFMC members in Sinkikala village on their activities concerning forest protection, conservation and management, and A/R CDM. The meeting was attended by the JICA Survey Team, DFO and other Officers of Allahabad Forest Division and Koraon Range, the partner NGO of JICA supported Uttar Pradesh Participatory Forest Management and Poverty Alleviation Project (UPPFMPAP/ the Project hereinafter.), and about 60-70 villagers of Sinkikala. The meeting started with a formal introduction of the Survey Team by Mr. Manoj Khare, DFO, Allahabad Forest Division.

(2) Key points emerged from the discussion with the JFMC members:

- The JFMC was formed in June 2011 and forest area (Reserve Forest notified as Village Forest/ Gram Van by the DFO) allotted to them is 69.8 ha. The nine (9) member JFMC is formed out of 81 Forest Users (members of forest user group). The total number of households in the village is about 300 households.
- A micro plan for 5 years was prepared upon formation of the JFMCs. Annual plans are also prepared based on the micro plan and activities are carried out as per the approved annual plans.
- 47 ha has already been treated (plantation, trenches and seed sowing along the trenches) with the support of the Project (30 ha in 2012-13, 10 ha in 2013-14 and 7 ha in 2014-15). The species planted are Amla, Behr, Khair (*Acacia catechu*), Acacia mangium, Chilbil (*Holoptelea integrifolia*), Imli, Mahua, Kat Sagon (*Haplophragma adenophyllum*), Neem etc. Along the trenches Khair seeds were sown. The survival rate is good and the Khair trees have come up well

along the trenches. One watchman has been engaged to protect the area and the JFMC members do keep a watch on the forest. The site is located near the village and usually the villagers go through the forest area to the nearest market. As mentioned by the Chairperson of the JFMC, Mr. Ram Mahender, each member participates in voluntary patrolling. Everyday five (5) persons (FUG members of the JFMC) are engaged in protection on a rotational basis. Since the watchman is available and the project is paying the wages for the watchman, the voluntary patrolling is done when needed.

- Between 2011 and 2015, a sum of Rs. 15.94 lakh was transferred to JFMC account and the expenditure till Sep 2015 was Rs.14.71 lakh.
- A village development fund (VDF) account has been opened and the membership fees, income from forest, revolving fund for SHGs along with the interests, and income of JFMC from other sources have been deposited in this account. A membership fee of Rs. 10 per member per annum is collected and so far Rs. 1,700 has been collected as membership fee.
- Under the entry point activities, the JFMC has purchased utensils and tent house materials, which are rented out to different persons in the village. The income earned from renting tents and other equipment is deposited in the VDF.
- Three SHGs have been formed. Two SHGs out of three have received seed money (10,000Rs as grant) as well as revolving loan (Rs. 100,000). One SHG has received Rs. 100,000 loan for poultry and another received Rs. 60,000 for goat rearing. Third one is in the process of receiving the loan for goat rearing.
- Under the Project, each SHG is provided with Rs. 10,000 as grant and up to Rs. 100,000 as loan, which they have to repay in 18 months' time with an interest of 8 per cent. The repayment starts after 6 months of disbursement of loan.
- The JFMC allowed its members to cut and carry grasses from the Village Forest areas for free of charge. The next year onwards, the JFMC will collect Rs. 5 per a bundle of grass (per one gatta) and also record the total collection of grass.
- The JFMC has maintained the records such as meeting register, cash book, plantation journal etc. with the help of member secretary who is a forest guard in charge of the village.

(3) Response of JFMC on A/R CDM

- The JFMC members including women expressed a sense of ownership over the forest and it seems they are committed to protect and conserve the forest.
- Earlier people were not keen to protect forest, hence the area became denuded. Now since it is notified as a Village Forest and JFMC has been formed, people have started taking interest in forest protection.
- Some of them mentioned about the ecosystem services they would get from the forest and also the financial benefits from the sale of NTFPs.
- The villagers are not aware of CDM and carbon credits. But the Animator engaged by the Project as well as the President of JFMC made a mention of CDM but they are also not fully aware of details of the CDM/ project design document etc.

(4) Challenges before JFMC

- Soil condition of many parts of the Village Forest is not good. There are rocky patches, which can't be used for plantations.
- Because of poor rains and lack of water, the growth of the plants is slow.
- The members always demand for financial support from the Project/ JFMC for different village development activities. In the meeting, the members were requesting the Project to provide further support for creation of drinking water facilities and water for other domestic use and irrigation.

- The JFMC was of the opinion that there has to be a continuity of support to the JFMC for another 5-6 years so that they can establish strong village institution as well as forest management practices.
- Out of 300 plus households living in the village only 81 have been considered as forest users and they are part of FUG. The JFMC members may convince other villagers to eventually become the members of FUG. Once the forest is regenerated and flow of income/ benefits from the forest there may be competition/ conflict between the FUG members and rest other villagers to take the benefits from the forest.

8.2 Meeting with Kharakadabar JFMC, Range – Meja, Allahabad Forest Division on 17th Oct 2015

(1) Introduction:

JICA Survey Team visited Kharakadabar JFMC on 18th Oct 2015 and had a discussion with the FUG members, Project Staff and representatives of partner NGO. The Deputy Project Director, Mr. A K Singh from the PMU of the Project facilitated the meeting. About 30 members of the FUG participated in the meeting.

(2) Key points emerged from the discussion with the Forest User Group (FUG) members:

- The FUG has 52 members and an area of 149 ha of Village Forest has been given to the JFMC for afforestation, protection and management. When the JFMC was formed in 2011 there were 85 forest users, who became members of the FUG. Now 33 of them are not interested in the forest protection and conservation as the wages paid by the project was much lower than that can be earned from other nearby places.
- As required of a JFMC, they have prepared a micro plan for 5 years and subsequently annual plans to plan and implement different activities of the project.
- 68 ha have been planted between 2011 and 2013 with local species such as Amla, Mahua, Khair, Neem, Chilbil, Kat Sagwan, Bamboo, Cassia siamea etc. The trees like Kat Sagwan, Khair and Cassia siamea have come up quite well despite poor rain and harsh soil conditions. The treated area was denuded long ago and there was no plantation undertaken in the area earlier.
- Three (3) SHGs have been formed and two have started income generation activities such as goatery and agriculture (vegetable farming). Each group has taken Rs. 100,000 as loan and Rs. 10,000 as seed money/ grant. The SHG has given Rs. 9,000 to each member for IGA with an interest of Rs. 2 per month. The SHG has to repay the loan to JFMC (VDF account) with an annual interest of 8 per cent. In case of agriculture activity, the members have used the loan for purchase of seeds and other inputs required for their individual farms. The crops grown by them are wheat, potato, onion etc. The SHG is yet to work on improving the package of practice and/ or introduction of new crops etc. Members of SHG involved in goatery have purchased 2-3 goats each but they are yet to sell any goats. Both the SHGs have started repayment of their loans (one has repaid Rs. 38,000 and other Rs. 42,000).
- The JFMC has given the responsibility of managing the tent house (tent house, utensils, generator set etc.) to one member and the rates for renting each item have been fixed. In the last two years Rs.15,760 has been earned by the JFMC excluding the wages provided to the members engaged in tent house activities.
- Regarding CDM, not much awareness is there among the JFMC members. But they have a clear sense of responsibility in protection and conservation of forest. They intend to keep the forest protected and they would harvest the fodder grass, NTFPs and fuel wood, when it is ready. The members are loud and clear on the benefits from the forest. If they get benefits/ income from the forest in a sustained manner then definitely the members would keep the forest intact.
- The members, as usual, expected more support from the Project and also expected a higher wage rate from the Forest Department for forestry works as the prevailing wage rate in the area (paid by NTPC) is Rs. 300 per day and the Forest Dept. pays only Rs. 150.

- It was understood that there is a need for concerted efforts to sensitize other villagers and FUG members to participate in the activities of JFMC. There is also a need for developing more detailed intervention plan for the SHGs (agriculture as well as goat rearing) and link them with different opportunities in the market. Some of the members are interested in dairy/ rearing of buffaloes. But the funds available are inadequate for buying buffaloes. The NGO may prepare detailed project proposal/ business plan and build the linkages of SHGs with financial institutions and other projects/ schemes.

Attachment 5.2 Status of REDD+ Readiness in Odisha

1. Forests in Odisha

Odisha is a state in Eastern part of India with a geographical area of 155,707 sq. km and with a population of 42 million. The state has borders with West Bengal (North East), Jharkhand (North), Chhattisgarh (West and North West) and Andhra Pradesh (South). Odisha has a coast line of 480 km (Bay of Bengal). Odisha has been divided into five major physiography regions i.e. the coastal plains in the east, the middle mountainous and highlands region, the central plateaus, the western rolling uplands, and the major flood plains. Odisha has third largest concentration of tribal population (22.85% of total population of the state) in the country and there are 62 tribal communities living in the state including 13 Particularly Vulnerable Tribal Group. 44.7 per cent of the state's geographical area is under 5th Schedule Areas (PESA areas). Out of 30 districts of the state 12 are considered as tribal districts.

Status of Forest in Odisha

Geographical Area (GA)	155,707 sq. km
Recorded Forest Area	58,136 sq.km
% of recorded forest area to the GA	37.34
Actual Forest Cover	43,943 sq.km
Actual Tree Cover outside the forest	6,411 sq.km
Total Forest and Tree Cover	54,340 sq.km
% of total Forest and Tree Cover to GA	34.90
Very Dense Forest	7,023 sq.km
Moderately Dense Forest	21,470 sq.km
Open Forest	21,861 sq.km
Reserve Forest	26,329 sq.km
Protected Forest	15,525 sq.km
Unclassed Forest	16,282 sq.km
Protected areas	1 national park, 1 proposed national park, 19 sanctuaries, one zoo and 11 mini zoos
Forestry sector budget for 2014-15	Rs. 5225.636 millions
Important Forest Products of the State	Kendu Leaf, Bamboo, Sal seed, Sal leaf, Hill brooms, Gums and Resins etc.
Plantations undertaken during 2014-15	198,891 ha
Compensatory Afforestation cumulative till June 2014	42,910.63 ha

Note: Compiled from State of Forest Report, 2015, FSI, Dehradun; Reports of Forest and Environment Department, Odisha.

The State of Odisha is endowed with vast stretches of forests of four important types i.e. Northern Tropical Semi-evergreen Forests, Tropical Moist Deciduous Forests, Tropical Dry Deciduous Forests and Tidal Mangrove Forests.

There are 19 Wildlife Sanctuaries covering an area of 8352.19 sq. km and one National Park of 145 sq. km (Bhitarkanika Park). Similipal NP over 845.70 sq. km still continues to be a proposed national park. There 2 tiger reserves, 3 elephant reserves and 14 elephant corridors in the state. There are a lot of efforts taken in the state in collaboration with local communities and civil society for conservation of biodiversity outside the protected areas. Some of the important ones are conservation of Olive Ridley Sea Turtle and Black Bucks etc.

Kendu leaf and bamboo are important forest produces of Odisha. The state is the third largest producer of Kendu leaf and the value of Kendu leaf traded in 2013 was Rs. 3.928 billion. 9 per cent of country's bamboo forest areas are in Odisha and the annual production of bamboo is 2 lakh metric tons.

Government of Odisha, following the PESA, brought out a policy on procurement and trade of NTFP in March 2000. Gram Panchayats have been authorized to regulate the purchase, procurement and trade of 68 items of NTFPs to ensure that the primary gatherers get fair price.

2. Forest Administration

The forests of the State are organized and administered by 37 Territorial Divisions and 13 Wildlife Divisions. There are 8 territorial circles; each looked after by a Regional CCF. The entire forest area has been divided in to 281 Ranges (Territorial-230 and Wildlife-51), 1,001 forest sections (Territorial-819 and Wildlife-182) and 3,136 beats (Territorial-3077 and Wildlife-59) for effective administration. The wildlife wings/ protected areas are managed under the directions of PCCF-Wildlife. Since Kendu Leaf is an important forest produce of the state, there is a PCCF to look after the activities concerning

procurement and trade of Kendu Leaf. There 19 Kendu Leaf Divisions looked after by 3 CCFs. Odisha Forest Development Corporation – the commercial arm of Forest Department, has 22 Divisions under 4 zones.

3. Forest Monitoring

In the state of Odisha, the state forest department (SFD) has a Monitoring Cell at the PCCF office with one Dy. Conservator of Forests (Evaluation) and One Deputy Ranger (Evaluation) under the supervision of Conservator of Forests (HRD) and control of Chief Conservator of Forests (ME & IV[1]). After receipt of the list of the plantation activities allotted to different Divisions from the Chief Conservator of Forests (PP & A) and Addl. Principal Chief Conservator of Forests (CAMPA) the monitoring and evaluation works are taken up on randomly selection basis adhering to certain feasible percentage of area. On ground, regular field inspections are carried out by the Range officer and information is recorded in the plantation journals. The wing periodically conducts:

a) Evaluation of planting activity in the 2nd year with reference to the achievement of the targeted area, boundary verification, posting of the pillars, and delineation of 4 ha plots, etc.

b) Evaluation of the plantation with reference to species suitability, height growth of the seedlings, percentage of survival, impact of Entry Point Activity, General observation on the growing stock of the plantation with reference to the protection from grazing and fire etc.

Under the project, monthly monitoring by the PMU and DMUs was complimented by daily based monitoring by the community supported by FMU and NGO. Also, third party monitoring was conducted to assess the survival of plantations and the quality of assets created under the project.

SFD also uses GIS technology to monitor the forest resources. Even under the JICA project satellite imageries are procured for carrying out periodical change detection and status of forest, mainly within the project areas. The GIS facility created under the JICA project is still continuing and now providing support to the state sponsored scheme 'Ama Jangala Yojana'. As part of project monitoring under JICA project, JFMC boundaries of the project JFMCs, all project interventions including plantations, SMC structures, EPAs, Meeting Centres are mapped along with field photographs and the data is maintained in GIS platform in different data layers. During micro planning detailed JFMC level maps depicting current forest status and site specific treatment details at 1:5,000 scales were prepared using satellite images, ground data and DGPS based boundary survey and demarcation. Under the project mobile application has also been developed for survey and demarcation of plantations, assets using in-built GPS, recording of associated field info and photograph and data uploading to central server, installed at the GIS lab of the PMU, by forester and verification by RO. Also, Web GIS viewer has been developed to view, query, print maps, field survey data uploading and update other attribute data.

4. Status of Safeguards and Safeguards Information System

Status of the safeguards and safeguards information system in Odisha is summarised as below.

Status of Safeguards and Safeguards Information System in Odisha

Items	Findings
Consistency/ relevancy to the national and international policy/ programme/ agreements	◆ REDD+ Strategy/ Policy has not been developed. ◆ State climate change action plan (2010-2015) prepared and a mid-term review of implementation of action plan on climate change was done in 2015. ◆ Draft state action plan on climate change for 2016 – 2020 is getting ready.
Effective State forest governance structure	◆ Forest Department has a fully functional institutional set up from the state level to the field level. ◆ JFM Resolutions were enacted in 1988 and subsequently modified in 1993, 2008 and 2011.

[1] Internal Vigilance

Items	Findings
	◆ Under OFSDP, JFMCs/ EDCs have been constituted. The project also has a functional institutional set up which runs parallel to the existing structure of forest Department. ◆ State FDA and FDAs have been established to implement NAP.
Respect for the knowledge and rights of indigenous peoples and local communities	◆ FRA is being implemented. 3.49 lakh individual titles have been distributed with a forest area of 5.50 lakh acres. 5004 community rights titles with an area of 1.79 lakh acres have been distributed. ◆ Based on the JFM resolutions 12,503 JFMCs are operating in the state to protect and manage 1.168 million ha of forest area. 504 Eco Development Committees are involved in protection of Protected Areas. ◆ Community has a long tradition of protecting the forest. OFSDP reinforced their efforts by providing them capacity development programmes and livelihood interventions. OFSDP works with 2,426 nos. of JFMCs and EDCs.
Full and effective participation of the relevant stakeholders	◆ REDD+ cell has not been constituted. No activities concerning REDD+ have been taken up. TERI had conducted a preliminary assessment in one village/JFMC for REDD+ and one video documentary has been produced on the activities of JFMC. ◆ Inter-departmental coordination committees are there at the state level to monitor and review activities of Climate Change Cell/ State Action Plan on Climate Change; implementation of OFSDP; implementation of FRA and other socio-economic safeguards.
Conservation of natural forests and biodiversity	◆ All the relevant national policy, laws and regulations are reinforced. ◆ Working plans/ management plans are prepared and implemented. ◆ Monitoring of the afforestation works is done by the State Forest Department. FSI monitors the forest cover through its own institutional structure and the report is published on a biannual basis. ◆ Central and state funded schemes are implemented for the purpose (CAMPA, NAP, GIM, NBM etc.) ◆ OFSDP has established a GIS cell to monitor the progress of afforestation and other interventions. ◆ Under OFSDP, JFMCs/ EDCs undertake activities that contribute to the conservation of natural forest and biodiversity (i.e. IGAs to reduce the dependency on forest resources, patrolling, keeping records of extractions/ felling, adopt alternative household energy to reduce the consumption of the fuel wood and etc.) ◆ State government is funding a community forestry project (Ama Jangala Yojana), which would work with 7,000 JFMCs. This project has emerged out of the initiatives and lessons learnt from OFSDP.
Actions to address risks of reversals	◆ No concrete actions are planned as REDD+ interventions have not been fully planned and implemented. ◆ However, the monitoring of the works and the changes in the forest cover are monitored at the state level. FSI monitors through its own institutional structure and the report is published on a biannual basis. ◆ The State Forest Department is monitoring the forest fire with the help of FSI. ◆ By adopting the Working Plan Code (2014), the base line for the carbon stock can be established, which enables the Forest Department to assess the reversals. ◆ OFSDP has the digitized boundary data of village forests and satellite imageries for the project area. MIS system is also operational. The project monitors the work progress as well as the changes in the forest condition.
Actions to reduce displacement of emissions	◆ No concrete actions are planned as REDD+ interventions have not been fully planned and implemented. ◆ Strong community based forest protection and management exists in

Items	Findings
	more than 12,000 villages. These communities can effectively monitor the displacement of emission and accordingly respond to the situation. ◆ Efforts are also being made to enhance the forest stock, production of NTFPs and ecosystem services.
Safeguards Information System	◆ No plan for establishing a Safeguard Information System was discussed as yet. Data availability, reliability of data, data management system may require a review to constitute a Safeguards Information System. ◆ OFSDP has GIS and MIS which are fully operational. The project developed the mobile application for field level data entry system which would enable the field staff to collect and upload the data directly to the system even when the internet connection is not available or erratic.

Source: JICA Survey Team (2016)

5. Efforts for Forest Protection, Management and Conservation

The State Government has been implementing several forest and wildlife conservation programmes including afforestation and reforestation in forest as well as areas outside the forest. The State has a Forestry Vision 2020, which emphasizes a) Increased flow of NTFPs and wood, b) Biodiversity conservation strategies, and c) Higher allocations, investment, insurance and incentives for better forest management.

Increased efforts have been made by the State Forest Department in last 5 years for afforestation with an annual average treatment area of 1,650 sq. km. Green Odisha Mission was started in 2013-14 as a measure of state's affirmative action to the commitment under State Action Plan on Climate Change. The mission envisages planting of 450 million seedlings during 2013-17.

With the support of Japan International Cooperation Agency, the state implemented a participatory forest management project named as Odisha Forestry Sector Development Project in 11 territorial forest divisions and 3 Wildlife Division from 2006-7 to 2014-15. The project worked with 2,370 Joint Forest Management Committees and 56 Eco Development Committees for sustainable forest management, biodiversity conservation, eco-tourism and poverty reduction.

Some of the important programmes and schemes implemented by the State Forest Department have been described below:

Implementation of important Laws, Programmes and Schemes related to forest management

Law/ Programmes/ Schemes	Activities/ Interventions
Forest Rights Act	➢ FRA is being implemented in the state. 48,195 Forest Rights Committees have been constituted by the Gram Sabhas to receive claims and verify them and recommend them to the Sub Divisional Level Committees. There are 43 Sub Divisional Level Committees and 30 District Level Committee to implement the FRA. A total of 616,332 claims (603,460 individual claims and 12,872 community claims) were received. As on 31 Jan 2016, 3.525 lakh individual titles have been distributed with a forest area of 5.55 lakh acres. 5036 community rights titles with an area of 1.859 lakh acres have been distributed.
Joint Forest Management	➢ Odisha is a pioneering state to involve communities in protection and management of natural forests and it was the first state to issue a resolution on JFM in 1988 and subsequently JFM Orders have been issued in 1990, 1993, 2008 and 2011. Based on the JFM resolutions 12,503 JFMCs are operating in the state to protect and manage 1.168 million ha of forest area. 1.53 million families are involved in JFM Committees to protect and manage forest. 504 Eco Development Committees are involved in protection of Protected Areas.
CAMPA	➢ CAMPA in the state was constituted in August 2009. The State CAMPA has formulated 5 Annual Plan of Operations and two Additional APOs. So far the state has received Rs. 11,551.47 million. Against the target (as on June 2014) of 56,831.65 ha of compensatory afforestation the state has achieved afforestation on 42,910.63 ha.

Law/ Programmes/ Schemes	Activities/ Interventions
	➢ In addition to afforestation, CAMPA funds have been used for management of wildlife in PAs including protection, anti-depredation activities, communication, habitat improvement, infrastructure development, zoo management etc. It will also support for preparation of comprehensive wildlife management plan for the entire state and implementation of 24 site specific wildlife conservation plan.
National Afforestation Programme	➢ Odisha received Rs. 292.3 million from GOI during 2012-13 to 2015-16 (till Nov 2015) for implementation of NAP. 46 FDAs have been formed in 46 divisions and NAP is being implemented involving 3,918 Vana Surakshya Samities (JFMCs)/Eco-Development Committees. Since 10th plan period up to 2014, a total of 120,929 ha area has been afforested under NAP.
Green India Mission	➢ Odisha was provided with Rs. 10.97 million during 2011-12 for preparatory activities under GIM. It was basically for training and institutional strengthening, selection of landscape and preparation of perspective plan etc. The perspective plan has been submitted to the Ministry. The State intends to increase the forest/tree cover of 77,500 ha plantation over degraded forests, shrub lands and improve the quality of forest cover through JFM approach in five landscapes of the State. It also proposes to restore abandoned mining areas and treatment of mined out areas. Some other activities included in the perspective plan are improvement of ecosystem services activities like wetland restoration, turtle conservation and establishing corridor connectivity, adoption of cleaner technology, provision of improved fuel efficient cooking equipments, solar lighting, biogas plants, char and wood bracketing etc.
Intensification of Forest Management Scheme	➢ MOEF&CC provides funds to the State supplementing its efforts for forest protection, management and preservation, and improving the health of the forest. Efforts are made to modernize the forest administration by supportive infrastructure, use of modern technologies, improving the communication and mobility of the forestry force. The funds are also used for patrolling of the forests, detection and monitoring of forest fires, creation and maintenance of fire lines, survey and mapping of forest areas and preparation of working plans. During 2012-13 to 2015-16 (till Nov 2015), the state received a sum of Rs. 70.954 million from the Central Government.
Green Odisha Mission	➢ The objectives of this mission are to increase the green cover of the State by a) increasing the area under forest & tree cover and b) increasing the density of the existing forest & tree cover. The mission also intends to emphasize on plantation of suitable indigenous species to enhance the quality of the growing stock; Conserve and regenerate bamboo forests; Cover all rural and urban roads under avenue plantation; Augmentation and sustainable management of medicinal plants; Raise suitable species of fuel, fodder, small timber, and other soft and hardwood species to meet the demands of the domestic and industrial sector and to reduce the biotic pressure on natural forests. ➢ The components of the mission are a) afforestation programme under increasing green cover (State Plan), b) afforestation programme under 13th Finance Commission Grants, c) afforestation under MGNREGS, d) afforestation under NAP, e) bamboo plantation under National Bamboo Mission, f) afforestation under Industrial Belt Plantations, g) Jagannath Ban Prakalpa - the scheme was started in the year 2000–01 to plant trees for the supply of timber for construction of the Chariot of Lord Jagannath, Puri. 2,326.34 ha have been planted in 9 forest divisions with active involvement of local communities; h) afforestation under CAMPA; and i) Medicinal species conversation programme. ➢ 2,161 Tribal Sacred Groves have been identified for sacred groves conservation. During 2014-15 plantation of 20,000 seedlings of RET species was undertaken in 200 sacred groves in 10 forest divisions.

Note: Information compiled from reports of MOEF&CC, Reports of Forest Department, reports of Tribal Development Department, Govt. of Odisha etc.

(1) Community Forest Management

Odisha has a long history of forest protection by the local communities. The recorded history of Community Forest Management (CFM) dates back to 1936. Lapanga - a village in Sambalpur district

have been protecting the natural forest from 1936. Although there are many villages that have been protecting forest before 80-100 years, but there is no authentic record available for establishing this. In many of these old protection cases the villages used to protect the forest for 10-20 years then harvest it for their own use. Since 1960s and 70s, many villages in western and central Odisha have been protecting the natural forests without the help of the Forest Dept. Nayagarh, Mayurbhanj, Bolangir, Sambalpur, Khurda, Keonjhar, Dhenkanal, Angul, Koraput and Phulbani are the important areas where the CFM initiatives are located. Many of the CFM villages have their own rules and regulations for forest protection, harvesting of forest produces and resolution of conflicts. They don't intend to collaborate with the Forest Department for implementation of JFM as they believe this would lead to imposition of rules and regulations by the Forest Department and the community would lose control over the forest and forest products.

