

Resource Manual

Capacity Building of State Forest Departments for Developing State REDD+ Action Plan



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RESOURCE MANUAL: CAPACITY BUILDING OF STATE FOREST DEPARTMENTS FOR DEVELOPING STATE REDD+ ACTION PLAN

2020



Biodiversity and Climate Change Division

Indian Council of Forestry Research and Education

(An Autonomous Body of Ministry of Environment, Forest and Climate Change, Government of India)

P.O. New Forest, Dehradun-248006





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Message



Climate change due to anthropogenic greenhouse gas emissions has become one of the challenges for the society. Deforestation and forest degradation in developing countries is one of the major sources of carbon dioxide emission. Forests have the potential to mitigate climate change through capture and storage of atmospheric carbon dioxide. Sustainably managed forests provide the sustained flow of ecosystem goods and services for well being of humankind.

REDD+ is one of the climate change mitigation options in developing countries for reducing emissions from deforestation and forest degradation, conservation of forests, sustainable management of forests, and enhancement of forest carbon stocks. REDD+ is now widely accepted as a climate change mitigation option under the United

Nations Framework Convention on Climate Change. In order to access the financial support for REDD+, developing countries need to develop the National REDD+ Strategy or Action Plan, Forest Reference Emission Level/ Forest Reference Level, National Forest Monitoring System and Safeguards Information System. India has developed its National REDD+ Strategy and Forest Reference Level. Development of National Forest Monitoring System and Safeguards Information System are under process.

Indian Council of Forestry Research and Education (ICFRE) has developed National REDD+ Strategy on behalf of the Ministry of Environment, Forest and Climate Change, Government of India. National REDD+ Strategy delegates a key responsibility to the State Forest Departments (SFDs) for the execution of REDD+ activities. States have to create a REDD+ Cell in the State Forest Departments and are also encouraged to develop their State REDD+ Action Plans for implementation of National REDD+ Strategy. ICFRE has developed State REDD+ Action Plans for the states of Mizoram and Uttarakhand under ICIMOD funded REDD+ Himalaya Project.

Ministry of Environment, Forest and Climate Change, Government of India has assigned the task of building the capacities of SFDs for preparation of State REDD+ Action Plans and on other aspects of REDD+ implementation to ICFRE. The manual for Developing State REDD+ Action Plan intends to facilitate State Forest Departments and provide step wise approach for developing State REDD+ Action Plans for implementation of the National REDD+ Strategy at the state level.

I compliment the team of scientists and experts of Biodiversity and Climate Change Division of ICFRE for bringing out this resource manual under the National CAMPA funded ICFRE scheme titled 'Strengthening Forestry Research for Ecological Sustainability and Productivity Enhancement'. I hope this resource manual will be helpful for the SFDs and other stakeholders for developing State REDD+ Action Plans.

Dated: 09 June 2020

(Arun Singh Rawat)





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Foreword



Reducing emissions from deforestation and forest degradation, role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) has come forth as forest linked climate change mitigation approach under United Nations Framework Convention on Climate Change. REDD+ aims to provide incentives for developing countries to undertake actions for conservation and sustainable management of forests. Developing countries are under different phases of REDD+ readiness. As per the

National REDD+ Strategy of India, capacity building of the State Forest Departments is required to implement and accurately assess and measure the performance of REDD+ activities.

Biodiversity and Climate Change Division of ICFRE has developed a Resource Manual for capacity building of State Forest Departments for developing State REDD+ Action Plans under CAMPA funded project component on Capacity Building of State Forest Departments for Developing State REDD+ Action Plans of ICFRE scheme titled 'Strengthening Forestry Research for Ecological Sustainability and Productivity Enhancement'. I hope this resource manual will serve as a guiding document for preparation of the State REDD+ Action Plan for effective implementation of REDD+ activities at the state level and also help to achieve the objectives of the National REDD+ Strategy of India.

I congratulate the scientists and experts of Biodiversity and Climate Change Division, ICFRE for bringing out this manual.

Dated: 09 June 2020


(Anurag Bhardwaj)



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Dr. R. S. Rawat



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Preface



The preparation of this manual lies in the strong approaching grounds and the readiness of the country towards REDD+. The ideas were shaped into reality after the initiative of Indian Council of Forestry Research and Education (ICFRE) in developing India's National REDD+ Strategy on behalf of Ministry of Environment, Forest and Climate Change, Government of India and thereafter preparation of State REDD+ Action Plans for the states of Mizoram and Uttarakhand under ICIMOD-GIZ funded REDD+ Himalaya Project. The step-by-step approaches adopted in this resource manual, are based on manual of the International Centre for Integrated Mountain Development (ICIMOD) on 'Developing State

REDD+ Action Plans: A Manual for Facilitators', brought under International Climate Initiative of BMU funded REDD+ Himalaya Project in 2017. ICFRE has further expanded the methodology in detail for developing State REDD+ Action Plan (SRAP), with the experiences gained in developing State REDD+ Action Plans for the States of Mizoram and Uttarakhand.

The manual has been written in a simple and easy to understand manner so that State Forest Departments can easily follow the methodology and process for developing their SRAP. The manual addresses five main stages for developing SRAP, i.e., prepare, analyse, plan, monitor and budget. The first stage: preparation is purely institutional and comprises of collection of preparatory data and analysis, the second stage: analysis involves identification and prioritization of drivers of deforestation and forest degradation through multi-stakeholder consultation processes. The rest of the three stages, i.e., planning, monitoring and budgeting deal with identification of intervention packages, safeguards analysis, monitoring activities and budget for identified activities along with operation plan. The 'Problem Analysis Workshop' and 'Solution Analysis Workshop' are the central group activities that give an outline towards and recognising the challenges faced by the respective areas and contributing necessary actions to improve the forest productivity. These contribute essential inputs in the whole process of developing SRAP. Later the SRAP core team helps in finalising the whole proposed targets and outcomes.

SRAP aims to identify and prioritize the drivers of deforestation & forest degradation and barriers for forest carbon enhancement, identify intervention packages for addressing prioritized drivers of deforestation and forest degradation and barriers for carbon enhancement activities.

I am thankful to International Centre for Integrated Mountain Development (ICIMOD), Kathmandu (Nepal) and all members of REDD+ Himalaya Project Team of ICIMOD led by Dr. Bhaskar Singh Karky, Programme Coordinator, REDD+ Initiative for giving their instant permission to use the contents of manual developed by ICIMOD. Supports of Mr. Nabin Bhattarai, ICIMOD and Mr. Kai Windhorst, GIZ are also gratefully acknowledged. I am also thankful to other authors of ICIMOD Manual 2017/13 namely Mr. Michael Richards



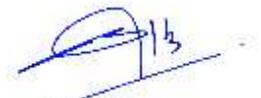
FAO, Charlotte Hicks UNEP-WCMC, Corinna Ravilious UNEP-WCMC, Mr. Niroj Timalsina ICIMOD, Mr. Giang Phan COPE, Mr Stevan Swan UNEP-WCMC, Mr Ben Vickers FAO and Mr. Rabindra Roy Symbiosis Associates.

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Necessary direction, guidance and encouragement provided by Sh. Arun Singh Rawat, Director General ICFRE, Dr. Suresh Gairola, Former Director General ICFRE, Sh. S.D. Sharma, Dy. Director General, ICFRE and Dr. Vimal Kothiyal, Assistant Director General (Research Planning), ICFRE for developing the project component on capacity building of the State Forest Departments for Developing State REDD+ Action Plans under ICFRE scheme and its further implementation is gratefully acknowledged. Support provided by Sh. Anurag Bhardwaj, Director (International Cooperation), ICFRE and other officers, scientists and staff of ICFRE for developing this resource manual are also thankfully acknowledged.

I am also thankful to all the support staff of Biodiversity and Climate Change Division, ICFRE for their help in preparing this manual.

Dated: 09 June 2020



(Dr. R.S. Rawat)



ABBREVIATIONS

AFOLU	:	Agriculture, Forestry and Other Land Use
APCCF	:	Additional Principal Chief Conservator of Forests
BCC	:	Biodiversity and Climate Change
CF	:	Conservator of Forest
CCF	:	Chief Conservator of Forests
D&FD	:	Deforestation and Forest Degradation
EDC	:	Eco-Development Committee
FAO	:	Food and Agriculture Organization of the United Nations
FREL/FRL	:	Forest Reference Emission Level/ Forest Reference Level
FSI	:	Forest Survey of India
GHG	:	Greenhouse Gas
Gt	:	Giga tonne
GIS	:	Geographic Information System
ICFRE	:	Indian Council of Forestry Research and Education
ICIMOD	:	International Centre for Integrated Mountain Development
ICS	:	Improved Cook Stove
IGA	:	Income Generation Activity
IPCC	:	Intergovernmental Panel on Climate Change
IPs	:	Intervention Packages
ISFR	:	India State of Forest Report
JFMCs	:	Joint Forest Management Committees
LPG	:	Liquefied Petroleum Gas
LULUCF	:	Land Use Land-Use Change and Forestry
MDF	:	Moderately Dense Forest



Mha	:	Million hectare
MoEFCC	:	Ministry of Environment, Forest and Climate Change
MRV	:	Measurement, Reporting and Verification
NDC	:	Nationally Determined Contribution
NFMS	:	National Forest Monitoring System
NGO	:	Non-Governmental Organization
NRS	:	National REDD+ Strategy
NTFPs	:	Non-Timber Forest Products
PAMs	:	Policies and Measures
PCCF	:	Principal Chief Conservator of Forests
PRA	:	Participatory Rural Appraisal
REDD+	:	Reducing emissions from deforestation and forest degradation, and role of conservation, sustainable management of forests and enhancement of forest carbon stocks
SFDs	:	State Forest Departments
SIS	:	Safeguard Information System
SMART	:	Specific, Measurable, Achievable, Realistic, Time-bound
SRAP	:	State REDD+ Action Plan
S&T	:	Science and Technology
UNFCCC	:	United Nations Framework Convention on Climate Change
UT	:	Union Territory
WG	:	Working Group



GLOSSARY

Cancun Agreements	The Cancun Agreements are a set of significant decisions agreed by Country Parties in the sixteenth session of the Conference of Parties to the UNFCCC at Cancun, Mexico in 2010, which includes a comprehensive package of decisions on core issues like finance, technology and capacity building to help developing nations by taking concrete actions to build sustainable future by arresting the greenhouse gas emissions and resist the negative impacts of climate change.
Carbon Stock	Carbon stock is the amount of carbon that has been sequestered from the atmosphere and is now stored within the forest ecosystem, mainly in living biomass, soil, dead wood and litter.
Conference of Parties	Conference of Parties (COP) is the supreme decision making body of the United Nations Framework Convention on Climate Change (UNFCCC) and it review the implementation of the convention and any legal instruments that the COP adopts and take decisions necessary to promote the effective implementation of the convention.
Deforestation	The conversion of forest land into non-forest land.
Forest Cover	Forest cover is an area of more than 1 ha in extent and having tree canopy density of 10 per cent and above.
Forest Degradation	Reduction in the tree cover and forest biodiversity mainly due to anthropogenic causes.
Forest Reference Level	Forest Reference Level (FRL) is a benchmark for emissions from deforestation and forest degradation, and removals from sustainable management of forests and enhancement of forest carbon stocks.
Greenhouse Gases System	Greenhouse Gases have the property of absorbing infrared radiation emitted from the earth's surface and re-radiating it back to earth, thus contributing to the greenhouse effect. Six major greenhouse gases are carbon dioxide, methane, hydrofluorocarbons, perfluorocarbons, nitrous oxide, and sulphur hexafluoride.
Geographic Information	Geographic Information System (GIS) is a computer-based system for capturing, storing, manipulating, analyzing and displaying data, which are spatially referenced to the earth.
Intervention Package	Intervention Package is a combination of strategies or activities planned for addressing the drivers of deforestation and forest degradation, and barriers for enhancement of forest carbon stocks.



Map	A diagrammatic representation of an area of land or sea showing physical features, cities, roads, etc.
Moderately Dense Forest	All lands with forest cover having a canopy density between 40-70%.
Measurement, Reporting and Verification (MRV)	<p>Measurement applies both to efforts to address climate change and to the impacts of these efforts, including the level of GHG emissions by sources and removals by sinks, emission reductions and other co-benefits.</p> <p>Reporting is implemented through the national communications and biennial update reports (BURs). Parties are required to report on their actions to address climate change in their national communications.</p> <p>Verification is addressed at the international level through international consultation and analysis of BURs, which is a process to increase the transparency of mitigation actions and their effects, and support needed and received.</p>
Nationally Determined Contribution	Nationally Determined Contribution (NDC) is the commitment by each country to reduce its national emissions of GHG and adapt to the impacts of changing climate including efforts to reduce deforestation and forest degradation under the Paris Agreement. NDC is climate plans of each country highlighting climate related targets, policies and measures to implement and contribute in global climate action plan.
Open Forest	Lands with forest cover having a canopy density between 10-40%.
Paris Agreement	The Paris Agreement entered into force on 4 November 2016 and it aims to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels. The agreement also aims to strengthen the ability of countries to deal with the impacts of climate change. The Paris Agreement requires all Parties to put forward their best efforts through their nationally determined contributions.
REDD	Reducing emissions from deforestation and forest degradation in developing countries.
REDD+	Reducing emissions from deforestation and degradation and the role of conservation, sustainable management of forests and enhancement of carbon stocks in developing countries, is a mechanism developed by the Parties to UNFCCC. It creates financial value for the carbon stored in forests by offering incentives for developing countries to reduce emissions from forests.



Results-based Payment	Result-based payments are the final phase in REDD+ that provides financial incentives to developing countries for results-based actions which should be fully measured, reported and verified (MRV).
Safeguards	Safeguards are measures to protect or to avoid risks while promoting REDD+ activities. A system for providing information on how the safeguards are being addressed and respected is one of the elements to be developed by developing country parties implementing REDD+ activities.
Spatial Analysis	It is a type of geographical analysis with space and time in which the results are derived by computer processing which are later explored and examined.
Theory of Change	It is a complete description along with the pictorial representation of how and why the necessary desired changes are expected to take place in a particular context. It starts with identifying the long term goals and then work in an inverse manner to realise all the outcomes and challenges that must be in place to achieve the goals.
United Nations Framework Convention on Climate Change	The United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1992 and entered into force on 21 March 1994. This convention has been ratified by 197 countries. The objective of the convention is to stabilize greenhouse gas concentrations at the level that would prevent dangerous anthropogenic interference with the climate system.
Very Dense Forest	Lands with forest cover having a canopy density of 70% and above.
Warsaw Framework	The Warsaw Framework for REDD+ includes seven decisions and builds on the Cancun Agreement on REDD+. Adopted at the 19th meeting of the Conference of Parties (COP) to UNFCCC in Warsaw, Poland in November 2013. The Framework addresses results-based finance for REDD+ and also includes decisions on national forest monitoring system, safeguards, forest reference emission level, measuring, reporting and verification, and the drivers of deforestation and forest degradation.



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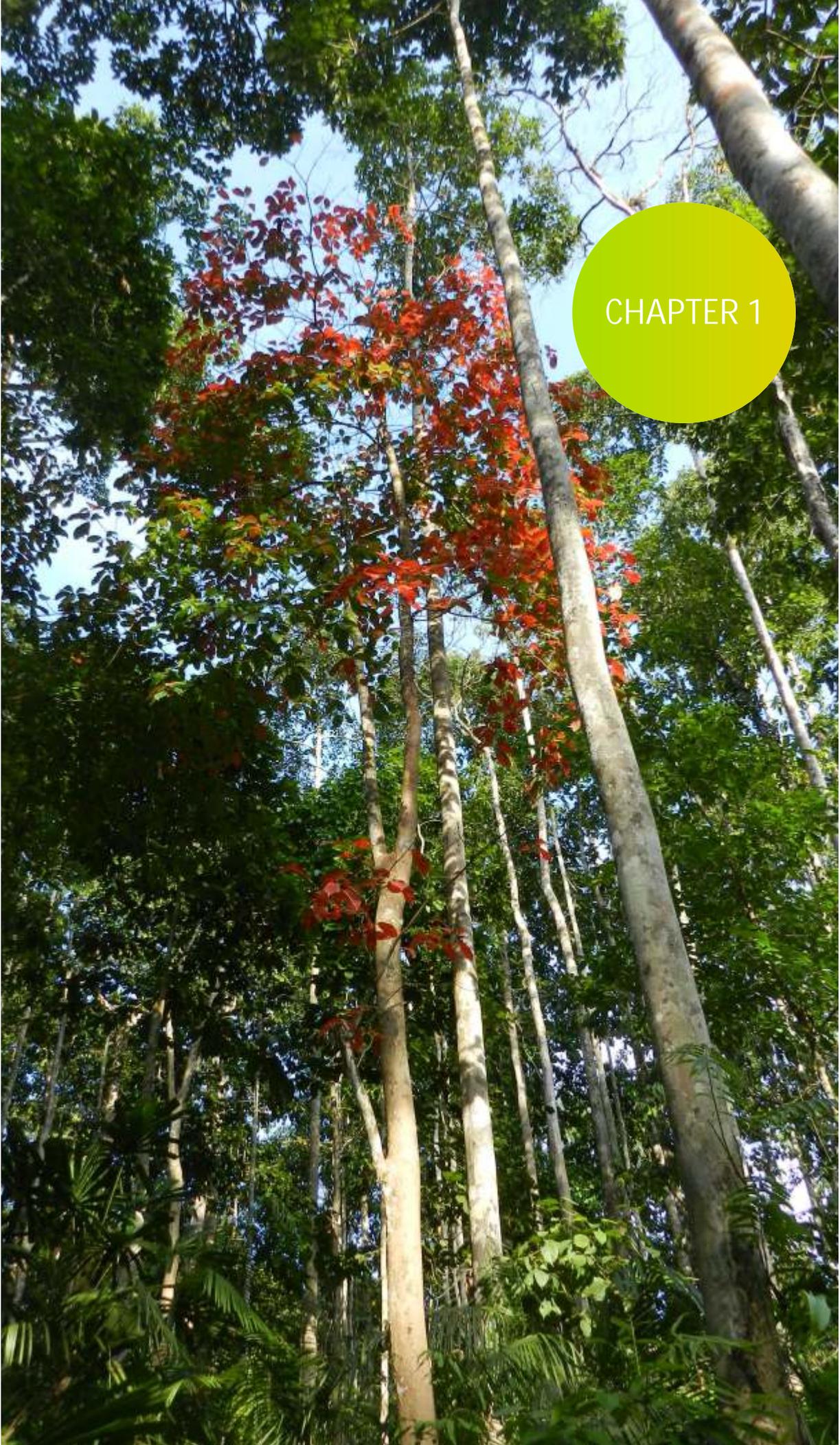
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CHAPTER 1



INTRODUCTION

Forests play a significant role in climate change mitigation and adaptation as they are sink and source of carbon. As per the Global Forest Assessment Report, the world's forests store about 296 Gt of carbon (FAO, 2015). Anthropogenic pressure on forests has led to deforestation and forest degradation thereby leading to emission of greenhouse gas (GHG). IPCC (2019) estimated that about 23% of total anthropogenic GHG emissions have been derived from agriculture, forestry and other land-use activities (AFOLU) from 2007 to 2016. GHG emissions from deforestation and forest degradation are reported to be 11% of the total emission from AFOLU activities (IPCC, 2019). Thus, there is a need for restoration of degraded forest land, conservation of forests and sustainable management of forests which will not only reduce GHG emissions but will also combat issues of forest land degradation and desertification. Policy approaches aiming towards the reduction in deforestation and forest degradation can reduce the emission from forests. Sustainable management of forests has enormous potential to enhance the carbon capture and storage capacity of forests.

India is a developing country known for its diverse forest ecosystems and mega biodiversity. It ranks 10th amongst the most forested nations of the world with 24.56% of its geographical area under forest and tree cover. According to the World Bank (2006), forestry in India is considered as the second major land-use after agriculture, with most of the rural communities living in forest fringe areas depending on forest resources for their livelihood and sustenance. About 200,000 villages are classified as forest fringe villages.

As per India State of Forest Report 2019, the total forest cover of the country is 7,12,249 km² which is 21.67% of the geographical area of the country. The tree cover of the country is estimated to be 95,027 km² which is 2.89% of the country's geographical area. The total forest and tree cover of the country is 8,07,276 km². Table 1 gives the forest and tree cover of India. State and Union Territory wise status of forest and tree cover is given in Table 2.

Table 1: Forest and Tree Cover of India

Class	Area (km ²)	Percentage of Geographical Area
Forest Cover		
Very Dense Forest	99,278	3.02
Moderately Dense Forest	3,08,472	9.38
Open Forest	3,04,499	9.26
Total Forest Cover	7,12,249	21.67
Tree Cover	95,027	2.89
Total Forest and Tree Cover	8,07,276	24.56
Scrub	46,297	1.41
Non-Forest	25,28,923	76.92
Total Geographic Area	32,87,469	100.00

(Source: FSI, 2019)

Table 2: Forest and Tree Cover in States and Union Territories

S. No.	States/ Union Territories	Geographical Area (km ²)	Total Forest Cover (km ²)	% of Geographical Area	Tree Cover (km ²)	% of Geographical Area
1	Andhra Pradesh	1,62,968	29,137	17.88	3,914	2.40
2	Arunachal Pradesh	83,743	66,688	79.63	848	1.01
3	Assam	78,438	28,327	36.11	1,408	1.81
4	Bihar	94,163	7,306	7.76	2,003	2.13
5	Chhattisgarh	1,35,192	55,611	41.13	4,248	3.14
6	Delhi	1,483	195.44	13.18	129	8.73
7	Goa	3,702	2,237	60.43	272	7.34
8	Gujarat	1,96,244	14,857	7.57	6,912	3.52
9	Haryana	44,212	1,602	3.62	1,565	3.54
10	Himachal Pradesh	55,673	15,434	27.72	829	1.49
11	Jharkhand	79,716	23,611	29.62	2,657	3.33
12	Karnataka	1,91,791	38,575	20.11	6,257	3.26
13	Kerala	38,852	21,144	54.42	2,936	7.56

14	Madhya Pradesh	3,08,252	77,482	25.14	8,339	2.71
15	Maharashtra	3,07,713	50,778	16.50	10,806	3.51
16	Manipur	22,327	16,847	75.46	173	0.77
17	Meghalaya	22,429	17,119	76.33	710	3.17
18	Mizoram	21,081	18,006	85.41	441	2.09
19	Nagaland	16,579	12,486	75.31	362	2.19
20	Odisha	1,55,707	51,619	33.15	4,648	2.98
21	Punjab	50,362	1,849	3.67	1,592	3.16
22	Rajasthan	3,42,239	16,630	4.86	8,112	2.37
23	Sikkim	7,096	3,342	47.10	36	0.51
24	Tamil Nadu	1,30,060	26,364	20.27	4,830	3.71
25	Telangana	1,12,077	20,582	18.36	2,514	2.24
26	Tripura	10,486	7,726	73.68	231	2.20
27	Uttar Pradesh	2,40,928	14,806	6.15	7,342	3.05
28	Uttarakhand	53,483	24,303	45.44	841	1.57
29	West Bengal	88,752	16,902	19.04	2,006	2.26
30	A&N Islands	8,249	6,743	81.74	41	0.50
31	Chandigarh	114	22.03	19.32	25	22.34
32	Dadra & Nagar Haveli	491	207	42.16	28	5.75
33	Daman & Diu	111	20.49	18.46	5	4.87
34	Jammu & Kashmir	53258	21122	39.66	7944*	3.57*
35	Ladakh	169421	2490	1.47		
36	Lakshadweep	30	27.10	90.33	0.29	0.97
37	Puducherry	490	52.41	10.70	23	4.66
	Total	32,87,469	7,12,249	21.67	95,027	2.89

*Combined values of Tree Cover for UTs of J&K and Ladakh

(Source: FSI, 2019)

Growing stock is considered as one of the most significant parameter to measure the forest productivity. It forms the basis of estimating forest biomass and carbon stocks. As per India State of Forest Report 2019, the total growing stock of wood in the country is 5,915.76 m³ which comprises 4,273.47 m³ inside forest areas and 1,642.29 m³ outside recorded forest areas (FSI, 2019). State and Union Territory wise growing stock and forest carbon stocks are given in Table 3.

