



उत्तराखण्ड शासन

UTTARAKHAND STATE REDD+ ACTION PLAN

2018



ICIMOD

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

On behalf of
Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety
of the Federal Republic of Germany


NORWEGIAN MINISTRY
OF FOREIGN AFFAIRS





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Uttarakhand State REDD+ Action Plan 2018

Prepared by:

International Centre for Integrated Mountain Development, Kathmandu
Indian Council of Forestry Research and Education, Dehradun
Forest Department, Government of Uttarakhand



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MESSAGE

Climate change is a global environmental issue that affects us all. Scientific findings indicate that risks associated with changes in climate are real, and the impacts are being felt in many sectors of economy essential for our wellbeing. India's National Action Plan on Climate Change (NAPCC) reflects the importance India attaches to the challenge of climate change. To supplement the NAPCC state Governments have also prepared their State Action Plans on Climate Change which are duly endorsed by Central Government.

The State of Uttarakhand located at the foothills of the Himalayan mountain ranges is rich in natural resources especially water and forests. Scientific findings suggest that the pace of global warming will be felt more severely by mountainous regions, which is likely to have adverse effect on its natural resources.

Globally forests are considered to have great potential for mitigation of climate change. UN Climate Change programme on 'Reducing emissions from deforestation and forest degradation, conservation of forest carbon stocks, sustainable management of forests, and enhancement of forest carbon stocks' in developing countries (collectively known as REDD+) aims to achieve climate change mitigation and adaptation objectives through forest conservation in developing countries. Conservation of forest resources has been a tradition in Uttarakhand. The world famous *Chipko* movement is testimony to this tradition. Uttarakhand has a long history of people's participation through a system of *Van Panchayats* in management of forests.

I have great pleasure in presenting this State REDD+ Action Plan (SRAP) for the state of Uttarakhand. I thank all the stakeholders involved in the preparation of this document especially efforts of Uttarakhand Forest Department, ICFRE and ICIMOD. I am optimistic that the SRAP for Uttarakhand will be a guiding document for involving communities in forest based climate change mitigation initiatives and support the implementation of National REDD+ Strategy in the state.

(Dr. Harak Singh Rawat)





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MESSAGE

The recently released IPCC Special Report indicated that human activities are estimated to have caused approximately one degree Celsius of global warming above the pre-industrial levels and is currently increasing at 0.2 degree Celsius per decade. Forests play an important role in global climate change regulation as forests are both source and sink of carbon. With increased concern for climate change in recent decades, the emphasis on the reducing the GHG emission from deforestation and forest degradation, conservation of forest carbon stocks, sustainable management of forests, and enhancement of forest carbon stocks have been in the focus of discussions within UNFCCC under the agenda of REDD+ and outside UNFCCC. India has played an important role in REDD+ negotiations from Bali Action Plan where for the first time concept of conservation was added to the agenda of REDD till the inclusion of REDD+ in Paris Climate Agreement.

Indian concept of REDD+ is a comprehensive one, where all REDD+ activities can be tested considering the diversity of national circumstances, and forest management imperatives and peoples association with forest resources. India is one of the few countries where forest and tree cover have increased in recent years transforming country's forests into a net sink owing to national policies aimed at conservation and sustainable management of forests.

India released its National REDD+ Strategy in August, 2018 with an overarching objective to facilitate implementation of REDD+ programme in the country in conformity with relevant decisions of UNFCCC and the national legislative and policy framework for conservation and improvement of forests and the environment. The National REDD+ Strategy has been aligned with the precepts of National Forest Policy. Centrality of local communities has been at the centre stage of National REDD+ Strategy by focusing on capacity building for the local communities including for the Gram Sabha (Village Council) and JFM Committees and also generating green jobs in forestry sector.

I hope the State REDD Action Plan (SRAP) for the state of Uttarakhand prepared by ICFRE, in collaboration with ICIMOD and Uttarakhand forest department will be a step forward in achieving various forestry programmes envisaged under Uttarakhand State Action Plan on Climate Change and National REDD+ Strategy.

I congratulate the team of experts from ICFRE, ICIMOD and Officers from Uttarakhand Forest Department, other line departments, research organisations, NGOs and community members for putting their best efforts in preparing the State REDD+ Action Plan for Uttarakhand.

I also compliment the hard work done by Dr. R.S. Rawat, Scientist Incharge and all team members of the Biodiversity and Climate Change Division, Directorate of Research, ICFRE for finalization and publication of this document.

Dated: 24th December 2018


(Dr. Suresh Gairola)

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उत्तराखण्ड शासन

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FOREWORD

In the recent years, climate change is one of the global environmental issues that have received attention of common man, scientists and policy planners. Global climate change is a threat having perceptible and tangible impacts upon human kind and nature. Along with global community, India is equally concerned about the impacts of climate change and is committed to the Paris Climate Change Agreement as a responsible Party to the United Nations Framework Convention on Climate Change (UNFCCC).

Forests play an important role in climate change mitigation and adaptation. REDD+ is a global climate change mitigation programme under UNFCCC that addresses deforestation, forest degradation and promotes sustainable management and conservation of forests, and enhancement of forest carbon stocks.

Forest management leads to biological sequestration of carbon which makes it the most effective and sustainable way to mitigate ambient concentration of carbon dioxide. The Green India Mission under National Action Plan on Climate Change (NAPCC) in one of the forestry based National Mission to achieve climate change objectives. Developing a methodological understanding of carbon stock changes under REDD+, forest conservation and sustainable management activities for REDD+ is one of the component mentioned in the State Action Plan on Climate Change for Uttarakhand.

Complying with the global agreements on REDD+, India in 2018 released its National REDD+ Strategy reiterating Government of India's commitment to climate change mitigation in accordance with the Paris Agreement on climate change. The National REDD+ Strategy focuses on mitigating options in the forestry sector across the country. The National REDD+ Strategy also expects states to develop State Action Plans on REDD+.

The Indian Council of Forestry Research and Education (ICFRE) in collaboration with International Centre of Integrated Mountain Development (ICIMOD), and Uttarakhand Forest Department has prepared State REDD+ Action Plan through a multi stakeholders consultation processes involving concerned line departments and agencies, NGOs, research organizations, and community members.

I would like to thank Forest Department (Government of Uttarakhand), ICFRE and ICIMOD in guiding the process for developing the State REDD+ Action Plan for the Uttarakhand. Implementing this action plan in the state will further pave way for developing a system for payment of ecosystem services in the state.

Dated: 21 December 2018


(Jay Raj)



ACRONYMS AND ABBREVIATIONS

AF	Agroforestry
BCC	Biodiversity and Climate Change
BMUB	German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
D&FD	Deforestation and Forest Degradation
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
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GPS	Global Positioning System
ha	hectare
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
JFM	Joint Forest Management
JFMCs	Joint Forest Management Committees
km	Kilometre
LPG	Liquefied Petroleum Gas
M	metre
MDF	Moderately Dense Forest
MLA	Member of Legislative Assembly
MoEF&CC	Ministry of Environment, Forest and Climate Change
MRV	Measurement, Reporting and Verification
NAPCC	National Action Plan on Climate Change
NDCs	National Determined Contributions
NFCAMS	National Forest Carbon Accounting and Monitoring System
NFMS	National Forest Monitoring System
NGO	Non-Governmental Organization
NRS	National REDD+ Strategy
NTFPs	Non-Timber Forest Products
OF	Open Forests
PAMs	Policies and Measures
PRA	Participatory Rural Appraisal
PRI	Panchayati Raj Institution
REDD+	Reducing emissions from deforestation and forest degradation, and role of conservation, sustainable management of forests and enhancement of forest carbon stocks
RS	Remote Sensing
SDRF	State Disaster Response Force
SFDs	State Forest Departments
SIS	Safeguard Information System
SMF	Sustainable Management of Forest
sq km	Square Kilometre
SRAP	State REDD+ Action Plan
TOF	Trees Outside Forests
UNFCCC	United Nations Framework Convention on Climate Change
UT	Union Territory
VDF	Very Dense Forest



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EXECUTIVE SUMMARY



REDD+ is an important climate change mitigation option by incentivizing developing countries to reduce emissions from deforestation and forest degradation, and through conservation of forest carbon stocks, sustainable forest management of forest and enhancement of forest carbon stocks through a range of forest conservation activities and policy measures. The aim of a REDD+ initiative is to lower the rate of deforestation and forest degradation as well as to sequester more carbon through sustainable management of forests for mitigating climate change.