(2) Ama Jangala Yojana

It is a scheme of the state government implemented through Odisha Forestry Sector Development Society using the lessons learnt from implementation of JICA assisted Forestry Sector Development Project. This scheme will be implemented using the operational manual of OFSDP. The scheme intends to restore forest and promote sustainable forest management through JFMCs. It would give greater focus on livelihood enhancement of forest dependent communities. The scheme would cover 7,075 JFMCs in 4 years' time to restore 0.5 million ha of degraded forest. The state intends to spend about Rs. 11,000 million for implementation of this scheme. Funds will be pooled from CAMPA, State Plan, MRLM and MGNREGS. NGOs have been engaged to implement the scheme (one from each district). CAMPA has provided the initial support (Rs. 186.20 million) for preparation of micro plans and strengthening of JFMCs.

6. Status of Odisha Forestry Sector Development Project (OFSDP)

Odisha Forestry Sector Development Project was implemented between 2006/07 – 2014/ 15 (including extension phase). The project has set a model for integrated approach to participatory forest management in other JICA forestry sector projects. A brief project profile is given below.

Project Profile of DFSDP

Particular	Description
Project Cost	Rs. 802.30Cr.
Project Area	11 territorial forest divisions (Angul, Balliguda, Bonai, Deogarh, Paralakhemundi, Jeypore, Phulbani, Keonjhar, Koraput, Rayagada, Rourkela) and 3 wildlife divisions (Balasore, Bhadrak and Satkosia)
Project Duration	2006/07 – 2012/13 (extended up to 2014/15)
Project Components and Outlines	i) Project Goal: To improve environment and alleviate poverty. ➢ Project objectives: Restoration of degraded forests and improvement of income level of villagers by promoting sustainable forest management ii) Restoration of degraded forests: 210,405ha iii) Coastal Plantation 2,920ha iv) Biodiversity Management ➢ Ecotourism Destination Development 7 sites ➢ Establishment of Community Reserves/ Heritage Sites: 2 sites and 13 sacred groves v) Community/ Tribal Development vi) EPA, IGAs through SHGs, carried out. 7,358 SHGs linked with loans. The total principal amount given to SHGs amounted Rs. 66.39 Cr. Rs. 4.67 Cr. Spent for CFCs (42 clusters). 70 clusters are functioning. vii) Eye camps, distribution of long lasting insecticide nets and smokeless chullas, no formal education centres and etc. were among the livelihood related interventions. viii) OFSDS now has the responsibility to undertake the following: ➢ Catchment area treatment plan for upper Kolab and upper Indravati RVPs ➢ Ama Jangala Yojana to strengthen 7,075 VSSs to protect and manage degraded forests through participatory forest management approach. The handbooks developed during OFSDP are used in the project.

The Project could achieve its target of restoration of degraded forestland in 11 forest divisions. The total afforestation target was 196,650 ha against which the Project carried out afforestation on 210,405 ha. All the afforestation activities except Artificial Regeneration of Teak (14,717 ha) were carried out through JFMCs. Micro plans were prepared to identify areas and different types of treatment/ afforestation to be carried out. Efforts were made to select the species in consultation with JFMCs and emphasis was given on plantation of NTFP species. Community based protection of forest and plantation was established through orientation and training of JFMCs. Engagement of Village Level Animators, NGOs and Support Agencies helped in strengthening of JFMCs for forest protection and implementation of different forest based and other livelihood activities. The JFMCs are generating some income from the sale of NTFPs from the JFM areas and village forest development fund has been created by each JFMC. The JFMC would maintain the assets created by the Project using the village forest development fund.

7. REDD+ Readiness in Odisha State and OFSDP and Suggested Areas for Further Development

From the above, REDD+ readiness status of Odisha and OFSDP can be understood as below.

REDD+ Readiness Status of Odisha State and OFSDP

REDD+ Requirements	Odisha State	OFSDP
State Action Plan	➢ SAPCC is prepared, in which forestry sector is covered. Partly fulfilled.	-
(Donor Intervention)	None	None
FREL/FRL	➢ Not set.	➢ Not set.
(Donor Intervention)	None	None
State/ Project Forest Monitoring System	➢ Done by the State Forest Department	➢ Done by the Project (Satellite based monitoring)
(Donor Intervention)	None	JICA
Safeguard Information System	➢ Existing laws and policies are followed. ➢ No safeguards information system is in place.	➢ Existing laws and policies are followed. ➢ Community empowerment and participation in forest management was an integral part of the project implementation process. ➢ Safeguards system was a part of the project process. ➢ No safeguards information system is in place.
(Donor Intervention)	None	JICA
MRV	➢ Partly established as part of the preparation of working plan and data collection for the same.	➢ Project M&E system was established and still operational. ➢ However, no REDD+ compliant MRV system has been established.
(Donor Intervention)	None	JICA

Source: JICA Survey Team (2016)

Based on the findings above, following areas can be suggested for further developed in the area of safeguards and safeguards information system.

Suggested Areas for Further Development - Odisha

Areas for Further Development
➢ The State Forest Department is waiting to receive the directions and more guidance from the MoEF&CC for implementation of REDD+.

Areas for Further Development
➢ State Government has to develop its strategy and action plan on REDD+. ➢ FREL/ REL needs to be established. ➢ MRV needs to be established. ➢ Existing MIS/ GIS system needs to be aligned to fulfill UNFCCC requirement. ➢ OFSDP already adopted the implementation process that complies with the safeguards requirement. However, for the adoption of REDD+ the objectives of safeguards, criteria and indicators are to be developed and existing information systems are to be improved and synchronized. ➢ Overall architecture of Safeguards Information System needs to be developed. ➢ Consensus between stakeholders/ line departments for data sharing needs to be established. ➢ Once the indicators are finalized, the means of verification and sources of data needs to be developed and operationalized. ➢ Safeguards technical reference materials (guidelines, manuals and etc.) and capacity development of the stakeholders for data management and reporting are required. ➢ Capacity building of Forest Department for implementation of REDD+ projects/ pilots.

Source: JICA Survey Team (2016)

Attachment 5.3: Status of REDD+ Readiness in West Bengal

1. Forests in West Bengal

The West Bengal is the only state in India, which has both coast lines as well as the Himalayan Mountains. The State has both Alpine and Sub Tropical climatic conditions. The State shares international boundaries with Bangladesh in the East, and Nepal and Bhutan in North. It shares boundaries with other Indian States – Assam, Sikkim, Jharkhand, Odisha and Bihar. The State has two distinct natural divisions i.e. the Northern Himalayas and Southern Alluvial Plains. West Bengal has number of perennial rivers. The river Ganga passes through the state and drains to the Bay of Bengal forming the famous delta of Indian Sundarban. Sundarban is the only mangrove forest of the world, which is a home to tigers. Sundarban Biosphere Reserve was constituted in 1989. Sundarban National Park, which is the core area of Tiger Reserve has been recognized by UNESCO as the World Heritage Site. The Tiger Reserve was declared in 1973 and it has the highest tiger population of the world.

Status of Forest in West Bengal

Geographical Area (GA)	88,752 sq. km
Recorded Forest Area	11,879 sq.km
% of recorded forest area to the GA	13.38
Actual Forest Cover	16,828 sq.km
Actual Tree Cover outside forest	2,088 sq.km
Total Forest and Tree Cover	18,916 sq.km
% of total Forest and Tree Cover to GA	21.31
Very Dense Forest	2,948 sq.km
Moderately Dense Forest	4,172 sq.km
Open Forest	9,708 sq.km
Reserve Forest	7,054 sq.km
Protected Forest	3,772 sq.km
Unclassed Forest	1,053 sq.km
Protected areas	1 Biosphere Reserve, 5 NPs, 15 Sanctuaries, 2 Tiger Reserves – 34% of the total forest area.
JFM Areas	4294 FPCs – protecting 592,243 ha 105 EDCs – protecting 69,836 ha
Forest Revenue and Expenditure – during 2013-14	Revenue – Rs. 1134.642 millions Expenditure – Rs. 4255.693 millions
Important Forest Products of the State	Timber, Poles, Fuel wood, Honey, Sal seed, Sal leaf, Lac, Bee wax, Kendu leaf etc.
Plantations undertaken in the last 5 years	64,942 ha and during 2013-14 - 14,864 ha

Note: Compiled from State of Forest Report, 2015, FSI, Dehradun; Reports of Forest Department, West Bengal.

The total population of the state is 91.27 million. It is the state with highest population density i.e. 1,028 per sq. km. There are 19 districts including 11 tribal districts and one hill district.

The total tree and forest cover of the state 18,916 sq. km i.e. 21.31 per cent of the geographical area. West Bengal has 10 major groups and 30 types of forests. The major forest types seen in the state are Dry Peninsular Sal forest, Sub-tropical Semi Evergreen and Tropical Wet Evergreen forest, Tropical Moist Deciduous and Dry Deciduous, Littoral and Swampy forests including mangroves. The state has significant area under plantations. The state has 2.7 per cent of the Indian landmass but it is home to 12.27 per cent of Indian biodiversity. There are more than 7000 species of described flora and more than 10,000 species of described fauna seen in the state. One Biosphere Reserve, two Tiger Reserves, five National Parks and 15 Wildlife Sanctuaries are there in the state.

2. Forest Administration

The Principal Chief Conservator of Forests (Head of Forest Force) is the administrative head of Forest Directorate. There are 7 territorial Circles, 22 territorial Forest Divisions, 243 Ranges and 509 Beats for administration of forests in the state. The Principal Chief Conservator of Forests (Wild life) is Chief Wildlife Warden and responsible for the management of the Protected Areas and there are 5 Circles, 9 Wildlife Divisions, 86 Ranges and 142 Beats for protection and management of PAs. Social Forestry is an important activity of the Forest Department. There are one Social Forestry Circle, 7 Divisions, 52 Ranges and 72 Beats under the Social Forestry Unit. Another administrative unit of the Forest

Directorate is Soil Conservation. There are one Soil Conservation Circle, 3 Divisions, 22 Ranges and 39 Beats for carrying out different soil conservation activities. There are 4 functional Circles and 17 Divisions and 71 Ranges are under them.

3. Forest Monitoring

West Bengal SFD has a well-documented Monitoring and Survey manual. The main objective of the monitoring is to assess (1) survival percentage of plantations during 1st, 3rd and 5th year, (2) assess growth parameters – (a) average seedling height per species during 1st, 3rd and 5th year (b) average breast height girth during 5th year, and (3) assess and evaluate the different parameters/work items. Also, Fire alerts system of FSI is being used for Fire monitoring in the state.

The state level monitoring system covers all plantations raised by different forest divisions under State Plan Scheme, JICA Project, Central sector and other external agency schemes.

In the state, out of total 25 Working Plans, 23 are approved by GOI, 1 is sent to GOI for approval and 1 is under preparation. Assessment of biomass in all five carbon pools (above-ground biomass, below-ground biomass, dead wood, litter, and soil organic matter) not yet started at the state level.

The project is in the process to adopt GPS based perimeter survey and demarcation of plantations as well as point survey of all the assets to be created under the project along with recording of photograph for each intervention. JFMC/FPC boundaries are being demarcated using Mauza/ Revenue village boundary maps and surveyed in the field using GPS but are yet to be digitized with the required accuracy. Recorded Forest area boundaries were also digitized using forest mauza boundaries.

The project has also introduced MIS for plantation monitoring that can be scaled up for state level system. Also, the project is working on designing digital and online mechanism of plantation journals.

4. Status of Safeguards and Safeguards Information System

Based on the available information, status of REDD+ preparedness has been reviewed. The findings for West Bengal are given in the table below.

Items	Findings
Consistency/ relevancy to the national and international policy/ programme/ agreements	◆ REDD+ Strategy/ Policy has not been developed. ◆ State climate change action plan prepared.
Effective State forest governance structure	◆ Forest Department has a fully functional institutional set up from the state level to the field level. ◆ West Bengal is the state, where JFM was originated in early 1970s. Community level institutions towards sustainable forest management have been established. Under WBFBCP, 600 JFMCs/ EDCs have been adopted. The project also has a functional institutional set up which runs parallel to the existing structure of Forest Department.
Respect for the knowledge and rights of indigenous peoples and local communities	◆ FRA is implemented. 43,187 individual titles and 747 community titles including CFR titles have been given by the end of January 2016. 20,342.47 acre and 498 acres have been given as individual and community titles respectively. ◆ According to the JFM notifications of 1989 and further revised in 2008, 4,294 FPCs/JFMCs and 105 EDCs have been constituted to protect about 6.5 lakh ha of forest areas. ◆ Strong institutions at the community level exist for forest protection and management. ◆ WBFBCP provides capacity enhancement and alternative livelihoods for JFMCs and EDCs.

Items	Findings
Full and effective participation of the relevant stakeholders	◆ REDD+ cell has not been constituted. Stakeholders' consultation with regard to REDD+ has not been initiated. ◆ WBFBCP adopts the participatory implementation of the project activities similar to other JICA supported projects. ◆ Inter-departmental coordination committees are there at the state level to monitor and review activities of Climate Change Cell/ State Action Plan on Climate Change; implementation of WBFBCP; wetland conservation; implementation of FRA and other socio-economic safeguards.
Conservation of natural forests and biodiversity	◆ All the relevant national laws and regulations are reinforced. ◆ Working plans/ management plans are prepared and implemented. ◆ Monitoring of the afforestation and biodiversity conservation works is being done by the State Forest Department. ◆ Central and state funded schemes are implemented for forest and biodiversity conservation (FDA, CAMPA, GIM etc.) ◆ Under WBFBP, JFMCs/ EDCs undertake activities that contribute to the conservation of natural forest and biodiversity. ◆ Two special regions have been identified in the state action plan on climate change for interventions and these regions are a) Darjeeling, the Himalayas and b) Sundarbans.
Actions to address risks of reversals	◆ No concrete actions are planned as REDD+ interventions have not been initiated in the state. ◆ FSI monitors the forest cover through its own institutional structure and the report is published on a biannual basis. ◆ The Working Plan Wing of the Forest Department monitors the extraction of forest produces, damage to the forest because of fire and other calamities. The Working Plan Wing has database on plantations undertaken by the Forest Department (year, area and important species) and when the plantations would be treated and harvested. The biomass removed from the forest is being estimated.
Actions to reduce displacement of emissions	◆ No concrete actions are planned as REDD+ interventions have not been initiated. WBFBCP as well as the Working Plan Wing of State Forest Department have the monitoring system which will provide the basis to plan for necessary interventions for displacement of emissions.
Safeguards Information System	◆ No plan for establishing a Safeguard Information System was discussed as yet. Data availability, reliability of data, data management system may require a review to constitute a Safeguards Information System. ◆ WBFBP has GIS and MIS Cell and intends to monitor the afforestation activities using satellite imageries. ◆ Working Plan Wing of the Forest Department has database on the forest stock and extraction of forest produces.

Source: JICA Survey Team (2016)

5. Efforts for Forest Protection, Management and Conservation

The State Forest Department manages the forests and protected areas as per the prescriptions of concerned working plans and management plans. Numbers of Centrally Sponsored Schemes, State Plan Schemes are being implemented for sustainable management of forest. Every year more than 15,000 ha area is being covered under different plantation programmes. Some of the important programmes related to forest protection and management have been mentioned in the table below.

Implementation of important Laws, Programmes and Schemes related to forest management

Law/ Programmes/ Schemes	Activities/ Interventions
Forest Rights Act	◆ FRA is being implemented in 12 districts of West Bengal since 2009 and there are 12 DLCs, 22 SDLCs and 2819 Forest Rights Committees constituted in the state to facilitate implementation of the act. Claims were received till 31st Oct

	2015. A total of 142,081 claims (131,962 individual and 10,119 community claims) were received by the FRCs and by 31st Jan 2016 43,187 individual titles and 747 community titles have been given to the beneficiaries. In addition 58 community forest resource rights have given to communities in Purulia district. Among the titleholders 6,659 beneficiaries are from the other traditional forest dwellers and rests belong to tribal communities. Similarly out of 683 community titles 166 titles have been given to other traditional forest dwellers. A total of 20,342.47 acres have been given for individual titles and 498.214 acres have been given for community titles. Majority of the titles have been given in Paschim Medinipur, Bankura and Purulia districts. At the state level the Managing Director of West Bengal Tribal Development Cooperative Corporation is the nodal officer for implementation of Forest Rights Act. Review meetings were conducted at the SDLC and DLC level as and when required and monthly progress report is prepared and submitted to the MOTA. The survey and demarcation of the area have been done manually before giving the titles to the beneficiaries and recently the survey of the area using GPS has started. More than 91,000 cases were rejected and the major reasons for such rejection were multiplicity of applications from the same family in case of tribals and lack of evidence in case of other traditional forest dwellers.
Joint Forest Management	◆ The first JFM notification was brought out in 1989, which was further revised in 2008. As on March 2014, 4,294 Forest Protection Committees/JFMCs and 105 EDCs have been constituted to protect about 6.6 lakh ha of forest areas. While 493,713 members are involved with FPCs and the EDCs have 22,881 members. ◆ Under JICA assisted WBFBC Project, 600 JFMCs/ EDCs have been adopted to work for forest and biodiversity conservation.
CAMPA	◆ The State has not received fund from GOI under CAMPA during last 4 years. Funds received by the State during 2009-10 to 2011-12 were Rs. 164,153 million. As against the target of compensatory afforestation of 3,649.92 ha the State had achieved plantation on 3,288.75ha.
National Afforestation Programme	◆ NAP is being implemented in the state through 23 FDAs and 1,460 JFMCs. During 2012-13 to 2014-15 (three years) the Government of India released Rs. 63.16 million to the state. The fund utilization during 2013-14 was Rs. 20.596 million. As on March 2014, 2,295 SHGs were supported under NAP to carry out different income generation activities.
Green India Mission	◆ During 2013-14, the Government of India released Rs. 30.075 million to the state for preparatory activities under the mission and prepare perspective plan.
Intensification of Forest Management Scheme	◆ During 2012-13 to 2015-16 (till Nov 2015), the State received Rs.25.693 million under the scheme. The funds are used for strengthening infrastructure for forest protection, survey and mapping etc.
Other Schemes	◆ Protective afforestation – afforestation and soil conservation works are being carried out in vulnerable areas of North and South Bengal. ◆ Eco Conservation of Sensitive Zone – this scheme is being implemented in the erosion prone areas of Darjeeling and Purulia districts and the activities include afforestation, gulley plugging, earthen check dams etc. ◆ Economic plantations – plantation of mixed hard wood species are carried out in the degraded areas of Tarai and Dooars. ◆ Coastal shelterbelt plantations, treatment of mangroves etc. are given priority. ◆ In South West Bengal the Forest Department is promoting plantation of quick growing species. The Forest Department promotes decentralised people's nursery for expansion of social/ farm forestry, strip plantations etc.

Note: Information compiled from reports of MOEF&CC, Reports of the West Bengal Forest Department, Report of Tribal Welfare Dept. West Bengal etc.

(1) Joint Forest Management in West Bengal

West Bengal is the state, where JFM was originated in early 1970s. The participatory forest management involving the local communities for regeneration of degraded forests through protection, sharing of

produce and improving the livelihood opportunities was initiated by the Forest Department as a pilot project in Arabari village during 1971-72. The then DFO/ Silviculturist, Mr. Ajit Kumar Banerjee took the initiatives of motivating the local villagers to protect forest. Arabari is a Sal forest area and Mr. Banerjee was carrying out some field trials. These trials were affected by grazing and illegal felling. He then initiated discussions with the villages to protect the forest and he assured them that he would discuss with the Government to provide them some benefits/ usufruct shares in future. 11 villages (618 families) participated in this programme to protect 1,270 ha of degraded Sal forest. An *ad hoc* Forest Protection Committee was formed to look after protection activities. The efforts of Mr. Banerjee paid well and the programme had a great success. The State Government brought out a Resolution on 7th March 1987 to share 25 per cent of the profit from the forest to the villagers. The West Bengal Government expanded it to other areas of the state. This initiative brought a remarkable change in the mindset of forest bureaucracy and established a good model of partnership between the Government and Communities. This was also extended to joint management of other common property resources. Many international agencies propagated this concept of joint management. As on March 2014, 4,294 Forest Protection Committees/JFMCs and 105 EDCs have been constituted to protect about 6.6 lakh ha of forest areas. While 493,713 members are involved with FPCs and the EDCs have 22,881 members. The State Government shares the usufruct benefits with the Forest Protection Committees from the harvesting of timber and poles. Rs. 1,487 million was shared with FPCs during 1995-96 to 2013-14.

Usufruct Sharing to FPCs in West Bengal

Year	No. of FPCs	No. of Beneficiaries	Amount in million Rs.	Share per FPC member in Rs.
1995-96	163	20311	12.337	607.40
1996-97	354	42361	24.345	574.70
1997-98	248	32156	25.124	781.32
1998-99	339	35530	28.70	807.76
1999-2000	445	50989	40.20	788.00
2000-2001	424	56479	45.55	806.00
2001-2002	520	45662	58.00	1,270.00
2002-2003	1454	45662	43.001	942.00
2003-2004	1454	51047	54.875	1,075.00
2004-2005	1510	60150	50.925	846.00
2005-2006	1944	56979	59.20	1,039.00
2006-2007	1967	57864	63.457	1,097.00
2007-2008	743	90103	151.123	1,677.00
2008-2009	583	64344	148.796	2312.00
2009-2010	233	24407	92.236	3779.00
2010-2011	327	33585	95.970	2857.53
2011-2012	625	114398	171.328	1497.65
2012-2013	598	59344	203.914	3636.00
2013-2014	557	41950	118.014	2813.00

Source: Compiled from the Annual report, brochure, website of the Forest Department, West Bengal

The WBFDCL (West Bengal Forest Development Corporation) is responsible harvesting and disposal of timber and other forest produces. The Corporation also harvests the produces from the JFM area and the revenue earned is shared with the respective FPCs. The Corporation directly manages 64 FPCs with about 3,900 members in Kalimpong Division. The Corporation helps the FPCs and EDCs in marketing of NTFPs especially the honey collected from the Sundarbans. In some cases the Corporation helps the EDCs in running various activities in the ecotourism sites.

6. Status of West Bengal Forest and Biodiversity Conservation Project (WBFBCP)

The salient features salient features of the project are given in the table below. With a strong tradition of Joint Forest Management, the project has been implementing the project activities through Forest Protection Committees.

Project Profile of West Bengal Forest and Biodiversity Conservation Project

Particular	Description
Project Cost	Rs. 4,060 million
Project Area	Afforestation in 30 Forest Divisions Biodiversity Conservation in 17 Divisions/ 8 Protected Areas
Project Duration	2012/ 13 – 2019/20 (8 years)
Project Components and Outlines	i) The project objectives: To improve forest ecosystem, conserve biodiversity and improve means of livelihoods through afforestation, regeneration, wildlife management and income generation activities. Adopts Joint Forest Management approach. ii) Afforestation: afforestation of degraded forest in recorded forest area; Tree planting outside forest area; Soil and Moisture Conservation; Production of Quality Planting material. 17 new central nurseries and expansion of 18 existing nurseries are planned. iii) Biodiversity Conservation: wildlife habitat improvement in protected areas; man-animal conflict mitigation; research iv) Community Development: Micro planning is in progress. 280 FPCs were selected from 22 DMUs (Annual Report of WBFD, 2013-14). v) MIS/ GIS system establishment is in progress. vi) Training of the project officials are being conducted on a regular basis as per the annual training calendar.

7. Status of REDD+ Readiness in West bengal State and Suggested Area for Further Development

The survey Team assessed the status of the REDD+ Readiness in West Bengal and also at the WBFBCP. From the findings, FREL/ FRL needs to be developed and MRV system including safeguards information needs to be developed and deployed by the state and the project to become REDD+ ready.

REDD+ Readiness Status of West Bengal State and WBFBCP

REDD+ Requirements	West Bengal State	WBFBCP
State Action Plan	➢ State Action Plan on Climate Change has been prepared, in which forestry sector is a part. No state action plan on REDD+ has been prepared.	-
(Donor Intervention)	None	None
FREL/FRL	➢ Not set.	➢ Not set.
(Donor Intervention)	None	None
State/ Project Forest Monitoring System	➢ Done by the Forest Department.	➢ Done by the project (being established)
(Donor Intervention)	None	JICA
Safeguard Information System	➢ Relevant laws/ policies are reinforced. However, the information is not aggregated to allow proper monitoring and reporting.	➢ Existing laws and policies are followed. ➢ Safeguards system was a part of the project process. ➢ No safeguards information system is in place. ➢ Project MIS/ GIS is being developed. However, the overall SIS needs to be defined and operationalized.
(Donor Intervention)	None	JICA
MRV	➢ Partly established as part of the preparation of working	➢ Project M&E system is being established. However, it still needs to be further developed

REDD+ Requirements	West Bengal State	WBFBCP
	plan and data collection for the same. ➢ In 24 Parganas South District, SFD and IIRS conducted Carbon assessment including sub-soil carbon.	for REDD+.
(Donor Intervention)	None	JICA

Source: JICA Survey Team (2016)

Based on the above assessment, following areas to be further developed have been identified.

Suggested Areas for Further Development –West Bengal

Areas for Further Development
➢ REDD+ action plan can be developed to enable systematic approach to REDD+ readiness interventions. ➢ WBFBCP already adopted the implementation process that complies with the safeguards requirement. However, for the adoption of REDD+, the objectives of safeguards, criteria and indicators are to be developed. ➢ Carbon stock assessment following the IPCC guidelines has been done in two forest divisions by the Working Plan Wing. Some of the working plans are being revised now using the new working plan code, 2014. ➢ An overall architecture of safeguards information system needs to be developed for effective and efficient data collection and management. Technical guidelines/ manuals can also be developed to facilitate the operationalization of safeguards information system in WBFBCP. ➢ REDD+ pilots may be undertaken under the auspices of WBFBCP in three different geographical regions i.e. North (Darjeeling and Jalpaiguri), South (Bankura and Medinipur) and Sundarbans, once necessary directions are received from the Central Government and fund becomes available. Based on these sites, site specific SIS can be developed as part of the overall REDD+ interventions. ➢ Further capacity development can be undertaken for the forest department officials/ staffs in MRV and safeguards.