Table 3: State and Union Territory wise total growing stocks and total forest carbon stocks

S. No.	States/UTs	Total Growing Stock (m ³)	Above Ground Biomass	Forest Carbon Stocks ('000 tonne)				Total
				Below Ground Biomass	Dead Wood	Litter	Soil Organic Carbon	
1	Andhra Pradesh	186.70	60,972 (20.93)	24,206 (8.31)	629 (0.22)	3,074 (1.05)	1,30,347 (44.84)	2,19,528 (75.34)
2	Arunachal Pradesh	533.08	3,30,856 (49.61)	1,00,379 (15.05)	7,816 (1.17)	15,436 (2.31)	5,96,836 (89.50)	10,51,323 (157.65)
3	Assam	138.36	85,844 (30.30)	21,148 (7.47)	1,102 (0.39)	7,223 (2.55)	1,54,832 (54.66)	2,70,149 (95.37)
4	Bihar	67.19	15,007 (20.54)	5,428 (7.43)	127 (1.02)	746 (1.02)	33,931 (46.44)	55,239 (75.61)
5	Chhattisgarh	458.88	1,45,912 (26.24)	46,908 (8.43)	1,858 (0.33)	9,969 (1.79)	2,75,603 (49.56)	4,80,250 (86.36)
6	Delhi	2.23	277 (14.19)	98 (5.03)	2 (0.11)	21 (1.06)	838 (42.86)	1,236 (63.26)
7	Goa	15.19	9,010 (40.27)	2,617 (11.70)	172 (0.77)	665 (2.97)	12,874 (57.54)	25,338 (113.24)
8	Gujarat	130.91	27,737 (18.67)	9,636 (6.49)	315 (0.21)	1,556 (1.05)	68,003 (45.77)	1,07,247 (72.18)
9	Haryana	21.78	2,455 (15.32)	929 (5.80)	18 (0.11)	137 (0.86)	6,927 (43.23)	10,466 (65.31)
10	Himachal Pradesh	372.26	1,10,045 (71.30)	30,745 (19.92)	2,559 (1.66)	2,711 (1.76)	1,06,300 (68.87)	2,52,360 (163.51)
11	Jharkhand	168.15	48,994 (20.75)	19,899 (8.43)	423 (0.18)	2,826 (1.20)	1,05,870 (44.84)	1,78,012 (75.39)
12	Karnataka	437.11	1,28,882 (33.41)	38,742 (10.04)	1,993 (0.52)	8,931 (2.32)	2,05,215 (53.20)	3,83,763 (99.49)
13	Kerala	202.36	67,979 (32.15)	19,070 (9.02)	1,017 (0.48)	5,001 (2.36)	1,19,889 (56.70)	2,12,956 (100.72)
14	Madhya Pradesh	449.01	1,65,067 (21.30)	64,630 (8.34)	1,535 (0.20)	8,156 (1.05)	3,49,339 (45.09)	5,88,727 (75.98)
15	Maharashtra	408.88	1,31,249 (25.85)	40,380 (7.95)	1,586 (0.31)	10,687 (2.10)	2,56,606 (50.53)	4,40,508 (86.75)
16	Manipur	48.10	44,723 (26.55)	13,317 (7.90)	508 (0.30)	3,924 (2.33)	1,16,251 (69.00)	1,78,723 (106.08)
17	Meghalaya	50.12	52,302 (30.55)	14,963 (8.74)	731 (0.43)	4,328 (2.53)	1,08,642 (63.46)	1,80,966 (105.71)
18	Mizoram	65.41	44,973 (24.98)	9,925 (5.51)	451 (0.25)	4,516 (2.51)	96,689 (53.70)	1,56,554 (86.95)

19	Nagaland	43.24	35,850 (28.71)	9,612 (7.70)	522 (0.42)	2,897 (2.32)	86,646 (69.39)	1,35,527 (108.54)
20	Odisha	394.06	1,26,656 (24.54)	39,066 (7.57)	1,647 (0.32)	9,062 (1.76)	2,55,857 (49.57)	4,32,288 (83.75)
21	Punjab	29.68	3,529 (19.09)	1,367 (7.40)	25 (0.14)	125 (0.67)	8,298 (44.89)	13,344 (72.18)
22	Rajasthan	113.46	26,155 (15.73)	10,865 (6.53)	191 (0.12)	928 (0.56)	70,224 (42.23)	1,08,363 (65.17)
23	Sikkim	37.26	17,645 (52.78)	5,372 (16.07)	505 (1.51)	664 (1.99)	32,994 (98.69)	57,180 (171.04)
24	Tamil Nadu	173.27	62,092 (23.55)	21,433 (8.13)	776 (0.29)	4,107 (1.56)	1,28,374 (48.69)	2,16,782 (82.23)
25	Telangana	122.41	41,389 (20.11)	17,227 (8.37)	333 (0.16)	2,031 (0.99)	90,862 (44.15)	1,51,842 (73.77)
26	Tripura	26.50	25,061 (32.44)	5,513 (7.14)	297 (0.38)	2,169 (2.81)	43,017 (55.68)	76,057 (98.44)
27	Uttar Pradesh	193.66	32,498 (21.95)	10,374 (7.01)	372 (0.25)	1,893 (1.28)	70,553 (47.65)	1,15,690 (78.14)
28	Uttarakhand	425.21	1,52,540 (62.77)	40,975 (16.86)	2,948 (1.21)	4,904 (2.02)	1,69,545 (69.76)	3,70,912 (152.62)
29	West Bengal	87.50	40,388 (23.90)	12,193 (7.21)	447 (0.26)	2,533 (1.50)	92,144 (54.52)	1,47,705 (87.39)
30	A&N Islands	93.57	49,468 (73.36)	15,823 (23.47)	1,116 (1.66)	2,912 (4.32)	43,347 (64.29)	1,12,666 (167.09)
31	Chandigarh	0.79	57 (25.91)	18 (8.10)	0.46 (0.21)	3 (1.58)	111 (50.28)	189 (86.08)
32	Dadra & Nagar Haveli	1.90	500 (24.14)	113 (5.47)	7 (0.35)	47 (2.25)	1,133 (54.70)	1,800 (86.91)
33	Daman & Diu	0.24	35 (17.23)	10 (4.91)	0.27 (0.13)	2 (1.21)	105 (51.15)	152 (74.64)
34	Jammu & Kashmir*	416.77	1,70,222 (72.09)	47,806 (20.25)	3,813 (1.62)	3,706 (1.57)	1,64,648 (69.73)	3,90,195 (165.25)
35	Lakshadweep	0.07	67 (24.73)	15 (5.42)	0.47 (0.17)	5 (1.77)	149 (54.89)	236 (86.98)
36	Puducherry	0.45	97 (18.54)	22 (4.22)	0.63 (0.12)	7 (1.42)	276 (52.57)	403 (76.87)
	Total	5,915.76	22,56,533 (31.68)	7,00,824 (9.84)	35,842 (0.50)	1,27,902 (1.80)	40,03,575 (56.21)	71,24,676 (100.03)

*Combined values for UTs of J&K and Ladakh

(value in parenthesis is carbon stocks in tonnes per ha)

(Source: FSI, 2019)



1.1 FORESTS AND CLIMATE CHANGE

Climate change is predicted to alter existing biome types, cause forest dieback, and biodiversity loss. Forests, like other ecosystems, are affected by climate change. Climate change is significantly affecting forests through changes in their physiology, structure, species composition and health, largely due to changes in temperature and rainfall. The impacts of climate change may be negative in some areas, and positive in others. However, forests also influence climate and the climate change process mainly by affecting the changes in the quantum of carbon dioxide in the atmosphere. Forests absorb CO₂ from the atmosphere, and store carbon in wood, leaves, litter, roots and soil thereby by acting as carbon sinks. Carbon is released back into the atmosphere when forests are cleared or burned. Forests by acting as carbon sinks are considered to mitigate global climate change. Overall, the world's forest ecosystems are estimated to store more carbon than the entire atmospheric carbon dioxide (FAO, 2006).

Forests play a vital role in the social, cultural, historical, economic and industrial development of the country as well as in maintaining its ecological balance. They are the resource base for sustenance of its population and a storehouse of biodiversity. Forests are vitally important for maintaining and regulating hydrological cycles. Almost all water ultimately comes from forestlands, forest-rivers, lakes, wetlands and forest-derived water tables. Agriculture and animal husbandry are dependent on forests and forestlands. Forests also play a major role in the adaptation and mitigation of climate change. It is important to assess the likely impacts of projected climate change on forests and develop and implement mitigation and adaptation strategies.

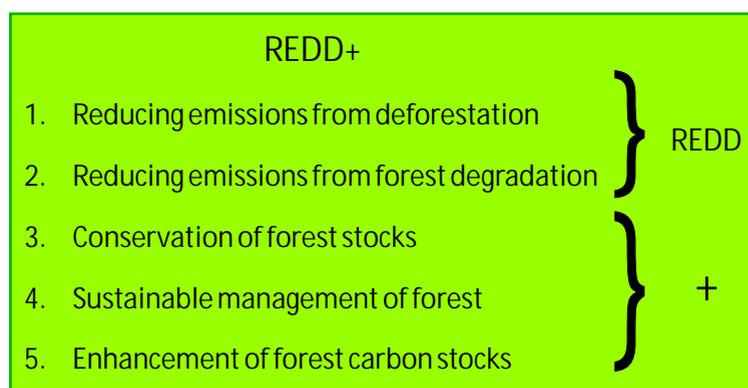
United Nations Framework Convention on Climate Change (UNFCCC) recognizes the role of forests as an effective measure to mitigate climate change. As per the guidelines provided by UNFCCC, land-use change and forestry measures such as conserving existing forest cover, developing commercial plantations, agroforestry, preventing and controlling forest fires, controlling diseases and pests, creating woodland, converting low productivity lands into grasslands etc. should be done by developing countries to combat climate change.

The Paris Agreement recognizes the central role of forests in achieving the goal of keeping temperatures well below 2°C through mitigation options that aim to reduce emissions from deforestation and forest degradation. India's Nationally Determined Contribution (NDC) Goal for the forestry sector is to create an additional carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent through additional forest and tree cover by 2030. It provides an opportunity for widespread greening of the country and also achieving the National Forest Policy target of 33% forest and tree cover. Implementation of REDD+ activities has been identified as one of the tools to meet NDC goal of the forestry sector.

1.2 REDD+ MECHANISM

The Conference of Parties (COP) of UNFCCC agreed that Parties should collectively aim to slow, halt and reverse forest cover and carbon loss. Accordingly, the concept of reducing emissions from deforestation and forest degradation in developing countries (REDD) was introduced under UNFCCC in the year 2005.

India proposed a policy approach named compensated conservation to compensate the countries for conservation and enhancement of their forest cover. India's concern was recognized in COP 13 of UNFCCC and incorporated in Bali Action Plan as *"Policy approaches and positive incentives on issues relating to reducing emissions from*



deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries". After inclusion of the role of conservation, sustainable management of forests and enhancement of forest carbon stocks, the concept of REDD became REDD+ as one of climate change mitigation actions in the forest sector (UNFCCC, 2007).

Cancun Agreements on REDD+ *"encourages developing country Parties to contribute to mitigation actions in the forest sector by undertaking the activities (reducing emissions from deforestation, reducing emissions from forest degradation, conservation of forest carbon stocks, sustainable management of forest and enhancement of forest carbon stocks) as deemed appropriate by each country Party and in accordance with their respective capabilities and national circumstances".* Cancun Agreements further requests the developing country Parties aiming to undertake REDD+ activities to develop national strategy or action plan, national forest reference emission level and/or forest reference level, national forest monitoring system and safeguards information system (UNFCCC, 2010).

Warsaw Framework for REDD+ stated that results-based finance be provided to developing country Parties for the full implementation of REDD+ activities from a variety of sources, public and private, bilateral and multilateral, including Green Climate Fund and alternative sources (UNFCCC, 2013). Paris Agreement recognized the role of forests as carbon sink for mitigation of climate change, and its Article 5 highlighted that *"Parties should take action to conserve and enhance sinks and reservoirs of greenhouse gases including forests. Parties are encouraged to take action to implement and support, including through results-based payments, the existing framework as set out in related guidance and decisions already agreed under the Convention for policy approaches and positive incentives for REDD+ activities".*

1.3 PHASES OF REDD+ IMPLEMENTATION

REDD+ activities can be implemented in three phases such as development of the national strategies or action plans, implementation of national strategies or action plans that could involve further capacity-building, technology development and transfer and results-based demonstration activities. UNFCCC sets out a three-phased approach for the implementation of REDD+ activities in a developing country:

PHASE 1

Readiness: It relates to the efforts that a country is carrying out to develop the capacities which are needed to implement REDD+. The countries design national strategies and action plans with relevant stakeholders, build capacity for REDD+ implementation, work on policies and measures for REDD+ implementation and design demonstration activities.

PHASE 2

Implementation: National strategies and action plans which are proposed in Phase 1 are implemented and tested. This phase may include results-based demonstration activities and require additional capacity building, technology development and transfer. Sub-national demonstration activities on an interim basis are allowed as countries scale up to national implementation.

PHASE 3

Results-based Actions: Results-based REDD+ actions are implemented at the national level and results are fully measured, reported and verified (MRV).

India is under the readiness phase of REDD+ implementation and has developed its National REDD+ Strategy and Forest Reference Level in 2018. Now, India is in the process of development of National Forest Monitoring System and Safeguards Information System for implementation of REDD+ Activities.

1.4 NATIONAL REDD+ STRATEGY

Preparation of the National REDD+ Strategy is one of the mandatory requirements for implementation of REDD+ activities. Objective of the National REDD+ Strategy 2018 is to facilitate the implementation of REDD+ programme in the country in conformity with relevant decisions of UNFCCC. The strategy focuses on creation of trained human resource capable of carrying out forest-related measurements at all levels of REDD+ implementation. The National REDD+ Strategy addresses a road map for addressing drivers of deforestation and forest degradation. India's National REDD+ Strategy proposes to establish a National Governing Council for REDD+ to coordinate and guide REDD+ related actions at the national level. A National Designated Entity for REDD+ shall also be established at the Ministry of Environment, Forest and Climate Change, Government of India to liaise with UNFCCC and states. The strategy devolves major responsibility for the execution of REDD+ activities on the State Forest Departments. Each state has to create a REDD+ Cell in the State Forest Departments and will be encouraged to prepare their State REDD+ Action Plans (MoEFCC, 2018).

The constitution and terms of reference of the State REDD+ Cell as per India's National REDD+ Strategy 2018 are given below:

Table 4: Constitution of State REDD+ Cell

• Principal Chief Conservator of Forests & Head of Forest Force	Chair
• Principal Chief Conservator of Forests (Planning/Budget)	Member
• PCCF/APCCF (nominated by Chairman)	Member
• APCCF/CCF (Monitoring)	Member
• Regional APCCF, MoEFCC or his representative	Member
• Two REDD+ Experts (Nominated by Chair)	Member
• Representative of prominent NGO	Member
• APCCF/CCF/CF (In-charge of Afforestation)	Nodal Officer

Terms of Reference of the State REDD+ Cell:

- a. Facilitate the implementation of National REDD+ Strategy in the State
- b. Preparation of State REDD+ action plan, sub-national/State level reference emission level/ reference level, forest monitoring system and Safeguard Information System (SIS)
- c. To oversee REDD+ preparation and implementation by JFMCs, Community Forestry Groups, Van Panchayats/ Village Forest Protection Committees
- d. Development of State REDD+ Learning/ Knowledge Sharing Platform for exchange and sharing of knowledge
- e. Explore the possibilities of REDD+ financing, development of REDD+ projects and facilitate REDD+ benefit sharing mechanism
- f. Arrange technical and institutional supports for implementation of REDD+
- g. Monitoring of REDD+ implementation in the state
- h. To approve and submit the plans and projects for REDD+ implementation to the NDE-REDD+, Government of India for financial support
- i. To organize training and capacity building seminars and workshops for the officials of the State Forest Department and village level institutions
- j. To institutionalize data collection and management, and adherence to safeguards
- k. To devise mechanisms to absorb lessons from pilots, as an input to the national and international policy processes and development
- l. REDD+ Cell will meet once in three months

1.5 STATE REDD+ ACTION PLAN AND ITS NEED

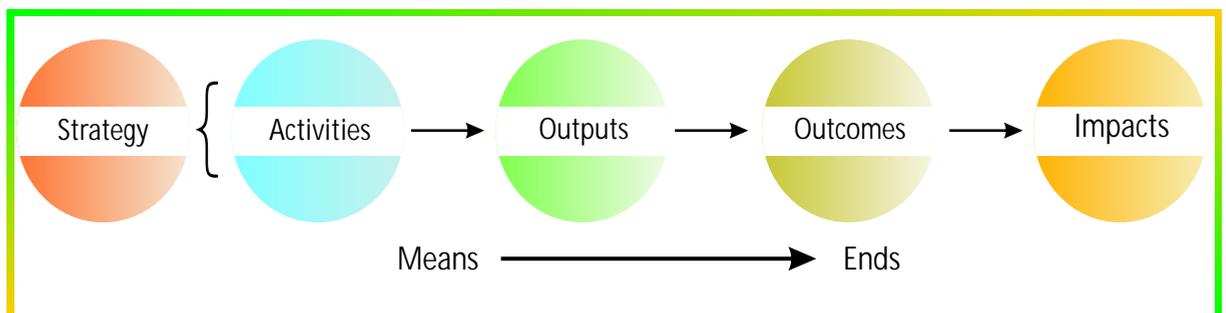
UNFCCC decision on REDD+ says that REDD+ activities can be implemented at sub-national level as an interim measure. National REDD+ Strategy 2018 also advocates the preparation of State REDD+ Action Plan (SRAP) for implementation of the Strategy at state level. India is a vast country with wide climatic variability and the drivers of deforestation and forest degradation vary from state to state. Hence, state-specific action plan on REDD+ will be helpful in identification as well as addressing the drivers of deforestation and forest degradation as well as barriers for enhancement of forest carbon stocks specific to the state. National REDD+ Strategy can be implemented at the state level through SRAP which is in accordance with UNFCCC decisions on REDD+.

1.6 THEORY OF CHANGE - FOUNDATION OF STATE REDD+ ACTION PLAN

Theory of change is a practice that helps to build a link between what to be achieved and how to be achieved. It brings challenges to think about the elements responsible for making change. It requires the underlying assumptions to make it in a holistic and realistic approach. This will bring the change successfully and will improve its adaptive capacity. It supports the wider arena of learning and brings innovative results while addressing the complexity of the situation. It needs logical thinking to understand the change dynamics and set short term and long-term goals to achieve the desired results.

Theory of Change involves strategic thinking and action to account for complex situations and unplanned activities to help work in cause and effect assumptions and analysis. It plays a strong emphasis on group discussion involving relevant stakeholders with a new level of performance, learning, accountability and efficiency, comprehensible visualisation representation involving problem and solution trees, spatially and temporally analysed maps. It is explained in Figure 1.

Theory of Change is integral to a robust planning design to bring interventions. It helps in monitoring information and learning framework including indicators and in scaling up. Moreover, the feedback loop in theory of change supports in timely evaluation which helps to reconstruct the predefined designed steps, necessary for achievement of the results. It is a powerful tool that brings a comprehensive description and illustration to take action for a desired outcome.



(Source: Richards *et al.*, 2017)

Figure 1: Establishing causal linkages with theory of change analysis

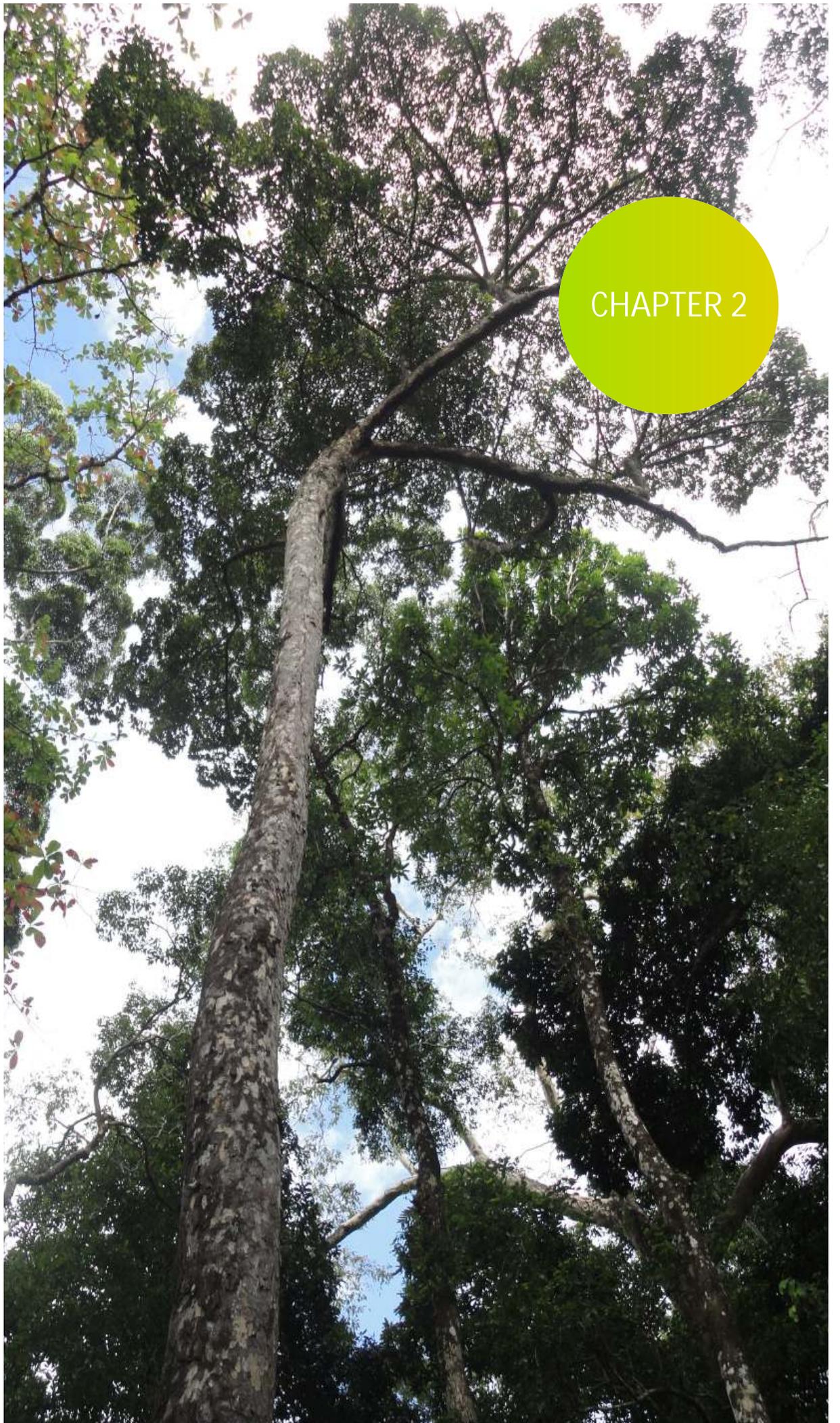
Process for developing State REDD+ Action Plan is based on the theory of change and working processes of theory of change in SRAP can be described as following:

1. Describe/identify the 'problem' that needs to be addressed including main causes and barriers.
2. Define who are the target groups of people that the SRAP is designed to engage and benefit.
3. Describe the specific activities and the level of participation of state departments/ organizations in the SRAP that are needed to achieve desired outputs.
4. State 2-3 or more measurable outcomes the SRAP aims to achieve.
5. Create a specific statement that describes the outcomes that will result from SRAP.

1.7 DEVELOPMENT OF STATE REDD+ ACTION PLAN

The resource manual for developing State REDD+ Action Plan is a guiding/ procedural document for the State Forest Departments for their planning processes for developing the State REDD+ Action Plan. International Centre for Integrated Mountain Development (ICIMOD) has developed a manual on 'Developing Sub-national REDD+ Action Plans: A Manual for Facilitators' under its REDD+ initiative (Richards *et al.*, 2017). ICFRE in collaboration with ICIMOD has developed State REDD+ Action Plans for the states of Mizoram and Uttarakhand by following the guidelines given in the aforesaid manual under REDD+ Himalaya Project. Biodiversity and Climate Change Division of ICFRE is implementing a project component on Capacity Building of State Forest Departments for Developing State REDD+ Action Plans of CAMPA funded ICFRE scheme titled 'Strengthening Forestry Research for Ecological Sustainability and Productivity Enhancement'. A manual for developing the State REDD+ Action Plan (SRAP) is required for building the capacity of State Forest Departments.





CHAPTER 2

STAGES FOR DEVELOPING STATE REDD+ ACTION PLAN

The resource manual focuses on the planning and designing of SRAP. The overall SRAP process covers mainly five stages viz preparation, analysis, planning, monitoring and budgeting (Figure 2). The first step i.e. 'Preparation' is purely institutional but the second step i.e. 'Analysis' involves multi-stakeholder consultation workshops i.e. 'Problem Analysis Workshop' and 'Solution Analysis Workshop' with a defined number of participants (approx 20-30 members). The rest of the three stages i.e. planning, monitoring and budgeting usually involve the core team (approx 10-20 members) for developing a SRAP. The detailed proposed steps for the preparation of SRAP are given in Annex 1 in the form of stages, steps, sub-steps and respective outputs.

Figure 3 shows the relation between five SRAP processes to the Multi-stakeholder Workshops (SW) as well as Expert Group Workshops (EW) in an outlined manner. Stakeholders from Forest Department, Agriculture Department, Horticulture Department, Animal Husbandry Department, Rural Development Department, Public Works Department, State Planning Department, Town and Country Planning Department, State Biodiversity Board, Land Resource, Soil and Water Conservation Department, Renewable Energy Department, Watershed Management Department, State Climate Change Centre/Cell, Disaster Risk Mitigation Centre, Revenue Department, Department of Urban Development, Power and Electricity Department, Commerce, State Remote Sensing Centre, science and technology institutions and academic institutions, forest-based industries, NGOs and local community members of Joint Forest Management Committee etc. should be included for multi-stakeholder consultation workshop for developing SRAP.

Following stakeholders should be included for Expert consultation workshop (EW):

- Officials from Forest Department
- Official from Science and Technology Department
- Officials from Forestry Research Institutions
- Official from Land Resource, Soil and Water Conservation Department
- Officials from Agriculture and Horticulture Departments
- Officials from Rural Development Department
- Officials from Public Works Department
- Officials from State Planning Department
- Officials from forest-based industries
- Officials from NGOs
- Local community members of Joint Forest Management Committee

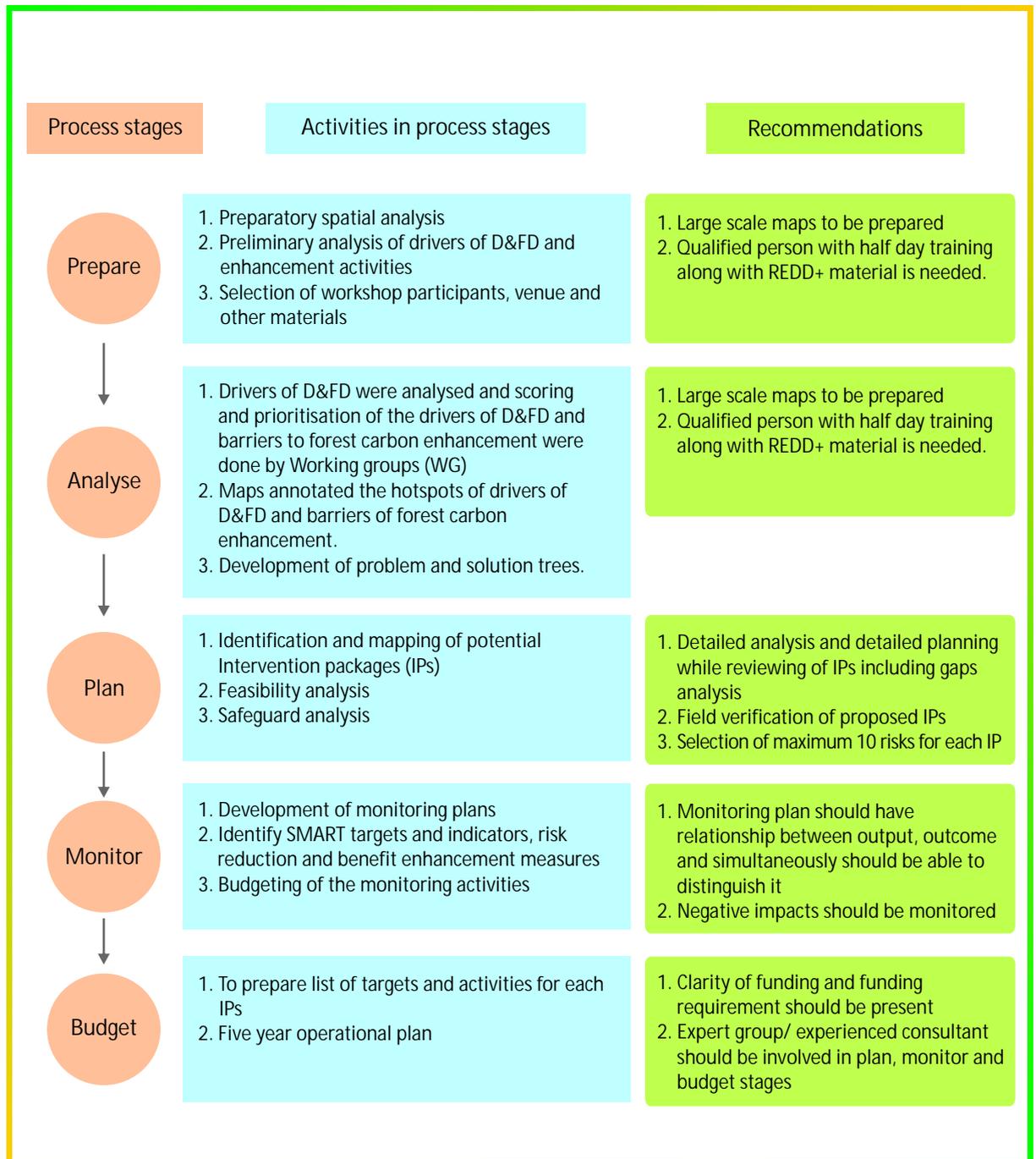


Figure 2: Framework for developing SRAP

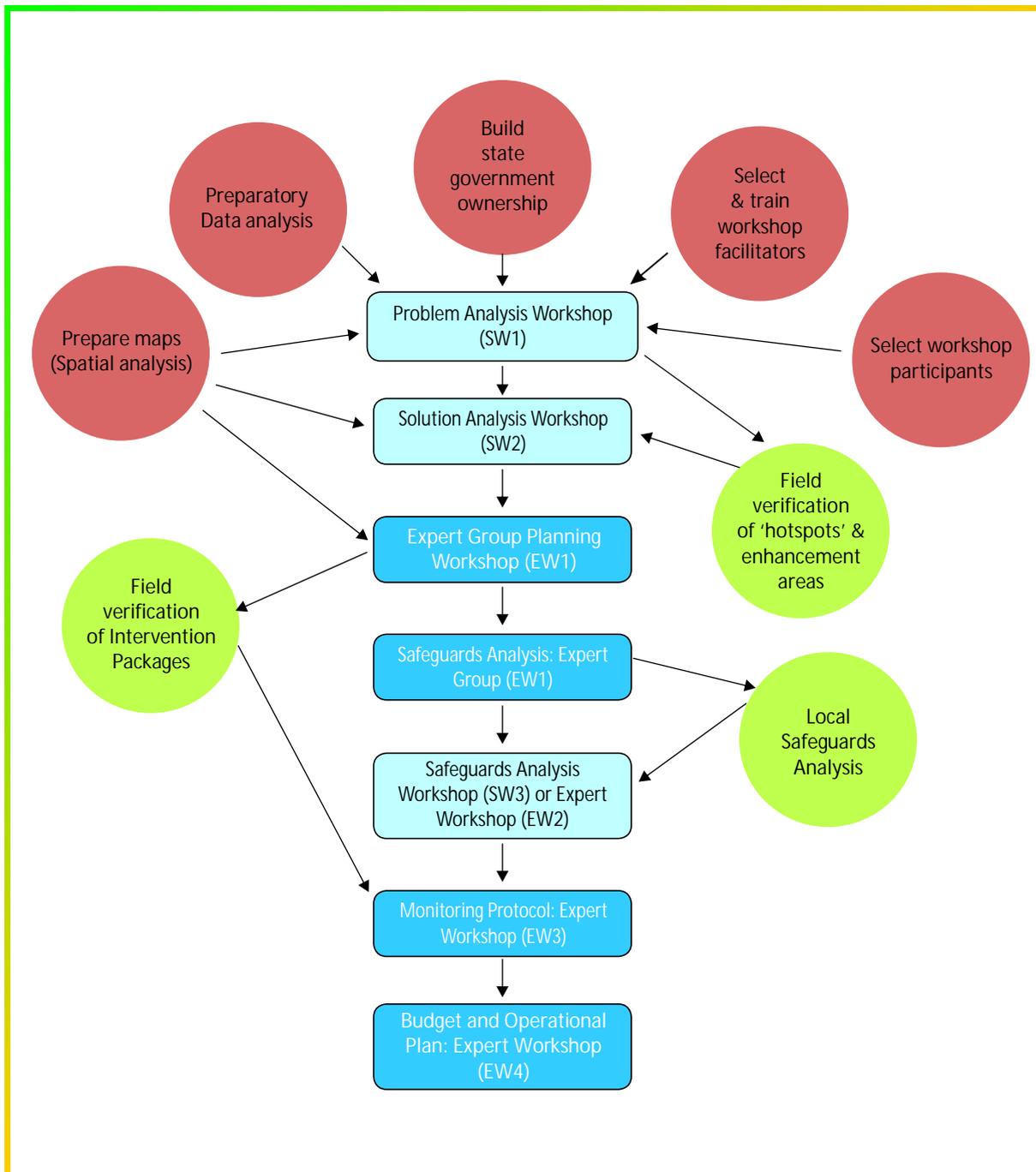
(Source: Richards *et al.*, 2017)