Recently, the Ministry of Environment, Forest and Climate Change, Government of India released the National REDD+ Strategy with the broad objective to create REDD+ architecture at National and Sub-National levels. The National REDD+ Strategy emphasises development of State REDD+ Action Plans for implementing the National REDD+ Strategy at the state level.

The Indian Council of Forestry Research and Education (ICFRE), in collaboration with International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal is implementing the trans-boundary REDD+ Himalaya Project in the north-eastern states of India. The project is mainly focusing on capacity building, technology sharing and knowledge dissemination in the context of REDD+. Mizoram and Uttarakhand states have been chosen as pilot states for developing State REDD+ Action Plans under this project.

Forest and tree cover of the Uttarakhand constitute about 47% of the total geographical area of the state. Forests are a crucial resource to the people of Uttarakhand as their livelihood and food security are derived from them. However, forests in the state are under tremendous pressure and have suffered from uncontrolled forest fires, overgrazing, invasive alien plant species, over-exploitation of forest resources and other changes in the land use pattern. The India State of Forest Report 2017 reported a net increase of forest and tree cover of 23 sq km in the state of Uttarakhand from the previous assessment of 2015.

ICFRE, in collaboration with ICIMOD and Uttarakhand State Forest Department, has prepared the State REDD+ Action Plan (SRAP) through multi-stakeholders consultation processes under the

REDD+ Himalaya Project. Through this consultation process, direct drivers of deforestation, forest degradation and barriers to enhancement have been identified and prioritized, and a set of REDD+ intervention packages, and their constituent activities, identified:

- Effective implementation of forest legislation/ policies and forest working plan prescriptions;
- Preparation of comprehensive land use plan;
- Deforestation free urbanisation and other settlements;
- Planning of development activities to avoid biodiversity rich areas and hot spots;
- Incentivizing agroforestry and horticulture with appropriate agriculture technologies;
- Sustainable management of forest products;
- Prevention of forest fire and provision of rewards;
- Adaptation to extreme climatic conditions and
- Simplified approaches for promoting forest carbon enhancement activities

For each of these intervention packages feasibility and safeguard analysis were undertaken. The

feasibility analysis involved analysing the risks and obstacles for implementation, and identifying risk mitigation measures to make them more cost-effective. The safeguard analysis involved checking each intervention package for governance, social and environmental risks, and how to mitigate them, and was also necessary to meet the UNFCCC 'Cancun Safeguards'. It is also a first step towards being able to contribute to the national Safeguards Information System (SIS) which is a requirement of the UNFCCC for a national REDD+ programme.

Another key step in developing the SRAP was developing the monitoring protocol; this involved setting quantitative targets for the outputs of each intervention package, and identifying indicators for their measurement. Finally a five year budget was developed for the intervention packages, which involved costing out all the implementation activities, including the monitoring activities.

Therefore, SRAP will enable implementation of India's National REDD+ Strategy in the state of Uttarakhand, and help obtaining results-based payment, social and environmental co-benefits under the international REDD+ mechanism.



1

INTRODUCTION

1.1 REDD+ and India

In 2014 the Intergovernmental Panel on Climate Change (IPCC) estimated that the forestry sector contributed about 9-11% of total Greenhouse Gas (GHG) emissions or approximately 5.8 Gt. CO₂ equivalent per year, mainly in developing or tropical countries (IPCC, 2014). However, the recent special report of IPCC on “Global Warming of 1.5°C” suggests that afforestation is the only carbon dioxide removal option which has to be considered for climate change mitigation (IPCC, 2018). Thus, under the United Nations Framework Convention on Climate Change (UNFCCC), reducing emissions from deforestation and forest degradation through conservation of forest carbon, sustainable management of forests and enhancement of forest carbon stocks, collectively known as REDD+, was developed as an international mechanism to mitigate climate change. For REDD+ implementation with results-based finance, UNFCCC set out four main requirements: development of a National REDD+ Strategy or REDD+ Action Plan, a National Forest Monitoring System, a baseline Forest Reference Level/ Forest Reference Emission Level which provides the basis for a system of measurement, reporting and verification of carbon emissions and a Safeguards Information System.

India has 29 States and 7 Union Territories and each state has its own plan and development programmes that contribute to the implementation of national policies, plans and programmes. Similarly for implementing the National REDD+ Strategy (NRS), a set of ‘sub-national’ or State REDD+ Action Plans (SRAPs) are essential since the ecology and drivers of deforestation and forest degradation vary from state to state. Also with such a big land area, local level planning of REDD+ activities is vital for cost-effective implementation. The SRAP addresses the drivers of deforestation





and forest degradation, as well as the barriers to forest carbon enhancement (mainly through reforestation, afforestation and forest restoration activities) in the State.

The SRAP is based mainly on a multi-stakeholder and multi-sectorial consultative process, complemented by spatial analysis using geographical information system, that leads to identification of a set of REDD+ 'intervention packages' and activities that respond to the drivers and barriers. There is also a careful analysis of the potential social and biodiversity side-effects or risks associated with the proposed REDD+ interventions, leading to a set of risk mitigation measures. This allows the SRAPs and the

NRS to respond to the REDD+ safeguards and meet wider social and development objectives such as gender equity, and informs the national Safeguards Information System. This makes the SRAP different to previous forestry plans.

In the context of REDD+, the 'sub-national level' refers to any administrative or jurisdictional unit subordinate to the national level, and can also refer to larger ecosystems or biomes where REDD+ policies are implemented. This report is based mainly on a multi-stakeholder consultation workshop undertaken at ICFRE, Dehradun (Uttarakhand) that included the participation of the relevant forestry sector stakeholders.

1.2 REDD+ Readiness in the National Context

A key part of most REDD+ programmes involves further reinforcement of measures aimed at forest conservation, increasing terrestrial carbon pools by promoting afforestation and reforestation, improved forest management, forest conservation, etc. There are also possible synergies between carbon sequestration and adaptation measures, e.g., through afforestation of vulnerable areas, watersheds, and rehabilitation of degraded lands. Singh *et. al.*, 2015 discussed in detail how various REDD+ actions can be implemented in India, and listed some key interventions required for sustainable forest management.

To facilitate REDD+ at the National level among all stakeholders, the government prepared a 'REDD+ Reference Document' (MoEF&CC, 2014). This Reference Document discusses the required policy framework to support REDD+ implementation as part of the forest management of the country. The document describes in detail the issues and concepts related to definitions as an approach to construct the national forest reference level. It also assigns institutional roles and responsibilities to government and non-government organizations, including MoEF&CC, FSI, ICFRE, SFDs, JFMCs, Village/ Gram Panchayats and Gram Sabhas, etc. Good governance and adherence to safeguards are necessary to ensure that REDD+ implementation supports the rights of the local communities and ethnic groups/ tribes as they have a key role in the conservation of

biodiversity and forests. The Reference Document also comprehensively addresses capacity building needs across all levels of government, expert organizations, civil society, other organizations and local communities. It also deals lucidly with the other key components of a National REDD+ Programme: the National Forest Monitoring System (NFMS), needed for the measurement, reporting and verification (MRV) of emissions, and the Safeguards Information System (SIS).

Indian Council of Forestry Research and Education on behalf of Ministry of Environment, Forest and Climate Change, Government of India has prepared National REDD+ Strategy (NRS) which has been approved and released by Ministry for submission to United Nations Framework Convention on Climate Change (UNFCCC). Objectives of the NRS is to facilitate implementation of REDD+ programme in India in conformity with relevant decisions of UNFCCC, in particular the Cancun Agreements, Warsaw Framework for REDD+, Paris Agreement, and the national legislative and policy framework for conservation and improvement of forests and the environment. The National REDD+ Strategy emphasises developing a robust REDD+ Framework through establishing a National Governing Council for REDD+. The NRS also underscores the importance of the REDD+ safeguards, stakeholders participation in REDD+ activities, and the role of the private sector (MoEF&CC, 2018).