Source: JICA Survey Team (2016)

8. Report on Visit of the Survey Team to Paschim (West) Medinipur District

The PMU, WBFBCP organised a field visit for the Survey Team to Paschim Medinipur District on Jan 23, 2016 to interact with Project Staff and Forest Protection Committee, and visit the Central Nurseries and Plantations. Three Central Nurseries were visited and the details have been given below:

8.1 Nurseries visited by the Survey Team

Forest Division	Place of the Nursery	Observations
Medinipur	Gopegarh (Medinipur FMU)	◆ A new nursery has been established on 1 ha area for production of quality planting materials using hycopots/ root trainers of 150 cc and 300 cc. During 2015, 200,000 seedlings were raised for the plantations under JICA Project. Seedlings were raised for one year in the nursery and then planted in the field. Now the nursery has the capacity to produce 350,000 seedlings. Good quality seedlings are being raised for Sal, Sal associate species such as Peasal, Neem, Mohul, Kusum etc. The nursery also raises Eucalyptus seedlings.
Medinipur	Arabari FMU	◆ A new nursery has been set up to produce QPM using hycopots. 200,000 seedlings were raised during 2015 and now the capacity is 370,000.
Silviculture South	Arabari FMU (research)	◆ Renovation of modern central nursery established during 1994 (the World Bank Forestry Project) has been done with a financial support from the JICA Project. This nursery was closed since 2009 and now it has started producing QPM and also undertakes research on nursery protocols. It has the capacity to produce 500,000 clones and 700,000 potted seedlings.

Benefits from the Central Nurseries as explained by the Project Staff: Good quality planting materials are available for plantation under the JICA assisted forestry project. Survival of plants is now 100 per cent (after one year) and earlier it used to be 80 to 85 per cent. These nurseries have become focal points for research on nursery protocols such as potting medium and mixture, use of different types and sizes of pots for different plants etc.

8.2 Visit to Forest Protection Committees (FPCs/ JFMCs):

8.2.1 FPC – Tasarara, Jamboni and Chakighata

The Survey Team members were given a warm reception by the members of Tasarara, Jamboni and Chakighata Forest Protection Committee in Medinipur Division (Range – Medinipur and Beat – Baghasole). The FPC was constituted in 1983 with 221 members from 3 villages and the area protected by the FPC is 84.76 ha. Eucalyptus was planted earlier in 40 ha area. During 2014-15 felling operation was carried out in 20 ha area and the FPC has just been provided with Rs. 4.9 lakh towards their share of 25% of the sale proceeds from the felling operation. The FPC has decided to distribute the money among the members equally.

Activities undertaken by the JICA Project through this FPC:

A micro plan has been prepared in consultation with the FPC. Afforestation of A2 model – Sal and associate species (Peasal, Neem, Red Sanders, Beheda, Haldu etc.) has been done in two patches - 10 ha and 20 ha.

Through convergence a mini deep tube well (183 metres) has been installed for drinking water as well as irrigation sourcing funds from RKVY (Rastriya Krishi Vikas Yojana) – this tube well is expected to help farmers to grow different vegetables, potato, mustard and ground nut. About Rs. 9 lakh has been spent for the tube well. A culvert has been constructed sourcing funds (Rs. 2 lakh) from RIDF (Rural Infrastructure Development Fund).

The FPC members are actively engaged in protection of the forest area including the plantation sites. Two paid watchers have also been engaged to protect the newly created plantation. The FPC members (9-member executive committee) usually meet once in a month to discuss protection and management of the forest. The members demanded planting of areas, where felling operations were done last year.

There are 14 women SHGs in the village, who are involved in collection of sal leaves and stitching of leaf plates as an income generation activities. The FPC members occasionally collect sal resin, mushrooms from the forest.

8.2.2 FPC - Sakhabay

The Survey Team members visited the plantation area of Sakhabay FPC (Division – Medinipur, Ranage – Chandrakana, Beat – Adharnayan) and interacted with the members in the plantation site. The FPC was constituted in 1998 with 256 (ST – 34, SC – 76 and the rest belonging to General Castes) members from three villages i.e. Sakhabay, Fatehgarh and Barasole. The FPC is protecting 113.98 ha of forest.

Activities undertaken by the JICA Project through this FPC:

Micro plan has been prepared and A1 model of plantation i.e. Eucalyptus clonal plantation has been done on 15 ha (Clone C3).

Felling operations were carried out during 2013-14 and 2014-15 and the FPC got about Rs. 8 lakh towards its share of benefits from the felling of trees. The three villages equally distributed the share from the felling. Fatehgarh invested the money in the temple; Sakhabay constructed a store room for religious activities; and in Barasol the FPC members used the funds in the Hari Temple. The FPC members requested the Survey Team and the Forest Department to raise more clonal plantations in the blank areas. Some of them also raised the issue of crop damage by the elephants and the paltry amount they get for the crop loss.

Attachment 5.4: Status of REDD+ Readiness in Tripura

1. Forests in Tripura

Tripura has a geographical area of 10,491 sq. km. The State is situated in the south-western corner of North-East India. It shares border with Bangladesh, Assam and Mizoram. International border with Bangladesh is 856 km (about 84 per cent of its total border) and the state is surrounded by a deltaic basin of Bangladesh on three sides. Population of the state is 3.67 million. Scheduled Tribes constitute 31.75 per cent of the state's population and there are 19 tribal communities living in the state.

Status of Forest in Tripura

Geographical Area (GA)	10,491 sq. km
Recorded Forest Area	6,294 sq.km
% of recorded forest area to the GA	59.99
Actual Forest Cover	7,811 sq.km
Actual Tree Cover outside the forest	233 sq.km
Total Forest and Tree Cover	8,044 sq.km
% of total Forest and Tree Cover to GA	76.71
Very Dense Forest	113 sq.km
Moderately Dense Forest	4,609 sq.km
Open Forest	3,089 sq.km
Reserve Forest	4,175 sq.km
Protected Forest	02 sq.km
Unclassed Forest	2,117 sq.km
Protected areas	725.341 sq. km (2 NPs and 4 Sanctuaries)
JFM Areas	1000 JFMCs and EDCs protecting an area of 260,210 ha
Forest Revenue and Expenditure in 2013-14	Revenue - Rs. 76.95 million Expenditure on forestry programmes – Rs. 743.75 million
Important Forest Products of the State	Timber, Bamboo, Cane, Rubber, Broom Grass, Medicinal Plants products
Plantations undertaken	2013-14 – 18,757 ha 2014-15 - 5,698.24 ha
Compensatory Afforestation during 2014-15	162.25 ha

Note: Compiled from State of Forest Report, 2015, FSI, Dehradun; Reports of Forest Department, Tripura.

Although the recorded forest area is 6,294 sq. km, the state has a forest and tree cover of 8,044 sq. km, which is 76.71 per cent of the geographical area. In addition to the Reserve Forest, the state has 2,117 sq. km area as unclassed forest. 2070.65 sq. km of unclassed forests are located inside Autonomous District Council Area (Sixth Schedule Area) and 124.823 sq. km outside the ADC. The forests in the state are mainly tropical evergreen, semi evergreen, and moist deciduous. Major forest types are Low Alluvial Savannah Woodland forest, East Himalayan Moist Mixed Deciduous forest and Secondary Moist Bamboo Brakes. Pure bamboo brakes occur over 934 sq. km, which is 15 per cent of the total forest area. Bamboo forests mixed with other miscellaneous trees occur over 2,397 sq. km. There are bamboo brakes in small holdings outside forest area which is about 109 sq. km. 19 species of bamboo and 6 species of cane are found in Tripura.

The State is located in the Bio-geographic zone of 9B-North-East Hills and is rich in bio-diversity. The flora and fauna of Tripura bear a very close affinity and resemblance with floral and faunal components of Indo-Malayan and Indo-Chinese sub-regions. The research on status of flora identifying 1,545 taxa revealed that there are 50 plants species restricted to Tripura and its neighbouring States and out of them 7 are endemic and 18 are rare plants. There are 266 species of medicinal plants in the State (68 trees, 39 shrubs, 71 herbs and 88 climbers). There are 90 mammal species in Tripura from 65 genera and 10 orders. Seven primate species have been documented in Tripura out of a total 15 found in India. Slow Loris, Stumped tailed Macaques, Phayre's Langur/ Spectacle Monkey and Hoolock gibbon are seen in Tripura. 342 Bird species are reported in the State, of which about 58 are migratory. 14 species of fish have been recorded, of which 2 are endangered and 12 vulnerable. Tripura has diverse ecosystems ranging from forests and grasslands to freshwater wetlands. There are 408 wetlands of different types. The State has 10 major rivers running over a total length of 903 km across the State.

Many of the forests of Tripura are right burdened. Rights and concessions were given to the people who traditionally live in the forests and these are clearly defined in the notification issued by the Department on 29.4.1952 and subsequent modifications thereafter. The local people from the villages surrounded

by Reserved Forests may have forest produce such as house posts, fencing post, Round timbers, firewood, thatch, bamboo, canes and other NWFP free of royalty for their own personal use but not for barter or sale. They are to obtain a permit which will remain valid for 3 months (January - March) and such posts, poles and logs shall be of trees which are not reserved. Grazing by a limited number of cattle is allowed free of charge in protected forests. Shifting cultivation (Jhum) is allowed in protected forests (PF) and Shifting cultivators (Jhumias) are allowed to collect forest produce free of royalty as stated earlier for the purpose of sale or barter.

2. Forest Administration

PCCF – Head of Forest Force is the administrative head of forest directorate. PCCF – Wildlife is the Chief Wildlife Warden and is responsible for management of Protected Areas. Tripura has 8 districts and since April 2015 these revenue/ civil districts have been considered as Forest Districts for better forest administration. In each district there is a District Forest Officer to look after all the forestry and wildlife related activities. Sub-Divisional Forest Officers work under the directions of the District Forest Officer. There is one Additional District Forest Officer to assist the District Forest Officer in forest administration. There are 8 District Forest Officers, 8 Additional District Forest Officers and 17 Sub-Divisional Forest Officers to look after territorial forest divisions. The territorial unit has 51 Ranges. There are 4 Wildlife Wardens to look after the protected areas and under them there are 8 WL Ranges. The functional circles/ units of the Forest Department such as Working Plan and Survey, IT and Statistics, Research and Training etc. are headed by a Chief Conservator of Forest.

3. Forest Monitoring

The M&E cell within the SFD mainly looks after the monitoring of all plantation level details.

Satellite based biennial report/data produced by FSI is used as the benchmark for state level forest monitoring. Recently JFMC boundary pillars are also being established in the field for better management of the forest.

Out of the total 9 Working Plans, 7 Working plans are already approved by GOI and 2 are under preparation (PWPR[1] already approved). New Working plan code 2014 recommendations regarding measurement of biomass for 5 carbon pools on sample basis have not yet started as most of the Working plans are approved till 2020. SFD feels that proper capacity building of field staff is required before the scientific measurements can be done at the field level as per the recommendations. Due to limited capacity in GIS and Remote Sensing within the department, Working plan division is assisted by the Tripura Space Application Centre in geo-referencing of paper maps, digitization of boundary data and preparation of maps.

Under JICA project detailed JFMC level maps depicting current status of the forest and proposed treatment details were prepared during micro planning stage at 1:5,000 scale using high resolution satellite data supplemented by ground truthing.

4. Safeguards and Safeguards Information System

The status of safeguards was assessed as per the UNFCCC principles of safeguards. The result is given in the table below.

Items	Findings
Consistency/ relevancy to the national and international policy/ programme/ agreements	◆ REDD+ Strategy/ Policy has not been developed. ◆ State climate change action plan has been prepared.
Effective State forest governance structure	◆ Forest Department has a fully functional institutional set up from the state level to the field level. ◆ There are 1,000 JFMCs and EDCs in the state protecting about 2.6 lakh ha of forest area. ◆ Tripura JICA Project works with 463 JFMCs and EDCs. The project also

[1] Preliminary Working Plan Report

Items	Findings
	has a functional institutional set up which runs parallel to the existing structure of forest Department.
Respect for the knowledge and rights of indigenous peoples and local communities	◆ There are areas in the state falling under Sixth Schedule of the Constitution. Tripura Tribal Area Autonomous District Council is responsible for governance of these areas and protection of rights of tribal people as well as for their development. ◆ FRA is implemented. Tribal Welfare Department not only monitors the progress of implementation but also the benefits received by the rights holders from various schemes of the Government. A total of 124,541 individual titles have been given by the end of December 2015 involving forest area of 1.756 lakh ha. 55 nos. of community claims have been given involving forest area of 36.897 ha. Tripura JICA Project provides capacity enhancement and alternative livelihoods for JFMCs and EDCs. JFMCs are keeping records of the forest resource extractions and rates sold.
Full and effective participation of the relevant stakeholders	◆ REDD+ cell has not been constituted. Stakeholders' consultation with regard to REDD+ has not been initiated. ◆ Tripura JICA Project adopts the participatory implementation of the project activities similar to other JICA supported projects. ◆ TFDPC (Forest Development and Plantation Corporation) and TRPC (Tripura Rehabilitation Plantation Corporation) are involved in plantation of rubber, bamboo etc. and help the tribal people/ Shifting Cultivators to raise plantation on their land. These institutions may have to work with Tripura Forest Department for future REDD+ projects.
Conservation of natural forests and biodiversity	◆ All the relevant national laws and regulations are reinforced. ◆ Working plans/ management plans are prepared and implemented. ◆ Central and state funded schemes are implemented for the forest and biodiversity conservation (FDA, CAMPA, GIM etc.) ◆ Under Tripura JICA Project, JFMCs/ EDCs undertake activities that contribute to the conservation of natural forest and biodiversity (i.e. IGAs to reduce the dependency on forest resources, patrolling, keeping records of extractions/ felling, adopt alternative household energy to reduce the consumption of the fuelwood etc.)
Actions to address risks of reversals	◆ No concrete actions are planned as REDD+ interventions have not been fully planned and implemented. ◆ Tripura JICA Project has a strong monitoring system to monitor and evaluate different activities including afforestation, livelihood improvement, and JFMC institution development. Livelihood improvement activities are monitored on a weekly basis while the activities of the JFMCs are monitored on a monthly basis. The same system shall be used for monitoring of any reversal and also displacement of emission. ◆ Tripura JICA Project has set up a NTFP Centre of Excellence, which is working on sustainable harvesting protocols for different NTFPs. The Centre helps establishment of community common facility centres to collectively work for sustainable harvesting, processing and marketing.
Actions to reduce displacement of emissions	◆ No concrete actions are planned as REDD+ interventions have not been fully planned and implemented. ◆ Tripura JICA Project has the monitoring system which will provide the basis to plan for necessary interventions for displacement of emissions.

Items	Findings
Safeguards Information System	◆ No plan for establishing a Safeguard Information System was discussed as yet. Data availability, reliability of data, data management system may require a review to constitute a Safeguards Information System. ◆ Tripura Government has a good information system to collect and compile data on implementation of FRA as well as economic activities for the forest rights holders. Tripura JICA Project has also a good GIS and MIS set up. This would help establishing SIS for REDD+ once necessary policy and strategies are adopted.

Source: JICA Survey Team (2016)

5. Efforts for Forest Protection, Management and Conservation

Ecological stability for socio-economic security of the people of the state has been the key motto of the Forest Department. The Department takes up multifaceted activities to prevent degradation of forests, restore the degraded forest, maintain the ecological restoration, improve the quality of forest and create livelihood opportunities through sustainable use of forest & biodiversity resources. The activities of the Forest Department are guided by different national and state forest legislations and policies promulgated by the state such as the State Afforestation Policy, Tripura Bamboo Policy, State Medicinal Plants Policy, Tripura Ecotourism Policy etc. The Forest Department prepared a perspective plan in 2006 for a period of 6 years.

During last 20 years the Forest Department has given emphasis on community involvement in forest protection and management. There are 1,000 JFMCs and EDCs functioning in the state. With the help of National Afforestation Programme and JICA assisted Forestry and Biodiversity Conservation Project, the Forest Department is focusing on institutional strengthening and livelihood enhancement of JFMC and EDC members.

Two externally aided projects are being implemented in Tripura; one is assisted by JICA to support a forestry sector development project (2007 to 2015 but extended to 2017) implemented in 7 districts through 463 JFMCs and EDCs. The other one is assisted by KFW, Germany (2007 to 2016) to improve the natural resource management in one district (Dhalai district).

The State implements various Central Sponsored Schemes and State Plan Schemes to enhance the forest cover and quality of the forest, conservation and management of Protected Areas etc. Some of the important programmes and schemes implemented by the State Forest Department have been described below:

Implementation of Important Laws, Programmes and Schemes related to Forest Management

Law/ Programmes/ Schemes	Activities/ Interventions
Forest Rights Act	The State has done lot of work on implementation of FRA. 1,040 Forest Rights Committees were constituted at the Gram Sabha level to receive claims and verify them and recommend them to the Sub Divisional Level Committees. The implementation of the act is closely monitored both at the state and district level. The state, after the issue of titles, has supported the FRA titleholders to carry out different economic activities through convergence. The FRCs received 193,879 claims (193,602 individual claims and 277 community claims) and 65,900 claims were rejected. A total of 124,541 individual titles have been given by the end of December 2015 involving forest area of 1.756 lakh ha. 55 nos. of community claims have been given involving forest area of 36.897 ha. Land demarcation using GPS has been completed for 120100 nos. of title holders. 93,349 title holders have been supported by different Line Departments for carrying out economic activities using the land given to them.
Joint Forest Management	In Tripura JFM was introduced in the early nineties, following the June 1990 circular of the Government of India. Forest Protection and Regeneration Committees (FPRCs) were formed to protect forest following a Government Order in 1991. These committees were later re-named as Joint Forest Management Committees (JFMCs). The 1991 resolution of the Government of Tripura was revised in 2001 (issues in January 2002).

Law/ Programmes/ Schemes	Activities/ Interventions
	There are 1,000 JFMCs and EDCs with a membership of 100,045 in the state protecting about 2.6 lakh ha of forest area. Tripura JICA Project works with 463 JFMCs and EDCs.
CAMPA	The State has received Rs. 289.036 million till 2015. Till June 2014 the state had planted 3,951.12 ha against a target of 5,459 ha. During 2014-15, the state has raised 162.25 ha of plantations under CAMPA.
National Afforestation Programme	Tripura received Rs. 264.6 million during 2012-13 to 2015-16 (till Nov 2015) from GOI. During 2013-14, plantations on 4,420 ha have been raised under the scheme. During 2014-15, the state raised 4,547 ha of plantations under NAP. 1,215 ha of bamboo plantations have been raised under the scheme during 2014-15.
Green India Mission	Tripura received Rs. 35.05 million under GIM for preparatory activities.
Intensification of Forest Management Scheme	Tripura received Rs. 88.384 million from GOI for implementation IFM scheme during 2012-13 to 2015-16 (till Nov 2015).
Angan Ban Prakalpa (Farm forestry)	Tripura Government has been promoting plantations of forestry tree species on the private land (fallow land and wasteland – upland and non-arable land) since 1996-97. Financial incentives and technical guidance are being provided to the farmers. Till 2013-14, the State Government had covered 26,891 farmers to raise plantations on 4,999.4 ha. The scheme includes planting of 150 teak / gamar stumps and 25 polybag seedlings of miscellaneous species at spacing of 3m x 3m over 0.15 ha. Rs. 100/- shall be disbursed in cash along with 150 teak / gamar stumps (on or before 15th April for Teak and on or before 30th May for gamar) for planting. Rs. 25/- shall be disbursed in cash along with 25 polybag seedlings of miscellaneous species on or before 15th June for planting. Rs. 150/- shall be disbursed in cash for maintenance in August on receipt of written certificate from the Gram Pradhan and the Beat Officer about proper planting and utilization of mini kits already supplied. Total value inputs and cash comes to Rs.425/- per beneficiary.

Note: Information compiled from reports of MOEF&CC, Reports of Forest Department, reports of Tribal Development Department, Govt. of Tripura etc.

6. Status of Tripura Forest Environmental Improvement and Poverty Alleviation Project (TFIPAP)

A brief profile of the Tripura JICA Project is given in the table below. Since 70% of the area in Tripura is covered with forest, many communities are dependent on forest resources, which was partly the cause of degrading forests. The project has a strong component on the NTFP development and marketing which contributes to the livelihoods of the forest dependent communities and thus, helping the communities to sustainably manage and utilise the forest resources. The project is currently on an extension phase.

Project Profile of TFIPAP

Particular	Description
Project Cost	Rs. 366 Cr. (approx.)
Project Area	7 Districts (7 Forest Divisions of 40 Ranges/ 1 Wildlife sanctuary)
Project Duration	2007/8 – 20014/15 (Currently on extension phase)
Project Components and Outlines	i) Project objectives: Improve forest density and income and livelihoods of the targeted households; conservation of soil and improving water regime and conservation of biodiversity. ii) Forestry Component ➢ Afforestation: The project target of 61,297 ha including agro forestry. 22,558.82 bamboo plantation; 30,628.23 ha miscellaneous plantations (2014-15). ➢ Agro Forestry: 8,522.82 ha (2015-16) agro forestry plantations were raised on patta lands (FRA). 9 agro forestry models were promoted by the project. ➢ Enrichment plantation: Plantation of broom grass, black cardamom, gandhaki and black pepper for the benefit of the JFMCs. ➢ Benefit sharing: JFMCs are entitled to 50% of the sale proceeds from timber at the time of the harvest and also entitled to collect all NTFPs. (JFMC resolution 2002.)

Particular	Description
	iii) Institutional Strengthening: ➢ JFMC/ EDC: 463 formed. 35,593 families manage 79,538 ha of forest land. iv) Special package for regrouped villages: 16 regrouped villages were supported by the project. 14 vocational training centres and 2 multi utility centres, 133 check dams, 1,405 kitchen gardens, 18 market sheds, one bamboo value addition centre and pre-primary school established. 76 SHGs organized. v) Infrastructures: ➢ 399 vocational training centre cum office buildings; 58 multi utility centres ➢ 2,448 check dams created. By this 1,229 SHGs/ JFMCs started fishery. vi) Livelihood Component: ➢ 1,500 SHGs formed. Fishery, piggery, poultry, duckery, mushroom, hone, broom grass, agarbati stick and rolling, and etc. ➢ Training programmes for community level institutions and other stakeholders conducted. ➢ NTFP Centre for Excellence has been established. It is specialized in developing, harvesting, value addition and marketing of NTFPs. 25 mini community common facility centres were established. vii) GIS/ MIS: all assets created under the project is in GIS platform for monitoring. Demarcation of project areas done. MIS is also developed in-house. It is web-enabled and helps the range level management unit to feed the data onto the system. viii) Biodiversity: inventory of biological resources, establishing conservation reserves, conservation areas, eco-tourism, plantations, habitat improvement, nature education, restoration of buffer area in the Trishna wildlife sanctuary, butterfly park, bison safari etc. were undertaken.

Source: JICA Survey Team (2016)

7. REDD+ Readiness in Tripura State and TFIPAP and Suggested Area for Further Development

From the above, the status of REDD+ readiness is assessed and given in the table below.

REDD+ Readiness Status of Tripura State and TFIPAP

REDD+ Requirements	Tripura State	TFIPAP
State Action Plan	➢ SAPCC is prepared in which forestry sector is a part. No REDD+ action plan is prepared.	-
(Donor Intervention)	None	None
FREL/FRL	➢ Not set.	➢ Not set.
(Donor Intervention)	None	None
State/ Project Forest Monitoring System	➢ Done by the State Forest Department	➢ Done by the project (Satellite based monitoring)
(Donor Intervention)	None	JICA
Safeguard Information System	➢ FRA implemented and individual as well community rights were given. Data synthesis is partly undertaken by the Tribal Welfare Department. ➢ Data sharing between the line	➢ Project MIS/ GIS is established and operationalized. ➢ Community participation/ empowerment is an integral part of the project implementation process.

REDD+ Requirements	Tripura State	TFIPAP
	departments are good.	➢ Record keeping on the forest resources at JFMCs has been maintained. ➢ The existing system needs to be aligned with the UNFCCC requirement.
(Donor Intervention)	None	JICA
MRV	➢ Partly established as part of the preparation of working plan and data collection for the same.	➢ Project MIS/ GIS is established. The system needs to be aligned with the UNFCCC requirement.
(Donor Intervention)	None	JICA

Source: JICA Survey Team (2016)

Based on the findings above, following areas can be suggested for further developed in the area of safeguards and safeguards information system.

Suggested Areas for Further Development in Safeguards –Tripura

Areas for Further Development
➢ REDD+ action plan can be developed. ➢ FREL/ REL needs to be established. ➢ MRV system needs to be established. ➢ Tripura JICA Project already adopted the implementation process that complies with the safeguards requirement. However, for the adoption of REDD+ the objectives of safeguards, criteria and indicators are to be developed and existing information systems need to be further improved and synchronized. The system can be further developed and aligned with the UNFCCC requirements. ➢ Tripura JICA Project may consider certifications/ registration under Climate Community Biodiversity Standards (CCBS) for REDD+. ➢ Pilots can be planned with Tripura JICA Project in different part of the state (North, South and Western Parts). ➢ REDD+ Pilot can also be planned with TFDPC and TRPC, the state owned corporations working with the patta land holders (FRA right holders) to undertake rubber plantations. ➢ Further capacity development would be relevant in MRV and safeguards.

Source: JICA Survey Team (2016)

8. Visit to Niharnagar JFMC in Rajnagar Range of Trishna Divisional Management Unit (28th Jan 2016)

Tripura JICA Project organised a visit of the REDD+ Survey Team to the field in Trishna DMU. The Survey Team had a meeting with the JFMC members, SHGs and Staff of the Forest Department. The District Forest Officer, the Wildlife Warden, Trishna and one Additional Director of PMU attended the meeting with Niharnagar JFMC. The JFMC was formed in February 2010 with membership from 75 families living in Krishnapur, Niharnagar and Krishnabashi Para. The JFMC has been allotted a forest area of 94 ha. Although the JFMC was formed in 2010, the villagers were involved in informal protection of the forest much earlier to this.