Figure 3: Stages, workshops and Activities in SRAP Process

STAGE A: PREPARATION

STEP A 1

OWNERSHIP AND SRAP CORE TEAM

Ownership of the SRAP process is vital for cross-sectoral collaboration among the departments which will be helpful in the identification of cross-sectoral causes of deforestation and forest degradation. The first step is to clarify who owns and takes responsibility for the SRAP planning process. National REDD+ Strategy 2018 (NRS) entrusts major responsibility for the execution of REDD+ activities and measurement of their performance to the State Forest Departments (SFDs). NRS also specifies the role of SFDs in addressing the drivers of deforestation and forest degradation, capacity building of all levels of SFDs, the line departments, local communities to enable proper implementation of REDD+ activities and accurate assessment and measurement of REDD+ performance. NRS says that State will create a REDD+ Cell in the State Forest Department, and appoint a Nodal Officer to coordinate the activities of State REDD+ Cell, and will be encouraged to develop their State Action Plan for REDD+. Therefore, ownership for SRAP planning process must be with State Forest Departments. Cooperation among the state government departments is needed in the SRAP planning process which will also be helpful in identification of cross-sectoral causes of deforestation and forest degradation, and collection of primary data and maps for spatial analysis.

Another important step for SRAP process will be formation of the SRAP core team which includes relevant 10 to 15 persons from state forest department, agriculture department, horticulture department, animal husbandry department, soil and water conservation department, department of rural development, urban development department, commerce and industries department, revenue department, public works department, power and electricity department, state biodiversity board, disaster mitigation and management centre, state planning department, state climate change centre, watershed management department as well as personnel from science and technology organisations, academic institutions, private sector, NGOs and JFMCs/ local community. Training/ capacity-building of SRAP core team on REDD+ and SRAP process is needed for developing a well planned and well designed State REDD+ Action Plan.

STEP A 2

PREPARATORY DATA COLLECTION AND SPATIAL ANALYSIS

A 2.1 Preparatory Spatial Analysis

Spatial analysis has an important role in the integrated land-use planning and maps have a vital role in the SRAP preparation process. Geographical information system and remote sensing data in the form of fine-scale digitised maps and related statistics are required for getting a clear picture or an idea for preparing better plans/interventions for implementation of REDD+ activities during multi-stakeholder workshops. A considerable amount of GIS and remote sensing data, images and maps are already available with central government agencies such as National Remote Sensing Centre, Forest Survey of India, Space Application



Centre and Indian Institute of Remote Sensing etc., and state government agencies such as State Remote Sensing Application Centre etc. Necessary GIS and remote sensing data/maps of state can be collected from the aforesaid agencies for more informed workshop analysis. It is also suggested to follow a complementary approach by focussing group participation in the planning process by the means of synchronization and assimilation of components in a consistent manner rather than an expert-led planning method.

GIS maps enhance the quality of participation and facilitating discussion among the stakeholders. Inputs from spatial analysis and GIS are required for various stages of SRAP process in order to process and validate the participatory data and analysis. The basic aim of data collection in the form of GIS maps is to assist and correlate the local knowledge of participants about changes in their area so that suitable intervention packages can be devised with better perception. The maps also bring forth validation of areas prioritised as vulnerable areas of deforestation and forest degradation in the future. It is important for SRAP core team to have a GIS capacity, if not, then a GIS expert/technician need to be involved in the core team. GIS expert/ technician will provide necessary support in the preparation of suitable large scale maps for presentation in the workshop and preparation of final maps for SRAP.

Before conducting preparatory spatial analysis at the state level for SRAP process, it is necessary to explore the availability of area-specific GIS maps with national and state level agencies, and also identify the gaps, if any. Maps are useful and help the workshop participants and support preliminary analysis such as change in forest covers and forest areas under deforestation and degradation. Therefore, it is suggested that GIS maps and data should be collected and analysed well in time. Following maps are required for spatial analysis and SRAP process:

- Google earth images for identification of hotspots of deforestation and forest degradation
- Current status of land cover and land use map
- Forest cover change map (5-20 years)
- Current forest cover map
- Political/administrative boundaries map

It is suggested to collect printed maps showing additional information apart from forest cover change or drivers of deforestation and forest degradation such as land use plans, population density, poverty rates, infrastructure development etc. Three dimensional high resolutions Google earth images will help to bring a clear picture of boundaries and areas affected due to deforestation and forest degradation. Hence, it is necessary that the core team should be aware of GIS software and group mapping processes considering present and future aspects so that high potential hotspots for deforestation and forest degradation, and carbon enhancement activities can be demarcated.

During the Problem Analysis Workshop, the participants are supposed to identify the drivers of deforestation and forest degradation (D&FD) and identify areas that are under risk from D&FD and also identify the barriers for carbon enhancement activities. Later, maps showing designated areas will be prepared for SRAP interventions based on this activity.



Planning for using maps in the participatory workshops (Hicks *et al.*, 2016, Richards *et al.*, 2017) include:

- Excessive map layers create confusion and delay results, hence only relevant maps showing forest cover and forest cover change in context to D&FD, must be chosen by the SRAP team, however, additional reserved maps may be used later if asked by participants.
- Extra information on the map adds to confusion rather than understanding the requisite information meant to be delivered.
- Maps should be comprehensive, and patterns, colours and lines should be distinguishable. Also, data classification and colours should be suitable for the participatory work.
- Workshop facilitators must have a clear background and understanding of maps (i.e. preparation, data collection and information shown) before demonstration so that they may answer and guide the participants for further group activities.
- Registration marks ('tic points') should be incorporated in the maps such that after the completion of the workshop, the participatory maps may be put back into the GIS version for preparing the final map for SRAP.
- How to use the maps is completely decided by the SRAP team as maps can be used in variety of ways such as overlaying of transparent maps and moving around the participant's groups; handing out large/small printed maps; allowing participants to annotate large maps, and may also be built during activities or discussions.
- There should be better communication and management between workshop planners and spatial analysis team so that correct maps (for example Figure 4) may be provided when needed.

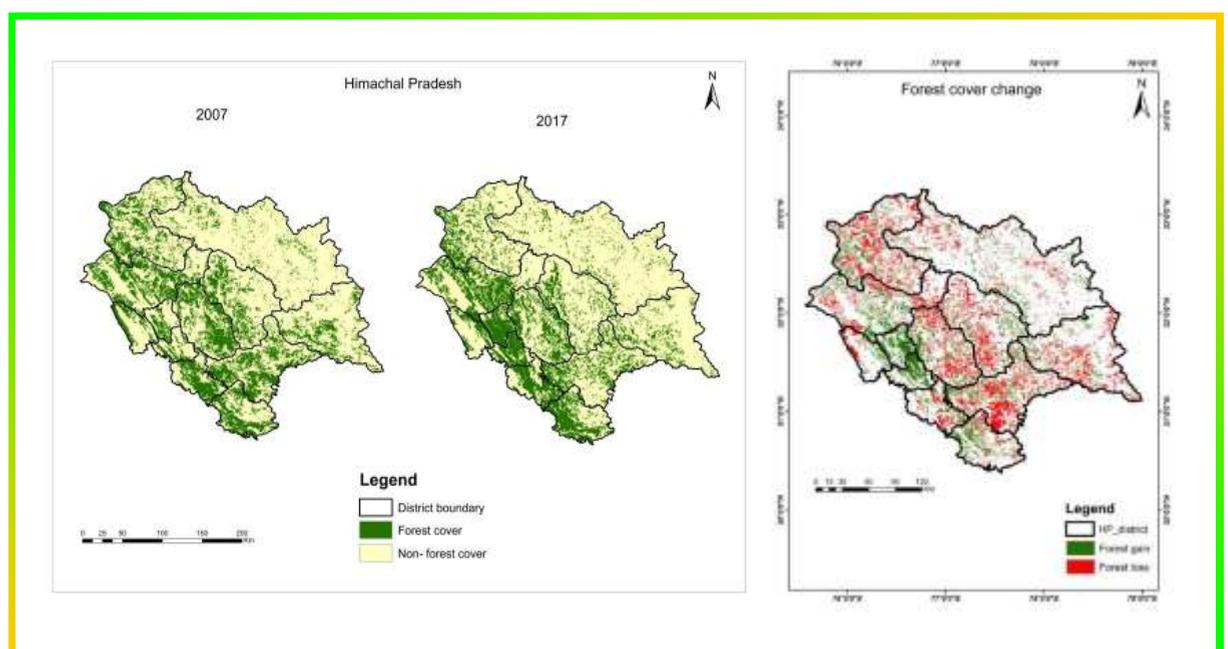


Figure 4: Forest Cover and Forest Cover Change Maps of Himachal Pradesh



A 2.2 Preliminary analysis of D&FD drivers and enhancement activities

A task for compilation and analysis of available information/ data on deforestation and forest degradation as well as information on barriers for up scaling of activities pertaining to enhancement of forest carbon stocks and sustainable management of forests in the state, need to be assigned to a team of two experienced persons. Preliminary analysis of information and data thus collected should be linked to the preparatory spatial analysis and should also be used for presentation in the problem analysis workshop. Drivers of D&FD identified in the National REDD+ Strategy and other state-specific drivers will directly assist in developing problem trees during the SRAP process.

The SRAP team should be aware of ongoing government initiatives/projects which can be brought up during the participant induced activities for better planning of desired outputs from the SRAP workshop to address the drivers of D&FD and promote carbon stocks enhancement activities. The outputs should be presented in three posters which will be made during group activities at Problem Analysis Workshop and later discussions will be made for final identification of drivers amongst the selected ones from the poster. The three posters have to demonstrate relevant information and data on:

- Drivers of Deforestation
- Drivers of Forest Degradation
- Barriers to Forest Carbon Enhancement

The posters should include pictures/maps/tables and figures with large written texts in bullet points. Box 1 represents guidance that can be taken by an expert.

BOX 1

Guidance for collection of preparatory data on drivers of deforestation & forest degradation and barriers of enhancement activities

The expert working with spatial analysis team must:

- Demonstrate maps of different forest types showing changes in land use and forest cover for past 10-20 years, if available.
- Demonstrate the secondary data on driver of deforestation and forest degradation such as infrastructure development, shifting cultivation, mining and forest fire etc.
- Distinguish the stakeholders/actors (e.g. turmeric cultivators, coffee planters, tea planters, palm oil planters, rubber planters etc.) associated with each driver.
- Analyse the future trends of deforestation and forest degradation.
- Collect data on progress and problems as well as on the potential of forest enhancement activities.
- Discuss challenges with key informants for scaling up enhancement activities, e.g., officials/ researchers working on forest enrichment etc.
- Review all the ongoing forestry-related projects and programmes in the state.

(Source: Richards *et al.*, 2017)



A 2.3 Preparatory Stakeholder Analysis

It is suggested that an expert from the state forest department should conduct the preliminary stakeholder analysis and also make a presentation in the Problem Analysis Workshop. An alternative approach to undertake participatory stakeholder analysis in the Problem Analysis Workshop was adopted in Mizoram & Uttarakhand SRAPs preparation processes. Box 2 provides some additional information on stakeholder analysis.

BOX 2

Guidance for provisional stakeholders analysis

It is important to prepare a list of such stakeholder groups who may be positively or negatively affected through implementation of SRAP (such as women/ farmers/local communities) or those who may influence the SRAP implementation design (private sector, state and national institutions). Hence, secondary data obtained through key informant and focus group interviews can form a basis for provisional stakeholder analysis.

As per the data available, each identified stakeholder group can be summarized as: number of people/size of stakeholder group; dependency on forests for their livelihoods; economic status; status of land tenure; organisational or institutional basis (if any), location (as shown on map); causes of vulnerability (if stakeholder group is vulnerable); gender issues (if any). If some data is available on livelihood status (human, social, financial, physical, natural and political) should be presented.

(Source: Richards *et al.*, 2017)

STEP A 3

SELECTION AND TRAINING OF WORKING GROUP FACILITATORS

The quality of outputs from the multi-stakeholder workshop depends on the quality of participation as well as the qualities of outputs depend significantly on the quality of workshop group facilitators. Thus, it is important that the facilitators must be carefully selected and trained. Working Group Facilitator should have the capability and quality to get the inputs from all the participants and also to conduct the proceedings of the working group in a balanced way. Necessary training on REDD+ and SRAP workshop methods should be provided to the Working Group Facilitators well in advance of the actual workshop for the preparation of SRAP. It is important that Working Group Facilitators should be integrated with the core team of SRAP.

STEP A 4

WORKSHOP PARTICIPANTS AND LOGISTICS

A 4.1 Selection of workshop participants

The quality of SRAP process and its outcomes depend on the selection of participants for multi-stakeholder workshops. The SRAP team should select about 30 participants for the workshops and selected participants should ensure that they will attend both the workshops. The SRAP team should aim for a balance of the following criteria for selection of the participants (Richards *et al.*, 2017):



- It should be kept in mind that some participants should have prior experience of multi-sectoral planning, analysis of D&FD drivers or forest enhancement activities;
- The participants should be adequately educated such that their effective participation can be observed in the workshop especially in group activities;
- Representativeness of state government departments (such as forest department, agriculture department, animal husbandry department, land resource, soil and water conservation department, revenue department, commerce and industries department, state biodiversity board, urban development department, disaster risk mitigation centre, horticulture and food processing department, public works department, rural development department, state planning department, state climate change centre, town and country planning department, power and electricity department), representatives of science and technology institutions, representative of academic institutions, representatives of local communities, joint forest management committees, NGOs working on natural resource management and rural development, women's folk group, and private sector. A reasonable balance could be 40% of participants from the state sector, 20% from science and technology institutions/ academic institutions, 20% from civil society, 10% from the private sector and 10% from local communities;
- Participants with 'know-it-all' personality should be avoided to ensure equitable participation;
- Participants from different ecological and geographical area;
- Women participants should be encouraged to attend the workshop. In order to ensure gender equity, approximately 30% of women participation should be considered in the consultation process;
- Participants who are willing to participate should be invited for the workshop as they can give good quality inputs consultation whereas the unresponsive participants may be disruptive and problematic.

A 4.2 Workshop invitations

An invitation letter should be sent timely, 2-4 weeks before to the workshop and if the participant does not give his/her confirmation within a time frame, a follow-up phone call or reminder should be given. Following points should be included in the invitation letter to the participants:

- Objectives and importance of the workshop and SRAP process;
- Commitment of the participants for stakeholder consultation workshops;
- Any other person other than the invitee is not allowed to attend the workshop unless the substitute person proposed has a similar position or rank or experience;
- The participants should give their confirmation timely so that suitable arrangements can be done to select appropriate participant;
- A certificate of participation will be given to the participants at the end of the stakeholder consultation workshops;
- Information regarding reimbursement of travel expenses.



A 4.3 Workshop venue and materials

A suitable venue with the following basic amenities should be selected for the workshop:

- Since the workshop activities will include taping of flipcharts and posters, hence appropriate wall spaces are needed. Thus, it should be made sure that the venue has proper space and other facilities to tape or hang the sheets;
- Each Working Group (WG) should have sufficient table space for working on the charts, thus every WG should be provided at least 2-3 tables;
- The room provided should be large enough for conducting plenary sessions as well as for all WGs to work;
- The location selected for the workshop should be pleasant as it will persuade participants to attend the workshop.

To avoid 'dropping in and out' of the participants from the workshop with a reason to attend their 'urgent meetings', location of the workshops should be judiciously selected such as distant from state government offices/departments.

Essential materials such as flipchart paper and stands, marker pens, masking and sticky tapes, cards of various colours, coloured pins, scissors and participant certificates needed for the workshop, should be arranged well in advance. A detailed list of materials to be required for organisation of the workshop is given in Annex 2.

STEP A 5

REDD+ ORIENTATION FOR WORKSHOP PARTICIPANTS

Knowledge and understanding of REDD+ may vary from participant to participant. Therefore, it is suggested to organise a half-day session about REDD+ for enhancing their knowledge and level of understanding. This will be helpful in getting better inputs from the participants before the start of SRAP consultation process.

Agenda of Stakeholders Consultation Workshop and Expert Group Workshop for Preparation of State REDD+ Action are given in Annex 3 and 4.

STAGE B: ANALYSIS

STEP B 1

OVERVIEW OF SRAP PROCESS AND PROBLEM ANALYSIS WORKSHOP

The Problem Analysis Workshop (SW1) is the first stage of the multi-stakeholder workshop. An overview of the SRAP design process, its objectives and structure of SW1 should be shown to the participants. Following are the main objectives of the Problem Analysis Workshop:

- To identify the drivers of deforestation and forest degradation and barriers for forest carbon enhancement activities;
- To prioritise identified drivers of deforestation and forest degradation and potential barriers for forest carbon enhancement activities;
- To identify potential REDD+ intervention activities after developing a strong reason and consequence understanding the drivers of deforestation and forest degradation and barriers to enhancement activities.

The suggested structure of the Problem Analysis Workshop is:

- Discussion of background data and spatial analysis;
- Selection of priority drivers of deforestation and forest degradation and barriers for enhancement activities;
- Development of problem trees, together with group exchanges.

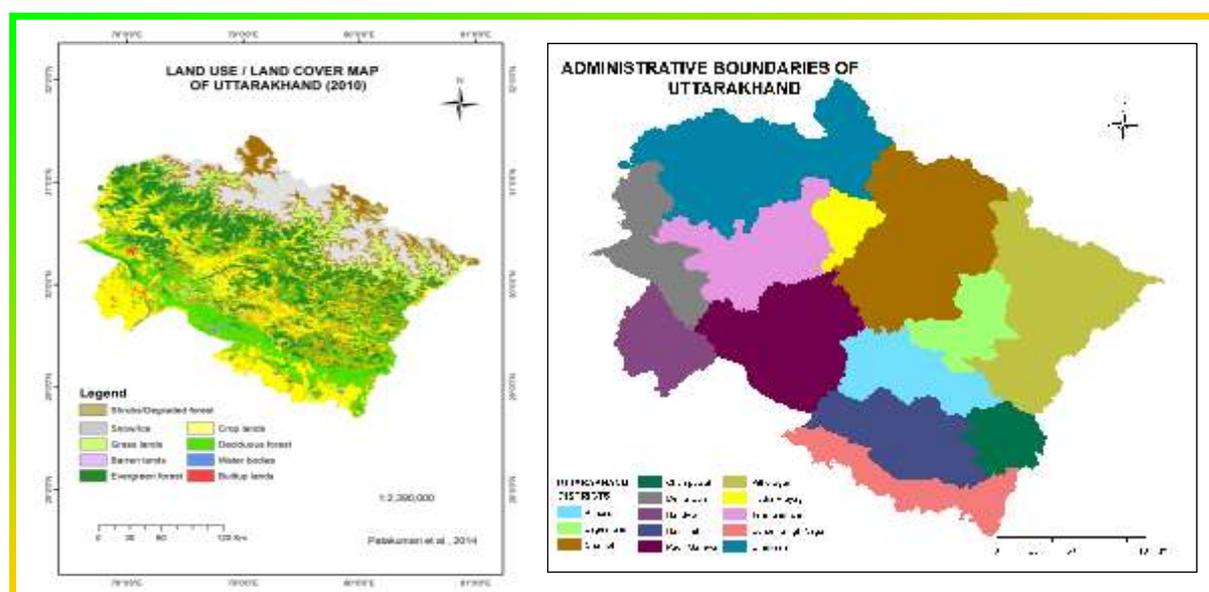


Figure 5: Use of maps in multi-stakeholder SRAP workshop, Uttarakhand

STEP B 2

PREPARATORY DATA PRESENTATIONS

B.2.1 Poster presentations

The posters prepared in Step A2 can be presented after the introductory session. Interactive poster presentations encourage an 'active learning mode' among participants which further enhance knowledge of data and level of understanding.



Based on the experience of using posters in Mizoram and Uttarakhand SRAPs preparation processes, the following are suggested:

- Participants are divided randomly into three Working Groups (WGs): (i) the first group will present a poster on drivers of deforestation, (ii) the second group will present poster on drivers of forest degradation, and (iii) the third group will present a poster on the barriers to forest carbon enhancement;
- The participants are encouraged to make comments on the poster explained by the presenter. These comments should be noted down by the workshop facilitator (not the presenter) on a flipchart/white board placed next to the poster during the time of presentation;
- The presenter from each group will be given 15 minutes for presenting the poster and 15 minutes will be given for collecting feedback from participants of other groups;
- The groups will change after 30 minutes and the same process will be repeated with the other two WGs;
- This process helps in collecting feedback from all participants having varied experiences of working on forests;
- Additional comments given by the participants can be annotated on posters during or after the group presentations.



Figure 6: Participants standing around the presenter during SW1, Uttarakhand

B2.2 Spatial analysis and maps

In the plenary session, presentation of the spatial analysis/preparatory maps (from Step A2) will be done. Maps should be taped on the wall or kept on flipchart stands so that maps should be clearly visible to the participants. Since the spatial analysis done in Stage A can help to decide which maps will be required for SW1, hence the spatial analysis must act as a guiding factor for the SRAP core team on significant drivers of D&FD and enhancement potential. The maps presented should include the following:

- A basic map of forest resources showing current forest and land cover and administrative boundaries in 6 copies are required for SW1;
- High-resolution Google earth images/maps showing sign of forest gain and loss over a period of time (say 5-20 years) and maps should include the indication of forest quality or forest degradation. This map will indicate the likely hotspots of deforestation and forest degradation;
- A map of current and planned land use such as developmental projects, mines, conversion of forest lands into agriculture fields /plantations etc.

The SRAP team should decide how best to present these maps which will further depend on the use of maps by participants during the workshop. Thus, it is preferred to provide large, printed versions of the 'basic planning map' to explore D&FD hotspots and potential areas for enhancement activities. Figure 7 provides an example of a planning map annotated by a working group (SW1) in the Mizoram multi-stakeholder workshop.

Note: The different colored pins denote particular drivers causing forest Degradation in different areas of Mizoram (green pin denotes shifting cultivation; red pin denotes fire; yellow pin denotes fire wood collection; blue pin denotes developmental activities etc.)

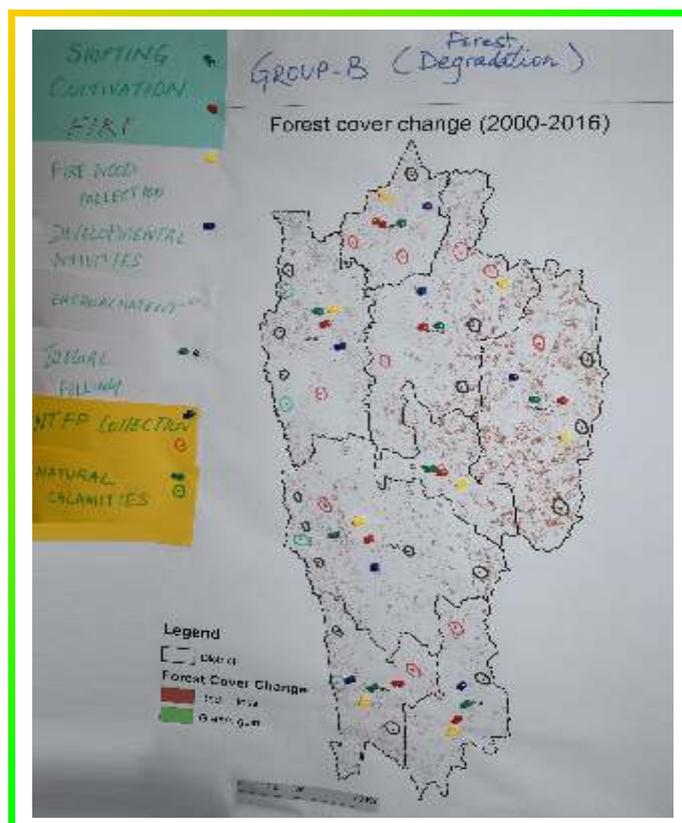


Figure 7: Identification of forest degradation hotspots in Mizoram

STEP B 3

PRIORITIZATION OF D&FD DRIVERS AND ENHANCEMENT ACTIVITIES

B 3.1 Identification and scoring of drivers and enhancement activities

The first task is a comprehensive clarification of 'direct drivers' and 'indirect drivers'. A 'direct driver' is a specific land use that replaces or degrades the forests. Other causes of D&FD are indirect or underlying causes, such as poor governance, insecure land tenure, etc. The National REDD+ Strategy also discussed these definitions, hence clarifying direct and underlying causes of D&FD in the country would make it easy to identify and prioritize the necessary interventions. Multi-stakeholder and expert group workshop analysis forms are given in Annex 5.