1.3 Evolution of the State REDD+ Action Plan (SRAP) Approach in India

According to FAO (2010), India is the tenth largest forested country in the world, but it also faces problems of forest degradation. India has 16 major forest types and 221 sub-group types (Champion and Seth, 1968). It is one of 17 'megadiverse' countries identified by Conservation International (1998) with four global biodiversity hotspots. The Protected Area network includes 104 National Parks, 544 Wildlife Sanctuaries, 77 Conservation Reserves, and 46 Community Reserves, extends over 16.2 million hectares (mha) and covers almost 5% of the national area.

In December 2015, the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) has funded the regional programme "REDD+ Himalayas: Developing and using experiences in implementing REDD+ in the Himalayas". This programme is jointly implemented by ICIMOD and GIZ in partnership with REDD+ focal points in four Himalayan countries: Bhutan, India, Myanmar and Nepal. In India, this programme is implemented by ICFRE. The basic aim of the programme is to improve the framework conditions for socially and ecologically appropriate REDD+ measures to mitigate climate change. In this context the measures primarily focus on capacity building and providing technical assistance for partners and stakeholders, as well as setting up a regional learning platform to enhance South-South cooperation in the implementation of REDD+.

Under the UN-REDD technical assistance, ICIMOD has developed the first sub-national REDD+ Action Plan (termed as the District REDD+ Action Plan) for Chitwan District in Nepal. The methodology used for this plan was adapted from Vietnam's experience in developing five sub-national REDD+ action plans which were supported by UN-REDD.

The ICIMOD managed REDD+ Himalaya Project activities for 2018 have included formulation of State REDD+ Action Plans for Mizoram and Uttarakhand States. For Mizoram State, the Indian Council of Forestry Research and education (ICFRE) and the Environment, Forest and Climate Change Department of the Government of Mizoram initiated the process in coordination with ICIMOD to develop India's first State REDD+ Action Plan (SRAP). This was replicated for the State of Uttarakhand.

The methodological process for developing the Uttarakhand SRAP is based on a multi-stakeholder consultation process involving the State Forest Department, local organizations, research institutions and universities. This process has involved a series of workshops jointly organized by ICFRE, ICIMOD and Uttarakhand Forest Department, and resulted in a set of Intervention Packages (IPs), including state-level policies and measures, risk mitigation measures, monitoring plans and a budget for implementing REDD+ in the state of Uttarakhand.

1.4 Linking India's Nationally Determined Contributions (NDCs) and the SRAPs

Article 4, paragraph 2 of the Paris Agreement states that each country should prepare, communicate and maintain successive Nationally Determined Contributions (NDCs) that it intends to achieve. Parties are mandated to implement a set of domestic mitigation measures with the aim of achieving the objectives of the NDCs.

One of the main mitigation actions in India's NDC 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". In order to achieve this target, the Government of India has prepared a National REDD+ Strategy (NRS) in accordance with the requirements of UNFCCC, to be eligible to get the result based financial incentives for REDD+. To meet the NDC target, increased cover of natural forests needs to be supplemented by a concerted focus on trees outside forests (TOF), which contribute significantly to the national carbon sink. Action with respect to TOF thus forms a significant part of the NRS aimed at a major increase in the national forest



carbon sink. Forest and tree cover, as well as being essential for the NDC, provides additional non-carbon benefits.

A SRAP is developed in consultation with provincial (sub-national) stakeholders to implement NRS at the sub-national/ state level. Since the drivers of deforestation and forest degradation are cross-sectoral (e.g., agriculture, mining, infrastructure), the

intervention packages (IPs) in the SRAP need to cover not only the forestry sector but also other sectors like energy, agriculture, biodiversity conservation, livelihoods, TOF, agroforestry and others. All the IPs need to be supported by an operational plan with a detailed budget which can support NDC target directly or indirectly. Most activities in a SRAP are formulated at the local level, which helps ensure feasibility and implementation effectiveness.



2

UTTARAKHAND STATE: CONTEXTUAL BACKGROUND



Uttarakhand became the 27th state of India in November 2000. It lies between 28°43'N and 31°27'N and 77°34'E and 81°02'E covering an area of 53,483 sq km. Uttarakhand shares its border with China (Tibet) in the North, Nepal in the East, Himachal Pradesh in the North and North West and Uttar Pradesh in the South (Figure 1). Uttarakhand has two Divisions: Garhwal and Kumaon. Garhwal Division consists of seven districts: Chamoli, Dehradun, Haridwar, Pauri, Rudraprayag, Tehri and Uttarkashi; and Kumaon Division consists of six districts: Almora, Bageshwar, Champawat, Nainital, Pithoragarh and Udham Singh Nagar.

Forest Cover: Uttarakhand has reported and recorded a forest area of 38,000 sq km which is 71 % of its total geographical area. However, according to India State of Forest Report 2017, total tree and forest cover is 25,062 sq km (FSI, 2017). Among the forest cover density classes, very dense forest is 4,969 sq km (20%), moderately dense forest is 12,884 sq km (51%) and open forest is 6,442 sq km (26%) respectively (Table 1). About 19% of the State is under permanent snow cover, glaciers and steep slopes where trees cannot grow.

Forest Type: Uttarakhand state has 34 forest types which belong to 8 forest type groups: Tropical Moist Deciduous, Tropical Dry Deciduous, Subtropical Pine, Himalayan Moist Temperate, Himalayan Dry Temperate, Sub Alpine, Moist Alpine Scrub and Dry Alpine Scrub. The area under different forest types is shown in Table 2.