JICA Project assisted the JFMC to prepare the micro plan and survey and demarcate the JFMC area. Different models of afforestation were carried out in 89.29 ha area. Bamboo plantations were undertaken in 35 ha area. One 10 ha patch of Muli Bamboo plantation was visited by the Survey Team. The plantation is well established and people have started harvesting selectively only for their own use. Mixed plantations have been done in 15 ha area. About 35 ha of Sal Coppice Forest is being protected by the JFMC for last 10-15 years, which was earlier degraded by people from Bangladesh (the village is located not very far from the international border). Because of protection by the villagers the forest has regenerated well. Patrolling by the JFMC is in vogue. Thinning and singling operations are occasionally done in this patch. The Forest Department before the formation of JFMC had fenced 5 ha area of Sal forest and made an eco-park, which is also being protected by the JFMC. Currently no

activities are being carried out in the eco-park area. With the support of JICA Project 8 nos. of water harvesting structures (under Soil and Water Conservation component) have been constructed and the SHGs are using them for fisheries. One Multi Utility Centre has been constructed by the Project as well as Social Welfare Department, where JFMC Office as well as the Anganwadi are functioning.

Four SHGs including one SHG of men are there in the JFMC (three women SHGs were formed after formation of JFMC) and 45 JFMC members are members of these SHGs. After first gradation in 2012 first loan was provided to 3 SHGs (Rs. 30,000 each to two SHGs and Rs. 35,000 to one SHG) for fishery and piggery activities. Fishery turned out to be quite profitable. Two SHGs made a collective profit of Rs. 32,000 and this does not include the volume of fish used for own consumption. Second gradation of SHGs has also been completed and all the three SHGs have taken loan of Rs. 30,000 each. They are continuing the same fishery and piggery activities. The SHGs requested the Project Staff for more training and revolving fund to carry out different income generation activities but they don't have a concrete plan/ long term plan for enhancing their income or to carry out any specific enterprise.

There is a village Animator (Field Facilitator) engaged by the Project from the village to help JFMC to implement different activities and maintain records. Among other records the JFMC keeps a record of NTFPs harvested from the forest. The JFMC has earned money from issue of grazing passes and sale of some NTFPs.

The villagers have realised the importance of having a JFMC in their village. Most of the people depend on wage labour to earn their livelihood in addition to agriculture. After JFMC they have got plenty of wage work in the village itself. Water bodies were created and SHGs are involved in fisheries. Since some structure are new, they hold less water now but subsequently fishery will be carried out in these new structures too. The JFMC has mobilized some resources from the Agriculture Dept. to plant Banana and Mango through one SHG. Enrichment of the plantations has been done through planting of ginger and turmeric. Now the male SHG intends to promote integrated farming – integration of agriculture crops, horticulture, livestock and fisheries. They are requesting the Project to provide them some resources. The male SHG has set up a nursery of mixed species using funds from MGNREGS.

During 2015, Niharnagar JFMC was awarded as the Best Performing JFMC of the State and Rs. 20,000 was given as prize money.

Attachment 5.5: Status of REDD+ Readiness in Sikkim

1. Forests in Sikkim

Sikkim is a small hilly state located in Eastern Himalayas with a geographical area of 7,096 sq. km and with a population is 0.611 million. There are four districts in the state and all are hills and tribal areas. Vast stretches of Tibetan Plateau are in there in North of Sikkim; the Chumbi valley of Tibet and Bhutan are in the East; Nepal is in the West of Sikkim and Darjeeling district of West Bengal is located in the Southern part of Sikkim. There are four distinct ecoregions – Tropical, Sub Tropical, Temperate and Trans-Himalayan. Sikkim has varying altitudinal gradients ranging from 300 meters to 8585 meters within a short distance.

Although the recorded forest area is 82.31 per cent of the geographical area, the actual forest and tree cover is only 47.8 per cent. Six types of forests are seen in Sikkim - Tropical Semi Evergreen Forests, Sub-tropical broad leaved Hill Forests, Himalayan Wet Temperate Forests, Sub-Alpine Forests, Moist Alpine Forests and Dry Alpine Forests.

Sikkim is a biodiversity hotspot and quite well-known for its efforts to protect and preserve its rich flora and fauna. Sikkim falls under Himalayan (2) Bio-geographic zone & Central Himalaya (2c) biotic province having about 9 types of forests types. Over 4500 flowering plants, 550 Orchids, 36 Rhododendrons, 16 Conifers, 28 Bamboos, 362 Ferns and its allies, 9 Tree Ferns, 30 Primulas, 11 Oaks, over 424 Medicinal plants, 144 mammals, 550 Birds, 33 Reptiles, 48 Fishes and over 650 Butterflies/moths are recorded in the state. Sikkim has 28 Mountains/Peaks, more than 38 Glaciers, 227 high altitude lakes/wetlands and about 104 rivers and streams.

Status of Forest in Sikkim

Geographical Area (GA)	7,096 sq. km
Recorded Forest Area	5,841 sq.km
% of recorded forest area to the GA	82.31
Actual Forest Cover	3,357 sq.km
Actual Tree Cover outside the forest	35 sq.km
Total Forest and Tree Cover	3,392 sq.km
% of total Forest and Tree Cover to GA	47.80
Very Dense Forest	500 sq.km
Moderately Dense Forest	2,160 sq.km
Open Forest	697 sq.km
Reserve Forest	5,452 sq.km
Protected Forest	389 sq.km
Unclassed Forest	0 sq.km
Protected areas	2,183.10 sq.km (one National Park and 7 Sanctuaries) 30.77 per cent of the GA – highest in the country
JFM Areas	159 JFMCs and 60 EDCs
Forest Revenue	2011-12 Rs. 111.517 million
Important Forest Products of the State	Medicinal plants products – Aconites, Jatamansi, Kutki, Pipla, Artemisia (Indian wormwood)

Note: Compiled from State of Forest Report, 2015, FSI, Dehradun; Reports of Forest, Environment and Wildlife Management Department, Sikkim.

In Sikkim forest areas have been kept aside for grazing and meeting the *bonafide* domestic need of timber, firewood and fodder. Gorucharan forests are there near the village for grazing of cattle and Khasmal forests are there for meeting the bonafide needs of the local communities.

2. Forest Administration

PCCF is also the Principal Secretary of Forest, Environment and Wildlife Management Department of Sikkim. Under the directions of the Principal Secretary one PCCF looks after the Environment and other manages the JICA project. Wildlife Wing is headed by a CCF. There are 5 Wildlife Divisions and 4 Territorial Divisions. Working Plan Wing of the Forest Department is headed by a CCF and there are 3 working plan divisions for preparation of working plans. Environment and Soil Conservation Wing is headed by a CCF and there are five divisions under this wing.

3. Forest Monitoring

In the state of Sikkim, SFD is yet to start measurements and data collection as per the recommendation of the National Working Plan code 2014. Although, in the state carbon assessment was conducted in

2010 in collaboration with IIRS and DST (under National Carbon Project under ISRO-Geosphere Biosphere Programme) for all 5 Carbon Pools.

Under the JICA project rapid biodiversity survey was conducted based on the biodiversity information collected from around 1,000 plots across the State covering different forest types and 300 plots in the known biodiversity hotspots of the state.

The centralized GIS lab under Working Plan Division caters to the need of the department as well as projects. All administrative boundaries and forest administrative boundaries (till beat and compartment level) are available with the GIS lab of SFD. Giving importance to the JFM concept and recognizing it to be the lowest unit of forest management, SFD of Sikkim has initiated and completed Rationalisation, Re-organisation and Re-constitution of JFMC boundaries to make it co-terminus with the Panchayat boundaries. Earlier JFM boundaries were having overlaps in the field.

Plantation Journal is the key monitoring document and SFD has recently introduced a common/uniform format for plantation journal with instructions to follow the same for all schemes and projects across the state. In the state ACF is responsible to do 100% inspections of plantations. DFO and CF are responsible to do 75% and 50% inspection of plantations and are required to record inspection report in the plantation journal itself.

SBFP project is planning to survey all plantations; soil and water conservation measures and other assets created under the project using GPS and would be incorporated in GIS environment.

4. Safeguards and Safeguards Information System

The status of safeguards was assessed as per the UNFCCC principles of safeguards. The result is given in the table below.

Status of Safeguards and Safeguards Information System in Sikkim

Items	Findings
Consistency/ relevancy to the national and international policy/ programme/ agreements	◆ REDD+ Strategy/ Policy has not been developed. ◆ REDD+ cell has been established in the Forest Department but not fully functional (All District Forest Officers are member of the Cell). ◆ A State Level Steering Committee on REDD+ has been constituted with the Secretaries of different Departments. ◆ State climate change action plan prepared.
Effective State forest governance structure	◆ Forest Department has a fully functional institutional set up from the state level to the field level. ◆ SBFP has reconstituted JFMCs so that they maintain consistency with the PRI.
Respect for the knowledge and rights of indigenous peoples and local communities	◆ FRA is at the very initial stage of implementation. No valid claims have been received. Sikkim Forest Act protects the rights of the community. Communities have their own forest and their dependence on forest managed by the FD is less. ◆ SBFP provides capacity enhancement and alternative livelihoods for JFMCs and EDCs through convergence.
Full and effective participation of the relevant stakeholders	◆ REDD+ cell has been constituted. ◆ SBFP involves community in management of forest as well as project infrastructures for biodiversity conservation and eco-tourism. ◆ Forest PLUS pilot is being implemented involving different stakeholders including the local communities.
Conservation of natural forests and biodiversity	◆ All the relevant national laws and regulations are reinforced. ◆ Working plans/ management plans are prepared and implemented. ◆ Central and state funded schemes are implemented for the purpose (FDA, CAMPA, GIM etc.) ◆ SBFP undertakes inventory of biodiversity and eco-tourism development that would contribute to the conservation of the natural forest and biodiversity.
Actions to address risks of reversals	◆ No concrete actions are planned as REDD+ interventions have not been fully planned and implemented. ◆ SBFP has not started monitoring the impacts of eco-tourism interventions on

Items	Findings
	the local environment. The inventory of biodiversity would inform the management plan although the plan for monitoring is not made due to fund shortage. ◆ Necessary documents are being prepared by Forest PLUS for jurisdictional REDD+ and these documents may include actions for addressing the risks of reversals.
Actions to reduce displacement of emissions	◆ No concrete actions are planned as REDD+ interventions have not been fully planned and implemented. ◆ SBFP has not started monitoring the impacts of eco-tourism interventions on the local environment. The inventory of biodiversity would inform the management plan although the plan for monitoring is not made due to fund shortage. ◆ Necessary documents are being prepared by Forest PLUS for jurisdictional REDD+ and these documents may include actions for reduction of displacement of emissions.
Safeguards Information System	◆ No plan for establishing a Safeguard Information System was discussed as yet. ◆ Data availability, reliability of data, data management system may require a review to constitute a Safeguards Information System. ◆ Monitoring system of SBFP is still under development.

Source: JICA Survey Team (2016)

5. Efforts for Forest Protection, Management and Conservation

The State is considered as a green state and it implements various programmes and schemes to enhance the forest cover and quality of the forest, conservation of biodiversity and management of Protected Areas etc.

The Chief Minister, Mr. Pawan Chamling was declared as the 'Greenest Chief Minister' of the country in Nov 1999 by Centre for Science and Environment, Delhi for his efforts for banning the use of plastic, green felling, grazing in high altitude pastures and forest etc. Under his leadership efforts are made to conserve the forest and biodiversity, and preserve the fragile Himalayan ecology. A lot of efforts are being taken to make it a green state.

1995-96 was declared as the Harit Kranti Year (Green revolution) by the state Government and it also declared 2000-10 as the decade of Harit Kranti. During 1996 the state Government declared incentives for eco-friendly and pollution free industries. Use of plastics and polythene bags were banned in 1997. In 2001, Sikkim banned the commercial activities such as mountaineering in sacred peaks, caves, rocks, lakes and also in Mt. Khangchendzonga. Use of chemical fertilizers and pesticides in agriculture was banned in 2002. In 2003 the State Government stopped the import of chemical fertilizers and pesticides in to the state. This process set up a strong foundation for Sikkim to become organic state. In Feb 2006 the state Government launched State Green Mission to raise avenue plantations, plantation of vacant and waste land, beautification of the state through plantation and landscaping. Ecotourism is given high priority as it is contributing significantly to the state's income. In 2008 a separate ecotourism directorate was created. In January 2008, the state Government set up a Glacier and Climate Change Commission to study the state of glaciers and impact on the hydrology of the state. During 2008 Sikkim ranked highest in the country in the Greenery Protection Index. It ranked highest in 2009 in Environment Sustainability Index for reducing pressure on the environment and state's response to maintain the environment. This ranking was done by Centre for Development Finance. The Chief Minister started an innovative programme named as 'Ten Minutes to Earth' in July 2009, which calls for everyone in Sikkim to dedicate ten minutes of their time to Mother Earth by planting a sapling on 25th June every year. The green governance efforts were further strengthened under Forestry and Environment Mission 2015, which aims at scientific management of forests and biodiversity for the benefit of all. Organic Mission of Sikkim, which was strengthened in 2010, intended to convert Sikkim into a totally Organic State by 2015 and all the agriculture produces would be grown using organic fertilizers.

Efforts are made for conservation of wildlife in the state. The state has special zones for conservation of Blue Sheep and Musk Deer.

Some of the important programmes and schemes implemented by the State Forest Department have been described below:

Implementation of important Laws, Programmes and Schemes related to Forest Management

Law/ Programmes/ Schemes	Activities/ Interventions
Forest Rights Act	FRA is at the very initial stage of implementation. Committees have been formed at the state and district level. FRCs have been constituted. No valid claims have been received. Sikkim Forest Act protects the rights of the community. Communities have their own forest and their dependence on forest managed by the FD is less.
Joint Forest Management	JFM was introduced in the state in 1998. On 24th May 2006 another resolution was brought in by the State Government for decentralization and universalization of JFM in the state. There are 907 villages (Gram Panchayat Wards) in the state and the Government decided to form one JFMC/ EDC in each village. The Ward Panchayat Member will become the Ex-Officio President of the JFMC or EDC. There are 159 JFMCs (4 Territorial FDAs) and 60 EDCs (5 WL FDAs) functioning in the state. JICA Project has a plan to work with 180 JFMCs and EDCs and at present it has implemented activities in 90 JFMCs and EDCs.
CAMPA	State CAMPA was set up in 2009. It has received Rs. 592.349 million from GOI (*Ad hoc* CAMPA) till 2015-16. Till 2014 the state has raised plantation of 3,114.64 ha against the target of 4,842.49 ha.
National Afforestation Programme	There are 9 FDAs in the state and 219 JFMCs and EDCs are associated with the implementation of NAP. The State received Rs. 167.10 million from 2012-13 to 2015-16 (till Nov 2015) from GOI for implementation of NAP.
Green India Mission	Sikkim received Rs. 29.955 million from GOI for the preparatory activities under GIM and for preparation of Perspective Plan.
Intensification of Forest Management Scheme	MOEF&CC provides funds to the State supplementing its efforts for forest protection, management and preservation. During 2012-13 to 2015-16 (till Nov 2015) the State Government received Rs. 36.395 million for implementation of different activities under IFMS. Funds are utilized for forest patrolling, effective forest check posts, control of illegal extraction of forest produces and transportation of forest produces etc.

Note: Information compiled from reports of MOEF&CC, Reports of Forest, Environment and WL Department, Reports of Tribal Development Department, Govt. of Sikkim etc.

6. Status of Sikkim Biodiversity Conservation and Forest Management Project (SBCFMP)

Sikkim Biodiversity Conservation and Forest Management Project commenced in 2010. The state is endowed with rich biodiversity and cultural heritage and thus, the emphasis is given on the biodiversity conservation and eco-tourism as a core to the livelihoods improvements in the forest dependent community. The status of the project as of the December 2015 is summarised in the table below.

Project Profile of SBCFMP

Particular	Description
Project Cost	JPY 6,347 Million or Rs. 330.57 Cr. (@ Rs.1=JPY1.92)
Project Area	4 Forest Divisions/ 27 Ranges
Project Duration	2010- 2020
Project Components and Outlines	i) The project has encountered continuous fund shortage, which hampered the progress of the project works. Between 2010 - December 2015, the average financial achievement is 28.25% and physical achievement was 29.16%. ii) GIS: Satellite data and software procured. GIS lab upgraded. Trekking trails/ foot trails maps were developed. 70 JFMC/ EDC maps for 10 ecotourism villages; maps for 11 ecotourism zones and cluster villages; 3 maps of wildlife watching areas prepared. Composite map of trekking trails of Sikkim developed. Grid map and digital elevation model map of Panch Pokhri conservation area for Musk Deer and Rhododendroniveum in Sikkim. 132 maps updated topographical, land use and forest resource atlas. iii) Biodiversity Component: Sikkim Biodiversity Action Plan prepared. Upgrading infrastructure at Himalayan Zoological Park and Butterfly Park. iv) Floricultural nursery (Plant Conservatory) established. 4 propagation nurseries established. v) Rapid Biodiversity survey conducted in 177 plots.

Particular	Description
	vi) Studies on Red Panda, Musk deer, rhododendrons were conducted. vii) Eco Tourism ➢ Eco tourism marketing cell established. Marketing strategies developed for both domestic and international markets. Took part in various festivals and exhibitions. ➢ Location of 7 Interpretation centres and 9 forest rest houses are identified. Survey on Trekking routs is done. ➢ Training, and exposure visits are conducted for the community members. ➢ State level workshop has been conducted. viii) JFM ➢ Plantation: 1,535 ha for 90 JFMCs/ EDCs; 500 ha plantation in religious areas; 8 ha JFM nurseries. ➢ Rationalisation/ Re-organisation/ Re-constitution of JFMCs/ EDCs done. 221 JFMCs/ EDCs were reorganized into 164 JFMCs + 64 EDCs in 9 forest divisions (4 territorial, 4 wildlife, and 1 national park). ➢ JFM manuals prepared and printed. ➢ 90 micro plans are prepared. ➢ EPA guidelines developed and implemented with 90 JFMCs. ix) Marketing, product designing and development for forest based/ non forest based handicrafts and other products conducted. 240 SHGs selected in 90 villages out of 9 forest divisions. Skills development training conducted. Prototypes for 7 bamboo products developed. Guideline on loan disbursement and IGA implementation prepared.

Source: JICA Survey Team (2016)

7. Status of REDD+ Readiness in Sikkim and SBCFMP

With the technical assistance from Forest PLUS, Sikkim had a head start in REDD+ interventions among the JICA supported states along with Himachal Pradesh and Karnataka. The state is in the process of establishing jurisdictional REDD at the sub-national level. FREL/ FRL is being constructed.

REDD+ Readiness Status of Sikkim State and SBCFMP

REDD+ Requirements	Sikkim State	SBCFMP
State Action Plan	➢ SAPCC has been prepared, in which forestry sector is a part. However, no REDD+ action plan has been prepared.	-
(Donor Intervention)	None	None
FREL/FRL	➢ Being established under Forest PLUS project	➢ Not set.
(Donor Intervention)	USAID	None
State/ Project Forest Monitoring System	➢ Done by the State Forest Department	➢ Done by the Project (Being Established)
(Donor Intervention)	None	JICA
Safeguard Information System	➢ Relevant laws and regulations are being implemented. ➢ FRA is in still early stage of implementation. ➢ Overall architecture of safeguards information system needs to be clearly defined. ➢ Data sharing/ management needs to be strengthened.	➢ Applicable laws and regulations are being implemented. ➢ Project M&E/ MIS system partly fulfills the requirement. It needs to be aligned with the UNFCCC requirement.
(Donor Intervention)		JICA

REDD+ Requirements	Sikkim State	SBCFMP
MRV	➢ Partly established as part of the preparation of working plan and data collection for the same. ➢ Presently being established under Forest PLUS	➢ Project M&E/ MIS system partly fulfills the requirement.
(Donor Intervention)	USAID	JICA

Source: JICA Survey Team (2016)

Based on the findings above, following areas can be suggested for further developed in the area of safeguards and safeguards information system.

Suggested Areas for Further Development - Sikkim

Areas for Further Development
➢ Sikkim Forest Department works with FOREST PLUS Programme of USAID, which will provide the Department a road map for implementing jurisdictional REDD+. The Forest PLUS is developing some tools and methods for implementation of REDD+. Drivers of deforestation and forest degradation (both planned and unplanned) have been identified. Forest PLUS is currently working on promotion of alternative fuel using biomass wastes.
➢ The Road Map is yet to be prepared. How to implement the road map is not yet clear. The kind of support required for implementation needs further assessment. However, further capacity development of Forest Department in MRV, establishing SIS and carbon trading along with the designing of the benefit sharing mechanism and setting up the appropriate institutional arrangement or implementation of the roadmap can further be looked into.
➢ Pilot projects of REDD+ can also be implemented.
➢ Towards establishing SIS, technical cooperation could help the state government to establish an inter-departmental/ multi stakeholder database which can be used for monitoring of REDD+ related activities as well as the monitoring of each department.
➢ The state also intends to become a member of GCF, which process can be supported through capacity enhancement.

Source: JICA Survey Team (2016)

8. Field visit to Chandaney Village, Dalapchen GPU, East Sikkim District (3rd Feb 2016)

The Regional Team of Forest PLUS organised a visit of REDD+ Survey Team to Chandaney village. The Survey Team had an opportunity to interact with villagers of Chandaney, GPU Officials, Dalapchen EDC members. The village is located near Pangolakha Sanctuary and also nearer to the West Bengal and Bhutan border.

Forest PLUS has identified this area as a pilot to address different drivers of deforestation. Fuel wood consumption is a major driver of deforestation. Most of the local residents are engaged in cultivation of cardamom, which requires a huge amount of fuel wood for processing and drying. About 20 kg of fuel wood is required for drying of one kg of cardamom. Sikkim produces 5,800 MTs of cardamom every year. It is an important source of livelihood for people. Cardamom is sold Rs. 1,200 to 2,000 per kg. Forest PLUS has made an assessment of fuel wood consumption in the area and pressure on the forest including the sanctuary. It has been motivating people in 5 GPUs to use biomass/ bio-wastes briquettes as fuel for cooking as well as for drying of cardamom. 30 persons have been trained as Master Trainers, who in turn train the villagers to prepare biomass briquettes. Now most of the people are using LPG for cooking and sometimes they use fuel wood. Average use of fuel wood for cooking is one quintal per household per month. In Chandaney village a Master Trainer is there and others also know how to make briquettes but there are only 3 moulds available in the village and people are demanding for more moulds to be provided to them. Two cakes/ briquettes are sufficient for one family to cook food for one day. One woman from the village has started selling briquettes – about 700 briquettes were sold to people in Ranipur and Rongley at the rate of Rs. 25 per piece.

Now Forest PLUS is working on improving the existing cardamom driers to make it more fuel efficient as well as the driers can use biomass briquettes. Earlier Spice Board installed a drier in the village but it could not function because of technical issues.

Forest PLUS has given 30 bee boxes in the target villages as a demonstration of apiculture, which would supplement the income of the family.

The pilot area is located close to the Nepal Border. There is no forest in Nepal side. The forest and sanctuary on the Indian side are at risk. Timber and NTFPs are illegally taken to Nepal. Forest PLUS is exploring with ICIMOD to work on Trans-boundary REDD+ project to protect and conserve the available forest resources.

Chandaney village is part of Dalapchen EDC, which was formed in 2002. This EDC is targeted by JICA assisted Sikkim Forest and Biodiversity Conservation Project. 5 ha mixed AR plantation was done in 2014. Under EPA, foot paths have been repaired and 2 sets of utensils have been provided to the EDC. The EDC has members from 6-7 villages and people still demand more support under EPA for construction of foot paths, repair of schools and club houses. The Chairperson of EDC attended one day training programme in Gangtok organised by PMU of JICA assisted Forestry Project. The EDC members expect the Project to support EDC for fodder development, supply of LPG cylinders and improved driers for cardamom drying.

Attachment 5.6: Status of REDD+ Readiness in Uttarakhand

1. Forests in Uttarakhand

Uttarakhand was born out of UP as a state in November 2000. The state has a geographical area of 53,483 sq. km with a population of 10.09 million living in 13 districts and all are considered as hill districts. The state has borders with Nepal, Tibet, Himachal Pradesh and Uttar Pradesh. Large areas of the state are under snow cover and steep slopes. Topographically the state can be classified in to 5 zones – Terrai and Bhabhar, Shiwaliks, Doon Valley, Mid-Himalayas and Greater Himalayas. 90 per cent of the state's area is under hills and mountains. According to the climatic conditions the state has been divided into 6 zones - warm temperate zone, cool temperate zone, cold zone, alpine zone, glacier zone and perpetually frozen zone.

Although the recorded forest area is 38,000 sq. km (71 per cent of the GA) but the actual forest cover is 24,240 sq. km (45.32 per cent). Uttarakhand forests fall under 34 forest types under 8 major groups. Forests commonly seen in the state are Moist Shiwalik Sal Forest, Himalayan Chir Pine Forest and Oak Forests.

The state has quite rich floral and faunal biodiversity. The state is represented by biographic zone 2B Western Himalaya and 7B Shiwaliks consisting of Kumaon and Garhwal two regions. 102 mammals, 600 of birds, 19 amphibians, 70 reptiles and 124 species of fish are found in the state. The state has more than 4,000 species of flowing plants, 225 species of orchids, 701 species of medicinal plants, 560 species of lichens, 95 species of fibre yielding plants, 8 species of bamboo (including 5 ringal species) and several species of natural dye yielding plants.

The forest resources of the state are categorized as Reserve Forest, Protected Forest and Unclassed Forest. Uttarakhand has a forest category known as Civil & Soyam Forest. These are legally classified as Protected Forest under the control of Revenue Department to meet the requirements of people living in forest fringe villages, and also to meet the present and future land requirement for various developmental activities.