The definition of each direct driver also needs to be as specific as possible, for example, agriculture is too general; the crop or combination of crops causing deforestation should be specified, and whether it is a small land holder or commercial agriculture. Another example of a driver that it is too general would be infrastructure; the type of infrastructure should be specified, e.g., national highways/roads, reservoirs, hydro projects. Table 5 provides examples of direct drivers and indirect drivers of deforestation as identified during in Uttarakhand SRAP process, and Table 6 lists the direct drivers and underlying causes identified by multiple stakeholders in the Mizoram SRAP process.



Table 5: Examples of direct drivers and indirect drivers of deforestation from Uttarakhand State REDD+ Action Plan

Direct drivers	Indirect drivers
<ul style="list-style-type: none"> • Diversion of forest land for non-forestry purposes • Deforestation due to encroachment • Rapid urbanisation • Change of land use • Relocation and rehabilitation of project localities 	<ul style="list-style-type: none"> • Unsustainable/unscientific collection of fuel wood, fodder and small timber • Irresponsible tourism on high altitude zone • Lack of awareness among people • Landslide due to road construction • Wrong or inappropriate policies • Deforestation due to natural factors

(Source: ICFRE, 2018 a)

Table 6: Direct drivers and indirect drivers identified for deforestation & forest degradation and barriers for carbon enhancement in Mizoram

Drivers	Deforestation	Forest Degradation	Barriers to forest carbon enhancement
Direct drivers or barriers to forest carbon enhancement activities	Topographic factors; Traditional Farming Methods; Limited Livelihood Options	Shifting Cultivation; Forest Fire; Firewood and NTFP Collection	Socio-cultural aspect and Tradition; Lack of Economic Resources; Topography
Underlying causes or indirect drivers	Limited Flat Land; Unavailability of Irrigation; No Alternative for Shifting Cultivation, Income Generation, Food Security; Lifestyle of Mizo People; Lack of Awareness to meet the Domestic Demand	Low Socioeconomic Status; Abiotic Factors (Soil, Rainfall, Temperature, Topography, Slope and Terrain); Remoteness; Lack of Awareness; High Livelihood Dependency on Forest Resources; Weak Government Policies and Poor Law enforcement; Land and revenue policies; Traditional practices; Lack of viable income opportunities	Traditional agricultural practices; Poor technology or lack of technical inputs; Low return from agriculture; Remote or inaccessible markets; Low impact of government initiatives on conservation; Lack of finance/credit for farmers; Insufficient research on improved tree planting technology; Low capacity/ awareness of extension; Traditional agricultural practice; Loss of soil on hill slopes; Water scarcity

(Source: ICFRE, 2018 b)

Workshop participants can be divided further into three Working Groups (WGs):

- WG 1. Deforestation drivers' group
- WG 2. Forest degradation drivers' group
- WG 3. Enhancement activities' group



The three WGs can be structured as follows:

- It is the choice of the participants that which group they would like to join.
- Participants with technical proficiency and well understanding of REDD+ are required in WG 3.
- The number of participants in each group should be same.
- Each group must include at least one representative from institutions or stakeholder groups.
- Gender balance across WGs should be followed.

Principle for the scoring system should be made clear and discussed among groups. The scoring system engages three variables from a score of 1 to 5 which signify the potential future threat level linked with the driver, the biomass impact level, and the forest area to be impacted. The sum of these three scores will designate the significance of every driver regarding its potential for reducing GHG emissions. The facilitators must highlight the analysis of current and future drivers or trends. On this basis, participants have to predict the future trends. However, past trends cannot be completely trusted while leading to future trends but they can assist since one scenario is in continuation of an on-going trend.

The difference between 'Deforestation' and 'Forest Degradation' should be made clear to WGs '1' and '2' so that overlapping can be avoided. As mentioned by Richards *et al.*, 2017, a rational definition of deforestation, based on the FAO definition of forest is the clearance or felling of at least half a hectare of forest (with at least 10% canopy cover).

The NRS already explains the D&FD drivers of India, hence making the process of prioritizing D&FD drivers and enhancement activities much easier and quicker. The participants have to decide which driver is most important in the state, along with identifying significant local drivers or enhancement opportunities that were left out or not given significance in the NRS.

Working Groups 1 and 2: Drivers of Deforestation and Forest Degradation

WGs 1 and 2 (separately) should:

- Brainstorm 'direct drivers' in pairs. Red cards can be used by WG 1 for the drivers of deforestation whereas the WG 2 can use brown cards for the drivers of forest degradation. The groups should be able to refer the identified drivers to any of the preparatory maps;
- Select cards with similar meanings and rephrase them. Select nearly eight direct drivers;
- Place coloured pins on 'basic planning map' to locate the identified drivers (use different coloured pin for each driver). If the identified driver is important and falls in an administrative area, still a coloured pin can be placed (even if the planning map shows local administrative area boundaries such as village, tehsil etc.);
- Prepare seven columns on a flipchart paper for ranking the drivers (see example in Figure 8). Complete the columns as per the following:

Column 1: Choose and place approximately eight important direct drivers

Column 2: Note down the most significant driver 'hotspots' based on the mapping exercise



Column 3: Give scoring to each driver according to its future level of threat (such as in about 5–10 years' time). Scoring should be given from 1 to 5 where 1 = very low; 2 = low; 3 = medium; 4 = high; 5 = very high

Column 4: Based on the quality/condition of forest under threat, give scoring for likely biomass impact of the driver. Scoring should be given from 1 to 5 where 1 = very low; 2 = low; 3 = medium; 4 = high; 5 = very high

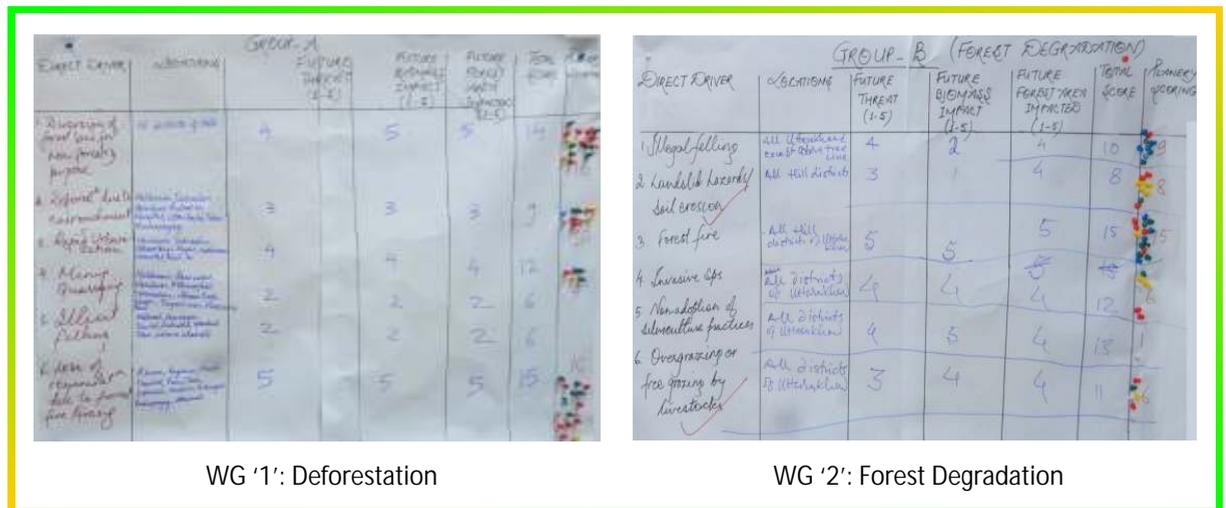
Column 5: Give scores for the forest area likely to be impacted from 1 to 5 where 1 = very small; 2 = small; 3 = medium; 4 = large; 5 = very large

Column 6: Add columns 3, 4 and 5 and calculate the total score for each driver.

Column 7: Leave blank for next exercise.

If the opinions of the WG members are dissimilar and unanimous scoring is not possible, the average score of individuals in the group can be used.

The WG 3 members should clarify the meanings of main forest carbon enhancement activities such as afforestation, reforestation, agroforestry, forest restoration including forest enrichment and improved forest management in natural or planted forests; as they are bound to have varying levels of technical understanding.



WG '1': Deforestation

WG '2': Forest Degradation

(Source: ICFRE, 2018 a)

Figure 8: Scoring of drivers of deforestation & forest degradation in Uttarakhand

The members of WG 3 need to have a clear understanding and basis for analysing the barriers for expansion of enhancement activities including a vital understanding of additionality i.e. REDD+ activities should be in addition to what will happen during normal course of time, e.g., commercial plantations using fast growing species or in other words, the SRAP should, in general, fund for forest carbon stock enhancement activities that have good potential for expansion and carbon removal, but which are constrained by a lower economic viability or another constraint or barrier. For example, natural forest

restoration has high potential for carbon removal, but is likely to remain small scale without significant financial and technical support (Richards *et al.*, 2017).

Therefore, areas with potential for expansion of each enhancement activity should be identified by WG 3 by sticking various coloured pins (different coloured pin for each enhancement activity) on a basic planning map. Figure 9 shows the ranking of each potential enhancement activity with six columns on flipchart sheets which can be concluded as follows:

Column 1: List the higher potential locations for expansion (based on the mapping exercise).

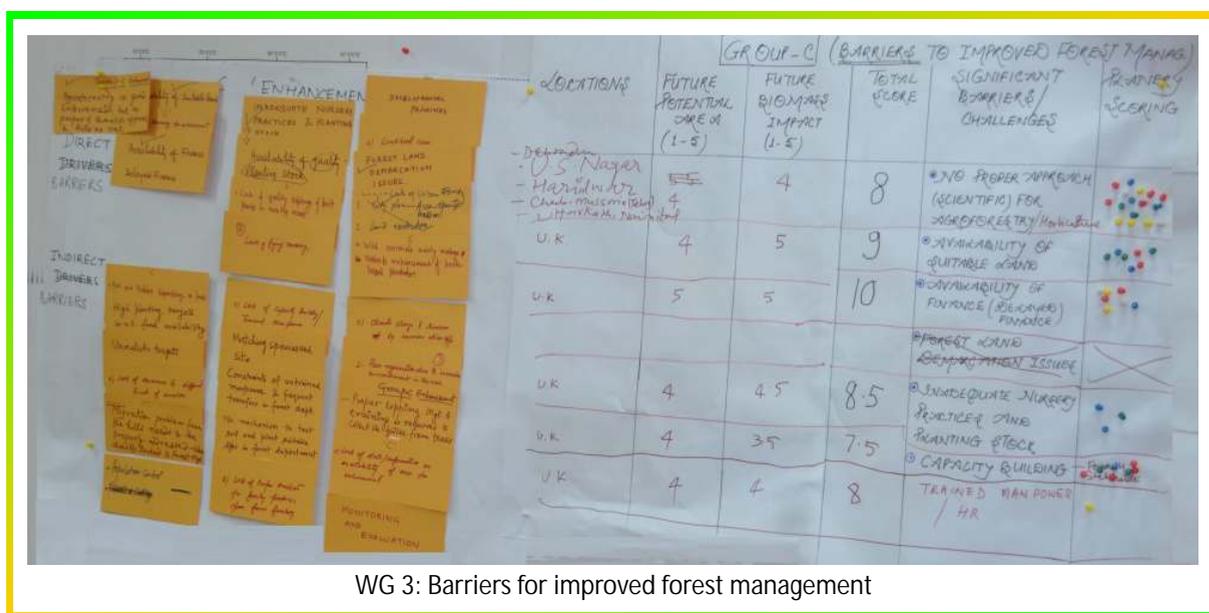
Column 2: Give scoring (1-5) to the future potential area of the enhancement activity.

Column 3: Give scoring (1-5) to the potential for forest biomass enhancement depending on the forest type.

Column 4: Calculate the total scores for each enhancement activity i.e. column 2 + column 3.

Column 5: Note down important barriers/ challenges to expansion. Laptop may be used if space on flipchart is insufficient.

Column 6: Leave it for plenary scoring.



WG 3: Barriers for improved forest management

(Source: ICFRE, 2018 a)

Figure 9: Scoring of barriers to carbon enhancement in Uttarakhand

B 3.2 Selection of priority drivers and enhancement activities

Three working groups (WGs) will come together in the plenary session in order to select the priority D&FD drivers and enhancement activities. Following steps are suggested:

- All WGs will tape/hang their worksheets on the wall or on the space provided.
- One participant from each group will briefly present their ranking exercise. More time will be needed



by WG 3 as their ranking will be more complex (about 10 minutes each for WG 1 and 2; about 15-20 minutes for WG 3).

- Five coloured pins (representing the top five priorities for each participant) will be given to each participant for placing them in the last column of three worksheets. The participant can place only one coloured pin on the identified driver/ enhancement activity or can even place all of his/her coloured pins in front of one driver. There is no need to use all of the coloured pins.
- Add the number of pins in the last column.
- Prepare a separate flipchart sheet by selecting only the top 6 to 8 scores. This should be a mixture of D&FD drivers and barrier to enhancement activities.
- Participants will discuss the scores to decide 3-5 priority drivers and enhancement activities. The scores can help this decision, but it is necessary to have a serious plenary discussion about each one (see Box 3).

BOX 3

How many priority drivers/enhancement activities should be selected?

There is no formula for deciding the number of priority drivers and/or enhancement activities, but experience suggests that five is probably the maximum for a coherent and focused programme of work. Trying to do more than five activities might not be cost-effective as efforts become diluted across many problems and activities.

Every SRAP is different – the point is to discuss how many drivers and enhancement activities should be included in the SRAP, and which ones have the highest potential for GHG emission reductions or removals. The stronger the focus of the SRAP on high potential opportunities, the more cost-effective it is likely to be.

It should also be noted that for the workshop methodology to work well, there should be at least five participants in each working group and that 5-7 participants per working group is a good number for equitable participation.

(Richards *et al.*, 2017)

Drivers of Reforestation		GROUP-A (Deforestation)					TOTAL PLenary SCORE	
GroupA-DRIVERS OF DEFORESTATION		Location in the State	Future Threat (1-5)	Future Biomass Impact (1-5)	Future Forest Area Impact (1-5)	Total Score	Plenary Score	
Forest fire	NE and SW part		3	3	2	8		
Shifting cultivation	All districts		4	4	4	12		
Developmental Works	All districts		1	1	1	3		
Swine Rearing	Haung, Langlet, Lamphel, Sankhup districts		3	2	3	8		
Natural Colonies	Lamphel & Haung district		1	1	1	3		
Collection of NTFPs	All districts		2	1	2	5		
Grazing	Aizawl & Champhai district		1	1	1	3		
Charcoal burning	Champhai & Sankhup district		1	1	1	3		

DIRECT DRIVER FOREST DEGRADATION	LOCATION	FUTURE THREAT (1-5)	FUTURE BIOMASS IMPACT	FUTURE FOREST AREA IMPACTED	TOTAL PLenary SCORE
1 SHIFTING CULTIVATION	ALL DISTRICTS	5	5	5	15
2 FIRE	ALL DISTRICTS	4	3	3	10
3 FORESTED COLLECTION	ALL DISTRICTS	3	3	3	9
4 SUBSISTENCE ACTIVITIES	AIZAWL, LANGLET, KOLASHIB, LANGLANG, SIHAH	3	2	2	7
5 ENRICHMENT	ALL DISTRICTS	3	2	2	7
6 ALLEGED FELLING (MUNSI, LANGLET, CHAMPHAI, AIZAWL)	4 BORDER DISTRICTS	3	3	3	9
7 NTFP COLLECTION	ALL DISTRICTS (CHAMPHAI)	3	1	1	5
8 NATURAL CALAMITY	MINAIT, LANGLET, CHAMPHAI	2	2	2	6

Figure 10: Plenary scoring of drivers of D&FD in Mizoram

(Source: ICFRE, 2018 b)

B 3.3 Mapping of D&FD drivers and enhancement activities

Identification of 'hotspots' for D&FD drivers and forest enhancement activities on the 'basic planning map' prepared by the spatial analysis team is the first task of each WG. Different coloured pins/cards should be used by each WG member to indicate the extent of severity of deforestation or forest degradation due to the identified driver. Analysis of barriers for the expansion of an enhancement activity by WGs, will hold the most unrealised potential for expansion of the enhancement activity. For example, Figure 11 is a map showing the areas of D&FD drivers and barriers to carbon enhancement activities in a group activity from a Problem Analysis Workshop in Mizoram in which participants identified hotspots for three activities. For this, participants used a base layer showing forest cover change in the state (2007-2016), overlaid with administrative boundaries.

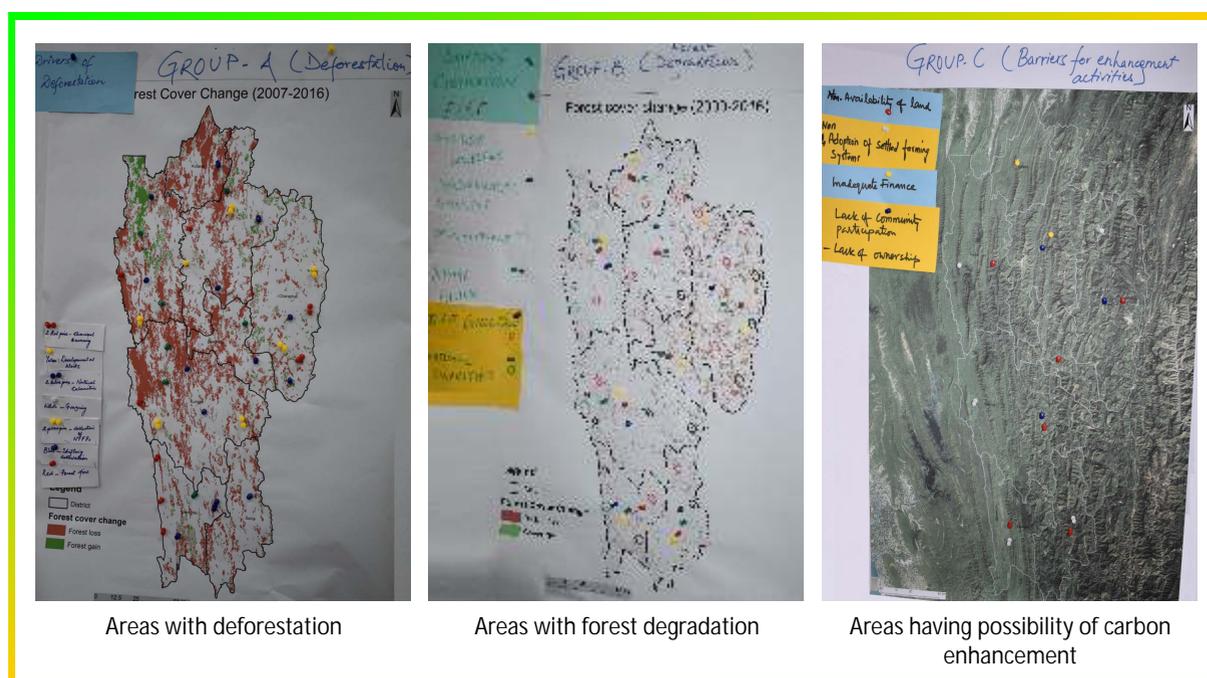


Figure 11: Maps of identified hotspots in Mizoram

(Source: ICFRE, 2018 b)

Since all the participants may not have the same level of thought process and understanding drawn from their experience is reflected in the mapping interpretation, therefore the facilitators need to check participants activities as most of them could be confused in the current or recent past whereas some might be thinking about the future scenario. Thus, it is important that the mapping should be approached in a way showing current and past scenarios. However, if any difference is found on the future aspect of the geographical pattern of the drivers, the WG may work on a second map. The same question should also be put in front of participants regarding the interaction of two or more D&FD drivers i.e. whether and where they think two or more D&FD drivers are related and how (e.g., charcoal production following clearance for shifting agriculture). It should be likely possible to point out these interactions on the map.

It is necessary to check the participatory interpreted maps with the preparatory spatial analysis maps for any difference which can be done by overlaying a transparency of the preparatory map onto the interpreted maps. If still the differences are unable to be determined in the workshop through discussion with the spatial analysis team, then the hotspots in question should be put on the list for field verification (Step B 4.5).

STEP B 4

PROBLEM TREES

B 4.1 Explanation and practice

The development of a problem tree of prioritized drivers of deforestation and forest degradation or barriers to enhance activity is the first task of the WGs. In this step, the key responsibility for the SRAP team is to balance between WGs as some of the participants might have finished their tasks whereas others are busy working on their problem trees.

The methodology of the problem tree and its related exercise must be explained by the workshop coordinator. This will help in the easy and immediate development of a 'real' problem tree as well as achieving important desired outputs without adding pressure to the participants.

Following steps are involved in problem tree:

1. Take four flipcharts and tape them together on the floor or tables. It is important to have a large area for smooth conduct of chart making activities thus, join 2-3 tables such that appropriate space may be made for spreading the worksheet.
2. Tape or hang a large-scale copy of the 'Problem Tree Instructions Sheet' (Annex 6) to the wall or on the provided space near each workable area.
3. WG should discuss and write problem statements on the red card (approximately ten words), thus it is important that the WG members should have same understanding of the problem. The red card should then be placed at far right hand side of the problem tree chart/worksheet as problem statement.
4. The members of each group should first discuss and write down all the causes of problem statement on yellow cards.
5. Rationalise the cards with similar meaning i.e. if there are 2-3 similar cards; make one card out of them and discard the rest.
6. Arrange the cards in such a manner that they represent the order of their cause and effect.
7. Identify the most direct or immediate causes. Replace these yellow cards with pink cards. Throw away the old yellow cards.
8. Take a pencil and draw arrows between the cards displaying the relationship leading to the problem

statement. The beneficial effect of using pencil is that changes can be made later in the problem tree without making things look untidy.

9. Write the name of the problem tree at the top of the sheet and keep it in a safer place for the next exercise in the Solution Analysis Workshop (SW2).

Following guidance can be given by the WG facilitator:

- Cards of the right colour should be used.
- One idea per card should be written.
- Only 7-8 words should be written per card.
- Since many participants will observe the problem tree, hence the use of large and clear written words is recommended.
- Discard the card and use a new one, if something needs to be crossed out.
- Every card should be specific such that everyone can understand it.
- Group members should sit or stand in front of the worksheet.
- Participants who seem to be less confident or shy (often female) should sit near to the worksheet as their preference is to sit or stand at the back.

Participants should be encouraged to ask questions to the WG facilitator so that better understanding can be developed about the method. Quality of participation (discussion regarding shy or dominating participants for achieving equitable participation) should be discussed with the participants after the activity is being done.



Figure 12: Discussion with participants regarding quality of participation in Uttarakhand

B 4.2 Development of problem trees

Having the same understanding of all WG members is important; hence the WG should first talk about their priority drivers or enhancement activities. Later the 'problem statement' can be written down on a red card which is generally used for driver name for D&FD such as 'Forest clearance for shifting cultivation' or 'Encroachment of forest land'. For an enhancement activity, the red card usually conveys a problem or limitation as regards expanding it, e.g. 'Lack of proper approach for enhancing quality of forests' or 'Significant barriers to scaling up improved natural forest management'.

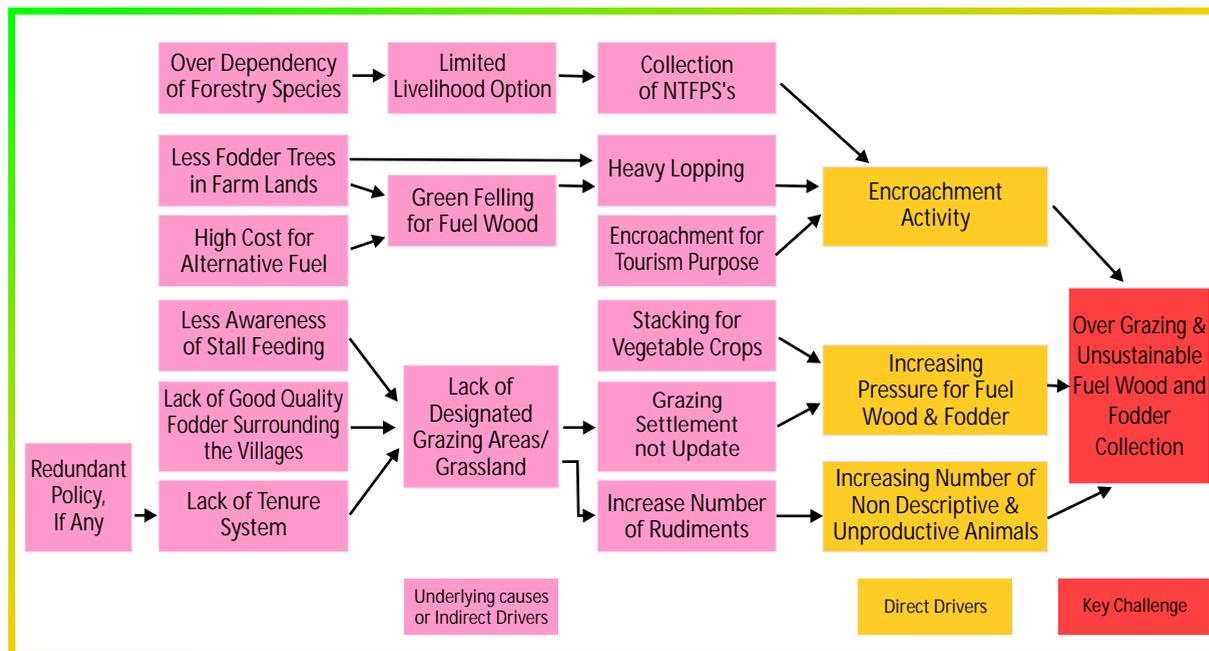
The WG can then develop the rest of the problem tree. Figures 13, 14 and 15 provide examples of problem trees from the SRAP case study in Uttarakhand.

B 4.3 Group exchange

'Group Exchange' exercise is very helpful in verification and improvement of the first draft of the problem trees. The exercise involves members of each WG (except the WG facilitator) visiting another group. The task of the WG facilitator and the remaining WG member is to explain the problem tree to the 'visitors'. The visitors are encouraged to ask questions, make appropriate comments regarding what they think is missing or wrong, and suggest changes that should be noted down (criticisms and proposed changes) by the WG facilitator or member. The visitors may also write down some potential ideas on new cards but without changing/moving the already existing cards. The whole exercise may take approximately 30 minutes.