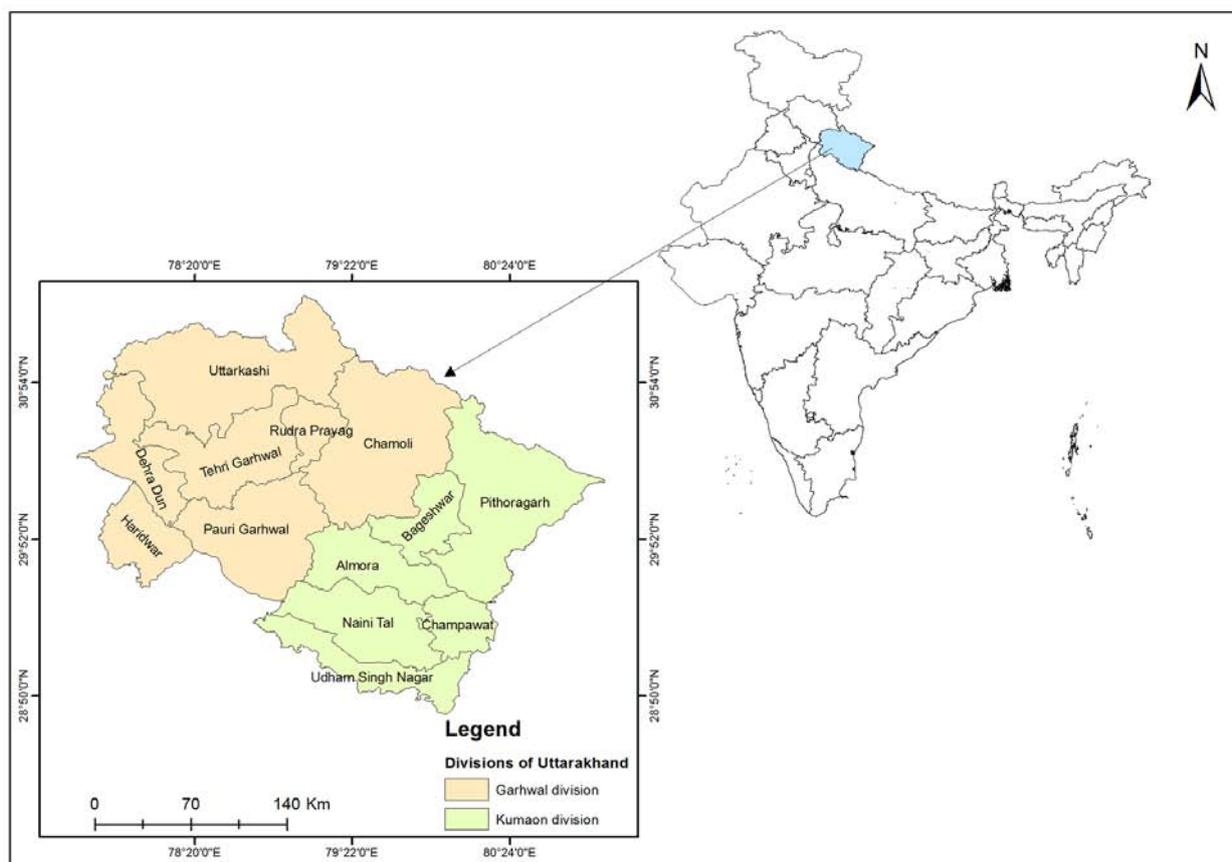


Figure 1: Uttarakhand State

Table-1: Forest Cover in Uttarakhand

Geographical Area	53,483 sq. km.
Total Forest and Tree Cover	25,062 sq. km.
Percent of State's Geographical Area	46.86%
Very Dense Forest within and outside recorded forest area	4,969 sq. km.
Moderately Dense Forest	12,884 sq. km.
Open Forest	6,442 sq. km.
Tree Cover	767 sq. km.
Per Capita Forest and Tree Cover	0.25 ha

Source: FSI, 2017

Table-2: Forest type wise classification of total forest area in Uttarakhand State

S. No.	Forest Type	Area (sq km)	Percent
1	3C/C2a Moist Siwalik Sal Forest	3,212.21	12.97
2	3C/C2c Moist Tarai Sal Forest	542.2	2.19
3	3C/C3a West Gangetic Moist Mixed Deciduous Forest	879.9	3.55
4	5B/C1a Dry Siwalik Sal Forest	364.4	1.47
5	5B/C1b Dry Plains Sal Forest	57.05	0.23
6	5B/C2 Northern Dry Mixed Deciduous Forest	697.88	2.82
7	5/1S2 Khair-Sissu Forest	242.35	0.98



S. No.	Forest Type	Area (sq km)	Percent
8	5/DS1 Dry Deciduous Scrub	216.98	0.88
9	9/C1a Lower or Siwalik Chir Pine Forest	449.41	1.81
10	9/C1b Upper or Himalayan Chir Pine Forest	6454.61	26.07
11	9/C1/DS1 Himalayan Subtropical Scrub	165.19	0.67
12	9/C1/DS2 Subtropical Euphorbia Scrub	42.04	0.17
13	12/C1a Ban Oak Forest	5009.21	20.23
14	12/C1b Moru Oak Forest	978.92	3.95
15	12/C1c Moist Deodar Forest	486.36	1.96
16	12/C1d Western Mixed Coniferous Forest Spruce, Blue Pine, Silver Fir	541.95	2.19
17	12/C1e Moist Temperate Deciduous Forest	264.29	1.07
18	12/C1/DS1 Oak Scrub	76.50	0.31
19	12/C1/DS2 Himalayan Temperate Secondary Scrub	25.02	0.10
20	12/C2a Kharsu Oak Forest (<i>Quercus semecarpifolia</i>)	244.59	0.99
21	12/C2b West Himalayan Upper Oak/Fir Forest	1131.34	4.57
22	12/C2c Moist Temperate Deciduous Forest	317.71	1.28
23	12/1S1 Alder Forest	10.16	0.04
24	12/2S1 Low Level Blue Pine Forest	3.99	0.02
25	13/C2b Dry Deodar Forest	362.96	1.46
26	13/1S1 <i>Hippophae/Myricaria</i> Scrub	85.80	0.35
27	14/C1a West Himalayan Sub-Alpine Fir Forest	194.49	0.78
28	14/C1b West Himalayan Sub-Alpine Birch/Fir Forest	611.84	2.47
29	14/1S1 <i>Hippophae/Myricaria</i> Brakes	19.23	0.08
30	14/1S2 Deciduous Sub-Alpine Scrub	211.94	0.86
31	15/C1 Birch/ <i>Rhododendron</i> Scrub Forest	138.44	0.56
32	15/E1 Dwarf <i>Rhododendron</i> Scrub Forest	32.36	0.13
33	16/C1 Dry Alpine Scrub	5.93	0.02
34	16/E1 Dwarf Juniper Scrub	33.57	0.14

(Source: FSI, 2011)

Topography: Uttarakhand has a highly varied topography with snow-covered peaks, glaciers, valleys, streams, beautiful lakes and a few patches of plains in the south. Some of the highest mountains in the world are found in Uttarakhand, such as Nanda Devi (7,817 m) the second highest peak in India, Kamet (7,756 m) and Chaukhamba (7,138 m). Uttarakhand can be divided into several physiographic zones running parallel to each other from north-west to south-east. The northern zone, popularly known as the Himadri, contains segments of the Zaskar and the Greater Himalaya ranges, with elevations ranging from 3,000 to 7,600 m. Most of the major peaks are located in this zone.

Adjacent to and south of the Greater Himalayas is a zone consisting of the Lesser Himalayas, known popularly as the Himachal, with elevations ranging between 2,000 to 3,000 m. To the south of the Himachal is a stretch of the Siwalik Range. The southern edge of the Siwalik Range merges with a narrow bed of gravel and alluvium known as the *Bhabar*, which interfaces to the south-east with the marshy terrain known as the *Tarai*.

Climate: The climatic conditions of Uttarakhand vary greatly according to the altitude and proximity towards the Himalayan ranges. The state has a temperate climate except in the plains where the climate is tropical with temperatures ranging



from sub-zero to 43°C. Most of the state's annual precipitation of about 1,500 mm is provided by the southwest monsoon, which blows from July to September. In the northern parts of the state, 3-5 m of snowfall are common between December and March.

Demographic Profile: As per the 2011 Census, the total population of Uttarakhand is 10,086,292 of which about 51% is male and 49% female. Of the total population of Uttarakhand state, around 70% live in the rural areas and around 30% live in urban areas. The growth rate of population in Uttarakhand in the last decade is 18.81% (Census, 2011).



3

METHODOLOGY AND PROCESS



3.1 Summary of the SRAP Approach

The methodology and process for formulating the Uttarakhand SRAP were based on the manual “Developing Sub-national REDD+ Action Plans: A Manual for Facilitators” (Richards *et al.*, 2017a). This manual is based on the experiences of developing five SRAPs in Vietnam and two SRAPs in Nepal under the UN-REDD Programmes umbrella programmes of these countries, and with full participation of the national REDD+ planning authorities. A summary of the SRAP approach is also available in an ICIMOD briefing paper (Richards *et al.*, 2017b). There are five main steps in the development of SRAPs as indicated in Table 3.

3.2 Workshops for Formulation of Uttarakhand State REDD+ Action Plan

ICFRE in collaboration with ICIMOD and Uttarakhand Forest Department has organized a two days multi-stakeholders consultation workshop and a one day expert consultation meeting for the formulation of the State REDD+ Action Plan (SRAP). The multi-stakeholders consultation workshop was attended by 48 participants (Annex 1) consisting of State REDD+ stakeholders including representatives of Uttarakhand Forest Department, other line departments of Uttarakhand Government, Science & Technology Institutions, ICFRE, ICIMOD and GIZ. The expert consultation meeting was attended by the core team of 16 members (Annex 2). The multi-stakeholders consultation workshop was held on 28-29 May 2018 and the expert consultation meeting was held on 1 June 2018 at ICFRE, Dehradun.