Status of Forest in Uttarakhand

Geographical Area (GA)	53,483 sq. km
Recorded Forest Area	38,000 sq.km
% of recorded forest area to the GA	71.05
Actual Forest Cover	24,240 sq.km
Actual Tree Cover outside the forest	752 sq.km
Total Forest and Tree Cover	24,992 sq.km
% of total Forest and Tree Cover to GA	46.73
Very Dense Forest	4,754 sq.km
Moderately Dense Forest	13,602 sq.km
Open Forest	5,884 sq.km
Reserve Forest	26,547 sq.km
Protected Forest	9,885 sq.km
Unclassed Forest	1,568 sq.km
Protected areas	6 – NPs and 7 Sanctuaries – 12 per cent of the GA of the State (NPs and WLS – 7,605.48 sq. km) 4 Conservation Reserve - 160 sq. km
Van Panchayat	12,089 VPs managing 5,449.64 sq.km panchayati forest
Forest Revenue and Expenditure	2012-13 Revenue – Rs.2,310.192 Expenditure – Rs. 3,915.503
Important Forest Products of the State	Timber, Pine Resin, Lichens and Moss grass, number of important Medicinal and Aromatic Plant products, Natural fibers, Pine needles etc.
Plantations undertaken during Eleventh Plan period	103,141 ha
Plantation during 2012-13	13,838 ha
Compensatory Afforestation under CAMPA	2011-12 to 2013-14 Target – 7,768.91 ha Achievement – 6,978.45

Note: Compiled from State of Forest Report, 2015, FSI, Dehradun; Reports of Forest Department, Uttarakhand.

2. Forest Administration

PCCF – HOFF is the head of Forest Directorate. There are other PCCFs responsible for a) Projects, b) Wildlife Management, c) Van Panchayats and d) Working Plan. The Forest Department has 13 Circles, 44 Divisions, 284 Ranges and 1,569 Beats for administration of the forest areas. The Territorial Wing

has 10 Circles, 29 Divisions, 244 Ranges and 1,552 Beat. A PCCF is based in Haldwani to look after Van Panchayats and Joint Forest Management. S/he is assisted by an APCCF, a CF and other officers.

3. Forest Monitoring

In the state of Uttarakhand out of 26 Working Plans presently work is undergoing for preparation of 4 Working Plans. FSI is assisting SFD in carbon assessment as per the New Working Plan Code 2014. In the state 287 research sample plots are being used for wood stock assessment since 1937.

SFD is having a Monitoring and Evaluation and Climate Change cell headed by CCF level officer. M&E cell does sample based survival assessment for 1st year, 2nd Year and 3rd Year of plantations. From this year onwards, monitoring of other assets like soil and moisture conservation measures, fire management etc. would be regularly carried out on annual basis. The cell is also planning to start satellite based monitoring of plantations soon.

The GIS cell at the headquarters caters to the need of the department as well as that of Working Plan Division. Forest administrative boundaries are available in digitized form till compartment level. Under Catchment Area Treatment Plantations LISS-IV satellite data is being used for monitoring purpose. All forest block boundaries are already digitized. Under e-green watch, GPS data is being uploaded by DFOs on the e-green watch portal. Data validation is being 4 by GIS cell at the headquarters and QC/QA is being done by FSI. SFD is using Bhuvan based WebGIS viewer developed by National Remote Sensing Centre (NRSC). Forest boundary pillars are being surveyed using DGPS survey. Presently, Van Panchayat boundaries are not available with the GIS Cell.

Uttarakhand JICA project has initiated DGPS based survey and demarcation of treatment areas and high resolution satellite image based mapping at 1:5,000 scale depicting present status of forest and treatment in the project areas. Also, MIS is being developed for Afforestation/plantation activities.

4. Safeguards and Safeguards Information System

The status of safeguards was assessed as per the UNFCCC principles of safeguards. The result is given in the table below.

Status of Safeguards and Safeguards Information System in Uttarakhand

Items	Findings
Consistency/ relevancy to the national and international policy/ programme/ agreements	◆ REDD+ Strategy/ Policy has not been developed. ◆ State climate change action plan has been prepared. ◆ A nodal officer for climate change and REDD+ has been appointed in the Forest Department. ◆ A Cell has been established in the Forest Department on Climate Change.
Effective State forest governance structure	◆ Forest Department has a fully functional institutional set up from the state level to the field level. ◆ Van Panchayat – traditional village forest management institution has been in vogue in the state since 1931.
Respect for the knowledge and rights of indigenous peoples and local communities	◆ Van Panchayats were evolved way back in 1931 to legitimize community rights over forest. 12,089 Van Panchayats are there in the state. ◆ FRA is being implemented but less number of claims has been received because of lack of awareness. Currently efforts are being made to create awareness among the forest dwelling communities on forest rights.
Full and effective participation of the relevant stakeholders	◆ The JICA Forestry Project, though still at the early stage, has initiated the process of community mobilization and capacity development. 750 Van Panchayats are being targeted for the project intervention. ◆ REDD+ pilot project in Nainital is being implemented by the Forest Department with the participation of Van Panchayats.
Conservation of natural forests and biodiversity	◆ All the relevant national laws and regulations are reinforced. ◆ Working plans/ management plans are prepared and implemented. ◆ Central and state funded schemes are implemented for the purpose (NAP, IFMS, CAMPA, GIM etc.) ◆ A REDD+ pilot project has been formulated in Nainital jointly by the Uttarakhand Forest Department and ICFRE. Efforts were initiated in 2014 and

Items	Findings
	the state has provided funds under CAMPA. The Project area is 61,194 ha, leakage area is 69,167 ha and the reference area is 423,532 ha.
Actions to address risks of reversals	◆ In the Pilot Project on REDD+ in Nainital, drivers of deforestation have been identified and the Forest Department is working with the Van Panchayats for protection and management of forest. The Project document is being prepared and the document will include necessary action for addressing the risks of reversals.
Actions to reduce displacement of emissions	◆ The Project document is being prepared for the pilot REDD+ site in Nainital and the document will include necessary action for addressing the issue of displacement of emissions. The Van Panchayats will be sensitized on this issue and necessary support will be provided to them check the displacement of emission.
Safeguard Information System	◆ No plan for establishing a Safeguard Information System was discussed as yet. The pilot project is yet to develop SIS. ◆ Data availability, reliability of data, data management system may require a review to constitute a Safeguards Information System.

Source: JICA Survey Team (2016)

5. Efforts for Forest Protection, Management and Conservation

(1) General

The Forest Department is implementing various programmes and schemes for sustainable management of forest and forest products. Conservation of natural areas, Protected Areas, Wildlife is given utmost priority. The Department has well established systems for resource survey, assessment, mapping and planning, monitoring and evaluation. There is a ban on green felling in the areas above 1,000 metre msl. Harvesting of other forest produces (MAPs – Medicinal and Aromatic Plants) are being done following the approach of Conservation, Development and Harvesting (CDH). Annual assessments are made Range wise to take a decision on harvesting of any MAP and then a joint harvesting plan is made with other stakeholders. Chir pine resin, which gives substantial revenue to the state, is a nationalized forest produce in Uttarakhand and its harvest and marketing is controlled by the Forest Department.

Uttarakhand Forest Resource Management Project is being implemented from 2014 with the financial support from JICA. The Project aims to address the drivers of forest degradation through conservation and promotion of livelihood options for the forest dependent communities. The Project proposes to work with 750 Van Panchayats in 13 Forest Divisions belonging to 9 districts and with Biodiversity Management Committees for conservation of sacred groves. First phase Van Panchayats (150 nos.) have been identified and micro plan preparation is going on. 5 NGOs have been engaged by the Project to mobilize the communities for project planning and implementation.

Some of the important programmes and schemes implemented by the State Forest Department have been described below:

Implementation of important Laws, Programmes and Schemes related to Forest Management

Law/ Programmes/ Schemes	Activities/ Interventions
Forest Rights Act	◆ 7,541 Forest Rights Committees have been formed by the Gram Sabhas. Other committees constituted in the state are 78 committees at the Sub-divisional Level; 13 committees at the District Level; and a state level committee. Out of 3,888 claims received 46 claims have been settled. 313 claims have been rejected due to the lack of sufficient proof. ◆ Rights over forests have already been given to the people through Panchayati Forest Rules, 1931, 76, 2001 and 2005. Uttarakhand is the only state to have such rules and rights for the communities. So the communities are not interested for rights under FRA. The tribal population in the state is very low and it seems they are not dependent on forest produces for their livelihood. The Tribal Welfare Department has initiated an awareness campaign to sensitize the community members so that more claims can be submitted.

Law/ Programmes/ Schemes	Activities/ Interventions
Joint Forest Management/ Van Panchayat	◆ Uttarakhand (Earlier it was part of Uttar Pradesh) has a long history of community based forest management, which dates back to 1920s. The Van Panchayat Rules was introduced long back in 1931 to govern the Van Panchayats/ Forest Councils under the erstwhile District Scheduled Act of 1874. Van Panchayats were constituted to protect, manage and conserve forest resources and said to be the oldest form of partnership between the Government and local communities in decentralised forest management. All the Van Panchayats are now in Uttarakhand. Prior to formation of Uttarakhand, the major amendments to the Van Panchayat Rules 1931 were done in 1972 and 1976. At present there are 12,089 Van Panchayats in Uttarakhand managing 0.5449 million ha of forest. ◆ JFM was introduced in 1997 in erstwhile UP. Uttaranchal Village Forest Joint Management Rules were enacted in 2001 to form Village Forest Committees (VFCs) in Uttarakhand. The World Bank funded a JFM project during the late 1990s and 2000s, and the project was implemented in 35 Forest Divisions in Uttarakhand. A total of 1,217 Village Forest Committees (VFCs) and 98 Eco-Development Committees (EDCs) were formed covering an area of 2,649.52 sq. km. 729 VFCs were formed in VPs. Uttaranchal Panchayati Forest Rules, 2005 superseded the Uttaranchal Village Joint Forest Management Rules, 2001 and currently no VFCs are formed in the state.
CAMPA	◆ The State CAMPA was established in July 2009. Till December 2015, the State has received Rs. 4,226.61 million from GOI (Ad hoc CAMPA). The State has prepared 5 APOs. The financial target in APO 2014-15 was Rs. 1,382.744 million, against which the expenditure was Rs. 901.889 million. During 2011-12 to 2013-14, 6,978.45 ha compensatory afforestation was undertaken the Forest Department.
National Afforestation Programme	◆ 37 Forest Development Agencies (FDAs) were formed in the state to implement NAP. During 2012-13, NAP was implemented in 15 FDAs through 625 JFMCs. Rs. 53.397 million was spent during this year to raise 10,792 ha plantations. Between 2012-13 and 2015-16 (till Nov 2015), the GOI released Rs. 161.2 million for implementation of NAP.
Green India Mission	◆ For the preparatory activities Uttarakhand received Rs. 5.1 million from the GOI during 2011-12. A perspective plan for GIM was prepared and submitted to the Ministry. The interventions mentioned in the perspective plan are treatment of around 170,000 ha area under moderately dense forest and open forests by gap filling with native valuable species; eco-restoration of 75,000 degraded open forest through ANR, silviculture operations, fire management, site specific soil & moisture conservation and plantation of climatic resilient species. The plan also includes activities for restoration of grass lands, conservation of high altitude alpine meadows through regulated grazing, cultivation of medicinal herbs, palatable species of grasses and alternate livelihood options for communities such as NTFP enterprises, community based eco-tourism in around 800 ha area. The Plan envisages to increase the forest cover by about 20%, restoration of scrublands of about 15,000 ha through conservation and propagation of locally existing species, bringing about 1000 ha of land area under Seabuckthorn cultivation. Conservation of Sacred Groves will also be given importance.
Intensification of Forest Management Scheme	◆ The state received Rs. 126.434 million during 2012-13 to 2015-16 (till Nov 2015) to implement various activities under IFMS. The funds are being utilized for improving the forest protection infrastructure, prevention and control of forest fires, survey and mapping of forest areas etc.

Note: Information compiled from reports of MOEF&CC, Reports of Forest Department, and Government of Uttarakhand etc.

(2) Van Panchayats in Uttarakhand

Van Panchayats (Village Forest Councils) are unique examples of community forest management exclusively found in Uttarakhand. During the forest settlements carried out by the British

Administration the local communities found that their rights over forest were restricted as the British forcibly took over all the forest and non-private land in the then United Province. The dependence of communities on forest was quite high for various forest produces and fodder. They vehemently opposed the process of forest survey and settlement and following massive protests by the local communities a Forest Grievance Committee (Kumaon Grievances Committee) was formed in 1921 to resolve the conflicts. As per the recommendation of the Committee the reserve forests were reclassified into Class I and Class II forests. Class I forests mainly comprised of broad-leaved species, having little commercial value while Class II forests comprised of commercially valuable species such as Chir pine, Deodar etc. Class I forests were de-reserved and handed over to the Revenue Department and VPs were formed on these forest areas as well as on Civil & Soyam lands. The Van Panchayat Rules (Kumaon Panchayat Forest Rules), under the District Scheduled Act of 1874, was introduced in 1931 to constitute Van Panchayats to own and manage panchayat forests. Subsequently the Rules were revised in 1972 and 1976. After formation of Uttarakhand as a separate state The Uttaranchal Panchayati Forest Rules 2001 were enacted, which to certain extent limited the autonomy of the Van Panchayats. The state also made an attempt to bring these institutions under Joint Forest Management (JFM) as a World Bank supported JFM project was ongoing in undivided UP. The Uttaranchal Panchayati Forest Rules, 2005 were enacted to consolidate VPs carved out of reserve forests and governed by the Indian Forest Act 1927 and VPs constituted on Civil & Soyam land and governed by the District Schedule Act 1931.

The state had 6,777 VPs covering nearly 400,000 ha in 2000 and subsequent State decided to form in all revenue villages with forests. Between the 2001 and 2005 large numbers of Van Panchayats were formed. Presently there are 12,089 VPs in 11 districts of Uttarakhand managing an area of over 545,000 ha comprising about 16% of the total forest area of the State. Those 5,300 VPs created after 2000 has average of 25 ha of forestland only. 1,172 VPs have less than 2 ha area, while 2002 VPs have an area between 2 to 5 ha.

The State Government implements various forestry development activities in the Panchayati Forests through the Van Panchayats. The profits from the forest produces harvested from the Panchayati Forests are shared with the respective Van Panchayat. The Government, in 2012, declared that 50 per cent of the Sarpanchs (Head of Van Panchayat) are reserved for women.

6. Status of Uttarakhand Forest Resource Management Project (UFRMP)

UFRMP started in 2014/15 and now is at the preparatory stage of the project activities. The project has indicated keen interest in incorporating REDD+ into the project interventions. The project activities are planned on the basis of traditional community forest management institutions called Van Panchayat with a strong component in NTFP development and marketing for livelihood improvement of the forest dependent communities. Furthermore, the project also aims at contributing minimising the risks of disaster (landslides and sediment) through restoring the ecosystem in the forest area.

Project Profile of UFRMP

Particular	Description
Project Cost	JPY 11,390million (Loan Agreement)
Project Area	9 districts (13 Forest Divisions) in Uttarakhand
Project Duration	2014/15 – 2021/22
Project Components and Outlines	i) The project aims at eco-restoration and enhancement of forest resources, expansion of livelihood opportunities & income generation of the forest dependent communities and mitigate the risks of sediment disasters. The components include eco restoration and community development-livelihood along with supporting component. ii) The project is still at the early stage of implementation. PMU is registered as a society. Now the procurement of consultant is in progress. iii) Out of 750 target Van Panchayats, 150 have been selected for the first phase project interventions. iv) 90% of the micro plan preparation is complete. Funds will be transferred to Van Panchayats after the approval of the micro plans.

Particular	Description
	v) 5 NGOs have been engaged by the project for community mobilization, micro plan preparation and capacity building of Van Panchayats. vi) Training of VPs on account keeping is completed. vii) viii) Livelihood: The project is in the stage of identifying the prominent livelihood activities. The project will select 8-12 activities. ix) REDD+: The Project intends to begin with 250 VPs for REDD+. Mapping and necessary documentations as per the international protocols shall be prepared, and the VPs shall be strengthened to protect and manage the forest and plantations. The Project intends to take some help from TERI in documentation. There is one Expert in the PMC Team, who would help the Project in REDD+ interventions. x) Vegetation mapping of the treatment areas of 250 VPs (all 2nd batch VPs) using differential GPS have been outsourced to an agency. This would serve as a baseline. The project intends to cover all 750 VPs. xi) xii) 50ha area per VP has been taken up for survey. xiii) Nainital REDD+ pilot project area is not within JICA project area. xiv) xv) MIS: Van Panchayat module (afforestation activities) has been developed and being tested. xvi) GIS: The Project will have a GIS lab and a small GIS lab will be established at each DMU. Required man power will also be provided by an agency outsourced by the project to each DMU.

Source: JICA Survey Team (2016)

7. Status of REDD+ Readiness in Uttarakhand and UFRMP

The state is yet to develop REDD+ action plan. However, the Forest Department has taken an initiative in establishing REDD+ pilot project in Nainital. UFRMP also has a keen interest in implementing REDD+.

REDD+ Readiness Status of Uttarakhand State and UFRMP

REDD+ Requirements	Uttarakhand State	UFRMP
State Action Plan	➢ SAPCC has been prepared, in which forestry sector is a part. However, no REDD+ action plan has been developed.	-
(Donor Intervention)	None	None
FREL/FRL	➢ Being established under REDD+ Pilot Project in Nainital	➢ Not set.
(Donor Intervention)	Funded by CAMPA	None
State/ Project Forest Monitoring System	➢ Done by the State Forest Department	➢ Done by the project(Being Established)
(Donor Intervention)	None	JICA
Safeguard Information System	➢ Relevant laws and regulations are implemented. Data aggregation for effective reporting needs to be strengthened.	➢ Existing laws and policies are followed. ➢ Project MIS/ GIS is being established. It can be aligned with the UNFCCC requirement. ➢ Community participation is an integral part of the project implementation process.

REDD+ Requirements	Uttarakhand State	UFRMP
(Donor Intervention)	None	JICA
MRV	➢ Partly established as part of the preparation of working plan and data collection for the same. ➢ MRV system would be developed under REDD+ Pilot	➢ Project MIS/ GIS is being established. It can be aligned to the UNFCCC requirement.
(Donor Intervention)	Assisted by IIRS	JICA

Source: JICA Survey Team (2016)

Based on the findings above, following areas can be suggested for further developed in the area of safeguards and safeguards information system.

Suggested Areas for Further Development – Uttarakhand

Areas for Further Development
➢ The State Forest Department has to develop its policy and state action plan on REDD+. ➢ The existing GIS/ MIS system can be aligned towards UNFCCC required MRV. ➢ For the adoption of REDD+ the objectives of safeguards, criteria and indicators are to be developed and existing mode of data management may need to be adjusted to fulfill UNFCCC requirement. ➢ Overall architecture of Safeguards Information System needs to be developed. ➢ Consensus between stakeholders/ line departments for data sharing needs to be established. ➢ Once the indicators are finalized, the means of verification and sources of data needs to be developed and operationalized. ➢ Safeguards related technical reference materials (guidelines, manuals and etc.) and capacity development of the stakeholders for data management and reporting are required. ➢ Relevant capacity development needs to be undertaken for the Forest Department Officials/ Staffs for MRV and safeguards.

Source: JICA Survey Team (2016)

Attachment 5.7: Status of REDD+ Readiness in Himachal Pradesh

1. Forests in Himachal Pradesh

Himachal Pradesh, located in Western Himalayas, is a mountain state with elevations ranging from 350 meters to 6,000 meters. The geographical area of the state is 55,673 sq. km. Population of the state is 6.86 million living in 12 districts. All the districts are considered as hill districts and 3 of them are tribal districts. The state has four agro-climatic zones – Shivalik Hill Zone, Mid Hill Zone, High Hill Zone and Cold Dry Zone.

Forest resources of the state are quite important because of the state's location in eco-sensitive Himalayan region. Although recorded forest area is 37,033 sq. km, the actual forest cover is 14,696 sq. km. The forests can be broadly classified into Coniferous Forests and Broad-leave Forests. The vegetation varies from Dry Scrub Forests at lower altitudes to Alpine Pastures at higher altitudes. In the mid-hill zone Deciduous Forests, Bamboo, Chil, Oaks, Deodar, Kail, Fir and Spruce are found. Major chunk of forests are there in Shimla, Kullu, Sirmaur, Kangra, Chamba and Mandi districts of the state especially in the altitude of 500 meters to 3000 meters. The state has very rich floral and faunal diversity. Out of 45,000 species found in the country 3,295 species (7.32%) are reported in the State. More than 95% of the species are endemic to Himachal Pradesh and about 5% (150 species) are exotic, introduced over the last 150 years.

National Forest Policy, 1988 mandates the Hill States to have at least two third of the geographical area as forest. However in case of Himachal Pradesh the State Government intends to have 50 per cent area under forest as around 20 % of the geographical area is inaccessible.

Status of Forest in Himachal Pradesh

Geographical Area (GA)	55,673 sq. km
Recorded Forest Area	37,033 sq.km
% of recorded forest area to the GA	66.52
Actual Forest Cover	14,696 sq.km
Actual Tree Cover outside the forest	757 sq.km
Total Forest and Tree Cover	15,453 sq.km
% of total Forest and Tree Cover to GA	27.76
Very Dense Forest	3,224 sq.km
Moderately Dense Forest	6,381 sq.km
Open Forest	5,091 sq.km
Reserve Forest	1,898 sq.km
Protected Forest	33,130 sq.km
Unclassed Forest	2,005 sq.km
Protected areas	5 National Parks, 26 Sanctuaries and 3 Conservation Reserves – Area – 6,008 sq. km (additional area of 2,383 sq. km to be notified)
JFM Areas	963 JFMCs
Forest Revenue and Expenditure	2013-14 Revenue Rs. 3578.345 Expenditure – Rs. 4399.065 2014-15 Revenue – Rs. 1157.81 million Expenditure – Rs 4494.922 million
Important Forest Products of the State	Timber, Resin, Khair, Bamboo, Grass, Medicinal Plants products
Plantations undertaken during 2014-15	12,730 ha

Note: Compiled from State of Forest Report, 2015, FSI, Dehradun; Reports of Forest Department, Himachal Pradesh.

2. Forest Administration

PCCF – Head of Forest Force is the administrative head of forest directorate. PCCF – Wildlife is the Chief Wildlife Warden and is responsible for management of Protected Areas. There are 12 Circles, 44 Divisions and 198 Ranges under the Territorial Unit of the Forest Department. There are 13 functional Circles and 6 Divisions.

3. Forest Monitoring

The SWAN Project has a defined system of monitoring. It uses GIS for planning, management and monitoring of different interventions. Quarterly monitoring mechanism is in place where progress reports are being sent from the field by Para workers at Panchayat Development Committee (PDC) to the Project Implementation Unit (PIU) and from PIU to the PMU in paper based structured formats. In Community land, Plantation Protection Groups were formed for protection activities.

The project impact assessment study has been done by the HP Agriculture University, Palampur and Central Soil and Water Conservation, Research and Training Institute in Dehradun.

In HP out of total 36 Working Plans 25 are already approved, 3 are already submitted to GoI, 8 are expired and revision is at different stages. Headquarter of Working Plan Division is established at Mandi and is headed by an APCCF ranked officer. Working Plan office at Circle level are headed by a CF ranked officer and established at 3 places, namely Mandi, Palanpur and Solan. In HP working plans are prepared for 15 years.

Before New Working Plan code 2014, primarily species of industrial and commercial timber were considered for sample plot level rudimentary carbon stock/ wood volume estimation. Assessment of biomass w.r.t five Carbon pools has not been carried out yet. Presently GIS/RS techniques are not used in Working Plan preparation and now SFD is planning to use such tools in Working Plan preparation.

As part of traditional monitoring mechanism, tour diaries and inspection notes are mainly used. Survival assessment of plantations is also carried out based on defined sample size. At present, under e-green watch data is being uploaded on the website and fire monitoring is already in place, where fire alerts are sent to the concerned field staff for timely action. Under Catchment Area Treatment (CAT) plans basic GIS data layers were created and can be used as base layers by SFD. SFD do not have JFMC level digitized boundaries in GIS form and is now planning to digitize the same. Digitization of the forest block boundaries as well as forest administrative boundaries till Beat level will be completed by March 2016. Out of 38 forest divisions in 15 divisions compartment level boundaries are already digitized and NRSC is doing the validation of the boundary data. The boundary data has already been uploaded on the Bhuvan based WebGIS viewer.

Based on the 'Green Accounting' study conducted in Mandi District, it was found that the official figures of NTFP and medicinal plants based on transit pass are mostly underreported the actual figure and thus involving community institutions (JFMC/Panchayats) would definitely would give accurate information.

4. Safeguards and Safeguards Information System

Himachal Pradesh is one of the pilot sites of Forest PLUS. It has been actively implementing carbon related projects since 2011. However, the safeguards is an area where the overall framework is lacking.

Status of Safeguards and Safeguards Information System in Himachal Pradesh

Items	Findings
Consistency/ relevancy to the national and international policy/ programme/ agreements	◆ REDD+ Strategy/ Policy has not been developed. ◆ REDD+ cell is being established in the Forest Department. No formal notification has been made for setting up of the cell by the Government. The Forest Department is participating in a REDD+ project supported by USAID (Forest PLUS). Rampur has been identified as a pilot to develop different tools and methodologies for improved ecosystem management, carbon inventories and baselines, establish multi-stakeholders dialogue and communication process, identify socio-economic incentives for improved forest management etc. ◆ The FD is implementing a Bio-Carbon Restoration Project (CDM Project) under the Mid-Himalayan Watershed Development Project started in 2008. The Project was registered with UNFCCC on 4th March 2011 and the area is 3216.50 ha (Forest land – 2943.65 ha, Community Land – 227 ha and Private land – 45.80 ha) area in 177 Gram Panchayats in 419 land parcels. The first crediting period is 20 years and the net GHG (CO_2) removal by the trees in the project area is 828016 tCO_2 e. 65582 CERs were generated for the first 5 years (2006-12) and were sold @ USD 4.75 per tCO_2. The World Bank has facilitated the sale of CER credits. The actual revenue generated for the first cycle (2006-12) was Rs. 19.30 million. The Project is expecting Rs. 80 million as revenue in 2018-19. ◆ A CDM cell is being established in the State under the Chairmanship of PCCF, which would take care of sale of CER credit after the completion of Mid-Himalayan Watershed Development Project.