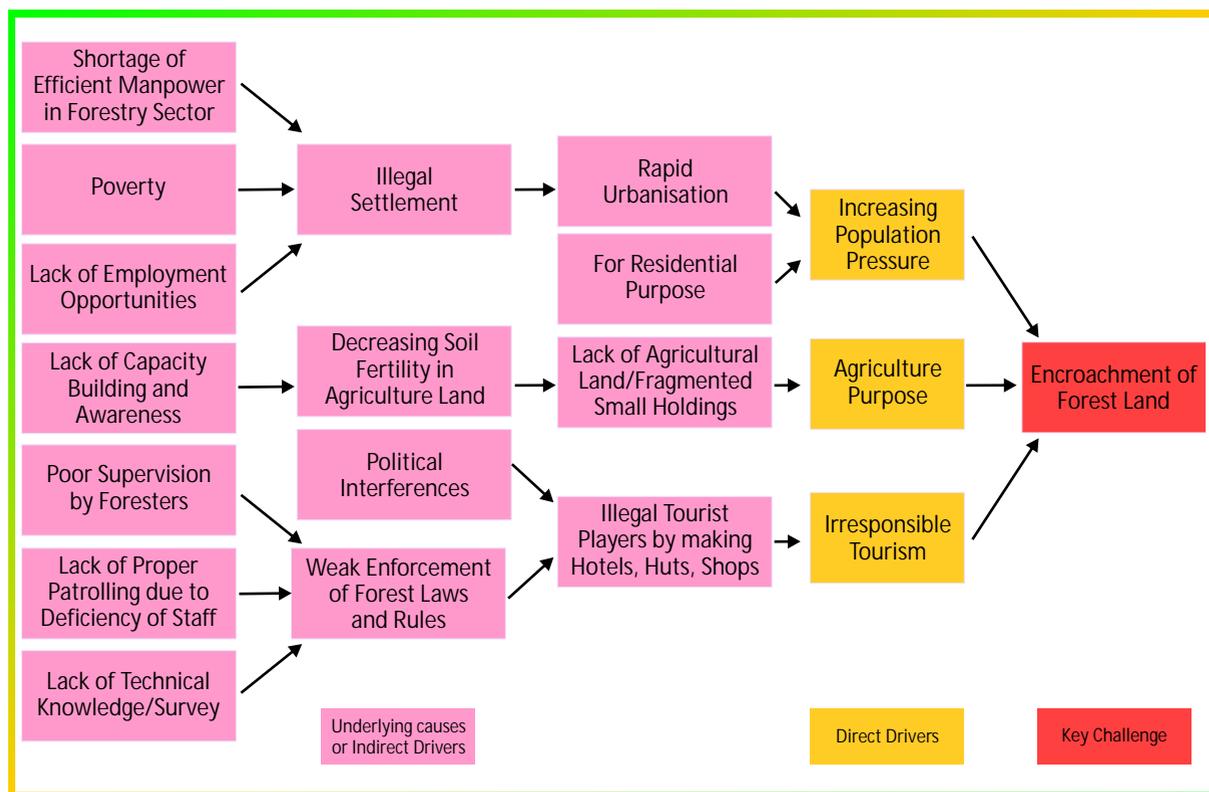
The visiting WG then returns to their problem tree to discuss the visitors' comments and suggested changes. It is essential for the WG to cautiously discuss regarding the proposed changes either should be done in the problem tree or not. If no changes are done, then proper justification should be made, if being asked again in a plenary session. Later after making final changes, the pencilled arrows should be drawn in ink, cards should be stick to the chart and the problem tree should then be taped on the wall.

Since all the WGs must finish the assigned task at the same time, hence it is suggested that if a WG finishes early, they can start identifying some 'entry points' for their solution tree (to be developed in SW2). Entry points are relatively short-term and low-cost actions or activities that respond to a specific connecting/underlying factor (on a yellow or pink card) in the problem tree. For example, a connecting/underlying factor such as 'lack of capacity in community organization' could be written as 'training or capacity building'. Use blue cards for writing entry points (first in pencil) and place them on the problem tree.



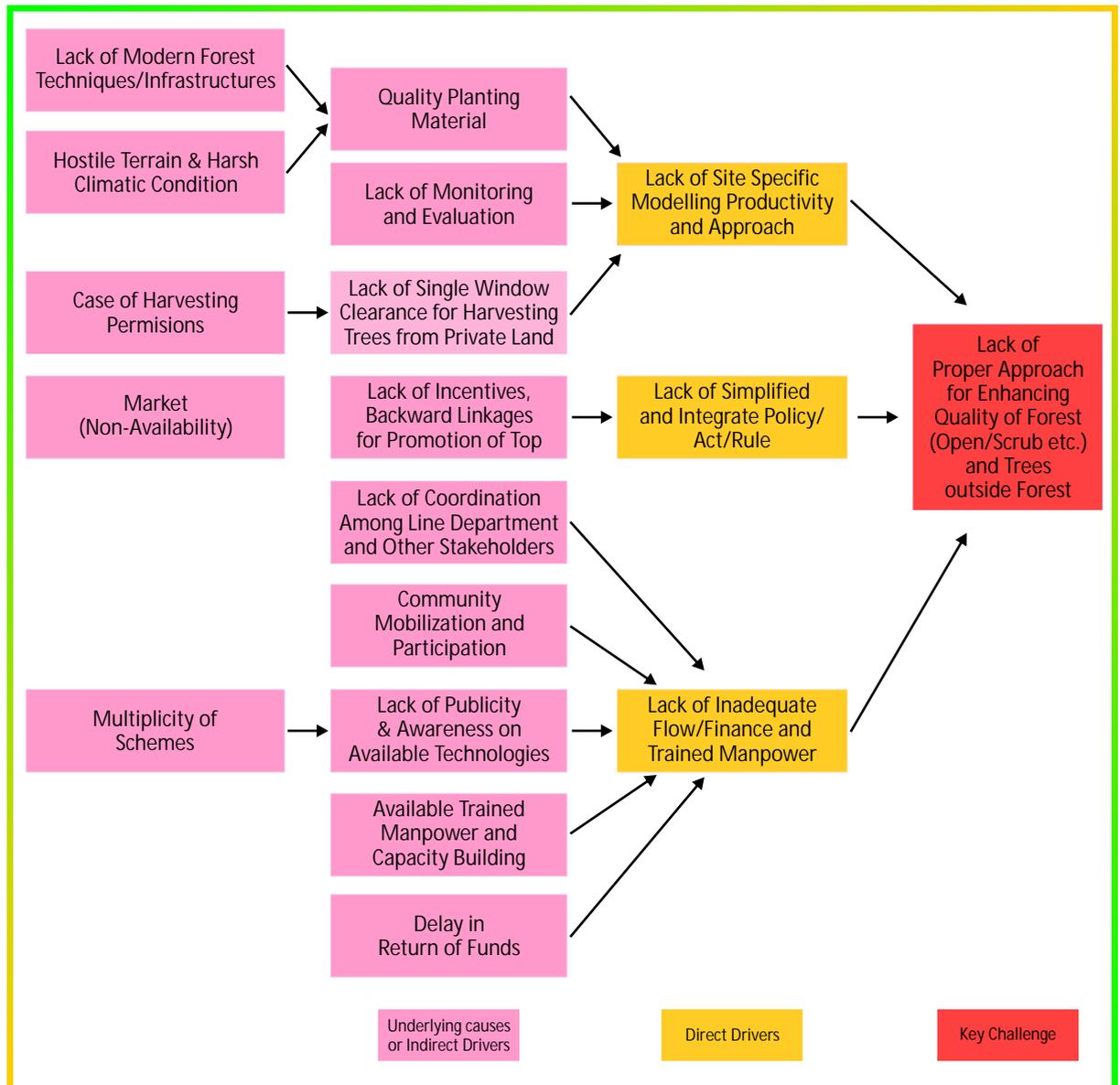
(Source: ICFRE, 2018 a)

Figure 13: Problem tree of overgrazing & unsustainable fuel wood and fodder collection in Uttarakhand



(Source: ICFRE, 2018 a)

Figure 14: Problem tree of forest land encroachment in Uttarakhand



(Source: ICFRE, 2018 a)

Figure 15: Problem tree for barriers of forest enhancement in Uttarakhand

B4.4 Museum visit

The participants are given a chance to examine all WGs posters of problem trees in a 'museum visit' for 30 minutes such that they may observe those problem trees they are not yet familiar with. Thus, every participant can spend about 10 minutes looking at each problem tree they have not seen before. However, within this whole process, the facilitator and one member of each WG have to remain seated at his/her working station to explain the problem tree to the visitors and if time allows, repetition of the explanation should be done 3 times in every 10 minutes.



The visitors are not allowed to move the cards but can give suggestions on the problem trees which should be noted down by the facilitator or WG member and later should be discussed among the WG for any final addition of suggestions to the problem tree or not. After the museum visit, all final changes in the problem trees, maps and worksheets should be photographed and folded away very carefully since they will be needed for the Solution Analysis Workshop (SW2).

B 4.5 Field verification of 'hotspots'

If differences are found between identified hotspots in SW1 and preparatory spatial analysis on annotated workshop maps, field verification should be then conducted by SRAP team in the hotspots and priority locations for enhancement activities identified after the Problem Analysis Workshop (SW1). Discussions with key informants, focus groups and local institutions (e.g., village council, village development committee, etc.) will help to clarify the importance of the driver(s) and/or the potential for an enhancement activity. After making conformity between the spatial analysis team and lead workshop participants, the maps should be revised so that they coincide (to avoid confusion later).

Later the spatial analysis team may also provide maps using GIS or mapping software to help check or clarify the hotspots, on the basis of which, locations of hotspots identified in SW1 may be revised by the SRAP team. This step demands an extra day for small discussion to process the analysis with the corresponding WG. If there is budgetary limitation for field verification, the workshop results should be then analysed by state 'experts'/key informants.

B 4.6 Problem analysis workshop report

It is suggested to note down all the discussions and data (processing done by computerised versions of problem trees using excel or other software) after SW1 and ground field visits while still fresh in the memory. The lead workshop coordinator should take primary responsibility for this, supported by the SRAP core team and the WG facilitators.

STEP B 5

SOLUTION TREES

B 5.1 Overview of solution analysis workshop

The Solution Analysis Workshop (SW2) should be held after Problem Analysis Workshop (SW1) and necessary GIS maps (forest cover map, forest cover change map, administrative boundary etc.) needed for SW2 should be used. The main objective of the Solution Analysis Workshop is to develop a set of solution trees in response to the problems analysed in SW1. This acts as a ground for an expert group workshop (EW1) to define a set of REDD+ Intervention Packages (IPs). The SW2 can be structured as:

- Development of Solution trees
- Group exchange and museum visit

B 5.2 Explanation and practice

A short and precise presentation of methodology for the solution tree should be given by workshop coordinator. Important points to be discussed are:

- Since all the cards are considered as results/ solutions which will further lead to desired outcomes, hence got the name 'solution tree' or 'results chain'. The solution tree in the REDD+ context is a theory of change that explains how GHG emissions can be reduced from forests or how GHG can be trapped from the atmosphere through forests.
- Cause and effect analysis of solution trees supports strategic and cost-effective REDD+ interventions.
- Solution tree should not be a mirror image of problem tree and it should focus on achieving the desired outcomes.
- During the process of developing a good strategy/ plan, solution tree cards must be checked because of the strong possibility of getting some links between the cards, hence revealing key assumptions from a solution tree.
- Initial step should be browsing the cards from the problem tree and then rephrasing the 'problem statement' as a desired result/outcome which is written on a green card and placed at the far right-hand side of the flip chart. The members of Working Group (WG) should agree on the rephrased words of the card. Simultaneously, it is the duty of WG facilitator to check shy/quiet members that either they are agreeing to the rephrased card or not.
- Identification of entry points is necessary which are 'relatively short-term and low-cost actions or activities that respond to a specific connecting/ underlying cause or problem. For example, low awareness of community members about forest laws which can be addressed through awareness raising programme.
- The maps shown during SW1 or preparatory spatial analysis showing the hotspots/potential carbon enhancement locations should support the solution tree analysis.

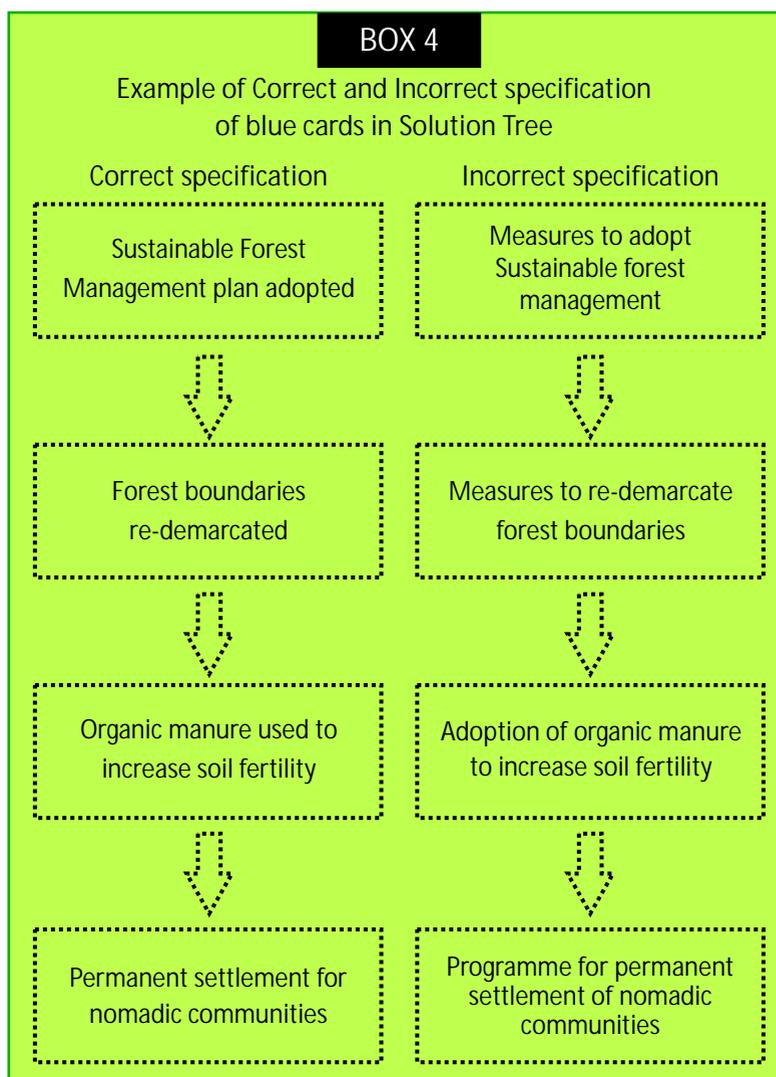
The mechanical steps for developing a solution tree are as follows:

- Tape or hang the following items near the WG workstation: the problem tree from SW1, a large copy of the solution tree instructions sheet (see Annex 6), a map of the relevant hotspots (or areas for enhancement) from SW1 and/or preparatory spatial analysis.
- Take four flipchart sheets and tape them together.
- Use green card and rephrase the problem statement as a desired result or outcome in less than 10 words.
- Brainstorm solutions or interventions to overcome the negative connecting/ underlying factors on blue cards, writing the cards as solutions or achieved results.
- Rationalise the cards.

- Arrange the cards in a cause-and-effect order.
- Replace blue cards with pink cards after deciding the most direct or immediate causes of the desired result or solution statement.
- Draw arrows with pencil between the cards.

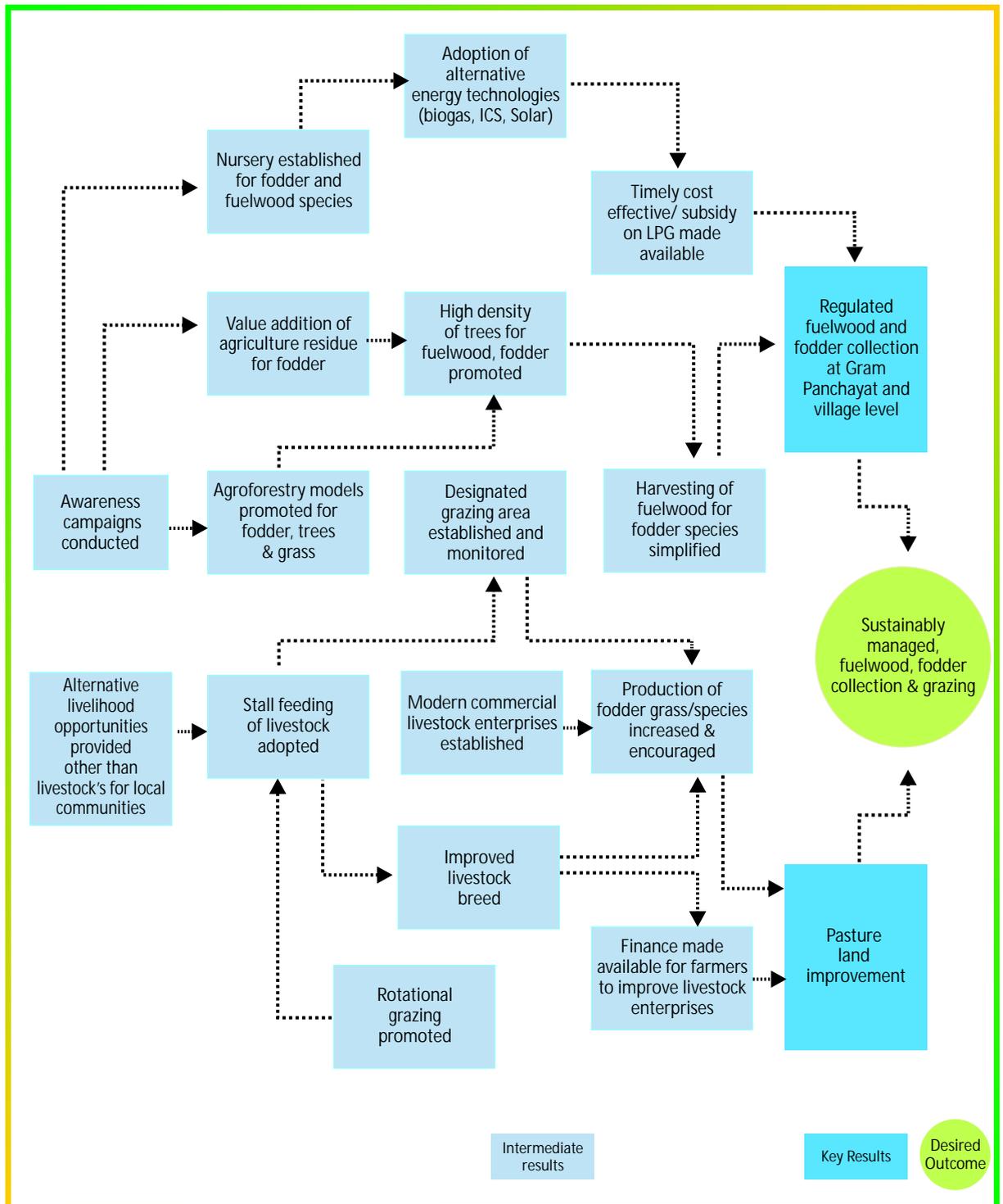
Additional guidance provided by the WG facilitators for developing the solution tree:

- Cards should be written as achieved results/ solutions, not as activities. The example of the difference between expressing cards as results has been provided in Box 4.
- To achieve the desired outcome from solution tree, mirror image of the cards of problem tree should be avoided. Cards in the solution tree should not be written as exact opposite of cards in the problem tree.
- The WG should check missing links between the solution cards. A card will be needed at every step in achieving a solution, including intermediate steps.



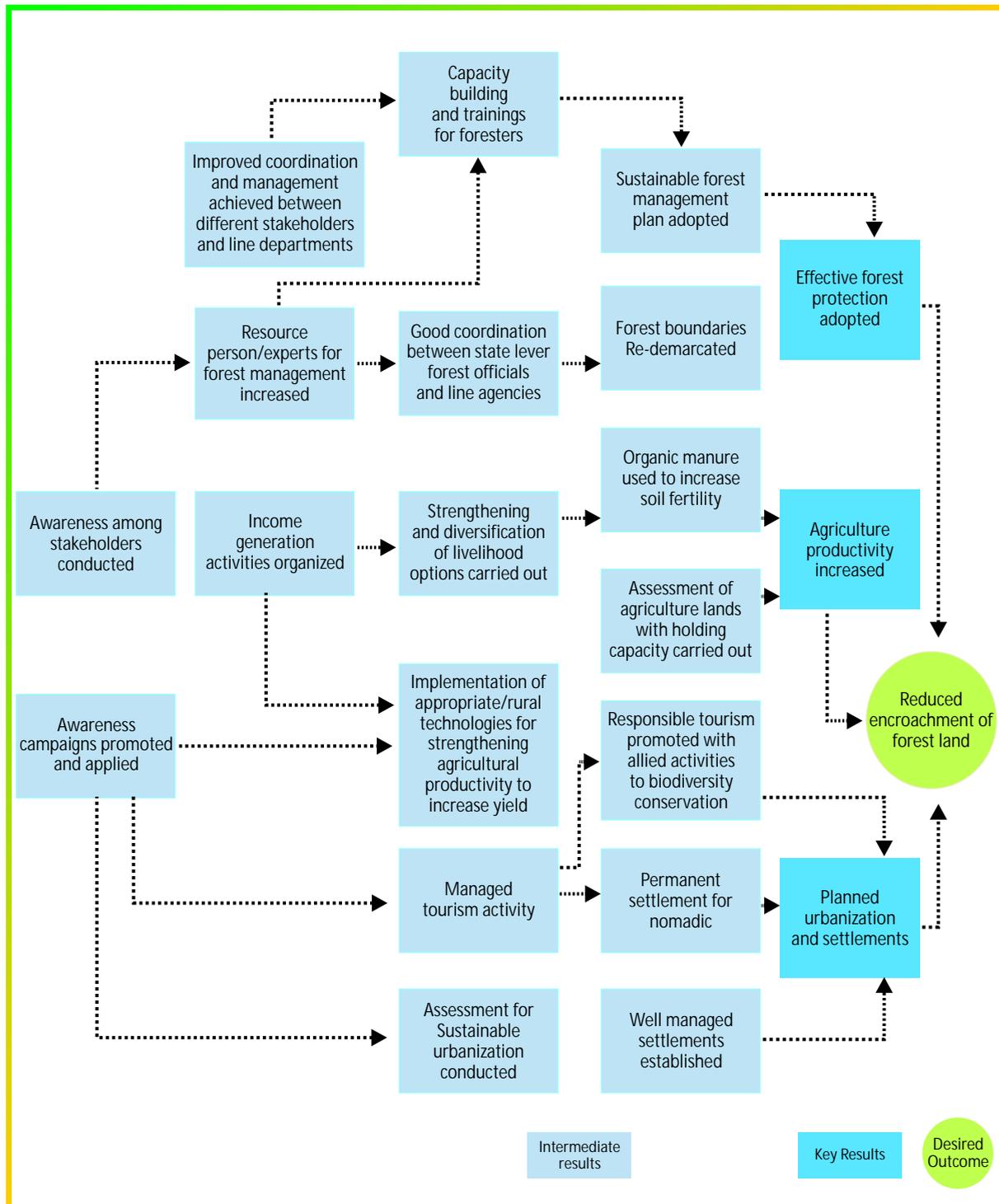
B5.3 Development of solution trees

Prior to moving to the solution trees, a brief recap should be given by the working group facilitator that where the working group had reached at the end of the Problem Analysis Workshop (SW1). Same steps should be followed by working groups as mentioned for the working groups in developing problem trees. Since the solution trees are considered the foundation of State REDD+ Action Plan, hence should not be hastily done. Figures 16, 17 and 18 show (as examples) the solution trees (Sustainably managed, fuelwood, fodder collection and grazing; Reduced encroachment of forest land; and Forest quality improved in Uttarakhand) corresponding to the problem trees in Figures 13, 14 and 15.



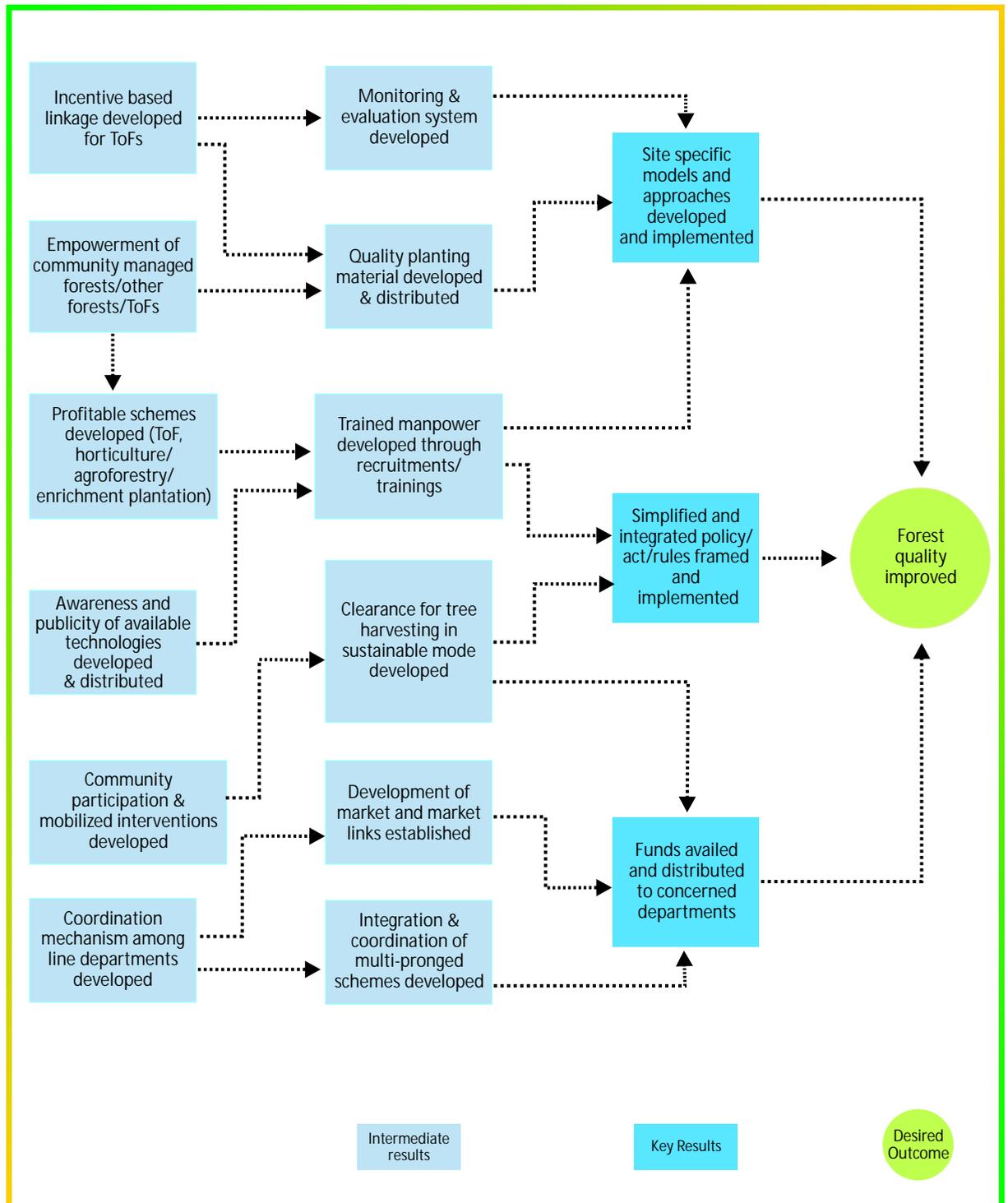
(Source: ICFRE, 2018 a)

Figure 16: Solution tree: Sustainably managed, fuelwood, fodder collection and grazing in Uttarakhand



(Source: ICFRE, 2018 a)

Figure 17: Solution tree on reduced encroachment of forest land in Uttarakhand



(Source: ICFRE, 2018 a)

Figure 18: Solution tree: Forest quality improved in Uttarakhand

B 5.4 Group Exchange

Same exercise is meant to be followed for group exchange as done in the problem analysis workshop (Step B 4.3) for validation and improvement of the solution tree.

B 5.5 Museum visit

The same method will again be followed for this exercise also as being done earlier in problem analysis workshop (Step B 4.4). Following the suggestions given by visitors, final solution trees should be prepared which will be later photographed and carefully folded up for processing and further use in Stage C.