**Table-3:** The main steps and activities in the SRAP process

Main Steps	Process/activities
Step A: Prepare <i>Initial consultation and inception workshop</i>	Train facilitators, select workshop participants and commission preparatory studies
Step B: Analyse <i>Expert analysis reviewed and endorsed by SHs</i>	Analyse satellite imagery maps, discuss and prioritize drivers of deforestation and forest degradation (D&FD) and constraints to forest (biomass) enhancement. Undertake and analyse stakeholder and institutional analysis Develop problem and solution trees for prioritized drivers and constraints to forest enhancement Identify and prioritise D&FD hotspots
Step C: Plan <i>Develop REDD+ activity package; identify risk and mitigation measures</i>	Identify SRAP intervention packages, analyse implementation using feasibility analysis, analyse social and environmental risks using safeguard analysis (complying with REDD+ safeguards), and identify risk reduction measures
Step D: Monitor <i>Develop monitoring protocol and indicators</i>	Develop monitoring plans for the SRAP activities or IPs, including for the implementation, social and environmental risk reduction and benefit enhancement measures
Step E: Budget and approval <i>SRAP approval from REDD working group</i>	Draw up a 5 year operational plan involving a detailed activity plan and budget for each IP Formulate the SRAP document for approval Endorsement of the Uttarakhand SRAP



4

DIAGNOSTIC ANALYSIS AND PLANNING

4.1 Prioritization of D&FD Drivers and Enhancement Activities

Following the introductory and contextual presentations, the participants were divided into three Working Groups (WGs) in order to analyse and prioritize the most important deforestation and forest degradation (D&FD) drivers, as well as the main barriers to scaling up forest carbon enhancement activities (reforestation, afforestation, landscape restoration, agroforestry, etc.) in the state. The prioritization of the drivers and barriers provides the basis for the SRAP in the sense that it defines the 'key challenges' which the REDD+ programme needs to overcome in order to generate positive carbon, social and biodiversity outcomes. It should be noted that the validity of the identification and prioritization process depends partly on how well the workshop participants are informed through the spatial analysis undertaken in preparation for the diagnostic analysis workshop.

A key distinction in this stage is the difference between 'direct drivers' and 'underlying causes'. 'Direct drivers' are the specific land use activities (e.g., commercial plantations) that replace or degrade the natural forest, whereas the 'underlying causes' are the indirect or underlying factors (e.g., weak forest governance) that lead to the direct drivers. The workshop participants were then divided into following three working groups (WGs) based on their expertise and interest, as well as maintaining a good institutional distribution between the three groups:

WG A: Deforestation drivers and underlying causes

WG B: Forest degradation drivers and underlying causes

WG C: Barriers to forest carbon enhancement

The process involved firstly prioritization (e.g., of deforestation drivers) within each WG, secondly a plenary presentation of the higher priorities by each WG, and thirdly an overall scoring





by all workshop participants of all the prioritized (by the three WGs) D&FD drivers and barriers to enhancement. Table 4 presents the results of the

priority D&FD drivers and barriers to enhancement identified for the Uttarakhand State.

Table-4: Priority D&FD drivers and barriers to enhancement in Uttarakhand (identified in consultation workshop)

Drivers	Deforestation	Forest Degradation	Barriers to enhancement
Direct drivers or barriers to forest carbon enhancement activities	Diversion of forest land for non-forestry purposes; Encroachment of forest land; Rapid urbanization; Mining or quarrying; Illicit felling; Loss of regeneration due to forest fire & grazing	Overgrazing and unsustainable fuelwood and fodder collection; Forest fire; Landslide hazards/soil erosion; Illicit felling, unsustainable management practices	Lack of scientific approaches to agroforestry/ horticulture; Unavailability or delayed availability of finance; Inadequate nursery practices & planting stock: lack of capacity building for forestry stakeholders
Underlying causes or indirect drivers	Unsustainable extraction of fuelwood, timber & fodder; Irresponsible tourism; Poor coordination between stakeholders; Lack of awareness	Illegal mining; Illegal NTFP collection; Road construction; Climate change; Invasive species, Non- adoption of silvi-cultural practices	Lack of data & information on availability of area suitable for enhancement plantation activity; High dependency on fuelwood and fodder; Poor regeneration due to invasive species and encroachment; Lack of a market and cumbersome process for selling farm forestry products; High migration from hills to forest fringes in the plains; Lack of trained human resources

The workshop participants decided on the following prioritized direct D&FD drivers and barriers (to enhancement):

- **Direct drivers of deforestation:** Diversion of forest land for non-forestry purposes; loss of regeneration due to forest fire and grazing; encroachment of forest land; and mining;
- **Direct drivers or causes for forest degradation:** Overgrazing and unsustainable fuelwood and fodder collection; forest fire; unsustainable management practices; and illegal felling
- **Barriers for improved forest management:** Lack of proper (scientific) approaches to agroforestry/horticulture, and the unavailability or delayed availability, of finance.

Then through a participant scoring system and discussion, two drivers for deforestation, two drivers for forest degradation and one barrier to improved

forest management were selected as follows:

- **Deforestation drivers:** Diversion of forest land for non-forestry purposes, and encroachment for forest land.
- **Forest degradation drivers:** Overgrazing and unsustainable fuelwood and fodder collection, and forest fire.
- **Barriers for improved forest management:** Lack of scientific approaches to agroforestry/ horticulture

These prioritized D&FD drivers and barriers for improved forest management constitute the ‘key challenges’ that provide the basis for the rest of the analysis, which involved developing a problem tree for each key challenge, and a solution tree from which the REDD+ Intervention Packages (IPs) could be identified, and that formed the basis of the SRAP.



Areas with deforestation



Areas with forest degradation



Possible areas for improved forest management

Figure 3: Identified areas with deforestation, forest degradation and enhancement activities in Uttarakhand

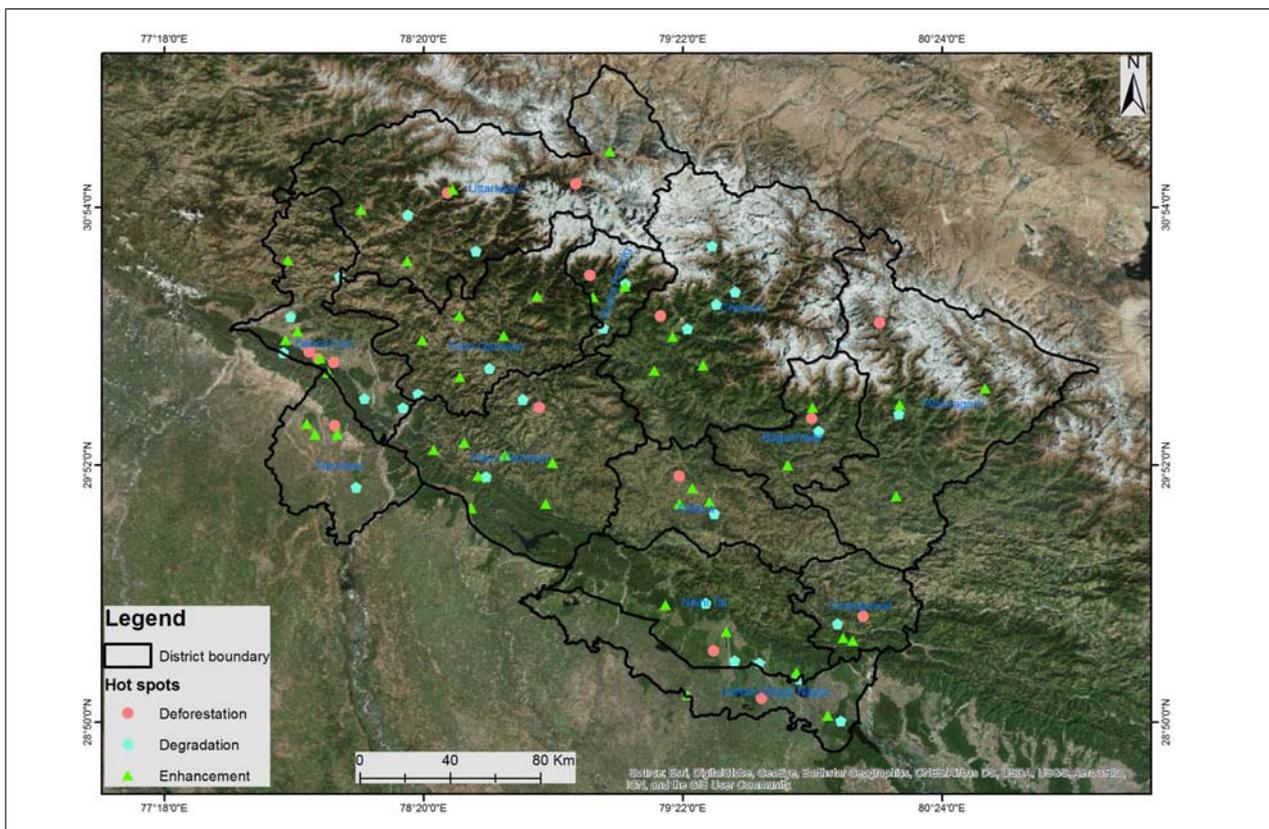


Figure 4: Map of hotspots

4.2 Development of Problem and Solution Trees

Problem and solution tree analysis (also called “participatory theory of change” analysis) is a participatory tool for mapping out the main problems, along with their causes and effects, to come up with a set of clear and manageable goals

and a strategy of how to achieve them. Detailed explanation is given in the manual for facilitator for developing sub-national REDD+ Plan (Richards *et al.*, 2017). There are two main stages to this process:



1. Identification of the direct and underlying causes of each key challenge in the form of a problem tree; and,
2. Inversion of the problems into objectives and solutions leading to a solution tree or “results chain” showing potential solutions or strategies that respond to the drivers or barriers, and which can then lead to identification of the IPs.

From the five sets of problem and solution trees, the following five desired outcomes were identified as needed to successfully address the main D&FD drivers and barriers to improved forest management:

- (i) **Reduced diversion of forest land for non-forestry purposes (to address deforestation):** Two key results were identified from the solution tree for this driver: State land use management plan implemented and strengthened, and strict implementation of forest laws.
- (ii) **Reduced encroachment of forest land (to address deforestation):** Three key results were identified from the solution tree (Figure 6): effective forest protection adopted, agriculture productivity increased, and planned urbanization and settlements.

- (iii) **Sustainably managed, fuelwood, fodder collection and grazing (to address forest degradation):** To address this driver, the desired outcome was sustainably managed, fuelwood, fodder collection and grazing. From the solution tree (Figure 7) two key results were identified: regulated fuelwood and fodder collection at the *Gram Panchayat* and village levels, and improvement of pasture lands.
- (iv) **Forest fire managed (to address forest degradation):** Key results for forest fire management were identified from the solution tree (Figure 8): strict law enforcement of forest fire and zero forest fire rewarded.
- (v) **Forest quality improved (to address barriers to improved forest management):** To address the lack of scientific approaches to agroforestry and horticulture, three key results were identified from the solution tree (Figure 9): site specific models and approaches developed and implemented, simplified and integrated policy/act/rules framed and implemented, and funds made available and distributed to the concerned departments.

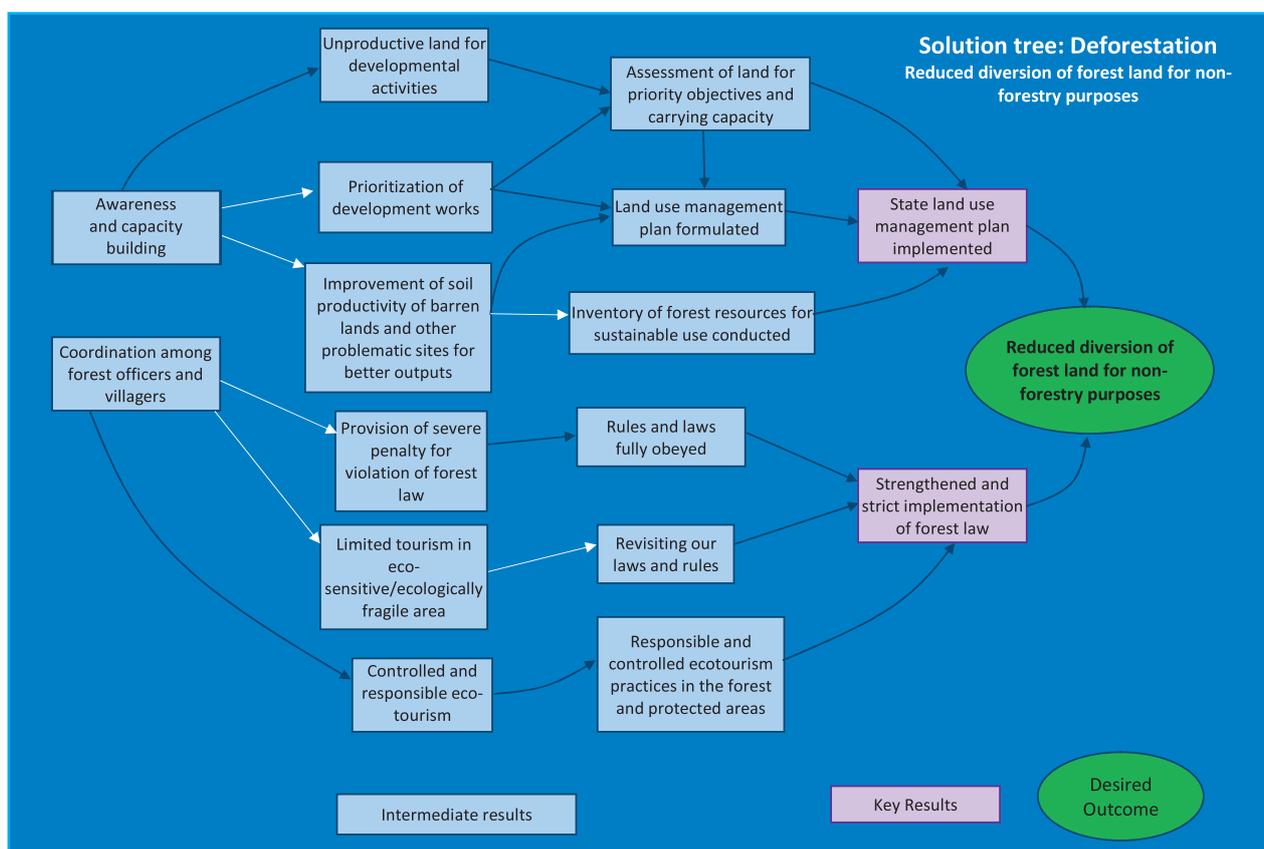


Figure 5: Solution tree: reduced diversion of forest land for non-forestry purposes