Items	Findings
	◆ State climate change action plan prepared. ◆ GHG emission inventories have been prepared twice. ◆ The State has prepared a Master Plan for Environment Management.
Effective State forest governance structure	◆ Forest Department has a fully functional institutional set up from the state level to the field level.
Respect for the knowledge and rights of indigenous peoples and local communities	◆ FRA is being implemented in the state but earlier the focus was on 2-3 districts. ◆ Rights and entitlements of the local communities are well documented in the state forest laws and rules. ◆ Participatory Forest Management is in vogue in the state since 1993. ◆ Kangra Forest Cooperative Societies were formed way back in 1940s to manage forest in collaboration with communities.
Full and effective participation of the relevant stakeholders	◆ REDD+ cell is being constituted. Stakeholder involvement will be ensured by the Cell.
Conservation of natural forests and biodiversity	◆ All the relevant national laws and regulations are reinforced. ◆ Working plans/ management plans are prepared and implemented. ◆ Central and state funded schemes are implemented for the purpose (NAP, CAMPA, IFMS, GIM and etc.)
Actions to address risks of reversals	◆ No concrete actions are planned as REDD+ interventions have not been fully planned and implemented. ◆ Some methodological tools are being developed by Forest PLUS as informed by the Forest Department.
Actions to reduce displacement of emissions	◆ No concrete actions are planned as REDD+ interventions have not been fully planned and implemented. ◆ Some tools and methods are being developed by Forest PLUS as informed by the Forest Department.
Safeguard Information System	◆ No plan for establishing a Safeguard Information System was discussed as yet. ◆ Data availability, reliability of data, data management system may require a review to constitute a Safeguards Information System.

Source: JICA Survey Team (2016)

5. Efforts for Forest Protection, Management and Conservation

(1) General

The Forest Department emphasizes on protection and conservation of forests, environment and wildlife. There is a ban on green felling and removals from forests. Only the dead, diseased, decaying trees are salvaged to meet the *bonafide* requirements of the local people.

The State implements various programmes and schemes to enhance the forest cover and quality of the forest, conservation and management of Protected Areas etc. Some of the important programmes and schemes implemented by the State Forest Department have been described below:

Implementation of Important Laws, Programmes and Schemes related to Forest Management

Law/ Programmes/ Schemes	Activities/ Interventions
Forest Rights Act	◆ 15918 Forest Rights Committees were constituted at the Gram Panchayat level to receive claims and verify them and recommend them to the Sub Divisional Level Committees. There are 57 Sub Divisional Level Committees and 12 District Level Committee to implement the FRA. A total of 5,692 claims (5,409 individual claims and 283 community claims) were received. As on Oct 2015, 346 titles were distributed including 108 community claims.
Joint Forest Management	◆ The HP Govt. issued the first JFM Notification on 12.5.1993 and following which Village Forest Development Committees (VFDCs) were constituted. In 2001 the State Government brought HP Participatory Forest Management Rules 2001, which prescribed for registration of VFDCs under Societies of Registration Act, 1860. ◆ 1562 JFMCs were formed but at present 963 JFMCs are functioning in the state.

Law/ Programmes/ Schemes	Activities/ Interventions
	◆ In Himachal Pradesh the Gram Panchayats are also playing important roles in protection and management of forest. Since the dependency of people on forest produces, in many villages, is low the participation of people in forest protection and management is apparently less.
CAMPA	◆ State CAMPA was set up in August 2009. So far Rs. 3374.6 million has been received by the State CAMPA from GOI. Till 2014-15 the state has utilized Rs. 2864.8 million from the CAMPA fund. Till the end of 2013-14 the state has raised 8,802 ha of plantations in different sectors of CAMPA. During 2014-15 the State spent Rs. 1,195 million on different activities proposed in APO 2014-15 as well as on the earlier APOs.
National Afforestation Programme	◆ NAP is being implemented in the state through State FDA and 36 FDAs formed at the Forest Division level. During 2014-15, the State spent Rs. 6.259 million under NAP and the Government received Rs. 7.253 million from the Central Government. During 2012-13 to 2015-16, the State Government received Rs.69.6 million for the Central Government for implementation of NAP. After the formation of State FDA in 2010-11, the state has achieved plantation of 7,546 ha under NAP with an expenditure of Rs. 145.189 million.
Green India Mission	◆ Rs. 12.65 million was received by the State for preparatory activities under GIM during 2011-12 and the funds were utilized during 2012-13. For the preparatory phase GIM will prioritize interventions in 4 forest territorial circles -Bilaspur, Mandi, Dharamshala and Hamirpur. A perspective plan was prepared and submitted to the MOEF&CC. The State intends to increase quality of forest cover and improve ecosystem services. The key activities proposed in the perspective plan include treatment of the degradation in moderately dense forest and open forest through plantations, restoration of grasslands, rehabilitation of shifting cultivation, restoring scrublands, Seabuckthorn, restoration of mangroves, ravine reclamation, restoration of abandoned mining areas, etc. It also proposes to promote mat making, basket making, tailoring and carpentry etc. as livelihood interventions.
Intensification of Forest Management Scheme	◆ During 2012-13 to 2015-16 (till Nov 2015), the State Government received Rs.114.489 million from GOI for implementation of IFM Scheme.

Note: Information compiled from reports of MOEF&CC, Reports of Forest Department, reports of Tribal Development Department, Govt. of Himachal Pradesh etc.

(2) Externally aided projects and institutions promoted for participatory forestry

Three externally aided projects are being implemented in the state. One is funded by the World Bank i.e. Mid Himalayan Watershed Development Project, which is being implemented in 10 districts since 2005. This project is going to be completed in 2016. Another project is Swan River Integrated Watershed Management Project supported by JICA, which has been in implemented since 2006 and is going to be over this year. With the support of KfW Germany the Forest Department has started implementation of climate change adaption project from Jan 2016. The project is for 7 years and will target 600 villages in 2 districts.

Different kind of institutions have been promoted at the community level by different Projects or Schemes but all efforts are intended to ensure participatory planning and implementation of project activities. A lot of emphasis has been given to work with the Gram Panchayats as these are constitutional bodies and these institutions can sustain the initiatives and assets created by the projects. The following table presents the types of committees formed especially by different projects to implement the activities.

Committees Constituted by HP Forest Department under Various Projects/Schemes

Sl. No	Name of Projects/Schemes	Year	Village Institutions promoted	Remarks
1	HP Forestry Project (HPFP)	1994-2001	Village Forest Development Committees – 154	Committees were formed under the provisions of JFM Notification dated 12.5.1993
2	Indo-German Eco-Development Project	1994-2005	Village Development Committees (VDCs) - 294	

Sl. No	Name of Projects/Schemes	Year	Village Institutions promoted	Remarks
3	IWD (Kandi) Project	1993-2005	Village Development Committees (VDCs) - 137	Committees were registered under Societies of Registration Act 1860
4	Sanjhi Van Yojana (SVY)	1998 Ongoing	Village Forest Development Societies (VFDS) – 360	
5	Great Himalayan National Park	1993 Ongoing	Village Eco-Development Committee (VEDCs) - 18	
6	Mid Himalayan Watershed Dev Project	2005 Ongoing	Gram Panchayat - 602	
7	National Afforestation Project (NAP)	2010 Ongoing	963 JFMCs	
8	Integrated Watershed Management Swan River Project	2006 Ongoing	Panchayat Development Committees – 96	PDCs have been formed at the GP level and registered under Societies of Registration Act 1860

Source: JICA Survey Team (2016)

6. Status of the Swan River Integrated Watershed Management Project (SRIWMP)

The Swan River Integrated Watershed Management Project is about to close. It is a watershed management project combining land improvement interventions and livelihood improvement. As for the land improvement, both the private and government lands were treated. The infrastructures created for soil-water conservation has provided multi functions both for the conservation and livelihoods activities.

Project Profile of SRIWMP

Particular	Description
Project Cost	Rs. 2,273million
Project Area	96 Panchayats in Una District, Himachal Pradesh (22 sub-watersheds of 619 km^2 out of 42 sub-watersheds of Swan River (Total catchment area is 1,204km^2)
Project Duration	2006/7 – 2015/16
Project Components and Outlines	1) Project components included afforestation, soil and water management works, soil protection/ land reclamation, livelihood improvement and institutional building. 2) Soil protection works undertaken on 12,456 ha (both government and private lands) 3) Soil Water conservation: 18,331 small scale check dams; 560 large scale check dams (silt detention); 23,849 m^3 spur and embankments; 362 ground hills. 4) Water harvesting structures: 130 structures constructed for 9,042 ha with the water storage capacity of 1,930,390m^3. 5) Soil Protection/ Land Reclamation: 1,179 ha of soil protection in damaged private land; 325 ha of land reclamation on damaged private land. 6) Livelihood interventions: 7) Project activities were implemented through Panchayat Development Committees which are registered under the Societies Act. 8) 871 SHGs; 55 plantation protection groups; 81 water user groups; 75 production groups; and 27 fisheries groups formed. 9) Horticulture demonstration; animal health awareness camps; lemon grass planting; fish farming; turmeric and Kharif onion cultivation were undertaken. Village foot path, top roof rain water harvesting tanks, foot bridge construction, village farm ponds renovation were carried out for improvement of community infrastructure. 10) GIS is used for monitoring. 11) Impact assessment results: project interventions contributed to reverse the degradation of swan river catchment. It also made positive impacts on the livelihoods of the beneficiaries.

Source: JICA Survey Team (2016)

7. Status of REDD+ Readiness in Himachal Pradesh State and SRIWMP

Himachal Pradesh is assisted by Forest PLUS and has experiences in implementing a few carbon projects. To become REDD+ ready, a systematic approach may be taken based on the long term action plan on REDD+. The REDD+ related interventions can be accommodated in the forthcoming project since Swan project is coming to an end.

REDD+ Readiness Status of Himachal Pradesh State and SRIWMP

REDD+ Requirements	Himachal Pradesh State	SRIWMP
State Action Plan	➢ Not yet prepared. ➢ State Action Plan on Climate Change contains an extensive assessment of carbon in the state.	-
(Donor Intervention)	-	-
FREL/FRL	➢ Being established under USAID Project in Rampur	None
(Donor Intervention)	USAID	None
State/ Project Forest Monitoring System	➢ Done by the State Forest Department	➢ Done by the Project
(Donor Intervention)	None	JICA
Safeguard Information System	➢ Relevant laws and regulations are implemented. However, the overall safeguards framework is yet to be defined.	➢ Existing laws and policies are followed. ➢ Community empowerment/ participation was a part of the project process. ➢ No safeguards information system is in place.
(Donor Intervention)	None	JICA
MRV	➢ Partly established as part of the preparation of working plan and data collection for the same. ➢ Used in World Bank Funded MHWDP[1] CDM project ➢ Would be developed under Forest Plus (USAID) project	➢ Project MIS/ GIS system may provide relevant information. However, the system needs to be aligned to fulfill UNFCCC requirements.
(Donor Intervention)	World Bank, USAID	JICA

Source: JICA Survey Team (2016)

Based on the above assessment, following areas are identified for the further development.

Suggested Areas for Further Development – Himachal Pradesh

Areas for Further Development
➢ Overall framework of safeguards and safeguards information system needs to be clearly developed. This will provide the basis for further developing indicators, identifying means of verification and data sources. ➢ Based on the outputs from Forest PLUS, the action plan on REDD+ can be developed. ➢ Towards establishing SIS, technical cooperation could help the state government to establish an inter-departmental/ multi stakeholder database which can be used for monitoring of REDD+ related activities as well as the monitoring of each department. ➢ Further capacity enhancement is required with respect to establishing MRV.

Source: JICA Survey Team (2016)

[1] Mid Himalayan Watershed Development Project

8. Visit to Project Sites of Swan River (Integrated Watershed Management) Project (13th Feb 2016)

The PMU of Swan River (IWM) Project organised a visit of Survey Team to Kangar Gram Panchayat, Takarla Gram Panchayat and Nakki of Thathal Gram Panchayat to see different activities of the Project.

(1) Kangar Panchayat Development Committee

The Survey Team visited a pond, which was renovated by the Project with an expenditure of more than Rs. 3 million. A small rain-fed water body was converted to a 90 m x 90 m pond with fence, solar lights, benches, tree planting surrounding the pond etc. Initially it was thought of making water available for the domestic animal but now it has been made as a place for recreation as well as for fishery. The pond is located near the Panchayat Office, Secondary School and Sati Mata Temple. Tourism Department has made a resting shelter near the pond and a cafeteria is likely to be opened in the resting shelter. Every day more than 100 people come to the pond for evening walk and recreation. The Project has set up two cages for fish farming. Fingerlings were released during 2014. The PDC has leased the pond for fishery to one person from the village for Rs. 96,600 for one year. There is a bore well near the pond constructed by the Irrigation and Public Health Department. Sometimes the bore well feeds water into the pond to maintain required water level for fishery. The pond has become a model project intervention and many Panchayat Development Committees are demanding for digging of ponds in their areas. Other activities undertaken in Kangar include plantation on 17 ha (10 ha on private land), one WHS, village foot path of nearly one km, construction of Mangers, supply of Chaff cutters etc. Kitchen garden was also being promoted through SHG members. In Kangar the Project has promoted 10 SHGs.

The Survey Team had a meeting with members of Kangar PDC, Swan Women Federation, Women SHGs and Production Groups. SHGs are organised to carry out different livelihood activities. Swam Women Association Network has been established under the initiative of the project – it is basically a federation of women from the Project Area. In the Project area the SHGs have come together to form ten Mahila Kalyan Manchas (women welfare organisations). Now these organisations have come together to form the federation. There are nearly 7,000 members in the federation. The federation is involved in promotion of turmeric cultivation and processing. Spices processing unit is being established with the help of the Project. The federation is also planning for processing of lemon grass oil. Marketing of the SHG products will be done through the Primary Agriculture Cooperative Societies in Una district. At the village level production groups have been organised to carry out farming, fisheries etc. The Project has initially provided the revolving fund, technical expertise and also other inputs to start different livelihood activities.

(2) Water harvesting structure, Takarla Panchayat Development Committee

The Survey Team visited a check dam (Habib wala dam – the catchment area is 35 ha and command area is 7 ha) in Takarla Gram Panchayat area. The Project spent Rs. 80,700 in construction of check dam but the benefits are quite distinct. Four families, who have land close to the dam have levelled their land (0.77 ha, which was never been cultivated) and started cultivation of wheat. Land levelling was done using the funds from MGNREGS. Pipe lines have been laid to other farm land of these four families for irrigation and 80 per cent of the expenditure on the laying the pipelines were sourced from the Agriculture Department. Because of the increased water availability crop productivity has increased for potato, wheat, mustard, onion, radish etc. Kharif onion has been introduced. These families have started cultivation of fodder. This has allowed the farmers to store feed for cattle and contributed to reduce the intensity of grazing. Farmers were assisted for construction of Mangers and renovation of cattle sheds, and chaff cutters were also provided. Increased fodder availability has led to increased income from the milk production. Two fish cages have been installed by the Project and fingerlings have been released but it is yet to be harvested. Construction of rain water harvesting structure/ check dams helped the farmers nearby to irrigate their land during the dry season, which enable them to grow off season vegetables (high value crops) and thus, their income increased. From two seasonal crops the farmers having land near the check dams can now cultivate different crops round the year.

In the same stream four check dams have been constructed in series to check erosion and enhance soil and water conservation.

(3) Plantation Protection Group, Nakki, Thathal Panchayat Development Committee

Plantation activities by the Project were done both on the government and private land. Plantation Protection Groups were formed involving women from the village for the protection of the plantations. The project provided assistance to the individual community members for plantations on their own land. The entire work will be undertaken by the project while the management responsibility lies with the land owner. The cost sharing is required in case of the individual beneficiary. Plantation activities were undertaken on Shamlat forest land, which are basically under the control of Revenue Department.

In Nakki (Thathal PDC) a Plantation Protection Group of 55 women was formed to look after a plantation of 10 ha on Shamlat land. 8,000 plants of Myrabolans, Neem, Moringa etc. were planted in 2012-13. The Project supported for creation of the plantation as well as its maintenance for three years. Currently there are 39 members in the Plantation Protection Group and they are keeping a close eye on the plantation. Other members withdrew as they don't want fodder grass and other benefits from the plantation area. The Group collects Rs. 10 per member per month and the money has been kept in the bank. The Group has spent some money on the maintenance of barbed wire fence. All the members cut and carry grass for their cattle from the plantation area. Annually grasses worth Rs. 48,000 are collected from the plantation site. Other NTFPs are yet to come. Once the trees will mature to produce different fruits/ NTFPs, the members will collect the NTFPs and the Group will sell them to different traders. Earlier the members were letting their cattle to graze freely in the forest and now they have started stall feeding.

Attachment 5.8: Status of REDD+ Readiness in Karnataka

1. Forests in Karnataka

Karnataka is a state in Southern India with a geographical area of 191,791 sq. km and with a population of 61 million. Karnataka is bordered by the Arabian Sea and the Laccadive Sea to the west, Goa to the north west, Maharashtra to the north, Telangana to the North east, Andhra Pradesh to the east, Tamil Nadu to the south east, and Kerala to the south west.

The reconstituted expert committee-I formed by Government of Karnataka has identified 43356.47 sq. km as total area of forest in Karnataka. The notified forest is 29688.37 sq. km. The rest 13668.10 sq. km forest includes Protected Forests, Unclassified Forests, Village Forests and private forests. Deemed forest areas are yet to be notified and they include proposed forests under section-4 of KFA, Betta lands, Bane, Jamamalai forest porampoke, Kans, Kumki, Paisari, Amrit mahal Kaval, Assessed waste lands, Kharab lands, Inam lands, thickly wooded areas, plantations etc.

The state is quite rich in forest and biodiversity. It is endowed with great diversity of climate, topography and soils. The forest resources of the state are categorized as evergreen, semi-evergreen, moist deciduous, dry deciduous, scrub and thorny forests and grassland.

The state has around 4500 species of flowering plants, 600 species of birds, 160 species of mammals, 160 species of reptiles, 70 species of frogs, and 800 species of fish. 1527.4 sq.km of the Nilgiri Biosphere Reserve falls in the state of Karnataka. There are 5 tiger reserves in the state with a tiger population of 406. 25 per cent of the country's elephant population and 10 per cent of the tiger population are in Karnataka. There are 5 National Parks, 27 Sanctuaries, 7 Conservation Reserves and one Community Reserve in the state.

Status of Forest in Karnataka

Geographical Area (GA)	191,791 sq.km
Recorded Forest Area	38,284 sq.km
% of recorded forest area to the GA	19.96
Actual Forest Cover	36,421 sq.km
Actual Tree Cover outside the forest	5,552 sq.km
Total Forest and Tree Cover	41,973 sq.km
% of total Forest and Tree Cover to GA	21.88
Very Dense Forest	1,781 sq.km
Moderately Dense Forest	20,063 sq.km
Open Forest	14,577 sq.km
Reserve Forest	28,690 sq.km
Protected Forest	3,931 sq.km
Unclassed Forest	5,663 sq.km
Protected areas	5 National Parks and 27 Sanctuaries – 9,329.19 sq.km 7 conservation reserves and one community reserve
JFM area	5200 VFCs and EDCs protecting nearly 340,000 ha forest area.
Forest Revenue and Expenditure	2013-14 Revenue – Rs. 1.61 billion Expenditure – Rs. 10.157 billion 2014-15 (Tentative) Revenue – Rs. 1.75 billion Expenditure – Rs. 11.617 billion
Important Forest Products of the State	Sandalwood, Rosewood, Bamboo, Rubber, Pulp wood, Cashew and other NTFPs.
Plantations undertaken during 2013-14	81,497 ha
Plantations undertaken during 2007 to 2015	457,272 ha
Compensatory Afforestation till June 2014	25920.92 ha

Note: Compiled from State of Forest Report, 2015, FSI, Dehradun; Reports of Forest Department, Karnataka.

2. Forest Administration

The Principal Chief Conservator of Forests (Head of Forest Force) is the administrative head of Forest Directorate. There are 13 territorial circles and 39 territorial forest divisions for administration of forests in the state. The Principal Chief Conservator of Forests (Wild life) is Chief Wildlife Warden and responsible for the management of the Protected Areas and Wildlife matters. There are 20 wildlife divisions in the state. There are also functional circles such as Forest Research and Utilization, Field Director (Project Tiger), Working Plan, Training & Forest Mobile Squad.

3. Forest Monitoring

In Karnataka, CCF (Evaluation) is the nodal officer at the headquarter level looking after all the evaluation works. In most cases ACFs are appointed as Evaluation officer for rapid assessment of the works and send his report in a well structured format directly to the CCF (Evaluation). As per the guideline sample plot of 0.1 ha for each 10 ha plantation is necessary for survival assessment. Each sample plot should be 31.62 x 31.62m. Capturing a photograph is also a prerequisite.

As per old WP code 2004 all Working plans for the Forest Divisions are approved. Presently only one working plan is being prepared as per New WP Code 2014.

SFD is having a centralized GIS facility to cater to the need of SFD, Working Plan as well as projects. At the GIS facility there are two sections – 1. GIS Section 2. MIS Section. In total 5 RFOs, 1 surveyor and 1 forest guard is working in the GIS facility. Also 12 GIS engineers are hired from the open market. In GIS section, forest administrative boundaries are being prepared till beat level. JFMC/ VFC boundaries have not been prepared/ digitized yet. All plantations are now surveyed in the field using GPS and details are available in digital GIS platform.

SFD in collaboration with NRSC is working on a pilot project in which Village/Cadastral maps/vector boundary data are being geo-referenced using high resolution satellite images of LISS-IV and Cartosat-1 supplemented by DGPS based Ground Control Points (GCPs). Under the pilot study 220 villages were taken up for the project and out of that 206 villages are already completed.

4. Safeguards and Safeguards Information System

The status of safeguards and safeguards information system in Karnataka is given below. There is a need to lay down the overall framework and development plan for safeguards information system since the information exists in fragments and needs to be synthesised.

Status of Safeguards and Safeguards Information System in Karnataka

Items	Finding
Consistency/ relevancy to the national and international policy/ programme/ agreements	◆ REDD+ Strategy/ Policy has not been developed. ◆ State climate change action plan has been prepared. ◆ No Cell has been established yet for REDD+. The Department is planning to set up such cell. ◆ The Forest Department is working with Forest PLUS to implement a REDD+ pilot in Shimoga Landscape (Forest Circle). Different tools and methodologies are being developed and tested. A Project Design Document is being prepared by Forest PLUS.
Effective State forest governance structure	◆ Forest Department has a fully functional institutional set up and from the state level to the field level.
Respect for the knowledge and rights of indigenous peoples and local communities	◆ FRA is being implemented in the state. The major emphasis of implemented is in the tribal districts. ◆ Village Forest Committees were formed to protect and manage forest following the Government Order in 1993 under Joint Forest Planning and Management.
Full and effective participation of the relevant stakeholders	◆ Joint Forest Planning and Management Resolution was framed in 1993 and was further revised in 2002 to involve communities in forest protection and management. ◆ JICA project has involved JFMCs/ EDCs for sustainable forest management. It also facilitated the planting of trees outside of forest. ◆ ◆ REDD+ pilot initiatives in Shimoga Landscape have been focusing on multi-stakeholders engagements. Regular workshops, training programmes and meetings are being organised with Line Departments at the District Level, Communities, Civil Society Organisations etc.
Conservation of natural forests and biodiversity	◆ JICA project promoted sustainable forest management and alternative livelihoods measures were taken up for the forest dependent communities to reduce the dependency on forest.

Items	Finding
Actions to address risks of reversals	◆ All the relevant national laws and regulations are reinforced. ◆ Forest monitoring is undertaken by the state as well as by the project. ◆ Working plans/ management plans are prepared and implemented. ◆ Central and state funded schemes are implemented for the purpose (NAP, CAMPA, GIM etc.) ◆ PDD being developed by the Forest PLUS may provide a means to address reversals.
Actions to reduce displacement of emissions	◆ Forest monitoring is undertaken by the state as well as by the project. ◆ No concrete actions are planned as REDD+ interventions have not been fully planned and implemented. However, the PDD being developed by the Forest PLUS may provide a means to address the issue of displacement of emission.
Safeguard Information System	◆ The REDD+ pilot initiative is yet to work on the SIS. ◆ Data availability, reliability of data, data management system may require a review to constitute a Safeguards Information System.

Source: JICA Survey Team (2016)

5. Efforts for Forest Protection, Management and Conservation

The State Government has been implementing several forest and wildlife conservation programmes including afforestation and reforestation in forest as well as areas outside the forest. Green felling was banned by the State Government twenty year ago. Currently only dead and fallen trees are salvaged. There is no planned deforestation and degradation by the Forest Department. The degradation happens because of the biotic pressure – collection of fuel wood, grazing, encroachment for agriculture and horticulture etc. Encroachment continues to be a major challenge before the Department. The Forest Department has well established forestry development practices and its impacts can be seen in many pockets of the state including the Protected Areas. The Department no longer adopts silvicultural practices of clear felling and planting systems.

The Forest Department gives high priority to agro-forestry, farm forestry and social forestry activities. Since 1983 farmers have been encouraged to plant trees on their own land. The State Government has a very good system of giving incentives to the farmers to plant trees on their own land. Rs. 45 per plant is provided to the farmers after the end of first year and third year based on the survival assessment.