B 5.6 Solution Analysis Workshop report

This report will be prepared by the workshop coordinator with the help of SRAP team and WG facilitators. Since this report will contain solution trees and maps developed by the WGs, hence it will be comparatively short.

STAGE C: PLANING

STEP C 1

IDENTIFICATION OF INTERVENTION PACKAGES

C 1.1 Expert Planning Workshop

The experiences gained from SRAP preparation for the state of Mizoram and Uttarakhand revealed that small 'expert group' meetings are more beneficial and highly productive than large multi-stakeholder meetings. Hence, SRAP preparation stages viz. planning, monitoring and budgeting (except for safeguards analysis) should be done with smaller team of expert members. SRAP team as well as supporting experts should join the Expert Group Planning Workshop (EW1).

C 1.2 Identification and mapping of potential Intervention Packages

A review of the solution trees is the first step for Expert Group Planning Workshop. It is possible to strengthen solution trees with cause and effect logic and assumptions. The expert group members should be careful in making any essential changes in the solution trees that have been developed through a participatory stakeholder process. The identification of Intervention Packages (IPs) from solution trees is preferred to be done in small teams (i.e. if EW1 has 10-20 people, 2-3 smaller teams can be easily made) and the outcomes can be later verified and improved through 'group exchange' exercise.

An intervention package can be defined as a set of interlinked activities that form a logical strategy for addressing the drivers of deforestation and forest degradation or barriers to the expansion of a forest carbon enhancement activity. Following are some other important criteria for defining an IP:

- It should have a direct and measurable impact on the forest resource,



- It should be independent of other IPs (so that the carbon outcome of each IP can be separated), and
- It should contain a practical strategy/incentive measures for changing the performance of stakeholders who at present are directly or indirectly deteriorating the natural resources or preventing expansion of an enhancement activity.

The IPs will be covering such strategies/activities that can be operationalised at the state level. An initial task is to identify national-level Policies and Measures mentioned in the National REDD+ Strategy as without them SRAP cannot succeed, hence it must be included in the solution trees. The solution trees developed for Mizoram included the following PAMs:

- Government policies on reducing shifting cultivation framed and implemented,
- Irrigation plan introduced,
- New Land Use Policy/ New Economic Development Policy implemented.

The solution trees developed for Uttarakhand included the following PAMs:

- Simplified and integrated policy/ act/ rules framed and implemented,
- Profitable schemes developed (tree outside forest/horticulture/agroforestry/enrichment plantation),
- Effective forest protection adopted,
- Land use management plan formulated,
- Rules and laws fully obeyed,
- Revisiting our laws and rules, and
- Provision of severe penalty for violation of forest law.

Prioritisation of 'key results' is the next step in the solution trees. For attaining the desired/final outcomes (i.e. green card), it is essential to get a solution card i.e. 'key results' (i.e. pink & blue cards and are kept on right-hand side of the solution tree and left to the green card) which basically excludes national level policies, acts and measures. Effectual implementation of solution cards is suggested by focussing only few major IPs as including all results is not a feasible option. Hence, two or three IPs per solution tree (IP may sometimes consist of more than one key result) and up to 5 key results should be selected.

Each prioritised key result can then be examined against the above-mentioned criteria of an IP. In order to achieve a final objective and an IP, a key result may be expressed as a strategy possibly in combination with another key result. For example, the key result 'Land use management plan formulated' was combined with another solution card 'Prioritization of development works' to form an IP called 'Preparation of comprehensive state land-use plan'. Some of the activities included in this IP were also drawn from the solution tree:

- Develop state land-use plan,
- Analysis of land capability, focussing on deforestation and reforestation,



- Participatory resource mapping and developmental potential,
- Demarcation of forest and encroached areas,
- Establish REDD+ Cell and state level working group under Principal Chief Conservator of Forests & Head of Forest Force, and
- Improve coordination between line departments and other agencies.

In some cases, key results sometimes may not be suitable to be considered as an IP such as 'Strengthened forest law enforcement' is much more suitable and precise than 'reduced illegal logging' which is a key result and not suitable for an IP as compared to the former. Table 7 represents the identified IPs, key results/strategies and activities in Mizoram.

Table 7: Intervention packages, strategies and activities Identified in Mizoram

S.No.	Intervention Package (IP)	Key Results/ Strategies	Activities
1	Sustainable land management and cropping pattern	Adoption and expansion of settled hill farming system	<ul style="list-style-type: none"> • Site survey, selection and preparation of land • Capacity building/ training on terracing/ contour and permanent farming system • Development of irrigation channels • Construction of vermi-compost/ manure collection tank (pit-holes etc.) • Awareness campaigns on agroforestry systems • Development of nurseries to promote agroforestry and enrichment plantation • Selection of appropriate paddy varieties • Financial and technical support for the establishment of wet rice cultivation cum fish farming
2	Adoption of horticulture crops	Promotion of horticulture crops for improved livelihood options	<ul style="list-style-type: none"> • Selection of appropriate cash crop varieties • Capacity building on plantation and management • Plantation of horticulture/cash crops • Financial and technical support • Development of cottage industries and establishment of market linkages



3	Creating mosaic habitat for biodiversity conservation	Establishment and connecting in-situ parks in the landscape for ecotourism opportunities	<ul style="list-style-type: none"> • Awareness campaigns on management of jhum cycle • Jhumming in cluster • Identification and selection of sites • Financial and technical assistance • Establishment of eco-parks, nature trails and homestays • Initiation of adventure tourism such as zip-liners, paragliding
4	Livelihood improvement	Providing income opportunities to shifting cultivation farmers	<ul style="list-style-type: none"> • Training/capacity building activities for Income Generation Activities (IGAs) • Vocational and value-added trainings for youth including 'Green Skill Development' programmes • Poverty Reduction Programmes through skills development trainings • Issuance of temporary land use passes • Establishment of market linkages • Establishment of storage facilities/ common facilities centres for NTFPs
5	Forest fire control and management	Community capacity building and involvement in forest fire management	<ul style="list-style-type: none"> • Effective enforcement of forest rules and regulations (targeting checking of illegal felling) • Plantation of fire-resistant tree species • Deployment of modern tools such as drones, GPS etc. • Capacity building programmes for front line staff and communities • Advanced research and management of forest fire • Land zoning and implementation relating to forest sector • Effective coordination between government, line agencies, and local communities
6	Sustainable energy supply	Alternative and sustainable energy made accessible to local communities	<ul style="list-style-type: none"> • Frequent coordination between supply agencies and transport agencies • Awareness programmes to encourage the local communities to adopt improved cook stoves (ICS) • Trainings on management and maintenance of ICS

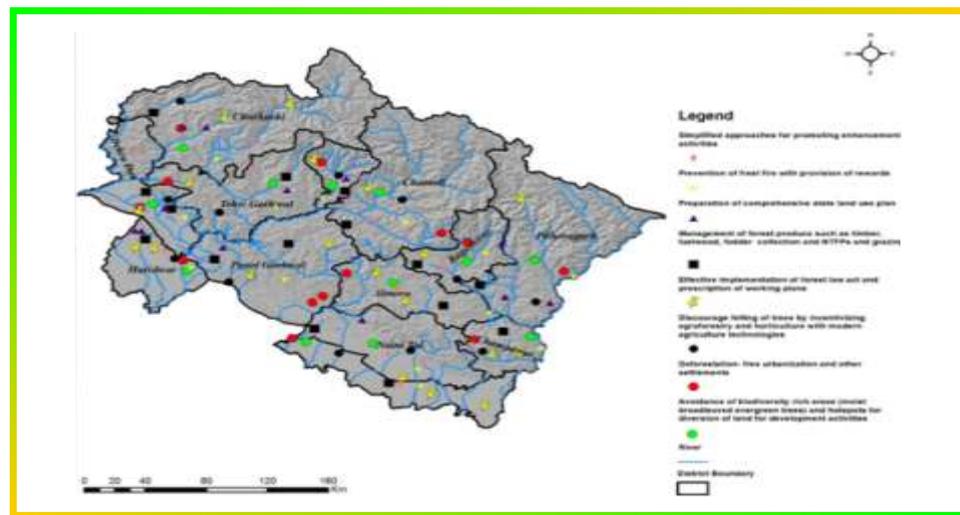


			<ul style="list-style-type: none"> • Enrichment plantation activities in supply reserve areas • Creation of firewood lot and monitoring visits • Awareness programmes on agroforestry and biomass energy • Selection of agroforestry species (firewood species such as <i>Derris robusta</i>, <i>Anogeissus acuminata</i>, <i>Schima wallichii</i>, <i>Pinus</i> species, <i>Quercus</i> species etc) • Development of nurseries to promote agroforestry
7	Market linkages for agriculture produce	Sustainable agriculture technology and models adopted	<ul style="list-style-type: none"> • Awareness and capacity building programmes/ trainings in sustainable agriculture practices • Demonstration plots of suitable agricultural practices • Procurement of tools and machinery suitable for hillside agriculture • Soft loans and financial assistance to farmers • Strengthening cooperation and coordination between cooperatives and farmers • Financial assistance for development of cooperative infrastructures (office, storage facilities etc.) • Value addition for agricultural produce • Developing communication amongst farmers, agriculture experts and, institutes, and markets • Development of mobile apps • Development of toll-free/helpline numbers
8	Demonstration of private plantation and agroforestry	Appropriate use of unproductive lands and reducing soil erosion	<ul style="list-style-type: none"> • Demonstration plots on appropriate agroforestry models • Promotion of homestead/kitchen garden • Selection of suitable horticulture crops • Watershed conservation for irrigation facilities • Exposure visits to farmers

(Source: ICFRE, 2018 b)

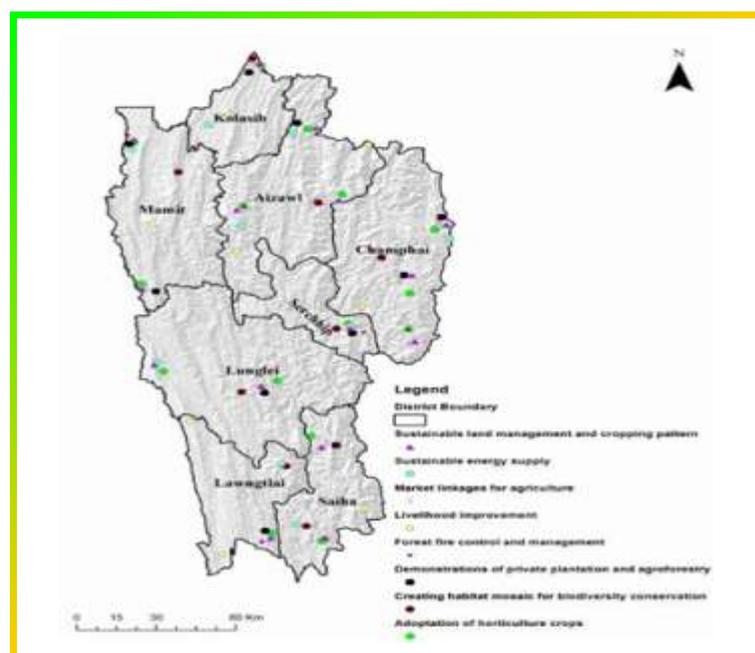


The expert group planning workshop must make sure that the specific IPs should not be contradictory to the National REDD+ Strategy i.e. IPs should follow the rationale of National REDD+ Strategy. Overall, there is no particular definition for IP but in general, an IP can act similar to strategy to obtain the desired result/outcome from a solution tree. If combining other set of strategies together (having logical activities), is forming an IP, it may again deliver desired outcomes. Lastly, mapping of the proposed IPs for feasibility and safeguards analysis should be done. Figures 19 and 20 shows participatory map of identified sites for implementation of activities in Uttarakhand and Mizoram respectively.



(Source: ICFRE, 2018 a)

Figure 19: Intervention activities in the hotspots for Uttarakhand



(Source: ICFRE, 2018 b)

Figure 20: Intervention activities in the hotspots for Mizoram



C 1.3 Feasibility analysis

Feasibility analysis involves analysing the risks and obstacles to implementation, and then identifying risk mitigation measures to make each IP more cost-effective. It provides a basis for deciding which IP is more practical while separating less feasible and less cost-effective IPs. EW1 in the next step will conduct feasibility analysis of the potential IPs. The first task will be done in smaller teams and will involve identification and analyses of risks and obstacles to implementation. It is considered that if SRAP becomes functional, the monetary source will be later enveloped through REDD+ finance, hence the term 'lack of finance/resources' should not be included under risks or obstacles. However, cost-effectiveness is a vital criterion in feasibility analysis. There are two main types of risks:

- Implementation risks that are internal to the SRAP process, such as management or technical capability, the political will of state government, governance problems, etc.
- External risks or threats, such as climate change, national policies conflicting with state policies or other sorts of national level interference, social breakdown, forest disease, etc.

Examining the relation/linkage between the cards on solution tree, few implementation risks and obstacles can be identified, and thinking about what could avoid one solution directing to the next one in the chain towards the final objective. It is suggested to draw five columns with following titles on a worksheet:

- Key result/IP
- Obstacle/risk
- Likelihood of obstacle/risk
- Impact of obstacle/risk
- Risk reduction measures

The combination of the probability of a risk or obstacle and its relative impact after it happens brings out the vitality or seriousness of a risk. These judgements are purely qualitative and comparative and should only be rated as High, Medium or Low. Table 8 shows the implementation risks and obstacles in Uttarakhand.

Table 8: Implementation risks and obstacles of IPs in Uttarakhand

S. No.	Key Results/IPs	Implementation Risk or Obstacles	Likelihood of Risk (H/M/L)	Impact of Risk (H/M/L)	Risk Reduction Measures
1	Effective implementation of forest legislation/policies and prescription of forest working plans	Low motivation for implementation, no incentive for implementation, long government procedures	M	M	Motivation and incentive for forest staff; simplification of government procedures



2	Preparation of comprehensive State Land Use Plan	Data deficit	L	H	Proper data collection; field sites visit, proper demarcations
3	Deforestation-free urbanization and other settlements	Unwillingness, unawareness of the local population	H	M	Proper planning with priority on environment, awareness of local population and private sector builders
4	Improved planning of development activities to avoid biodiversity rich areas (moist broadleaved evergreen trees) and hot-spots	National government and State government prioritize land use conservation without considering biodiversity richness	L	L	Identification of biodiversity rich areas and hot spots. Public and policy makers made aware on biodiversity conservation needs
5	Discourage felling of trees by incentivizing agroforestry and horticulture with modern agriculture technologies	Lack of motivation and incentive for farmers to keep trees on farm. Low awareness at farmer level for maintaining agroforestry and horticulture	L	L	Simplified procedures for harvesting and marketing of trees on farm. Promote agroforestry, horticulture and modern agriculture technologies
6	Sustainable management of forest products such as timber, fuel wood, fodder collection & NTFPs and grazing	Lack of technical inputs for management plan development, over dependency and overexploitation of forest resources	M	H	Develop management plans for harvesting forest resources on a sustainable basis



7	Prevention of forest fire with provision of rewards	Low awareness and low interest of forest officials and local community members; anthropogenic fire for developing grasslands and clearing agriculture fields.	H	H	Mobilize community members and forestry staff; establish a reward mechanism
8	Adaptation to extreme climatic conditions	Low understanding of climate impacts	L	M	Develop comprehensive plan on ecosystem based adaptation based on climate impacts
9	Simplified approaches for promoting enhancement activities	Low understanding of climate impacts	L	M	Identify enhancement activities on government forest, protected forest and private forest including agroforestry

(Source: ICFRE, 2018 a)

Now the expert group can analyse the overall feasibility of each IP. This depends on several factors such as:

- Likelihood and severity of implementation risks and obstacles;
- Feasibility and cost-effectiveness of risk reduction measures;
- Implementation cost of the IP;
- Opportunity cost of the proposed land use, such as forest restoration, agroforestry, etc.;
- Strength of incentive measures associated with the IP.

To explain the opportunity cost, it is the net income per hectare of the land use associated with the driver (such as a commercial coffee plantation) or the alternative land use to an enhancement activity (e.g., illegal logging in a potential forest restoration area). The higher the opportunity cost, the lower the feasibility of the REDD+ land use. For example, if the direct driver is shifting agriculture the opportunity cost will be quite low, but if it is palm oil it will be high, and if it is a hydro project it will be very high (Richards *et al.*, 2017). Since, quantifying opportunity cost against the net benefit of REDD+ land use is not feasible,



so qualitative judgement about the relative profitability of the different land uses will be considered much ideal.

The behavioural change of the key stakeholders (example: land users) (example: by adopting sustainable land-use practices), is key to the success of an Intervention Package (IP). As per Richards *et al.*, 2017, an IP which combines strengthened tenure rights or land security with carbon payments can be rated as a strong incentive measure, whereas an IP that relies only on carbon payments to farmers is likely to be a weak incentive measure. It is suggested to draw seven columns on a worksheet and complete it as follows:

- Names of IPs
- Implementation risks and obstacles: Low (3), Medium (2) or High (1)
- Feasibility/cost-effectiveness of risk reduction measures: High (3), Medium (2), Low (1)
- Implementation cost of IP: Low (3), Medium (2), High (1)
- Land use opportunity cost: Low (3), Medium (2) or High (1) (i.e., low, medium or high net income per hectare from the current (driver) or alternative land use)
- Incentive measures for changing stakeholder behaviour: High (or strong) (3), Medium (2) or Low/weak (1)
- Total feasibility score.

Table 9 provides overall feasibility analysis of Intervention Packages (IPs) in the state of Mizoram.

Table 9: Overall feasibility analysis of Intervention Packages (IPs) in the state of Mizoram

Intervention Packages	Implementation risks/obstacles (L=3, M=2, H=1)	Cost-effectiveness of risk reduction measures (L=1, M=2, H=3)	Implementation cost (L=3, M=2, H=1)	Opportunity cost (L=3, M=2, H=1)	Incentive measures (L=1, M=2, H=3)	Total score
Sustainable cropping pattern and land management	1	3	2	3	3	12
Adoption of horticulture crops	2	2	1	3	3	11
Creating habitat mosaic for biodiversity conservation	3	3	3	1	1	11
Livelihood improvement	1	3	1	3	3	11
Forest fire control and management	2	3	2	1	1	9



Sustainable energy supply	3	3	1	3	3	13
Market linkages for agriculture produce	1	3	1	3	3	11
Demonstration of private plantation and agroforestry	1	1	2	3	3	10

(Source: ICFRE, 2018 b)

Under feasibility analysis it is concluded that a high score implies greater feasibility and/or cost-effectiveness of the IP, while a low score implies serious feasibility issues. If an IP receives a low feasibility scoring then it should be discarded after discussing with EW1. However, if the EW1 finds the IP more feasible and cost-effective, the IP should be kept. Similarly, SRAP will be more effective if it focuses on a smaller number of well-resourced IPs rather than having a large number of IPs.

STEP C 2

SAFEGUARDS ANALYSIS (RISKS AND BENEFITS)

C2.1 Provisional identification of risks and benefits

As per Cancun Agreements, REDD+ activities should promote and support a set of seven social and environmental safeguards for effective implementation of REDD+ actions which are also known as the “Cancun safeguards”. Addressing and respecting of the following seven Cancun Safeguards will avoid, or at least minimize the negative governance, social and environmental impacts:

- Actions complement or are consistent with the objectives of national forest programmes and relevant international conventions and agreements;
- Transparent and effective national forest governance structures, taking into account national legislation and sovereignty;
- 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 Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples;
- The full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities;
- Actions are consistent with the conservation of natural forests and biological diversity, ensuring that REDD+ activities are not used for the conversion of natural forests, but are instead used to incentivise



the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits;

- Actions to address the risks of reversals; and
- Actions to reduce displacement of emissions.

Safeguards Analysis of the proposed Intervention Packages (IPs) against the 'Cancun Safeguards' need to be done. Since safeguards are considered more important to national level policies and measures thus, someone with a strong understanding should explain the safeguards and how analysis of safeguards to be done w.r.t. proposed IPs.

The formation of two teams (A and B) is considered necessary for this task. Team A should take care of social and governance issues (safeguards a–d) whereas environmental safeguards (safeguards e–g) will be taken care by Team B. Team A should consist of participants with social expertise keeping gender balance in mind. Team B should include participants with stronger technical and biodiversity understanding. Large scaled maps will be provided to both teams showing the provisional location of the IPs.

Identification of risks or threats to the safeguards; and identification of where an IP can contribute significant governance, social or environmental benefits, is the main aim of this task. Having too many social and environmental risks will be side-effects between various objectives. While identifying social risks or threats, it should be kept in mind that whether it will impact a 'vulnerable stakeholder group' or not.

It is suggested to keep the risks and benefits as specific as possible. Only selective benefits options with the objective of its enhancement should be chosen such as gender equity, improved governance and biodiversity conservation. Later 'group exchange' exercise will be done for questioning, making comments and improvement of analysis. The outcome of this step will be a list of potentially important risks and benefits for each proposed IP.

C 2.2 Local safeguards analysis

The safeguard analysis involves checking of each Intervention Package (IP) for governance, social and environmental or biodiversity related risks, and how to mitigate them in order to meet the Cancun Safeguards. The analysis also refers to the contribution made by IPs for the enhancement of social and environmental benefits. One of the crucial criteria needs to be considered for social risk is: whether the IPs negatively impact a targeted vulnerable group, and for an environmental risk whether it negatively impacts biodiversity and ecosystem services. To perform risks and benefits analysis in proposed IP locations/hotspots, the SRAP team should conduct a one day workshop with local stakeholder representatives using participatory rural appraisal methods. Maps of the proposed IPs should be taken to inform these meetings.

Justification and explanation of the suggested IPs is must for this exercise. The local stakeholders should also be asked to identify environmental risks and benefits but the discussions should be more focused on



social and governance issues. Two simple forms for Local Safeguards Analysis are proposed in Annex 5 for 'Local Risks Analysis' and 'Local Benefits Analysis' using large sheets of paper (or a blackboard/ whiteboard if there is one). The proposed Local Risks Analysis form has three columns:

- Column 1: when writing a proposed IP, it should be broken down into its component activities so that it is as clear as possible;
- Column 2: write a short description of the risk, including why people think it is a risk; in the case of social risks include vulnerable stakeholder groups affected;
- Column 3: while identifying how risk can be reduced or prevented, it should be emphasised that 'risk reduction measures' need to be feasible and cost-effective.

The Local Benefits Analysis form is similar except that the last column is for benefit enhancement measures, e.g., an activity to enhance gender equity benefits. Again, these need to be feasible and cost-effective. It is important not to rush these exercises; local stakeholders will need time to digest and discuss these new ideas.

If there is time after this exercise, the SRAP team can present the list of risks and benefits from EW1 for discussion. This should not be done before the local risks and benefits analysis since it would limit independent thinking, and some local stakeholders may not like to disagree with state officials, e.g., they could have a perception that they would be less likely to be selected as future 'project beneficiaries'.

C 2.3 Safeguards analysis workshop (EW2)

C 2.3.1 Introduction and participants

The necessity of holding third stakeholder workshop (SW3) arrives after answering certain questions like whether local safeguard analysis has desirable & effective participation and representation of local and multiple stakeholders. This can also be included in expert group workshop (EW3). The major aim is to take decision on 'serious' risks and benefits by EW2/SW3 which might cause changes or removal of an IP. EW2/SW3 is also required to take decisions on feasible risk reduction and benefit enhancement measures for inclusion in the SRAP.

Spatial analysis in the form of large scale maps can help in bringing clarity while taking decisions by connecting the living conditions and their dependency on forest resources.

In terms of participation, some of the SW2 participants should be the same from SW1 as it will help to maintain consistency regarding the workshop methods. It is suggested that gender equity should be given importance, thus at least one-third of them should be female.

C 2.3.2 Risks and benefits analysis by working groups

For analysing IPs, participants are suggested to form working groups (WGs) of 5-7 participants in each



group along with equal distribution of stakeholder group representatives in each working group. Based on the number of participants and IPs, each WG may have two or more than two IPs.

Prioritization of risks and benefits identified in EW1 and local safeguard analysis is the first task of WGs. Red coloured card represents risk and the identified risks should be marked with an asterisk as well as the risks which relate to Cancun Safeguards must be identified and marked with double asterisk. After placing the cards logically and rephrased (if necessary), new cards should be taken to write IPs. It should be noted that each IP should not have more than 10 risks but, if different views of WG members is found, voting is required.

For analysis of implementation risks, a worksheet with five columns should be prepared with headings as: IP/key result; Risk; Likelihood of risk; Impacts of risk; and Risk reduction measures. The WG can then complete the columns as follows:

- Name of IP or key result.
- Place or tape the agreed red cards.
- Give ratings as High, Medium or Low to the possibility or probability of the risk. However, if the possibility of the risk is low then there is no need to carry on with the analysis as it will not be rated as a 'serious risk'.
- Assuming the risk/threat has taken place, assess the impact of the risks High, Medium or Low. If the level of impact is Low, analysis can be discontinued. However, the remaining risks are 'serious risks' as they have at least a medium possibility or a medium level of impact if they happen.
- Identify one or two practical and cost-effective risk reduction measures for each 'serious risk'.

Maps also help to strengthen safeguards analysis. For example, if the loss of biodiversity and natural forests conversion is a risk then the maps which show natural forests and biodiversity hotspots are considered important. A similar process and form are applied for benefits analysis. Thus, identification of benefits for enhancement through REDD+ activities should be carefully done with a clear explanation. Since the benefit enhancement measures are related to 'multiple benefits' of REDD+ such as adding measures towards poverty alleviation, promoting gender equity and biodiversity conservation, thus they need a strong justification. The key criteria for identification of benefit enhancement measures are feasibility and cost. Moreover, enhancement measure should not be more ambitious than the key result or IP. The time given to analyse risk and benefit analysis is around four hours.

Some examples of implementation risks and analysis of IPs in Mizoram are shown in Table 10 whereas risk and benefit analysis done in SRAP of Mizoram are presented in Table 11. It is unnecessary to separate social risks from environmental and governance risks. In the SRAPs of Mizoram and Uttarakhand, no such gender equity risks were identified, but it cannot be considered to be the same case for every SRAP.

Table 10: Implementation 'risks' and obstacles analysis of Intervention Packages in Mizoram

Intervention Packages	Implementation Risk or Obstacles	Likelihood of Risk (H/M/L)	Impact of Risk (H/M/L)	Risk Reduction Measures
Sustainable land management and cropping pattern	Current unsustainable management practices	H	H	Awareness, exposure to best practices, motivation, incentives
Adoption of horticulture crops	Lack of technologies and market assurance	M	M	Research and extension, technological inputs, Improve market linkage
Creating habitat mosaic for biodiversity conservation	Lack of awareness and motivation, Lack of sense of ownership	L	M	Public awareness and participation, reduce human wildlife conflict
Livelihood improvement	Lack of skills, limited opportunities	H	H	Trainings and skills development, creating new employment opportunities
Forest fire control and management	Carelessness, Lack of awareness,	M	H	Awareness campaigns
Sustainable energy supply	Inadequate supply Transportation and infrastructure, poverty	L	M	More programs on sustainable energies targeted to rural areas
Market linkages for agriculture produce	Transportation, distance to remote areas, Lack of support prices	H	H	Improve connectivity, improve infrastructure and communication, Assured prices
Demonstration of private plantation and agroforestry	Lack of skills, good seedlings and willingness	H	H	Awareness campaigns

(Source: ICFRE, 2018 b)



Table 11: Analysis of social and environmental benefits of Intervention Packages in Mizoram

Intervention Packages	Social/environmental benefits	Likelihood of benefit (H/M/L)	Impact of benefit (H/M/L)	Benefit enhancement Measures
Sustainable land management and cropping pattern	Higher economic returns from	M	H	Target farmers with arable land
Adoption of horticultural crops	High value agriculture	M	M	Establish market linkage for horticulture produce
Creating habitat mosaic for biodiversity conservation	Increase in floral and faunal biodiversity	L	L	Reduce possibility of human wildlife conflicts
Livelihood improvement	Livelihood opportunities created	H	H	Develop programmes for targeted groups
Forest fire control and management	Wild and uncontrolled fires managed	M	H	Demarcations required supported by adequate awareness campaigns
Sustainable energy supply	Improved access to energy	H	H	Adequate finance available for promoting and adoption of sustainable energy supplies
Market linkages for agriculture produce	Value addition of farm products	M	M	Selection of appropriate farmers that adopt improved technology
Demonstration of private plantation and agroforestry	Appropriate use of unproductive lands, Economic benefits	H	H	Adequate finance for the establishment of demonstration sites and training program to manage the demonstration sites

(Source: ICFRE, 2018 b)

C.2.3.3 Group exchange and museum visit

'Group exchange' exercise among WGs is important to check the analysis of risks and benefits and make improvements accordingly. The process of the museum visit will be the same as in SW1 and SW2. The WGs will write down important suggestions and make final changes in their analysis tables accordingly.