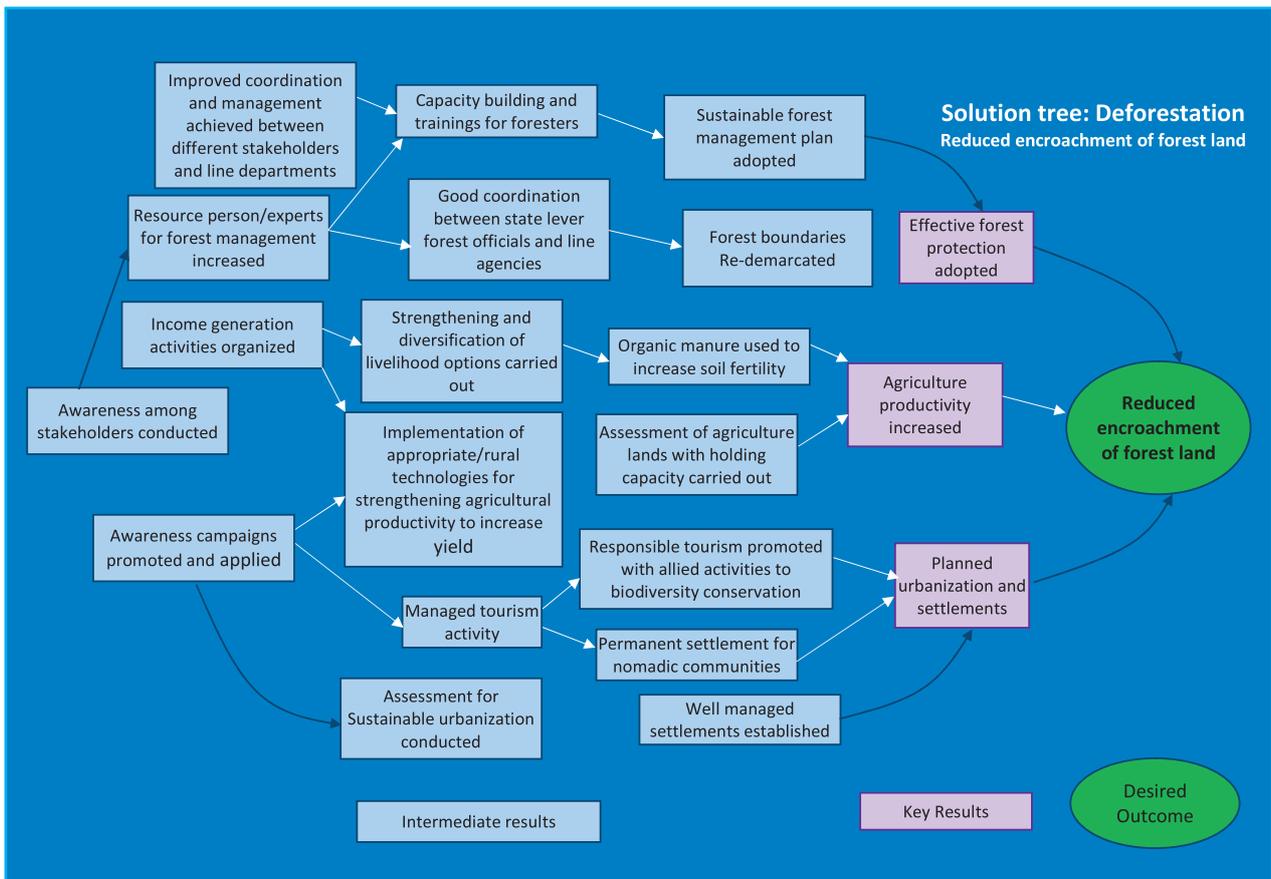


Figure 6: Solution tree on reduced encroachment of forest land

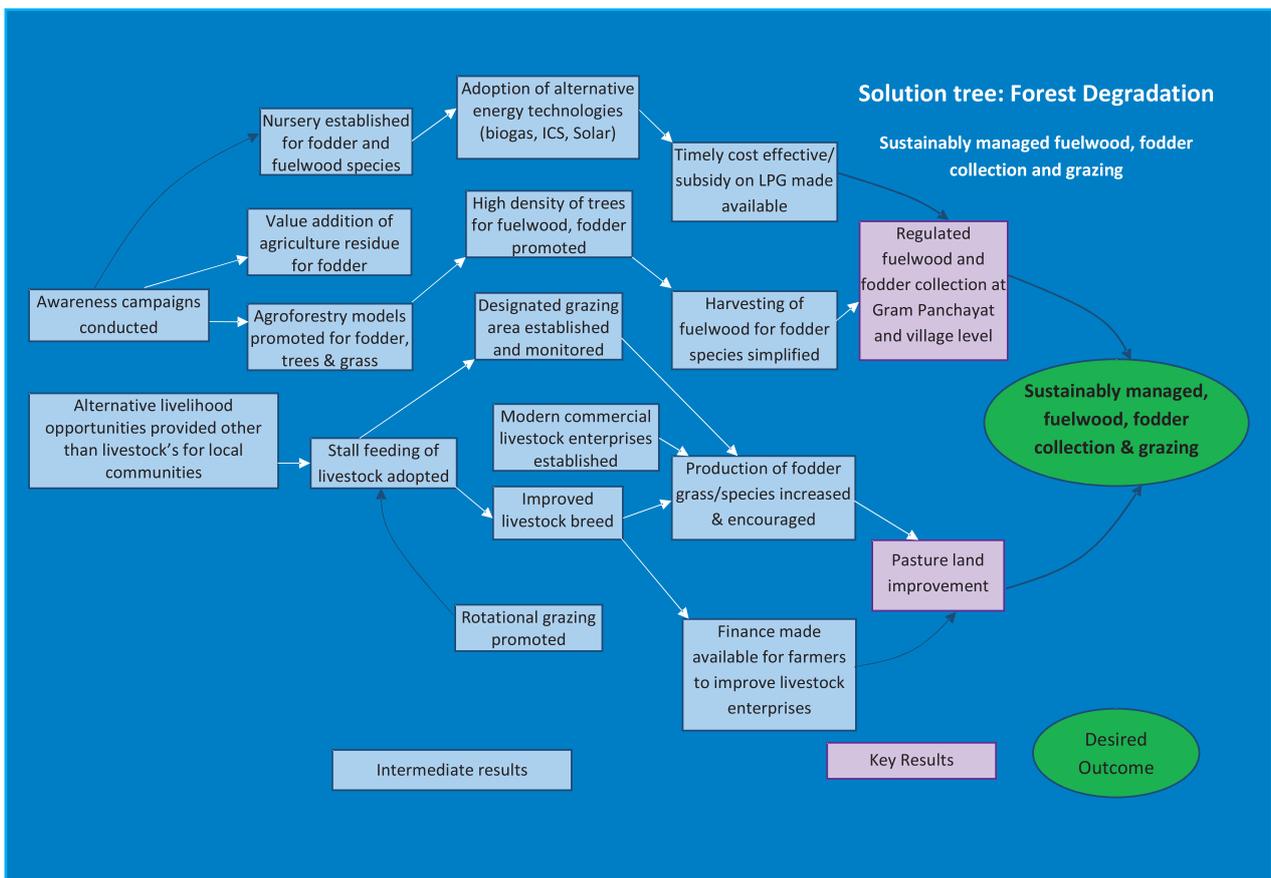


Figure 7: Solution tree: sustainably managed, fuelwood, fodder collection and grazing