Some of the important programmes and schemes of the Government have been mentioned in the table below.

Implementation of important Laws, Programmes and Schemes related to forest management

Law/ Programmes/ Schemes	Activities/ Interventions
Forest Rights Act	12,378 Forest Rights Committees have been constituted at the Gram Sabha level to receive claims and process them. The Act is being implemented in 27 Districts. A total of 297,639 claims (292,293 individual claims and 5,346 community claims) were received. As on Jan 2016, 9,104 titles were distributed involving a forest area of 38,499 acres. These titles include 193 community claims. 124,206 claims were rejected because of multiple applications from one family, lack of proper evidence and documentation. Even application were there for revenue land. A huge number of applications have been received from other traditional forest dwellers (246,464 individual claims). Two districts – Uttar Kannada and Shimoga received huge applications and it was a challenge before the FRCs and SDLCs to process these applications.
Joint Forest Management	Joint Forest Planning and Management (JFPM) was introduced in Karnataka during 1993 through a government order. Village Forest Committees (VFCs) were formed to work with the Forest Department to protect degraded forests having canopy density up to 0.25. Amendments to the G.O. were brought in during 1996 which provided co-membership for the spouses and removed the limitations of canopy density of forest for JFPM especially in the tribal areas. Karnataka Forest Act (KFA) was amended to provide statutory back-up to the JFPM programme. JFPM order was further revised in 2002 to overcome the operational problems and enhanced the proportion of share of VFCs from 50% to 90% in respect of Non Timber Forest Produce (NTFP) and 75% in plantation assets. About 5200 VFCs/EDCs were constituted in the state to protect and manage nearly 340,000 ha of degraded forests.

Law/ Programmes/ Schemes	Activities/ Interventions
CAMPA	Against the target of 25,400.37 ha of compensatory afforestation the state has achieved afforestation on 25,920.92 ha. The total fund released during 2009-10 to 2015-16 was Rs. 2942.633 million. During 2014-15, the state has spent Rs. 69.096 million to undertake afforestation on 2,418.14 ha.
National Afforestation Programme	The GOI released Rs. 374.20 million under NAP between 2012-13 and 2015-16 (till Nov 2015). A sum of Rs.1812.06 lakh was spent during 2014-15 for creation of 450 ha of plantation, maintenance of 3240 ha of plantation raised in first year and maintenance of 9598 ha of plantation raised in second year, and advance work of 2900 ha.
Green India Mission	A sum of Rs. 26.745 million was released by the Central Government for preparatory activities under GIM. The State Government prepared a perspective plan for GIM and submitted to the Ministry. GIM will support activities at the village level to identify vulnerable hill slopes and take up soil/water conservation measures, plantation of suitable indigenous species etc. Under the cross cutting interventions it will promote use of alternative fuel energy including bio-gas, solar devices, LPG, improved stoves, biomass based energy etc. Under livelihood enhancement the Mission will support technology for value added products, certification and marketing of non-timber forest produce and enhanced forest based biomass in the form of fuelwood, fodder and food.
Intensification of Forest Management Scheme	MoEF&CC provides funds to the State supplementing its efforts for forest protection, management and preservation. The funds are used for forest protection, watch towers for detection and monitoring of forest fires, creation and maintenance of fire lines, survey and demarcation of forest areas and strengthening forest infrastructure etc. During 2012-13 to 2015-16 (till Nov 2015), the State Government received a sum of Rs. 118.029 million to implement various activities under the scheme.
State Sector Schemes - Development of Degraded Forests	Development of Degraded Forests through afforestation and various other measures like protection from grazing, fire, promotion of natural regeneration, soil and water conservation works. During 2014-15 a sum of Rs.243.39 lakh was spent for raising 368 ha plantations, maintenance of 1041 ha plantation and advance works for plantation in 92 ha.
Greening the Urban Areas	Greening of Urban Areas in order to prevent pollution caused due to high population, vehicles and industries by planting flowering and fruit bearing trees in Corporation. Tree parks, wood lots and avenue plantations are being established in the towns and cities. During 2014-15, Rs.1913.79 lakhs have been spent for raising 1850 ha of plantations, maintenance of 5698 ha plantations and advance work on 268 ha with raising of 4.693 lakh seedlings.
Social Forestry	A sum of Rs. 2351.28 lakhs was spent for raising 2214 ha plantations, maintenance of 9903 ha older plantations and advance work on 1548 ha and raising of 9.76 lakhs seedlings.
Krishi Aranya Protsaha Yojane (agro-forestry)	Seedlings raising and distribution including the scheme Krishi Aranya Protsaha Yojane (agro-forestry) - In the year 2014-15, Rs.1494.52 lakhs have been spent for maintenance of 149.884 lakh seedlings, raising of 145.757 lakh seedlings and Rs.186.13 lakh has been distributed as incentive to the beneficiaries including conducting workshop and publicity under KAPY programme. Krishi Aranya Protsaha Yojane - was launched in 2011. As per the guidelines of the programme, the farmers may obtain the seedlings at subsidized rates at nearest nurseries of the department. Seedlings so obtained be planted in their lands and nurtured, in which case they get incentive for each surviving seedlings from the Government. Apart from getting incentive they are entitled to get returns from such seedlings when it yields.
National Bamboo Mission	During 2014-15 Rs.254.75 lakh was spent for raising 2,500 ha of bamboo plantation, maintenance of older Bamboo plantation and improvement of existing stock.
MGNREGS	An expenditure of Rs.75.013 crore has been made during 2014-15 for plantation on 3626.39 ha and 3534 km roadside plantations. Under Agro Forestry Programme, 96.47 lakh seedlings were planted in the land of 55010 beneficiaries.
Conservation and Management of Mangroves	Activities under the scheme included raising of mangrove plantations and maintenance of older mangrove plantations to check and prevent sea erosion in the coastal region, creating awareness, training and publicity among the local population.

Note: Information compiled from reports of MOEF&CC, Reports of the Karnataka Forest Department, reports of Ministry of Tribal Affairs, GOI etc.

6. Status of Sustainable Forest Management and Biodiversity Conservation Project (SFMBCP)

The project was closed in 2014. Based on the project completion report, the achievements are given in the table below. The project GIS cell has become the ICT cell in the forest department and continues to work on the GIS/ satellite based forest monitoring.

Karnataka Sustainable Forest Management & Biodiversity Conservation Project

Particular	Description
Project Cost	JPY 16,099 million (Approximately Rs. 838.5 cr.)
Project Area	1,870km2 of degraded forests in Karnataka State Covering 30 districts (all districts of Karnataka state)/ 1,222 villages within the 2 km of forest fringe area.
Project Duration	2005 – 2014
Project Components and Achievements	i) Afforestation: 285,000ha The component comprised of 7 models of NR and ANR, timber plantation, fuel wood and small timber plantation, NTFP plantation, school and mangrove plantation. Children's Forest Programme was implemented with the help of OISCA for environmental education. ii) Farm Forestry: 2,165 ha of demonstration plots were established and 160 tons of seeds and 760lakh seedlings were distributed to the farmers. In 2015, 75% of overall survival rate was recorded. This component contributed to enhance the awareness among the beneficiaries. iii) Biodiversity Conservation in one National Park and Four Wildlife Sanctuaries: Fire line formation: 2,144 km Habitat improvement: 7,036.5 ha iv) Eco development: vaccination, fodder development in fringe villages, new elephant proof trench and maintenance iv) EDCs/ VFCs: 73 EDCs/ 1,222 VFCs v) IGAs: 6,066 SHGs formed. IGAs included livestock rearing, dairy farming, sheep and goat rearing, poultry keeping, petty shops and others like eateries, tailoring etc. Revolving fund (Rs. 1 lakh to each EDC/ VFCs) was also established for income generation activities. vi) GIS/MIS: In house ICT centre was established and now integrated to the Karnataka Forest Department. Main programmes managed by the ICT centre - Forest land diversion, tree felling permission, forest produce tracking system, Timber Auction and transport, integrated concurrent asset monitoring system and seedling distribution and monitoring.

Source: Project Completion Report, March 2015 (Karnataka Sustainable Forest Management & Bio-diversity Conservation/ KSFMBC Project)

7. REDD+ Readiness in Karnataka State and SFMBCP and Suggested Area for Further Development

Karnataka is one of the pilot sites of Forest PLUS. PDD is being developed for Shimoga circle/ landscape in the state by Forest PLUS. This exercise would provide capacity development among the forest officials/ staffs and also to set a model for the rest of the state to develop the similar. The challenge is to secure funds for implementing PDD for Shimoga circle since USAID will not provide the fund for implementation. The Forest Department is apprehensive of benefits from the carbon market and does not want the Forest PLUS to communicate the target VFCs in REDD+ pilot site about the benefits from carbon market. The Forest Department is of the view that sustainable management of forest and NTFPs would provide distinct benefits to the communities and there should be more investment for livelihood enhancement of the forest dependent people.

REDD+ Readiness Status of Karnataka State and KSFMBC

REDD+ Requirements	Karnataka State	SFMBCP
State Action Plan	➢ Not yet developed. ➢ SAPCC has been developed in which forestry sector is a part.	-
(Donor Intervention)	None	None
FREL/FRL	➢ Being established under	➢ Not set.

REDD+ Requirements	Karnataka State	SFMBCP
	USAID Project in Shimoga Circle/ Landscape	
(Donor Intervention)	USAID	None
State/ Project Forest Monitoring System	➢ Done by the State Forest Department	➢ Done by the Project
(Donor Intervention)	None	JICA
Safeguard Information System	➢ Relevant laws and regulations are reinforced. ➢ Data aggregation is yet to start. Overall framework of safeguards is yet to be defined.	➢ Existing laws and policies are followed. ➢ Safeguards system was a part of the project process. ➢ No safeguards information system is in place.
(Donor Intervention)	None	JICA
MRV	➢ Partly established as part of the preparation of working plan and data collection for the same. ➢ Is being developed under Forest Plus (USAID) project	➢ Project MIS/ GIS was operational during the project period. ➢ It still needs to be further developed for REDD+.
(Donor Intervention)	➢ USAID	JICA

Source: JICA Survey Team (2016)

From the above, following areas are identified for further development.

Suggested Areas for Further Development – Karnataka

Areas for Further Development
➢ Overall framework of safeguards including principles, criteria and indicators need to be developed. sources
➢ Further capacity development can be undertaken in MRV and safeguards.
➢ The PDD is being prepared for the Shimoga Landscape (Forest Circle). Based on this document, SIS can be developed on a pilot basis.
➢ A strategy including action plan to further improve and upscale the tools, techniques and methods developed by the Forest PLUS.
➢ Technical guidelines/ manuals for MRV and SIS can be developed.

Source: JICA Survey Team (2016)

8. Visit to Forest PLUS Pilot Site – Kikeri Village Forest Committee (Date 24th Feb 2016)

The Regional Team of Forest PLUS based in Shimoga organised a field trip to Kikeri Village in Mandagadde Range in Shimoga Forest Division (Shivamogga). This village has been chosen as a pilot for experimenting different tools, techniques and methodologies of Forest PLUS. Kikeri as well as 2-3 neighbouring villages would form a cluster for action learning pilot on institutional governance and policy issues on NTFP. Forest PLUS intends to strengthen policies for sustainable management of NTFPs through improved governance/institutions and data management system through VFCs and also plans to experiment VFC based auctioning system for marketing of NTFPs instead of contractors. NTFPs are usually auctioned at the Range Level and efforts would be made to strengthen the capacity of the VFCs to procure and auction the NTFPs at the VFC level. Forest PLUS is working with ITD-HST (earlier named as FRLHT, Bangalore) to develop techniques for sustainable harvesting of three major NTFPs- Cinnamomum, Sapindus (Soap nut) and Ailanthus. It has completed four trainings of collectors on sustainable harvesting of the above NTFPs and quantitative trials on three species are underway in four sample plots.

A meeting was conducted with the members of VFC and its Chairperson, Dy. Ranger, Forest Guard, and Forest PLUS team to understand their experience of working with Forest PLUS programme.

Kikeri Village Forest Committee (JFMC) was formed in 1996 and there are 58 members in the VFC. All the people belong to Scheduled Caste community. Micro plan was prepared after the formation of VFC but was never revised or new micro plan was not prepared after the completion of tenure of the micro plan. About 50 ha plantations were carried out in VFC area. The VFC members were not very clear about the total area available to the VFC for protection and management. The villagers mentioned that the forest area is more than 1000 ha but the treatments were carried out only in 50 ha area. Bamboo plantation was raised under National Bamboo Mission. MGNREGS funds were used for construction of staggered trenches (more than 300 trenches have been constructed). Earlier 35 improved boilers were provided by the Forest Department to the VFC for processing of areca nut in order to reduce the consumption of fuel wood.

A lot of changes have happened in the last 15 years. The community is more actively involved in forest protection and the consumption of fuel wood has significantly reduced. People continue to use small timber, fencing materials (for agriculture fields), timber for house building but the VFC is regulating the use and also any destructive harvesting practices. Some people collect a small bamboo like forest produce for basket and mat making (the produce is locally called as oklandi). The traditional healers of the village and the neighbouring areas do collect some medicinal plants products for making medicines.

Soapnut (*Sapindus spp.*) is an important NTFP of the area. Plenty of trees are there on the private land too. Although all the villagers collect and sell Soapnut and but 20 families depend on Soapnut collection and sale as a side business. About 5 tons of Soapnut are collected every season. Because of the price fluctuations people are no more interested in collection of Soapnut. The usual price is between Rs. 8-15 per kg but sometimes it become Rs. 2-3 per kg. People can collect more if there is a better price offered to them. Forest PLUS identified Soapnut to improve the quality of the produce and for organised marketing of the produce. ITD-HST has organised training programmes for the VFC members on when and how to collect the produce and to use tarpaulin to collect the produce so that it does not get mixed with soil/sand etc. The initiative of Forest PLUS has recently started and they are planned to assist the VFC to collect the produces from the neighbouring villages and auction at the VFC level. Buyers will be contacted from other markets to participate in the auction. Harvesting of Cinnamomum was banned by the Forest Department three year ago so people can't collect it from the forest.

The VFC intends to get some revolving fund from the Forest Department to start income generation activities. It has also requested the Forest Department to take up pond renovation and other soil and moisture conservation works.

Although there are 58 households in the village 86 claims have been submitted to the FRC under Forest Rights Act. Survey of area for 27 claims has been completed and now because of elections code of conduct the work has been stopped.

One of the pilots of Forest PLUS for carbon estimation is located in Kikeri but the villagers were not involved in carbon estimation exercises.

Attachment 7.1: 3rd Field Survey Schedule

Date			Itinerary of the Survey Team	Accommodation
7	25	Mon	2125 DEL (CX695)	Delhi
	26	Tue	AM Meeting with JICA India Office PM DEL → BBI	Bhubaneswar
	27	Wed	Meeting with Odisha FD	Bhubaneswar/Delhi
	28	Thu	Site Visit to Keonjhar Division	Bhubaneswar
	29	Fri	Site Visit to Anandapura Wildlife Division	〃
	30	Sat	Courtesy Call to PCCF-HOFF	〃
	31	Sun	Documentation	Bhubaneswar/ Delhi
8	1	Mon	Document preparation/ Discussion with OFD	〃
	2	Tue	Meeting with Odisha Principle Secretary (Forest)	〃
	3	Wed	Meeting with Odisha FD/ Return to Delhi	Delhi
	4	Thu	Reporting at JICA India Office	Delhi
	5	Fri	Meeting with FAO 2245 DEL (CX698)	In Flight
	6	Sat	Arrival at Tokyo	

Note: Mr. Suzuki of JICA Tokyo arrived in Delhi on 31st July 2016 and joined the survey team on 1st August 2016

* 3rd Field Survey Team Member

Position	Name	Affiliation
MRV	Kei Suzuki	Japan Forest Technology Association
Forest Monitoring	Shalabh P. Bharadwaj	Nippon Koei
Socio-Economy/ Safeguards	Michiko Ebato	Nippon Koei

Attachment 7.2: Minutes of Meetings

Date	26th July 2016 11:00 – 12:00
Venue	JICA Delhi Office
Persons attended	JICA: Ms. Sachiko Imoto, Mr. Vineet Sarin, Ms. Ai Tachikawa Survey Team: Mr. Kei Suzuki, Mr. Shalabh Bharadwaj, Ms. Michiko Ebato
Objective	To discuss on the survey schedule and survey outline

- Ms. Ebato (Survey Team) explained the survey schedule, framework of technical cooperation (T/C) and loan project, and preliminary PDM.
- <u>A need for collective action:</u>
  - Ms. Imoto (JICA Delhi Office) suggested that the T/C should include the component of networking with the states which are making attempts to introduce REDD+. The central government could take advantage of the state level efforts. It is important for the states to come forward and put across their requirement/proposal and must press upon the central government to move ahead on REDD+. It is also important to involve other donors.
  - Ms. Ebato (Survey Team) responded that the PDM can be adjusted accordingly to include the networking related activities.
- <u>Outputs of other donors:</u>
  - Mr. Sarin (JICA Delhi Office) requested that the T/C should reflect upon and take advantage of the outputs produced by the preceding attempts of other donor agencies.
  - Ms. Ebato (Survey Team) responded that it will be done.
- <u>REDD+ Cell at MoEF&CC</u>
  - No further progress at the MoEF&CC with regard to REDD+ cell and policy and strategy document.
  - The Survey Team (Ms. Ebato) requested an appointment with the Climate Change Cell at MoEF&CC.
- Others:
  - OFSDP has been requested by JICA to assist the Survey Team in undertaking the field survey.
  - The Survey Team was requested to go ahead to make an appointment with the FAO Delhi Office.

Materials (Supplied by)	

Date	27th July 2016 10:00- 16:00
Venue	Odisha Forestry Sector Development Project (OFSDP)
Persons attended	OFSDP: Dr. A.K. Pattanaik, (PCCF and PD OFSDP), Dr Meeta Biswal (APD OFSDP, Mr. P.R. Singh (APD PFSDP), Mr. P.C.Mishra (JPD OFSDP), Dr.Pradeep Karat (JPD OFSDP), Mr. Lingaraj Otta (RCCF, Rourkela), Dr. S. Panda (RCCF Angul), Mr. Rohita Lenka (DFO Keonjhar), Mr. Pratap Kr Behera (DPD OFSDP), Mr Sudarshan Behera (DPD OFSDP), Mr. Godabarish (DFO Angul), Survey Team: Mr. Kei Suzuki, Mr. Shalabh Bharadwaj, Ms. Michiko Ebato
Objective	To discuss on the survey schedule, objective, and outputs

- Dr. A.K. Pattanaik (OFSDP) requested the survey team to give a presentation on REDD+ - covering the concept and how it can be done. Mr. Suzuki (Survey Team) has given the presentation.
- Dr. A.K. Pattanaik opined that REDD+ readiness is very much required in the state for quantification of the measurements as per the prescriptions but capacity building is required for the OFD staff and officials.
- Other OFD officials and the project officials also opined that framework/rules, processes and set of tools and techniques need to be established or fine-tuned in line to the requirement of REDD+.
- Ms. Ebato (Survey Team) explained the survey schedule, objective and outputs. The nature of the T/C has been discussed with OFSDP and its formulation process.
- The Survey Team explained that the discussion with OFD would be necessary for the following reasons.
  - To understand whether to further advance in REDD+ is a policy decision by OFD which should be fulfilled as a precondition of the T/C.
  - The implementing agency envisaged for the T/C is OFD.
- The Survey Team explained that the T/C would also provide guidance to OFSDP-II for implementing the REDD+ pilot projects.
- The survey schedule is further discussed. The Survey Team requested a courtesy call to OFD on 30th July 2016. OFSDP-II requested the Survey Team to provide them with a note explaining the purpose of this survey.
- Some of the field officers of the OFD gave a brief presentation on the selection process of the sites for REDD+ pilot under the project.
- Officials informed that OFSDP-II has done preliminary short listing of the Keonjhar and Angul Forest Divisions which are likely to be taken up for pilot site selection for REDD+.

Materials (Supplied by)	-

Date	30th July 2016 11:00- 13:00
Venue	PCCF office, Odisha Forest Department
Persons attended	OFD: Mr. S.S. Srivastava (PCCF, HOFF), Dr J.P.Singh (APCCF), Mr Pradeep Karat (JPD OFSDP) Survey Team: Mr. Kei Suzuki, Mr. Shalabh Bharadwaj, Ms. Michiko Ebato
Objective	To discuss on the survey schedule, objective, and outputs

- Under Green India Mission, launched by GOI's in 2011-12 as part of National Action Plan on Climate Change (NAPCC) and action plan was prepared. During 2012-13 a 10 year perspective plan was also prepared. Five landscapes were selected for 2015-16 annual plan covering 10 VSS from each landscape from Odisha. INR 30 Million was received from GOI in 2015-16.
- PCCF opined that increasing density of forest is taken up now under Afforestation program.
- In Odisha there are 50 Forest Divisions and out of that 44 are Territorial Forest Divisions which are managed as per Working Plans and 6 Wildlife Divisions managed as per Wild Life Management Plans. Out of these presently 37 Working Plans are now being revised. Field based data collection and laying of plots for carbon assessment and processes of information collection on biomass and Co2 estimation is critical for WP preparation.
- Presently Working Plan code 2014 is being introduced where sample plot based biomass and carbon assessment is planned to be introduced as 37 Working Plans
- OFD is planning to initiate field data collection from October onwards until December 2016 so that by March 2017 draft Working Plan is ready.
- There is a need for Capacity Building of officers and field staff on Biomass estimation and Carbon assessment and requested for TC as soon as possible.
- Survey team explained that OFD need to fasten up the process of sending their request to MoEF for TC and meanwhile team would explore and recommend to JICA if Capacity Building on CO2 estimation can be taken up prior to full-fledged TC. As part of the concept note for TC, survey team explained the importance of certain information that is required from OFD side for the note.
- PCCF summed up that OFD definitely require TC to build the capacity of the OFD officials in the field based data collection processes as well as data compilation and analysis and integration with satellite based information.

Materials (Supplied by)	Nil

Date	02nd August 2016
Venue	Secretariat, Forest, Government of Odisha
Persons attended	Forest and Environment, GO Odisha: Mr. Suresh Chandra Mohapatra, Principal Secretary, Forest and Environment; Mr. S.S.Srivastava, PCCF (HOFF), OFD; Mr. A.K.Pattanaik, PCCF (Projects); Dr Meeta Biswal (APD OFSDP; Dr.Pradeep Karat (JPD OFSDP); JICA Tokyo: Mr. Kazunobe Suzuki, Survey Team: Mr. Kei Suzuki, Mr. Shalabh Bharadwaj, Ms. Michiko Ebato
Objective	To discuss on the survey objective, requirement of OFD, acceptance and initiation of the process of concept note preparation for T/C

- Mr. Kazunobe Suzuki briefly explained about the objective of the visit
- Mr. S.S.Srivastava, PCCF (HOFF) and Mr. A.K. Pattanaik, PCCF (Projects) supplemented and explained briefly about the previous meetings between the Survey team with OFD and the OFSDP Project.
- Ms. Michiko supplemented and elaborated with a brief presentation focusing on background and shared findings of JICA survey on REDD+. Ms. Michiko also explained about the JICA T/C and how it is different than the Loan project and also explained about the proposed interventions in T/C in comparison to the Loan project.
- Mr. Suresh Chandra Mohapatra, Principle Secretary accepted in principle about the requirement of the T/C and enquired about the tentative duration of the T/C as foreseen. Mr. Kazunobe Suzuki explained that the duration depends on various factors and generally is of minimum 3 to 5 years duration. The detailed design would be dispatched once the GOJ receives a proposal of T/C from OFD through MoEF.
- Mr. Suresh Chandra Mohapatra, Principle Secretary nominated Dr. A.K Pattanaik, PCCF Projects as the nodal person for JICA survey team to further discuss and concretize the concept note on the T/C.
- Mr. S.S.Srivastava, PCCF (HOFF), requested for support on CB of OFD officials on Carbon measurements required for Working Plan preparation. Mr. Kazunobe Suzuki replied that he is aware of the request from OFD side through the JICA survey team and although it is a very short notice but would discuss how best JICA can support and go ahead on this.

Materials (Supplied by)	Nil.

Date	05th August 2016
Venue	FAO, 55 Lodhi Estate, New Delhi,
Persons attended	FAO: Mr. Gurulingappa G. Koppa, Asst. FAO Representative (Programme); Ms. Uma Balaji, Programme Assistant Survey Team: Mr. Kei Suzuki, Mr. Shalabh Bharadwaj, Ms. Michiko Ebato
Objective	To discuss about the FAOs assistance in Forestry Sector in India

- **The project entitled 'Strengthening National Forest Inventory and Monitoring Protocols and Capacities in India', is a Technical Cooperation Project funded by FAO.**

  A. MoEF & CC is the nodal Ministry and DG (Forest) would be the chairperson of the TCP.

  B. The TCP would be implemented from March 2016 to December 2017

  C. The project objective is - To improve sustainable forest and trees management in India through enhanced data collection and management mechanisms and national reporting capabilities in forestry and contributions to reporting in allied sectors.

  D. Key activities

  - Comprehensive NFI Design Review

  - Information needs assessment workshop

  - NFMS Action Plan development

  - Design of New NFMS

  - Design and development of frameworks for integrated forest management

  - Capacity building of FSI, GoI and state government personnel

  - Design of mechanisms/models/protocols for enhanced interaction between state and national levels, and also between States and the network of ICFRE institutions relating to use of NFMS data

  E. The first steering committee meeting is scheduled for 10th August 2016 and inception workshop for 29th August 2016.

  F. TCP would cover National Level Forest Monitoring System and the pilot states for TCP would include around 5-9 States (out of which 5 states would be Uttarakhand, Madhya Pradesh, West Bengal, Karnataka, and Maharashtra)

  G. FAO would be dispatching around 4 International Experts from various disciplines that include – 1. Remote Sensing/ GIS 2. Forest Policy 3. Assessment 4. Capacity Building

  H. From the states it is expected that DFO and CCF level officers would be the target group.

  I. For the TCP request came from the Government side.

- **FAO has also initiated development of a proposal 'Green Agriculture: Transforming Indian agriculture to promote global conservation benefits'**

  A. The objective is to develop and implement of a multi-sector Programmatic Framework under GEF 6 to achieve transformational changes in India's agricultural practices to secure global environmental benefits, enhance food security, and improve livelihood resilience

  B. This programme will be funded under GEF-6 and is being developed in close collaboration with Ministry of Agriculture (MoA) and Ministry of Environment, Forests and Climate Change (MoEFCC).