C 2.3.4 Safeguards analysis workshop report

As for SW1 and SW2, data processing, analysis and reporting should take place as soon as possible. The lead workshop coordinator should be primarily responsible for the report, supported by the SRAP core team and WG facilitators.

STEP C 3

REVIEW OF INTERVENTION PACKAGES

C 3.1 Analysis of existing state plans and projects

A comparison of the proposed IPs with approved forestry linked projects/plans (approved or budgeted) is another important task for the SRAP team/Expert Group. Since most of the states have their own forest development plans/ projects/ working plans, hence make this comparison more important:

- To avoid repetition along with reducing costs of SRAP;
- For checking out conflicts between SRAP and other state plans/projects.

The cost and resource necessities of SRAP will automatically get reduced if the state existing plans/projects are enclosing most of the activities proposed in IPs which if so, can be approached for preliminary 'gap analysis'. However, a detailed gap analysis is needed to be done at Stage E (budgeting) as it will be helpful to estimate the fund requirements of SRAP.

A possible conflict may arise when any stringent forest protection policy encounters with an IP such as when an IP is encouraging community-based sustainable management in buffer zones or in particular areas such as high revenue plantations which are established based on SRAP enhancement activities and fast-growing exotic species. Thus, it is essential that such circumstances may be carefully negotiated between the SRAP team and state forestry programme or project proponents as there is a possibility of overlapping between the two parties. The overlapping between IPs and state plans/projects may be noted during the budgeting stage. The SRAP can be implemented under another plan/project but SRAP activities should be included in the operational plan of SRAP and be subject to the SRAP monitoring protocol.

C 3.2 Selection of IPs for detailed planning

Before proceeding to the monitoring and budgeting stages of the SRAP, a final review of IPs is necessary and needs to be done by the SRAP team or expert group members. The key question for the SRAP team is: can the IP be cost-effectively modified or re-planned to reduce the risks, including the proposed risk reduction measures, or would it be better to simply remove the IP? Thus, to reduce risks, reference should also be made to the maps to check the potential to modify the location of the IPs.



The selection of IPs is not as simple as it seems since IPs carry the potential for 'additional' emission reductions, simultaneously the feasibility and cost-effectiveness of each IP, hence must be regarded. As per the speculation, SRAP should not pay for carbon removal or reductions that would happen in one way or the other, such as due to feasible commercial forest plantations. Thus, an overall amalgamation of activities and interventions can be involved in SRAP which will:

- Provide inducement/ incentivize or compensation for carbon removal activities that would probably not happen without funding from REDD+, such as restoration of natural forests and community-based sustainable forest management;
- Provide support and shape to accomplish effective forestry and land use activities considering carbon removal which would take place in any manner.

As been discussed earlier, the other key criteria for defining an IP are:

- To have a direct impact on the resource;
- The IP should be independent of other IPs;
- There is an adequate strong incentive for land users/practitioners for transforming their existing practices.

However, it is also important to reiterate that the SRAP should be as persistent as possible; therefore it is recommended to have a maximum of six IPs. After observing the need for 'REDD+ Implementation Agreements' with local stakeholders, implementing and managing SRAP will be much easier considering a geographical focus within the state area as it would also cut down the implementation costs.

After following a careful study of the feasibility and safeguards analysis, if there is an argument between expert group/SRAP team regarding the selection of more than five feasible IPs and disagreement on which IPs to be discarded, voting is ultimately preferred. The SRAP team may also take an advice of the State REDD+ Cell.

C 3.3 Revision of IP location maps

The location of IPs in the maps should be finally revised by the SRAP team or expert group such that no issues should be left even after following the feasibility and safeguards analysis. To overcome this, the spatial analysis team should be asked to place all the IPs on a computer generated map which will help the decision makers.

C 3.4 Communication with multiple stakeholders

All the participants should be communicated regarding the whole process and justification for the selection of IPs. If the budget and time permits, all the workshop participants should be invited for a day meeting to discuss the selected IPs. If there are constraints of budget and time, at least a letter and/or email should be sent to each workshop participant.

STAGE D: MONITORING

STEP D 1

OVERVIEW OF MONITORING FOR REDD+ AND SRAP

D 1.1 REDD+ monitoring levels

The REDD+ monitoring involves three main levels i.e. the national or state or SRAP level, and the local or IP activity implementation level (Figure 21).

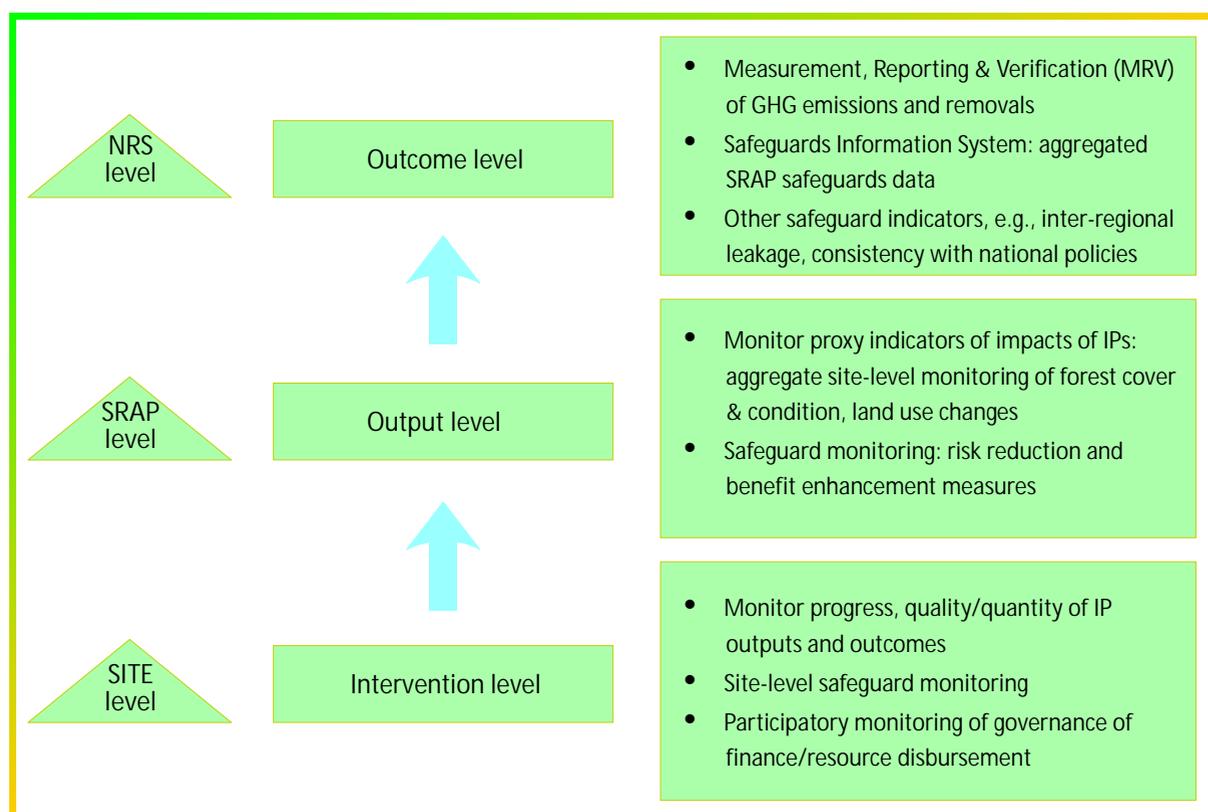


Figure 21: Three levels of REDD+ Monitoring

(Source: Richards *et al.*, 2017)

D 1.1.1 National level monitoring

At the national level there are three main monitoring tasks or functions:

- As per the UNFCCC, countries must develop their measurement, reporting and verification (MRV) system of GHG emissions at national level as all international REDD+ payments or compensation must be 'results-based'. This further has to be compared to the Forest Reference Level (FRL) such that REDD+ profits can be calculated and the country can claim for results-based-payments.



- Monitoring progress and, as much as possible the results from national level PAMs.
- A country must develop its own 'Safeguards Information System' (SIS) which will show the determination of a country to meet the UNFCCC safeguards which will be later followed by submission of 'Summary of Information' on how this system is being implemented.

D 1.1.2 State level monitoring

Monitoring and reporting of emission reductions and removals at the state level is not necessitated by the UNFCCC. Accounting at the national level suggests 'leakage' (supplanting of D&FD) is not an issue for developing SRAP, however it is important to mitigate leakage risks of the IPs. Therefore, every state has its SRAP which can be coordinated to achieve the objective of National REDD+ Strategy.

Measurements of the impacts of IPs on carbon emissions and removal can be carried out by monitoring 'proxy indicators' such as changes in forest area and its condition explains the main role of REDD+ monitoring at the state level.

D 1.1.3 Intervention level monitoring

As described in safeguards analysis, even though a SRAP has been approved, agreement on execution of IPs is necessary from local partners/stakeholders whose subsistence or rights are getting affected or whose participation is required. The manual does not provide negotiations held between the SRAP implementing agencies and local stakeholders, but the process should follow the participatory rural appraisal or local stakeholder consultation. The outcome of this will be a 'REDD+ Implementation Agreement' (RIA) with local stakeholders which provides site level approach for monitoring execution of IPs. The components of the RIA will include:

- Duties of all concerned parties;
- Deliverables needed for release of payments or incentives (if required); and
- Outcomes of any violation of the terms of agreement.

At the site level, collection of RIA implementation and outcome indicators can be done. However, for effective implementation of SRAP, the site level monitoring is crucial since:

- Timely revision of IPs by informing 'adaptive management';
- Allows conformity with RIAs to be checked;
- Sets off payments or inducements as conferred under the RIAs;
- Contributes to transparency and stakeholder rights due to the participation of local stakeholders in the monitoring process; and
- Communicates the national Safeguards Information System (SIS).

The monitoring system should be 'qualitative' such that unexpected or obstinate impacts in SRAP could be identified along with the implementation of IPs and safeguard-related indicators. Thus, an early warning of



spontaneous or unanticipated effects can be provided through adaptive management which in turn necessitates a standard flow of informal data from the local level. This can further be achieved through meetings between the SRAP monitoring office, local field staff and local stakeholders, who can be informally organised into focus groups. Gender issues should be addressed through an all-women focus group.

D 1.2 Indicators

Being the core of any monitoring system, an indicator shows the progress towards achieving a target or objective. An indicator can be properly defined as “a quantitative or qualitative factor or variable that provides a simple and reliable means to measure how well a desired outcome, value, or criterion is being achieved or fulfilled”. An important note to consider is that an indicator shows the progress towards achieving targets and goals but cannot be a target or goal. Therefore, suitable indicators can be identified through clear and quantifiable (if possible) targets or objectives.

An important feature of indicators should be show ‘attribution’ i.e. the ability to show cause and effect. In other words, an attribution explains that why something has changed (e.g., why the condition of the forest has been changed?). Thus, an indicator can be misleading without attribution, for example, an enhancement in forest condition might take place due to project based activities rather than the SRAP. When the indicators are obtained from various points along a connecting chain, they show a good level of attribution.

Differentiation between output, outcome and impact indicators is as follows:

- Output indicators: immediate or short-term, easy to identify and have high levels of attribution;
- Outcome indicators: liable to be short to medium term, harder to identify and tend to have a moderate level of attribution; and
- Impact indicators: long-term, difficult to identify and low attribution level.

A good monitoring plan should have a combination of output, outcome and impact indicators. Table 12 shows few examples of output, outcome and impact indicators identified for Uttarakhand.

D 1.3 SMART targets

According to Richards *et al.* (2017), targets should be SMART i.e. Specific, Measurable, Achievable, Realistic and Time-bound (SMART) which are vital for recognizing indicators. A SMART target is:

- Specific - the target should have a specific outcome or impact
- Measurable - the target should be measurable
- Achievable - the target needs to be achievable, as well as cost-effective



- Realistic - the target should be realistic as regards the resources and capacity needed to achieve it (allowing for the potential of REDD+ funding to increase this capacity)
- Time bound - the target should have a clear and realistic timeframe

Identification of an appropriate indicator becomes very easy if the SMART target is clearly understandable. Table 13 provides an example of SMART targets and indicators proposed in the SRAP workshop in Mizoram.

Data collection method is vital for an indicator to assess the cost of a monitoring system. In most of the cases, the SRAP indicators will have a low cost due to already existing data which can be easily accumulated.

Table 12: Examples of output, outcome and impact indicators for Uttarakhand

Indicator types	Examples
Output Indicators	<ul style="list-style-type: none"> • Number of forest staff receiving incentives • Number of poorest of poor representatives taking part in the preparation of local forestry plans • Number of awareness programmes conducted each year • Number of monitoring activities per year • Number of affected households supported with alternative livelihood options
Outcome Indicators	<ul style="list-style-type: none"> • % of women participated and engaged in forest related activities • % of communities receiving incentives to adopt agroforestry and horticulture practice • % of encroached/conflict land identified • % of activities guided by State Land Use Plan implemented each year • Number of appropriate models of agroforestry and horticulture developed • % reduction in women's fuelwood collection time
Impact Indicators	<ul style="list-style-type: none"> • % of forest quality improved after effective implementation of forest legislation/policies and prescription of working plans • % of demarcated state owned forest • Number of communities protected from natural disasters • Area of biodiversity rich areas and hotspots conserved after streamlining the development activities identified and documented • % increase in quality of forest after forest fire management

(Source: ICFRE, 2018 a)

Table 13: Targets and indicators (selected IPs) from the SRAP workshop of Mizoram

Key result	SMART targets	Indicators
Sustainable land management and cropping pattern	At least 10% of households received exposure to better farming system	Number of households received the better farming system exposure visit
	250 households consuming indigenous crop products from agroforestry systems	% of agroforestry area under hybrid/exotic species cultivation
Adoption of horticulture crops	Four awareness programmes carried out on usage and hazards of fertilizers	Number of awareness programmes on usage and hazards of fertilizers
	70% of households getting good market linkage on horticulture produce	Number of households getting good market linkage on horticulture produce

(Source: ICFRE, 2018 b)

STEP D 2

TARGETS AND INDICATORS

D 2.1 Expert Monitoring Protocol Workshop (EW3)

After the IPs get finalised (Step C3), the monitoring plan for SRAP is meant to be developed by an expert group workshop. However due to lack of funding, a monitoring expert can be invited/hired for developing the monitoring plan in the SRAP. Two main tasks are involved in developing the monitoring system:

- Identification of targets and indicators;
- Development of monitoring plans.

Based on indicators needed, the process can be further divided into:

- Proxy indicators for carbon outcomes of IPs;
- Implementation progress (IP output indicators);
- Implementation risk reduction measures;
- Risk reduction and benefit enhancement measures;
- Negative impacts.

D 2.2 Proxy indicators for carbon outcomes of IPs

Verification of changes in forest biomass and area due to implementation of IPs are essential for targets and indicators which are further required by the proxy indicators. Table 14 shows few examples of forest biomass targets and proxy indicators identified in the Mizoram SRAP.

Table 14: Target and proxy indicators for Mizoram

Key results/IPs	Targets	Proxy indicators
Effective implementation of forest Legislation/policies and prescription of forest working plans.	Forest quality improved at least by 10%	Forest quality (after effective implementation of forest legislation/policies and prescription of working plans)
Preparation of comprehensive State Land Use Plan	100% boundary between forest and encroached land in conflict areas demarcated	Length of boundary between forest and encroached land in conflict areas demarcated
	At least 30% of encroached forest in conflict areas restored	Area of forest land recovered after demarcation
Deforestation- free urbanization and other settlements	At least 100 km boundary demarcated between urban and forest areas	Length of demarcated urban boundaries with forest
	At least 25% of encroached forest area recovered	Area of forest recovered after eviction of forest encroachers
Planning to avoid development in biodiversity rich areas (moist broadleaved evergreen trees) and hotspots	All biodiversity rich areas and hot-spots having areas of at least 2 sq km identified and documented	Area of biodiversity rich areas and hotspots identified & documented
	At least 50 sq km of biodiversity rich areas and hotspots conserved after improved planning and regulation of development activities	Area of biodiversity rich areas and hotspots conserved after streamlining the development activities
Incentivizing agroforestry and horticulture with appropriate agricultural technologies to discourage tree felling	1000 households adopted agroforestry and horticulture using appropriate technologies	Number of households adopted agroforestry and horticulture using appropriate technologies

(Source: ICFRE, 2018 b)

D 2.3 Implementation progress (IP Outputs)

Outputs obtained from an implementation of IPs help to identify targets and indicators of implementation progress (presuming these IPs have been identified). It is easy to define indicators from outputs when the outputs are assigned as targets. Table 15 shows implementation targets and indicators for an IP from the Mizoram SRAP. The assessment of progress implementation indicators is usually done at 'hotspot' or site level.

Table 15: IP implementation targets and indicators for Mizoram (IP: Sustainable Energy Supply)

IP outputs	Targets	Indicators
Supply of LPG improved and Improved Cook Stoves (ICS) promoted	60% of Households used sustainable energy sources programmes	Number of households using sustainable energy
	Two awareness and training programme conducted to encourage local communities to adopt ICS in each hotspot	Number of awareness programmes to encourage the local communities to adopt ICS
	200 households installed ICS	Number of households adopting sustainable energy sources
	50% of households accessed finance for energy supply	
Firewood supply for the local community managed	60% reduction in per households fuelwood consumption in hotspots	Average amount of fuelwood consumed per households after receiving sustainable energy sources
	All seedlings planted	Number of firewood plant species planted
	At least one/two skill development programme conducted in each district	Number of skill development programme conducted
Agroforestry promoted	Two awareness and training programme conducted	Awareness programmes on agroforestry and biomass energies
	One nursery established in each hotspot	Development of nurseries to promote agroforestry

(Source: ICFRE, 2018 b)

D 2.4 Risk reduction and benefit enhancement measures

As identified in Step C2, the targets and indicators are also needed for the risk reduction and equity enhancement measures, including implementation of risk reduction measures as identified in Step C1.3. The indicators shown in the SRAP will not only provide vital support to the Safeguards Information System but will also evidently prove that it is trying to meet the UNFCCC safeguards such that the negative impacts may be reduced and benefit opportunities may be enhanced. Table 16 provides details of targets and indicators for social, environmental risk reduction measures in the SRAP of Mizoram.



Table 16: Targets and indicators for social, environmental risk reduction measures for Mizoram

IP/Key result	Outputs	Risks	Risk Reduction Measures	Risk Reduction Targets	Indicators
Adoption of horticulture crops	Horticulture/Cash crops planted and promoted	Introduction of new pest and disease	<i>Application of proper agriculture techniques</i>	70% of households having pest and disease free crops	Number of Households having pest and disease free crops
	Value addition for Horticulture crops promoted	Excessive use of pesticides and chemical fertilizers	<i>Awareness on hazards and usage of fertilizers</i>	Four awareness programme carried out on usage and hazards of fertilizers	Number of awareness programmes on usage and hazards of fertilizers
Creating habitat mosaic for biodiversity conservation	Jhumming cycle regulated	Lack of awareness and motivation, Lack of sense of ownership	Public awareness and participation	Four awareness campaigns per year on wildlife conservation and ecotourism	Number of awareness campaigns conducted
	<i>In-situ</i> conservation of flora and fauna promoted		Reduce human-wildlife conflict	20% of human-wildlife conflict reduced	Number of human wildlife conflicted cases
	Nature-based tourism developed and promoted				

(Source: ICFRE, 2018 b)

D 2.5 Negative impacts

It is advised that the likely risks/negative impacts should also be monitored along with observation of the progress of implementation targets and risk/ benefit measures such that a better adaptive management system may be facilitated by timely notifying the SRAP coordinator. The indicators of negative impacts will warn that something is off beam and remedial measures are immediately needed. Negative impacts do not need targets and the risk analysis tables can be used to identify the indicators.

STEP D 3

MONITORING PLANS

Monitoring plan can be compiled in a standard monitoring plan form with eight columns (see Table 17). Following is suggested to complete the columns:

- IP or key result.

- Target: risk reduction and benefit enhancement targets.
- Indicator: each target can have more than one indicator for each target; however it increases the cost of monitoring.
- Data collection method/Data source i.e. if data for the indicator is already present such as in a report, note down the source; if not, decide the method of data collection.
- Identify: Where the data will be collected.
- Decide: When or how frequently the data will be collected.
- Establish: Who will be responsible for collecting the data.
- Relative cost of data collection: High, Medium or Low.

Most indicators do not require costly data collection methods; quite often the data already exist or are relatively easy to collect. Wherever possible the data collection method should build on existing monitoring systems, e.g., using periodic forest inventory data or annual household surveys conducted by the department of agriculture or the national statistical office (these surveys sometimes have data on the consumption, sale or purchase of forest products). If a household survey is needed, a statistician's help may be needed for the sample survey design.

Table 17: Monitoring plan for proxy indicators of selected IPs in SRAP of Uttarakhand

IP/Key Result	Targets	Proxy indicators	Source/ Data collection method	Where	When	Who	Relative cost (H/M/L)
Effective implementation of forest legislation/policies and prescription of forest working plans	Forest quality improved at least by 10%	Forest quality (after effective implementation of forest legislation/policies and prescription of working plans)	Field survey, Remote sensing and GIS applications, completion report				
Preparation of comprehensive State Land Use Plan	100 % boundary between forest and encroached land in conflict areas demarcated	Length of boundary between forest and encroached land in conflict areas demarcated	Division Forest Office/ Range Forest Office and completion report				
	At least 30% of encroached forest in conflict areas restored	Area of forest land recovered after demarcation					



Deforestation - free urbanization and other settlements	At least 100 km boundary demarcated between urban and forest areas	Length of demarcated urban boundaries with forest	Field survey, direct field observation, completion report				
	At least 25% of encroached forest area recovered	Area of forest recovered after eviction of forest encroachers					
	One designated site for settlement of nomadic communities	Area designated for the settlement of nomadic communities	Site observation and field reports				
Planning to avoid development in biodiversity rich areas (moist broadleaved evergreen trees) and hotspots	All biodiversity rich areas and hotspots having areas of at least 2 sq km identified and documented	Area of biodiversity rich areas and hotspots identified & documented	Field survey, field data sheets, field report and completion report				
	At least 50 sq km of biodiversity rich areas and hotspots conserved after improved planning and regulation of development activities	Area of biodiversity rich areas and hotspots conserved after streamlining the development activities	Site observation and final report				

(Source: ICFRE, 2018 a)

STEP D 4

BUDGETING OF MONITORING ACTIVITIES

Including the cost for monitoring activities in the overall budget of SRAP is relatively significant. At the end of EW2 i.e. at Stage E, the monitoring costs (including data analysis) and reporting costs can be estimated (estimating monitoring costs in EW2 will stay fresh in the minds of the SRAP team/expert group) after which the guidance in Stage E can be followed.

STAGE E: BUDGETING

STEP E 1

TARGETS AND ACTIVITIES

The main aim of the budgeting workshop (EW4) is to develop a five year operational plan for the SRAP. Persons from finance or accounting staff should be engaged in this step. Well-established national budgeting system(s) and templates for developing the operational plan can be used.

The list of identified activities for each IP (Step C1.2) will be considered as the initial point for the budgeting part and formulating OP. The SMART targets (Step D1.3) are also necessary for this step. The SMART target for selected IP in Mizoram SRAP (refer to Table 7) i.e. "Sustainable land management and cropping pattern" will be: 80% reduction of shifting cultivation area in all hotspots. Hence, the activities for achieving this target should have been identified in Step C1.2 along with the addition of Step C1.3 regarding risk reduction and monitoring activities. Thus, for the strategy 'Adoption and expansion of settled hill farming system', following activities can be recognized for the first two years of operation:

- Conduct the site survey, selection and land preparation (Year 1, Quarter 2);
- Develop training programme on capacity building/terracing/contour and permanent farming system (Year 1, Quarter 3-4);
- Develop irrigation channels (Year 2, Quarter 1);
- Construct vermi-compost/manure collection tanks (Year 2, Quarters 1-2);
- Conduct awareness campaigns on agroforestry systems (Year 2, Quarter 3);
- Develop nurseries to promote agroforestry and enrichment plantation (Year 2, Quarter 2);
- Select appropriate paddy varieties (Year 2, Quarters 3-4);
- Monitoring financial and technical support for the establishment of wet rice cultivation cum fish farming (Year 2, Quarters 2-4).

STEP E 2

OPERATIONAL PLAN

For this step, involvement of expert group members is compulsory, in which an Operational Plan (OP) is developed either by placing large sheets of flipcharts being taped together or by using a laptop with a projector (Excel spreadsheet is generally used in preparing budget and OP). The OP worksheet can be developed and completed as follows:

- Column 1: The OP worksheet should be positively marked correctly considering the IP and Strategy. The list of activities (from Step E1) can be placed in Column 1. For identification purposes, the activities are numbered as S1a (Strategy 1, activity (a)), S1b (Strategy 1, activity (b)), etc.
- Column 2: Each activity requires a set of more detailed tasks for effective implementation hence, these can be identified in small group brainstorm sessions, arranged in chronological order, and entered in Column 2 as T1 (task 1), T2, T3, etc., for each activity.
- Column 3: Should include the person, official or organisation that should be given the responsibility to carry out each activity and task.
- Column 4: Should include the number of days needed per 'event' such as training workshop, consultancy study, etc.
- Column 5: Should include the calculated human resource cost per 'event'.
- Column 6: Should contain specifications for the material resources needed for each task, such as transport, per diems/daily allowance, hire of equipment, communications, materials, etc.
- Column 7: Should include the cost estimation of material resources per 'event'
- Column 8: The total unit cost i.e. the combined human resource and material costs per event will be entered in Column 8.

The remaining columns will include the number of events per year. Five more columns will be needed for the total cost per year i.e. equal to the number of events per total unit cost.

Extra columns are required if the IPs are partially covered by other programmes and projects such that the financial contribution of these sources and the amount to be covered by the government or donors can be illustrated. Table 18 presents an example of operational plan worksheet.

Table 18: Example of operational plan worksheet

Activity	Tasks	Responsibility	Person days per event	Labour cost/event	Material resource	Material cost/event	Total unit cost/event	Number of events					Cost per year Rs.						
								Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5		

The SRAP Report

The general structure for the SRAP report is presented in Table 19. The structure and layout of the SRAP report varies from country to country. Each REDD+ Intervention Package is presented in a concise manner which includes tables of the feasibility and safeguards analysis, monitoring plans and budget. Summarised IP description as an example for Mizoram REDD+ Action Plan is given in Annex 7.

Table 19: General structure for SRAP report

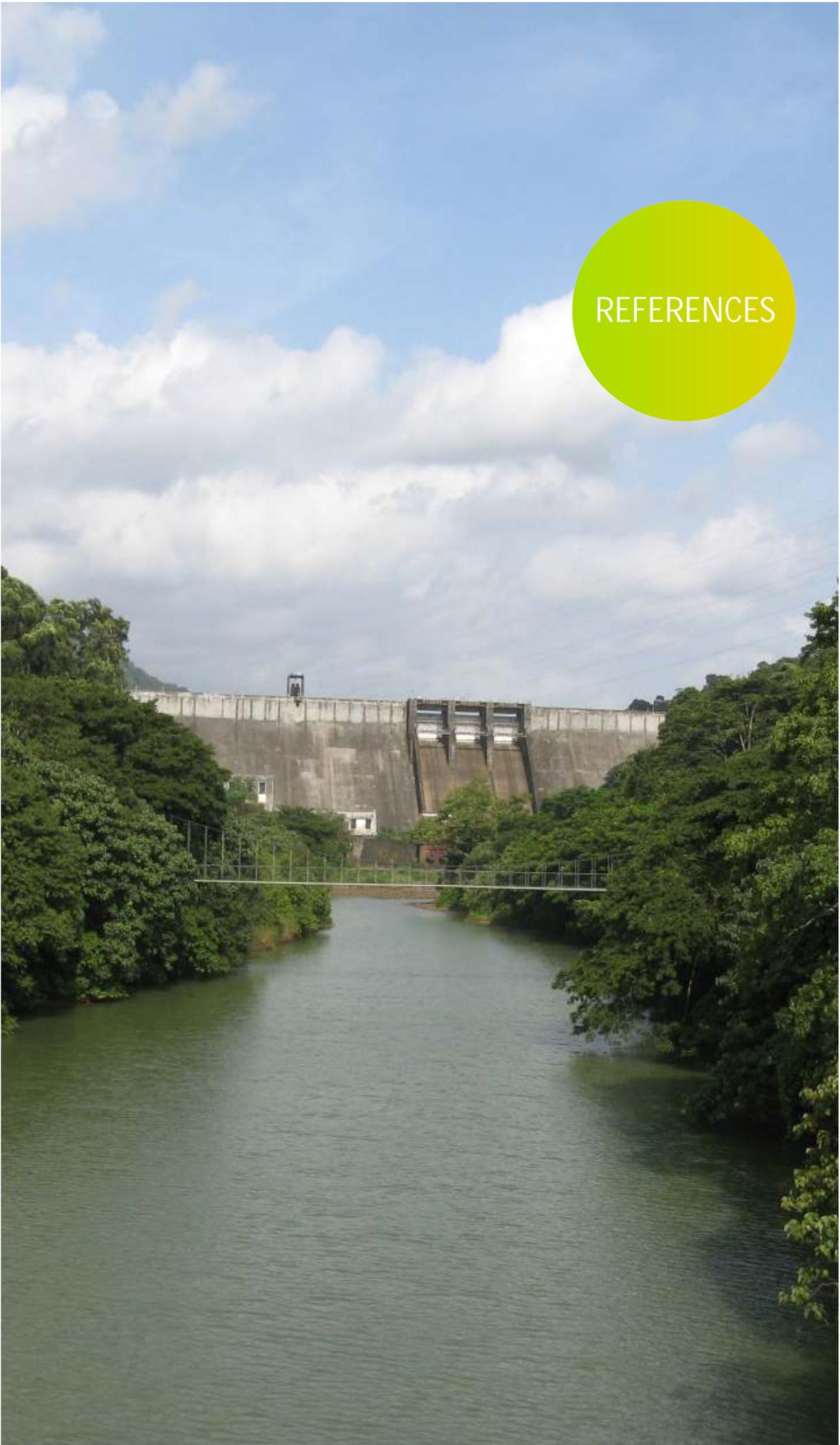
Title	Contents need to be included
Executive Summary	List of Intervention Packages, Summary of budget
List of Abbreviations	List of acronyms and other abbreviations used in the report
Introduction	REDD+ National Strategy, REDD+ Readiness in the National Context, Evolution of the State REDD+ Action Plan Approach, Linking India's Nationally Determined Contributions and the SRAPs, etc.
Methodology	Summary of the SRAP approach, Workshops for the formulation of respective State REDD+ Action Plan



Diagnosis	Prioritization of D&FD drivers and enhancement activities; Development of problem and solution trees, Development of Intervention Packages (IPs), Identification of Strategies and Activities; Feasibility analysis of IPs, Map with the location of drivers/enhancement activities; Summary of solution tree analysis
Interventions	Summary of solution tree analysis and derivation of IPs; Table of IPs, including IP outputs and activities; safeguard analysis; Gaps Analysis; Monitoring
Safeguards Analysis	Summary of Safeguards analysis process; Table of (serious) risks and benefits, including risk reduction and benefit enhancement measures
Budget	Summary of budget and Operational Plan
References	List of references or bibliography
Annexes	<p>Lists of workshop participants</p> <p>List of members of SRAP core team, Expert Group, Spatial analysis team, Multiple Stakeholder Working Group, etc.</p> <p>Tables with ranking of D&FD drivers and enhancement activities</p> <p>Problem trees</p> <p>Solution trees</p> <p>Feasibility Analysis tables</p> <p>Safeguards Analysis tables</p> <p>Monitoring Plan tables</p> <p>Operational Plan and Budget</p>





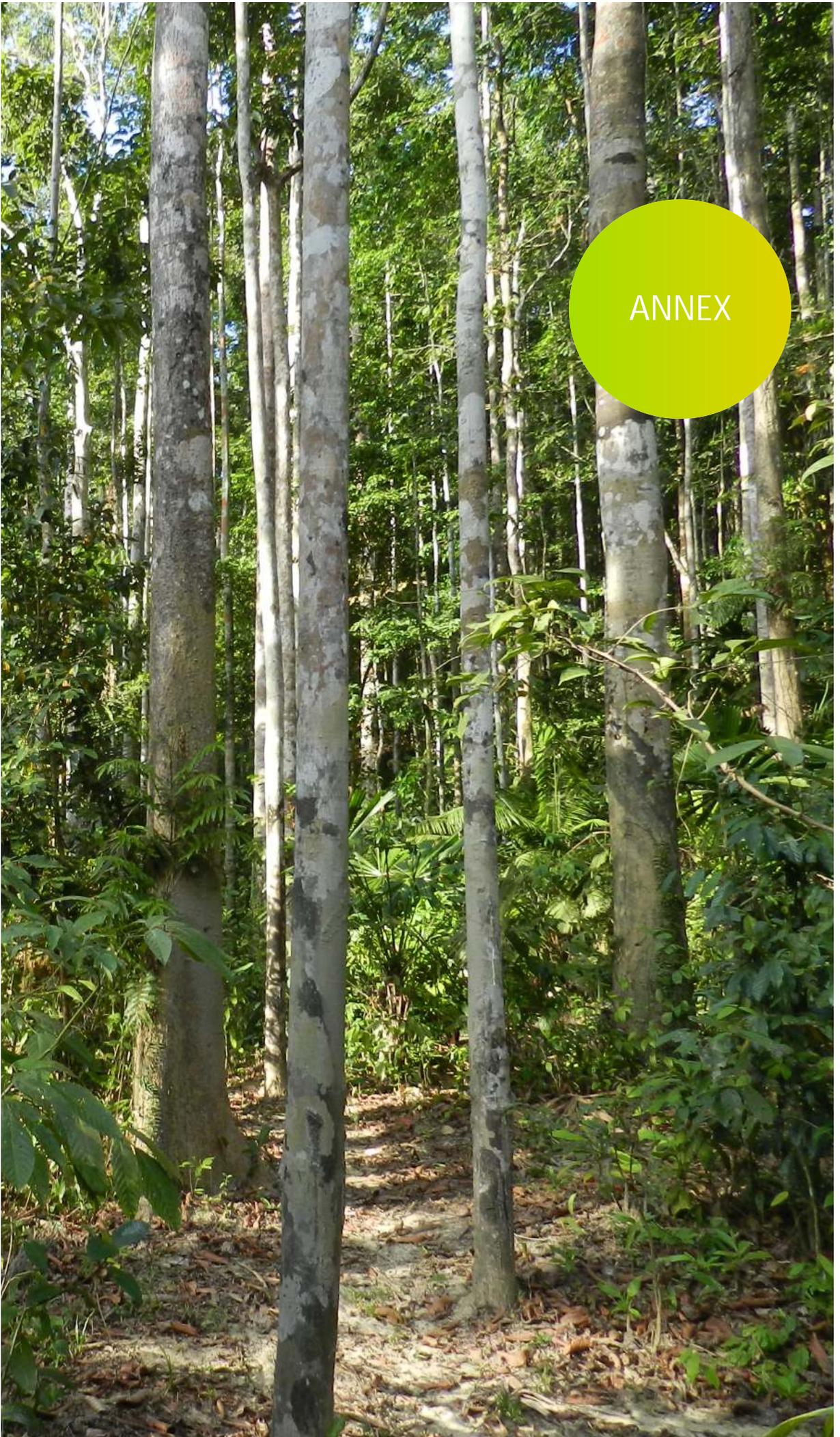


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ANNEX



ANNEX 1

SRAP Stages, Steps, Sub-steps and respective outputs

Stages and Steps	Sub-steps	Outputs
Stage A: Preparation		
Ownership and SRAP core team		SRAP core team established; Multi-stakeholder SRAP Working Group established
Spatial analysis and background data collection	Preparatory spatial analysis; Preliminary analysis of D&FD drivers & enhancement activities; Preparatory stakeholder analysis.	Maps informing stakeholder workshops; Basic planning map for workshop annotation; Poster on D&FD drivers; enhancement activities; stakeholder analysis.
Selection and training of working group facilitators		Training of WG facilitators
Workshop participants and logistics	Selection of workshop Participants; invitations; venue and materials	List of invited workshop participants
REDD+ orientation for workshop participants		Workshop participants with a better understanding of REDD+ and SRAP process
Stage B: Analysis		
Overview of SRAP process and Problem Analysis Workshop (SW1)		
Preparatory data presentations	Poster presentations Spatial analysis	Annotated maps and posters of drivers and stakeholder analysis
Prioritisation of D&FD drivers and enhancement activities	Identification and scoring of drivers and enhancement activities; Selection of priority drivers and enhancement activities; Formation of Working Groups; Mapping of drivers and enhancement activities.	3-5 prioritized drivers and enhancement activities; Working Groups formed; Annotated maps of D&FD hotspots and location of enhancement activities.
Problem trees	Explanation and development of problem trees including group exchange; museum visit; field verification of hotspots and problem analysis workshop report	Problem trees and report of Problem Analysis Workshop (including findings from field verification).
Solution trees	Overview of Solution Analysis Workshop (SW2); Explanation and development of solution trees; group exchange; museum visit and solution analysis workshop report	Solution trees; Maps with potential REDD+ interventions mentioned in the report of solution analysis workshop.



Stage C: Planning

Identification of Intervention Packages	Expert Planning Workshop (EW1); Identification and mapping of potential IPs; Feasibility analysis; Field verification of proposed IPs.	List of proposed IPs including strategies and activities; Maps of proposed IP locations; Table of analysis of risks and obstacles; Feasibility analysis table; Short report of IP field verification.
Safeguards analysis (risks and benefits)	Preliminary identification of risks and benefits (in EW1); Local Safeguards Analysis; Safeguards Analysis Workshop (SW3) or Expert group safeguards workshop (EW2).	Local Safeguards Analysis tables; Safeguards Analysis Workshop tables and Report.
Review of Intervention Packages	Analysis of existing sub-national plans and projects; Selection of IPs for detailed planning; Revision of IP location maps.	Revised IPs following 'gaps analysis' with existing plans and projects; List of selected IPs, strategies and activities; Revised IP location maps.

Stage D: Monitoring

Overview of monitoring for REDD+ and SRAP	REDD+ monitoring levels; Indicators and SMART targets.	
Targets and indicators	Expert Monitoring Plan Workshop (EW3); Proxy indicators (for carbon outcomes); Implementation progress (IP Outputs); Risk reduction and benefit enhancement measures; Negative impacts.	Monitoring targets & indicators for: (a) Carbon outcomes (proxy indicators) (b) IP Outputs (c) Implementation risk reduction measures (d) Risk reduction and benefit enhancement measures (e) Negative impacts
Monitoring plans		Monitoring Plans for: Proxy indicators (carbon outcomes). Implementation progress. Implementation risk reduction measures. Risk reduction and benefit enhancement measures. Negative impacts.
Budgeting of monitoring activities		Cost needed to monitor the plans

Stage E: Budgeting

Targets and activities		List of targets and activities for each IP
Operational Plan		5 years operational plan for SRAP



ANNEX 2

List of Materials Required for Multi-Stakeholder Workshops

Materials Required	Quantity
Power point projector	1
Printer	1
Large size flipchart paper	200 sheets
Coloured cards of medium thickness are preferred:	
• Yellow	150
• Blue	150
• Brown	100
• Green	100
• Red	100
• Orange	50
• Pink	50
Flip chart stands (for spatial analysis maps and posters)	6
Soft boards (for pins to stuck into maps)	6
Black marker pens	50
Pencils	12
Scissors	6
Erasers	6
Rulers/Scales	6
Thin masking tape (for taping coloured cards to flipchart paper)	12
Sticky tape (for taping flipcharts or maps on wall)	6
Coloured pins (for scoring and sticking into maps)	500
Name tags	40
Participant certificates	35
Dustbins	6

Agenda of Stakeholders Consultation Workshop for Preparation of State REDD+ Action

ANNEX 3

DAY 1	
Duration	Activities
0.30 hrs.	Registration of Participants
1.30 hrs.	Welcome to participants Brief Introduction by Participants
	Brief about REDD+: A climate change mitigation option in the forestry sector under UNFCCC and introduction to State REDD+ Action Plan (SRAP) Workshop
	Address by Chief Guest
	Vote of Thanks
0.15 hrs.	Group Photo & Tea / Coffee Break
	REDD+ Orientation for the Participants
1.30 hrs.	Introduction to REDD+ and implementation framework at National and international level
1.00 hrs.	Overview of the National REDD+ Strategy
1.30 hrs.	Overview of SRAP design process including an explanation of the objectives and structure of workshop. Discuss ownership and core team-Preparation Stage
	Problem Analysis Workshop (SW1)
1.30 hrs.	Preparatory spatial analysis and data collection: Preliminary analysis of deforestation & forest degradation (D&FD); drivers, stakeholder analysis; Examples of spatial analysis and posters of preliminary drivers' analysis
1.00 hr	Lunch Break
2.00 hrs	Prioritization of D&FD drivers and enhancement activities: Explanation and practical Group exercise: D&FD Drivers' in 2 Groups + Enhancement activities in 1 Group
1 hrs.	Prioritization of drivers and identification of hotspots Group work and plenary discussion
0.30 hrs.	Formation of Working Groups (WGs): Mapping of driver hotspots & high potential areas for enhancement activities
0.15 hrs.	Tea/Coffee Break
2 hrs.	Introduction on Problem Tree and group work to develop Problem Tree
0.30 hrs.	Working group exchange/ Museum visit
DAY 2	
Solution Analysis Workshop (SW2)	
0.15 hr.	Overview, objective and structure of the Solution Analysis Workshop
1.35 hrs.	Solution Tree Analysis: Introduction on Solution Tree and group work to develop Solution Tree
0.15 hr.	Tea/Coffee Break
1.00 hr.	Working Group Exchange and Discussion
1.00 hr.	Lunch Break
1.00 hr.	Verification and Finalization of Problem Trees and Solution Trees
0.15 hr.	Tea/Coffee Break
1.00 hr.	Group Discussion on Strategies and Activities
0.30 hr.	Summarize Outputs of the day, Way Forward and Closing Remarks
0.05 hr.	Vote of Thanks
DAY 3	
Compilation and analysis of Information of Stakeholder Consultation Workshops by Workshop Coordinator and Workshop Facilitator(s)	



Agenda of Expert Group Workshop for Preparation of State REDD+ Action

ANNEX 4

DAY 1	
Time	Activities
2.00 hrs	Expert Group Planning Workshop (EW1) <ol style="list-style-type: none"> 1. Objective of Expert Group Workshop 2. Validation and Refinement of Solution Tree 3. Validation and Refinement of Intervention Packages 4. Prioritization of Intervention Packages (IPs)
0.15 hrs	Tea/Coffee Break
2.00 hrs	<ol style="list-style-type: none"> 5. Finalization of IPs & activities 6. Identification of areas to implement the IPs 7. Identification and mapping of potential Intervention Packages
1.00 hr	Lunch Break
	8. Feasibility analysis: Analyze the risks and obstacles in implementation of Intervention Packages
0.15 hrs	Tea/Coffee Break
2.00 hrs	Safeguards Analysis Workshop (EW2) <ol style="list-style-type: none"> 1. Safeguards analysis for governance, social and environmental or biodiversity related risks and benefits for each IP 2. Mitigation measures for risks in order to meet the Cancun Safeguards of the proposed intervention packages
DAY 2	
2.00 hrs.	Monitoring Protocol Workshop (EW3) <ol style="list-style-type: none"> 1. Identification of targets and indicators
0.15 hrs	Tea/Coffee Break
1.30 hrs	<ol style="list-style-type: none"> 2. Development of monitoring plans
1.00 hr	Lunch Break
3.00 hrs	Budgeting Workshop (EW4) Development of Five Years Operation Plan with budget requirement
0.30 hrs	Way Forward and Closing Remarks
0.05 hrs	Vote of Thanks



ANNEX 5

Multi-Stakeholder and Expert Group Workshop Analysis Forms

Form to score drivers of deforestation/ forest degradation

Direct Driver	Actual or potential location[s]	Future threat [1-5]	Future biomass impact [1-5]	Future forest area impacted [1-5]	Total score	Plenary score

Form to score forest carbon enhancement activities

Forest carbon enhancement activities	Actual or potential locations	Future potential area [1-5]	Future biomass impact [1-5]	Total score	Significant barriers or challenges	Plenary score

Form to identify key results, strategies and activities from solution tree

Key results	Strategies	Activities

Form for analysis of implementation risks and obstacles

Key results/IPs	Implementation risk or obstacle	Likelihood of risk	Impact of risk	Risk reduction measures



Form for overall feasibility analysis of proposed IPs

IPs	Implementation risks/obstacles L=3/M=2/H=1	Cost-effectiveness of risk reduction measures H=3/M=2/L=1	Implementation Cost L=3/M=2/H=1	Opportunity Cost L=3/M=2/H=1	Incentive Measures H=3/M=2/L=1	Total Score

Form for Local Risks (Safeguards) Analysis

IPs/Activities	Risks	Risk Reduction Measures

Form for local benefits analysis

IPs/activities	Benefits	Benefit enhancement measures

Form for workshop analysis of risks (safeguards)

IP/Key result	Risks	Likelihood of risk	Impact of risk	Risk reduction measures

Form for workshop analysis of benefits

IP/Key result	Benefits	Likelihood of benefit	Impact of benefit	Benefit enhancement measures



Form for identifying proxy indicators

Key results	Targets	Proxy indicators

Form for implementation progress (IP Output) targets and indicators

IP outputs	Targets	Indicators

Form for risk reduction targets and indicators

IP outputs	Risks	Risk reduction measures	Risk reduction targets	Indicators

Form for benefit enhancement monitoring targets and indicators

IP outputs	Benefits	Benefit enhancement measures	Benefit enhancement targets	Indicators

Form for monitoring plans

IP/Key result	Target	Indicator	Data source or data collection method	WHERE	WHEN	WHO	Relative cost (H/M/L)

(Source: Richards *et al.*, 2017)



Instruction Sheets for Problem Tree and Solution Tree

Instruction Sheet for Problem Tree

- Take four flipchart sheets and tape them together;
- At the top of flipchart sheet, write down the name of the problem tree;
- Discuss and elucidate the problem that needs to be overcome;
- Simplify or summarise the problem in less than ten words on a RED card and place it at the far right hand side;
- Make sure that each group member should have same understanding of RED card;
- Brainstorm causes of problem/challenge and note them on YELLOW cards;
- Use black or blue marker pens only;
- Rationalise the cards and arrange them in cause and effect order;
- Take a pencil and draw arrows between cards;
- Identify direct/ immediate causes and replace yellow cards with PINK cards;
- Tape down the cards and use marker pen to mark arrows after the group exchange exercise.

Instruction Sheet for Solution Tree

- Take four flipchart sheets and tape them together;
- Rephrase/ rearticulate the problem statement or key challenge as desired outcome on a GREEN card in less than 10 words;
- Brainstorm solutions/ interventions and note them on BLUE cards;
- Rationalise the BLUE cards and arrange them in cause and effect order;
- Check for assumptions between the cards;
- Write blue cards as solutions/ results;
- Identify direct/ immediate causes of desired outcome, rewrite them on PINK cards and discard the replaced blue cards;
- Take a pencil and draw arrows between cards;
- Tape down the cards and use marker pen to mark arrows after the group exchange exercise;
- At the top of flipchart sheet, write down the name of the solution tree.



Summarised IP description in Mizoram REDD+ Action Plan

A. General Information

IP Name	Sustainable land management and cropping pattern
Drivers or barriers addressed	Deforestation and forest degradation: Land management and suitable cropping pattern will support in settled farming, which further supports in decreasing the rate of deforestation. In addition, minimizing shifting cultivation ultimately reduces the rate of forest degradation as well.
IP description	Shifting cultivation has become one of the most important drivers for forest deforestation in Mizoram. Assisting and guiding local communities to adopt sustainable land management techniques and cropping pattern with suitable income generating activities helps in reducing deforestation.
Objectives	Sustainable land management in shifting cultivation areas for livelihood and to reduce deforestation
Strategies	Promotion and adoption of settled hill farming system
Incentives for participation & changing stakeholder practices	Improving capacities of local communities to diversify income generating activities by providing appropriate crop varieties and promotion of agroforestry. Financial and technical support will be provided. Ensuring participation of poor and marginalized people in training activities and exposure visits.
Outputs and activities/tasks	<p>Output 1- Terracing /contour and permanent farming system adopted</p> <ul style="list-style-type: none"> ? ● Site survey, selection and preparation of land. ? ● Capacity building training on terracing/contour and permanent farming system ? ● Development of irrigation channels <ul style="list-style-type: none"> • Construction of water tanks • Deployment of pipe channels for collection and irrigation ? ● Selection of appropriate crop varieties ? ● Plantation of crops, pulses, cereals, spices and others <p>Output 2 – Vermi-compost/Organic Manure Generated</p> <ul style="list-style-type: none"> ? ● Construction of vermi-compost/manure collection tank (pit -holes etc) ? ● Training programmes for local communities <p>Output 3 – Agroforestry and enrichment of plantation promoted</p> <ul style="list-style-type: none"> ? ● Awareness campaigns of Agroforestry systems. ? ● Development of nurseries to promote agroforestry and enrichment plantation <ul style="list-style-type: none"> • Financial and technical support for nursery establishment. • Selection of appropriate plants/tree species • Training programme on management of nurseries • Investigate and explore waste land • Plantation activities in the waste land <p>Output 4 - Wet Rice cultivation (WRC) with fish farming promoted</p> <ul style="list-style-type: none"> ? ● Area survey and preparation of land ? ● Selection of appropriate paddy varieties ? ● Paddy cultivation ? ● Financial and technical support for the establishment of WRC cum fish farming ? ● Exposure visits



B. Feasibility Analysis

Outputs/ activities	Risks or obstacles	Risk reduction measures	Risk reduction targets	Indicators
Terracing /contour and permanent farming system adopted	Existence culture and lack of finance	Awareness, exposure to best practices, motivation, incentives	30% of people took part in awareness campaign At least 10% of households received exposure to better farming system. At least 40% of the households motivated to shift to settled farming	Number of awareness campaigns conducted Number of households received the better farming system exposure visit Number of Households motivated towards settled farming.
Vermi-compost/Organic Manure Generated	Time consuming	Incentivize the households	40% households generated vermi-compost/organic manure	Number of households generated vermi-compost/organic manure
Wet Rice cultivation (WRC) with fish farming promoted	Terrain conditions	Practicing terracing for WRC in gentle slope lands	10% adopted WRC with fish farming	Number of households adopted WRC with fish farming
Overall feasibility of IP				
Implementation Risks/obstacles L=3/M=2/H=1	Cost-effectiveness of risk reduction measures H=3/M=2/L=1	Implementation cost L=3/M=2/H=1	Opportunity cost L=3/M=2/H=1	Incentive measures S=3/M=2/W=1
1	3	2	3	3

C. Safeguards Analysis

Serious risks	Risk reduction measures	Risk reduction targets	Indicators
Reduction in indigenous crops that are staple food of poor	Implement multi-level agroforestry practices with a focus on indigenous crops	250 households consuming indigenous crop products from agroforestry systems	% of total agroforestry area under hybrid/exotic spp. cultivation
Elite capture of exposure visits	Establish transparent grant approval, monitoring & reporting mechanism	50% of poor/marginal households receiving exposure visit	Number of poor/ marginal households receiving exposure visit
Benefits	Benefit enhancement measures	Benefit enhancement targets	Indicators
Improved soil fertility and crops productivity	Training on generating organic manures and minimizing soil erosion	50% of Households received training on organic manure generation and soil management	Number of Households receiving training on organic manure generation and soil management



D. Monitoring Protocol

How does the IP ensure effective provision for monitoring	Regular monitoring by State Government, Agriculture Department and Environment, Forests and Climate Change Department. Allocation of adequate budget for monitoring		
Implementing partners	State Government, Agriculture Department, Environment, Forests and Climate Change Department and local communities		
Proxy indicators for impact on forest area or condition	Proxy impact indicators	Target	
	Number of households practicing shifting cultivation.	80% reduction of shifting cultivation area in all hotspots	
IP implementation targets	50% households capacitated for settled farming system 500 households received financial and technical support for agroforestry 200 households initiated wet rice cultivation 5% households generated vermi-compost/organic manure 50 households received training on System of Rice Intensification (SRI) and fish farming 25 community water tank installed		
Monitoring Protocol		Indicators	Source of data or data collection methods
	Proxy indicators	Number of households practicing shifting cultivation	Baseline and monitoring from HH records of farming practice
	Intervention indicators	Number of households capacitated for settled farming	Field observation and report completion
		Number of households receiving financial and technical support for agroforestry	Training report, field observation and report completion
		Number of WRC initiated Households	Field observation and report completion Training report, field observation and report completion
Number of households generated vermi-compost/organic manure		Training report, field observation and report completion	
Risk reduction indicators	Number of households received trainings on SRI and fish farming	Field observation and report completion	
	Number of community tank installed		
	Implement multi-level agroforestry practices with a focus on indigenous crops	Focus group and key informant discussions; field report and report completion	
	Establish transparent grant approval, monitoring & reporting mechanism	Grant records, survey and report completion	



E. Budget Plan (5 years)

Introduction	Standard government price norms are used Annual increase in costs by 10% to allow for inflation factored in		
Implementation cost including monitoring	Activity	Budget (Rs.)	Remarks
	Terracing /contour and permanent farming system adopted	23,000,000	
	Vermi-compost/Organic Manure Generated	1,000,000	
	Wet Rice cultivation (WRC) with fish farming promoted	25,000,000	
	Community water tanks	17,500,000	
Total Budget: Rs. 66,500,000			





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