  C. This multi-sector project is proposed to be implemented in the states of Uttarakhand, Rajasthan, Madhya Pradesh, Odisha and Mizoram.

  D. The project covers 2 major components:

- Component 1: Governance of India's agriculture and allied sectors mainstreams biodiversity, land degradation, climate change mitigation and sustainable forest management - Component 2: Agricultural practices deliver biodiversity, land degradation, climate change mitigation and sustainable forest management E. The proposed project will include multi-sector, state-specific interventions in at least two districts in each state, under: 1. biodiversity, 2. land degradation, 3. climate change mitigation, and 4. Sustainable forest management.	
Materials (Supplied by)	Nil.

Attachment 7.3: List of Personnel met during 3rd field survey period

States	Institute/Department/Agency	Name	Designation
Odisha	Odisha Forestry Sector Development Project (OFSDP)	Dr. Ajit Kumar Pattnaik	Principal Chief Conservator of Forests (Projects) , Project Director
		Dr. Meeta Biswal	APD (AJY)
		Mr. Pradeep Raj	Joint PD
		Mr. RP. R. Singh	APD
		Mr. P. C. Mishra	JPD
		Mr. Lingaraj Otta	RCCF, Roukela
		Dr. S. Panda	RCCF Angul
		Mr. Rohita Lenka	DFO Keonjhar
		Mr. Pratap Kr. Behera	DPD
		Mr. Sudarshan Behera	DPD
		Mr. Godabarish	DFO Angul
	Department of Forest and Environment, Odisha	Mr. Suresh Chandra Mohapatra	Principal Secretary (Forest and Environment)
		Mr. S.S. Srivastava	PCCF(HOFF)
		Dr. J. P. Singh	APCCF
Donor	FAO	Dr. Gurulingappa G. Koppa	Asst. FAO Representative (Programme)
		Ms. Uma Balaji	Programme Assistant
	JICA India Office	Ms. Sachiko Imoto	Senior Representative
		Mr. Vineet Sarin	Principal Development Specialist
		Ms. Ai Tachikawa	Representative

Attachment 7.4 : Field Note of OFSDP-I Sites Visit

Date	28th July 2016 07:00- 19:00
Venue	Field Visit to Keonjhar
Persons attended	OFSDP: Mr. Rohita Kumar Lenka (DFO Keonjhar Forest Division) Survey Team: Mr. Kei Suzuki, Mr. Shalabh Bharadwaj, Dr. Michiko Ebato
Objective	To acquaint with field situation w.r.t drivers of degradation, FRA, Wild life Sanctuaries etc.

- **Visited Arjunbilla VSS:**
  - Total area of VSS is 108 ha., out of which 80 ha area was Treatment Area.
  - Area was treated under ANR (with 1600 plants/ha.) and ANR Gap planting (200 plants/ha.) models
  - Area is mainly Sal dominated
  - One Control plot per VSS is laid out for comparison in intervention and non-intervention

Plantation site

VSS Meeting Centre

Transparency Board

- **Murgapahadi VSS:**
  - -Four hamlets consist of Murgapahadi VSS
  - -ANR Plantation of 2008-09 covering 80 ha.
  - -Area dominated by Sal Plantations

ANR Plantation of 2008-09, Murgapahadi VSS

R.F. permanent Pillar

Pressure of livestock on Forest

VSS Building and Transparency board

- **NTFP Godown:**

  -Laxminarayan SHG Clusted

  -Rs 10 lakh per building/godown was provided by JICA

  -The cost of Sal plate making machines is around Rs 20,000 per machine

  -Sal leaf plates are made in the SHG cluster

  -The cluster covers 23 SHG's from 9 villages

  -Sanjauli VSS is maintaining the cluster

  -Recently, in the month of June 2016 Sal leaf plates worth Rs 7 Lakh was manufactured and sold.

  -The sal plates are sold to different parts of the country.

  -One bundle covers around 1000 plates and is sold at a price of Rs 250 per bundle

  -Collection price of Sal leaf as well as profit is shared proportionately among the SHG members

	
NTFP Godown, Sanajauli VSS	Sal plate making machine

- **Compensatory Plantation in Revenue Land**

  -Compensatory plantation is carried out in the land outside forest land when there is diversion of Forest land for any developmental project.

  -Once plantation is done by forest department on Revenue land, the land is notified as Reserve Forest after mutation.

	
Compensatory Plantation	Compensatory Plantation-2003-04, Joda East

- **Kanjpani Ghat region, Keonjhar**

  -The area is predominantly covered by practice of Podu cultivation (Shifting Cultivation)

	
Shifting Cultivation	Shifting Cultivation

- **Mining**

  -Keonjhar is rich in Iron Ore

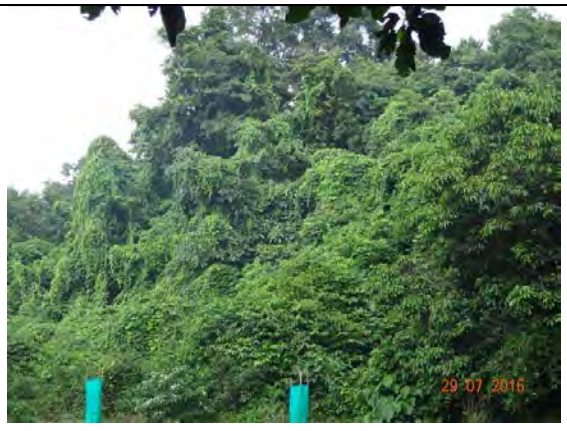
  -Forest land is allocated on lease for iron ore extraction

	
Iron Ore extraction	Plantation of extracted heap of debris near mining area

Date	29th July 2016 08:00- 19:00
Venue	Field Visit to Keonjhar
Persons attended	OFSDP: Mr. Sangram Keshari Behere (DFO Keonjhar Wild Life Division) Survey Team: Mr. Kei Suzuki, Mr. Shalabh Bharadwaj, Dr. Michiko Ebato
Objective	To acquaint with field situation w.r.t drivers of degradation, FRA, Wild life Sanctuaries etc.

- Hathgarh WLS:
  - In the Hathgarh WLS, out of 72,000 ha. around 10,000 ha. are is under human settlement
  - Some of the drvers of degradation include:
    a. Illicit tree felling for fuel and timber (Around 2 kg/day / person of fuel wood is required)
    b. Stone mafia
    c. Podu / Shifting cultivation
    d. Aroumd 10,000 cattle population within Hathgarh WLS
  - Some of the constraints in effective management of WLS includes:
    a. There is no cut-off date for FRA settlement process and filing of application
    b. No GPS/DGPS survey of land is happening during FRA settlement
    c. Even satellite imageries are not being used
  - Man animal conflict is low due to presence of dense forest and undisturbed habitat.
  - The OFD maintains well documented elephant movement
  - Rs 10 lakh compensation is annually handed over due to crop/house damage and human injury.
  -Rs 1,50,000 compensation is given for human injury and Rs 3,00,000 for loss of life
  - NTFP extracted by villagers is not recorded by OFD.

Hathgarh WLS



Yam Climbers

Attachment 7.5: Project Design Matrix

Version 1

Project Title: Project for Development of REDD+ Implementtaion Mechanism for Sustainable Forest Management in Odisha State, India
Implementing Agency: Odisha State Forest Department
Target Group: Odisha State Forest Department, local residents
Period of Project: xxx. 2017- xxx. 2022 (5 years)
Project Site: Odisha State, India

Dated

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal Odisha State Forest Department becomes a technical knowledge hub of sustainable management of forest including REDD+	To be defined.	To be specified.			
Project Purpose The Sustainable Forest Management Practices through REDD+ becomes an integral part of the Forest Management in Odisha					
Outputs 1. State REDD+ policy and strategy are developed. 2. FRL for Odisha is established. 3. MRV system is put into practice. 4. Safeguards Information System for Odisha is put into practice. 5. A knowledge network on REDD+ for sustainable forest management is established.	1-1. State REDD+ policy and strategy is published as an official document. 2-1. FRL of Odisha is accepted by the Government of Odisha. 3-1. Operation Manual for MRV system is formally approved. 3-2. Regular reporting is carried out. 3-3. xxx Forest Department officers/Staff are trained. 4-1. Operation manual on safeguard information system are formally approved. 4-2. Reports on the safeguards are prepared 5-1. A meeting for sharing knowledge and lessons in Odisha is held on an annual basis. 5-2. Publications on REDD+ and sustainable forest management are prepared.	1-1. Official notification of the approval of the State REDD+ policy and strategy 2-1. Official notification of the approval of the FRL. 3-1. Official notification of Odisha Forest Department for approval of the Operation Manual of MRV. 3-2. Reports prepared by Odisha Forest Department 3-3. –do- 4-1. Official notification of Odisha Forest Department for the approval of the manual. 4-2. Reports submitted 5-1. Proceedings 5-2. No of copies circulated	The state forest department does not change its policy towards REDD+.		

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Activities 1-1. Prepare outline of the State REDD+ policy and strategy 1-2. Officially approve the above outline by the Odisha State Forest Department. 1-3. Draft the state REDD+ policy and strategy. 1-4. Officially approve the state REDD+ policy and strategy	**Inputs** **The Japanese Side** ◆ Experts (long/Short term): ・Chief advisor (REDD+) ・FRL ・Forest Monitoring/ MRV ・Safeguards Information System ・Institution/ Networking ・Project Coordinator ◆ Trainings in Japan ◆ Cost of the activities ◆ Cost of the necessary equipment	**The Indian Side** ◆ Project Director (chairperson of the JCC) ◆ Project Manager ◆ A counterpart for each JICA Expert ◆ Administrative staff ◆ Office space for JICA Experts (with necessary furniture) ◆ Necessary arrangements to acquire necessary data requested by JICA Experts ◆ Project operation cost (i.e., cost for C/P personnel, etc.)	Odisha State Forest Department can provide necessary counterparts and efforts for the project. **Pre-Conditions** **<Issues and countermeasures>**		
2-1. Carry out an assessment of technical/ infrastructure requirements for establishing FRL. 2-2. Designe the capacity development programme for Odisha Forest Department to establish FRL. 2-3. Develop training materials for capacity development programme based on the results of 2-1. 2-4.Carry out the capacity development programme for the Odisha Forest Department for establishing FRL. 2-5. Develop FRL and emission factirs for Odisha State					
3-1. Carry out the situational analysis of the existing state level forest monitoring system 3-2. Identify capacity development needs 3-3. Develop capacity development plan based on the results of 3-2 3-4. Develop necessary training materials/ programmes based on the needs identified under 3-2. 3-5. Implement capacity development activities based on 3-3. 3-6. Implement interventions required to enhance QA/ QC of data. 3-7. Procure necessary equipment and install at an appropriate location. 3-8 Collect and analyse the data. 3-9. Prepare reports on a regular basis.					
4-1. Carry out a situational analysis of the safeguard information system and required data availability. 4-2. Carry out stakeholder analysis. 4-3. Establish a platform to discuss and develop safeguard information system for REDD+ in Odisha with participation of the stakedholers defined under 4-2. 4-4. Define the objectives of safeguard information system through stakeholder consultation by the stakeholder					

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
patform. 4-5. Identify monitoring indicators by the stakeholder platform. 4-6. Develop guidelines for safeguards information system on the data collection, management and reporting. 4-7. Prepare capacity development plan for safeguards information system. 4-8. Carry out capacity development activities. 4-9. Collect and analyse the data. 4-10. Prepare reports on a regular basis.					
5-1. Identfy knowledge network participants 5-2. Establish knowledge network 5-3. Publish and circulate newsletters regularly. 5-4. Organize national worknshop on Sustainable Forest Management and REDD+ to share the learnings from the project.					

Govt. of Odisha
For. & Env. Dept.

Attachment 7.6: Application for JICA's Technical Cooperation

Memo No. 15046 Dt. 12-08-16

APPLICATION FORM FOR JAPAN'S TECHNICAL COOPERATION

1. **Date of Entry**: Day _____ Month _____ Year _____

2. **Applicant**: The Government of Odisha, Forest & Environment Department.

3. **Technical Cooperation (T/C) Title**: Project for Development of REDD+ Implementation Mechanism for Sustainable Forest Management in Odisha, India

4. **Type of the T/C** ※**Select only one scheme.**

   ■ Technical Cooperation Project / Technical Cooperation for Development Planning

   □ Science and Technology Research Partnership for Sustainable Development (SATREPS)

   □ Individual Expert □ Individual Training

5. **Contact Point (Implementing Agency):**

   Odisha Forest Sector Development Society, Forest & Environment Department, Government of Odisha

   Address: Odisha Forestry Sector Development Society, SFTRI Campus, At/PO. Ghatikia, Bhubaneswar-751003, Odisha, India.

   Contact Person: Dr. A.K. Pattanaik, Principal Chief Conservator of Forests (Project), Odisha Forest and Environment Department

   Tel. No.: 91-674-2386084 Fax No. 91-674-2386085

   E-Mail: ajitpattnaik13@gmail.com

6. **Background of the T/C**

Internationally, REDD+ has gained an importance in promoting sustainable forest management and most of the modalities are developed. At the national level, India submitted the INDC to the UNFCCC, indicating the overall direction towards reduction of carbon emissions. Nationally, India has come up with a policy to create carbon sink of 2.5 to 3 billion tons by increasing the forest and tree cover by 2030. With this background, the National REDD+ Policy and Strategy is being developed and state level efforts in introducing REDD+ as a means of sustainable forest management has been initiated in some states.

Odisha's total forest cover accounts for 32.34% (50,354km2) of the total

geographical area whereas the total area recorded as forest accounts for 58,136km2. The quality of the forest areas has been more or less stable or indicating the gradual increment. Out of the total forest cover, 7,023 KM^2 is categorized as dense forest, 21,470 KM^2 is moderately dense and 21,861KM^2 is open forest. However, the diversion of the forest land for other purposes has been seen strictly regulated by the MoEF&CC and State Forest Department as per Forest Conservation Act- 1980. Furthermore, the human habitation inside and surrounding the forest areas has increased the biotic pressures on the forest ecosystem and in need of appropriate intervention.

Odisha state forest department has implemented Odisha Forestry Sector Development Project with the loan assistance from Japan International Cooperation Agency (JICA) for sustainable forest management through community participation and livelihood improvement. The achievements of the project has been regarded as one of the model projects among the JICA assisted Forestry Sector Projects in India. Furthermore, having the sizable amount of CAMPA fund is likely to flow to the state which would be meaningfully utilized for afforestation & regeneration and restoration of degraded forest, Thus it is imperative to have the advanced monitoring system that can capture the changes in the forest cover, assessment of carbon stock and safeguards measures in the state.

With this background, a preliminary idea of T/C was formulated in order to enhance REDD+ readiness of the Odisha Forest Department, to promote sustainable forest management and to share the learnings with other states for out scaling of REDD+.

7. Outline of the T/C

(1) Overall Goal

Odisha State Forest Department becomes a technical knowledge hub of sustainable management of forest including REDD+ .

Objectively Verifiable Indicators:

To be defined.

(2) T/C Purpose

The Sustainable Forest Management Practices through REDD+ becomes an integral part of the Forest Management in Odisha.

Objectively Verifiable Indicators:

To be defined.

(3) Outputs

Output 1:

State REDD+ policy and strategy are developed.

Objectively Verifiable Indicators:

1-1: State REDD+ strategy is published as an official document.

Output 2:

FRL for Odisha is established.

Objectively Verifiable Indicators:

2-1: FRL of Odisha is accepted by the Government of Odisha.

Output 3:

MRV System is put into practice.

Objectively Verifiable Indicators:

3-1: Operation manual for MRV system is formally approved.

3-2: Regular reporting is carried out.

3-3: xxx Forest Department Officers/ Staffs are trained.

Output 4:

Safeguards Information System for Odisha is put into practice.

Objectively Verifiable Indicators:

4-1: Operation manual on safeguards information system are formally approved.

4-2: Reports on the safeguards are prepared.

Output 5:

A knowledge network on REDD+ for sustainable forest management is established.

Objectively Verifiable Indicators:

5-1: A meeting for sharing knowledge and lessons learned in Odisha is held on an annual basis.

5-2: Publications on REDD+ and sustainable forest management are prepared.

(4) T/C Site

The T/C targets the entire Odisha. (Map attached - ANNEXURE - A.)

(5) T/C Activities

Output 1:

State REDD+ strategy is developed.

Key Activities:

1-1: Prepare outline of the State REDD+ policy and strategy

1-2: Officially approve the above outline by the Odisha State Forest Department.

1-3: Draft the state REDD+ policy and strategy.

1-4: Officially approve the state REDD+ policy and strategy.

Output 2:

FRL for Odisha is established.

Key Activities:

2-1: Carry out an assessment of technical/ infrastructure requirements for establishing FRL.

2-2: Design the capacity development programme for Odisha Forest Department to establish FRL.

2-3: Develop training materials for capacity development programme based on the results of 2-1.

2-4: Carry out the capacity development programme for the Odisha Forest Department for establishing FRL.

2-5: Develop FRL and emission factors for Odisha State

Output 3:

MRV system is put into practice.

Key Activities:

3-1: Carry out the situational analysis of the existing state level forest monitoring system

3-2: Identify capacity development needs

3-3: Develop capacity development plan based on the results of 3-2

3-4: Develop necessary training materials/ programmes based on the needs identified under 3-2.

3-5: Implement capacity development activities based on 3-3,

3-6: Implement interventions required to enhance QA/ QC of data

3-7: Procure necessary equipment and install at appropriate location

3-8: Collect and analyze the data

3-9: Prepare reports on a regular basis

Output 4:

Safeguards Information System for Odisha is put into practice.

Key Activities:

4-1: Carry out a situational analysis of the safeguards information system and required data availability.

4-2: Carry out stakeholder analysis

4-3: Establish a platform to discuss and develop safeguards information system for REDD+ in Odisha with participation of the stakeholders defined under 4-2.

4-4: Define the objectives of safeguards information system through stakeholder consultation by the stakeholder platform

4-5: Identify monitoring indicators by the stakeholder platform

4-6: Develop guidelines for safeguards information system on the data collection, management and reporting

4-7: Prepare capacity development plan for safeguards information system.

4-8: Carry out capacity development activities

4-9: Collect and analyse the data

4-10: Prepare reports on a regular basis

Output 5:

A knowledge network on REDD+ for sustainable forest management is established.

Key Activities:

5-1: Identify knowledge network participants

5-2: Establish knowledge network

5-3: Publish and circulate newsletters regularly

5-4: Organise national workshop on Sustainable Forest Management and REDD+ to share and disseminate the learnings from the project

(6) Input from the Recipient Government

To be defined at the later stage. Indicative inputs to be anticipated from the Indian side are given below.

- Project Director, Chairperson of the JCC
- Project Manager
- A counterpart for each JICA Expert
- Administrative staff
- Office space for JICA Experts (with necessary furniture)
- Necessary arrangements to acquire necessary data requested by JICA Experts
- Project operation cost (i.e. costs for C/P personnel assigned for each JICA expert.)

(7) Input from the Japanese Government

To be discussed at the later stage. Indicative inputs anticipated from the Japanese side are given as below.

- Experts (Long/ Short term):
  - ✓ Chief advisor (REDD+)
  - ✓ FRL
  - ✓ Forest Monitoring/ MRV
  - ✓ Safeguards Information System
  - ✓ Institution/ Networking
  - ✓ Project Coordinator
- Trainings in Japan
- Cost of the activities
- Cost of the necessary equipment

8. Implementation Schedule

The project duration is for 5 years.

The detailed implementation plan will be worked out at the later stage

9. Description of an Implementing Agency

Odisha Forest Department

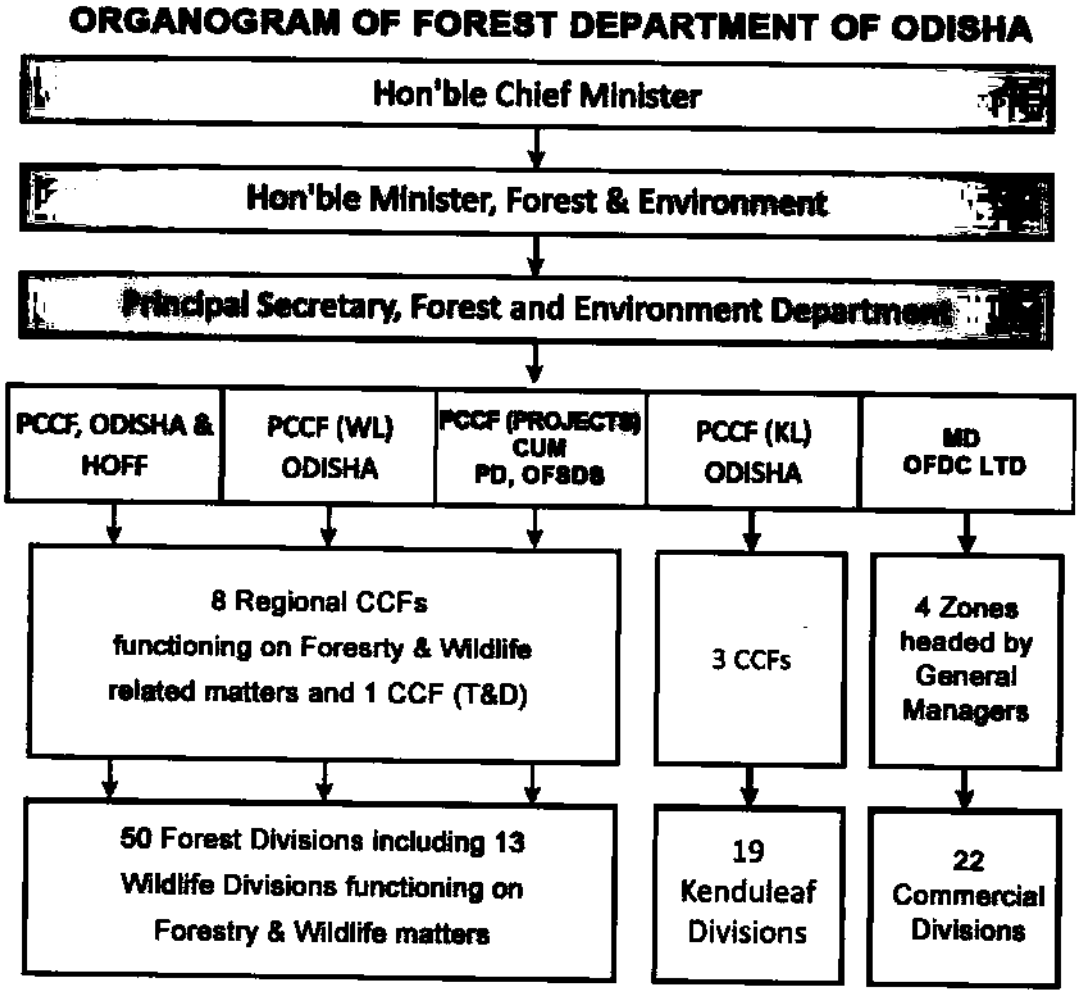
- **Budget**

Budget Outlay for the Forest and Environment Department of Odisha State

Year	Non Plan	Plan	Total
2011-12	38309.00	28648.51	66957.51
2012-13	27952.84	36873.23	59826.07
2013-14	25791.51	39351.00	65142.51
2014-15	26370.62	25885.74	52256.36
2015-16	23040.96	23796.40	46837.36

Source: http://odishaforest.in/budget_exp.jsp

- **Organogram**



10. Related Information

(1) Prospects of further plans and actions/ Expected funding resources for the Project:

Odisha Forestry Sector Development Project (Phase II) has been proposed to JICA for loan assistance. The supplemental survey will take place in August 2016 – December 2016 for the review of the proposal. REDD+ component has been proposed as part of the Phase II proposal and will benefit from T/C when implementing its REDD+ component.

(2) Activities in the same sector of other donor agencies, the recipient government and NGOs and others:

Activities by other donor agencies, if any:

- Not applicable.

Other Relevant Activities (Activities in the sector by the recipient government and NGOs), if any:

Taking a cue from the learnings from the Odisha Forestry Sector Development Project, *Ama Jangala Yojana* is being implemented with the state funding is launched since from 2016-17 to 2021-2022 for sustainable management of forest in Joint Forest Management mode with the active participation of local communities and livelihood improvement of the forest dependent communities.

Other relevant information (Available data, information, documents, maps, etc. related to the Project)

Nil.

11. Global Issues *(Gender, Poverty, Climate change, etc.)*

Through this T/C, Odisha state forest department will be better equipped to monitor the forest dynamics and carbon sequestration. This will provide data with all precession essential in connection with monitoring in the context of climate change and also help achieve the targets indicated by Ministry of Environment, Forest & Climate Change, and Government of India in INDC. In addition to this the capacity development of the Forest Department would lead to better monitoring of the impact of various interventions made by the Forest Department for improvement of forest cover and restoration and regeneration of degraded forest and sustainable management of the forest.

12. Environmental and Social Considerations

Not Applicable.

13. Others

Signed: _____ 11/8/2016

Title: Principal Secretary to Govt. Forest & Env. Deptt.

On behalf of the Government of Odisha

Date: 11.08.2016.

ANNEXURE - A

ADMINISTRATIVE MAP OF ODISHA FOREST DIVISION