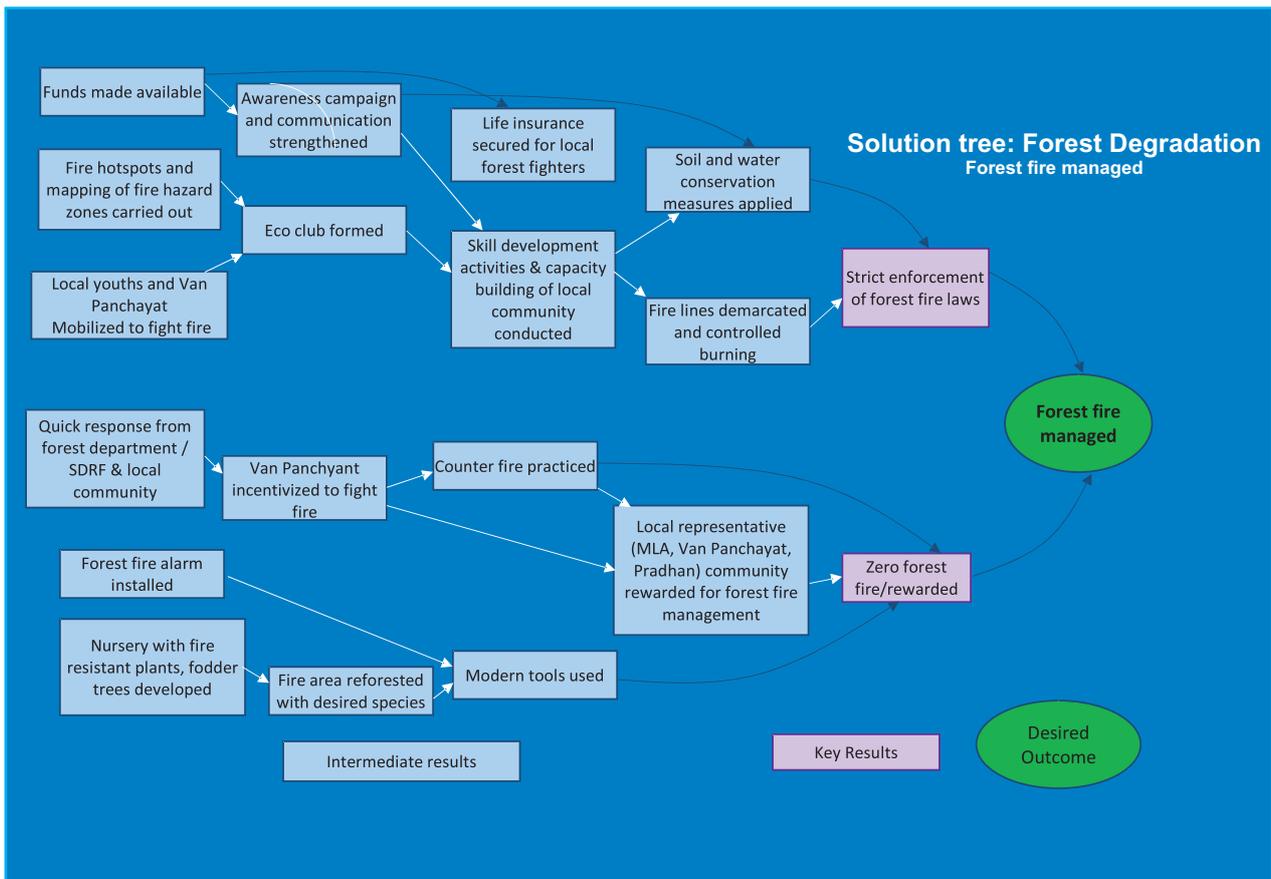


Figure 8: Solution tree: forest fire managed

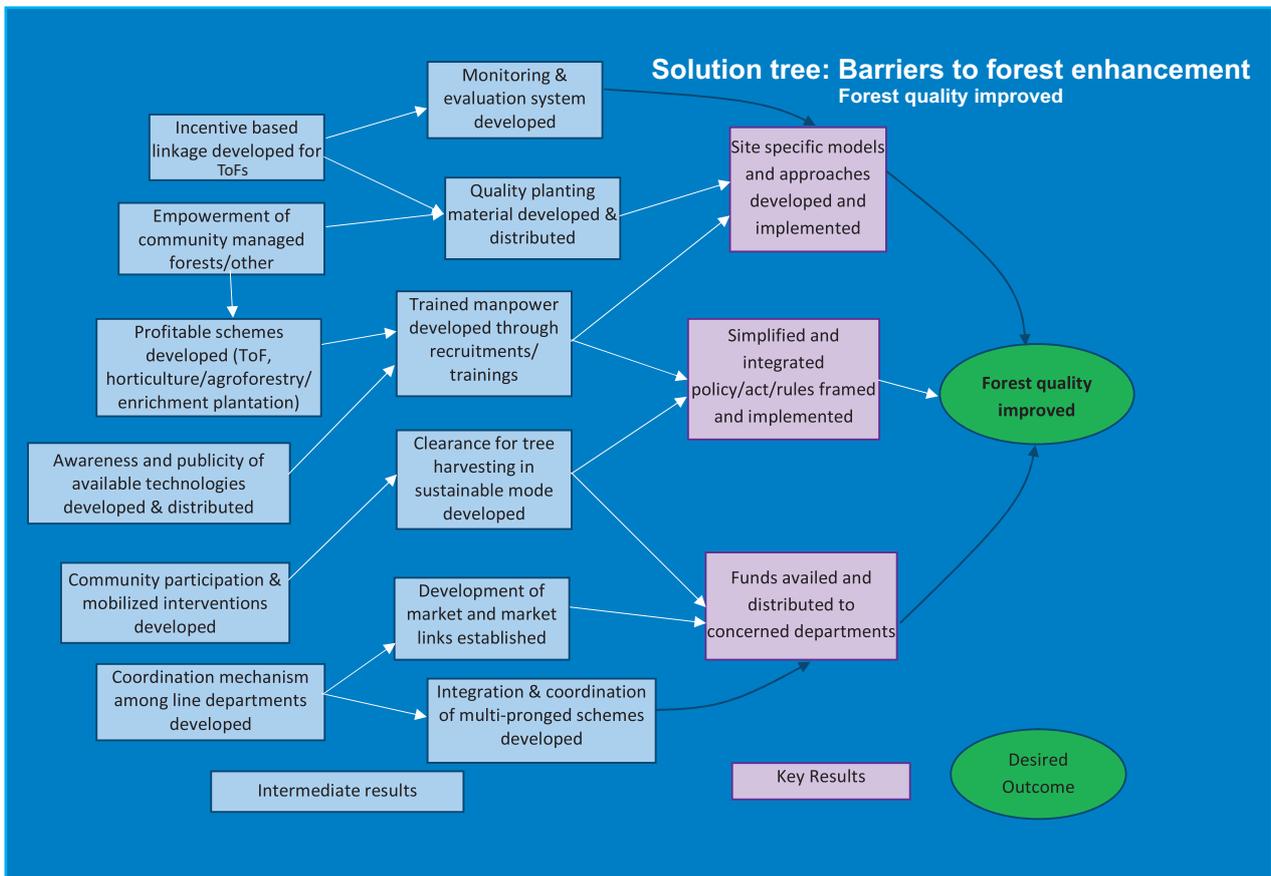


Figure 9: Solution tree: forest quality improved



4.3 Development of Intervention Packages

The most important key results in the solution trees were used as the basis for identifying the strategies in the intervention packages (IPs). Each IP requires a strategy and outputs mentioned in Table

5 below. It is important to note that each IP should be implemented and monitored independently, especially if different sources of funds are available from different ministries or agencies.

Table-5: Intervention packages, strategies and outputs

Names of IPs	Strategies	Outputs
Effective implementation of forest laws/acts and prescriptions of forest working plans	Conservation of forest	Quality and health of forest improved
Preparation of comprehensive State Land use Plan	Effective protection of forest	Clearly defined land use plan developed, adopted and executed
Deforestation- free urbanization and other settlements	Planned urbanization and settlements in forest fringe areas	Reduced forest area encroachment from rapid expanding urbanization and developmental activities
Improved planning of development activities to avoid biodiversity rich areas (moist broadleaved evergreen trees) and hot-spots	Conservation of biodiversity hotspots	High value biodiversity hot-spots conserved
Discourage felling of trees by incentivizing agroforestry and horticulture with appropriate agriculture technologies	Increased area of agroforestry and horticulture practice using appropriate technologies	Loss of trees reduced through improved agroforestry and horticulture production
Sustainable management of forest products such as timber, fuel wood, fodder collection & NTFPs and grazing	Increased production of timber, fuelwood, fodder, NTFPs and grass	Sustainable and planned supply of forest products to local communities
Prevention of forest fire with provision of rewards	Frequency and area of forest fire reduced	Damage to forest minimized through community participation and incentive mechanism
Adaptation to extreme climatic conditions	Providing training to the local communities	Preparedness on outbreaks of pests & diseases, soil erosion and other natural calamities
Simplified approaches for promoting enhancement activities	Forest quality improved through TOF (urban, roadside, farmland); agroforestry (farmland) and enrichment plantation (within degraded forest)(Enhancement of Forest Carbon Stocks)	Increased area under TOF, agroforestry and through enrichment plantation in open/ degraded forest areas

4.4 Identification of Strategies and Activities

Each IP requires a set of activities for achieving the strategies and outputs. These are shown in Table 6.



Table-6: Strategies and activities

Name of IPs	Strategies	Activities
Effective implementation of forest legislation/ policies and prescription of forest working plans	Conservation of forest	<ul style="list-style-type: none"> Capacity building and awareness campaigns amongst stakeholders Timely preparation/revision of forest working plans Monitoring prescriptions of forest working plans and forest legislation/ policies
Preparation of comprehensive State Land use Plan	Effective protection of forest	<ul style="list-style-type: none"> Develop State Land Use Plan Implement the Plan Demarcation of forest and encroached areas Establish REDD+ Cell and state level working group under Principal Chief Conservator of Forests & Head of Forest Force Improve coordination between line departments and other agencies
Deforestation-free urbanization and other settlements	Planned urbanization and settlements in forest fringe areas	<ul style="list-style-type: none"> Demarcation of urban boundaries with forest Permanent settlements for nomadic communities Eviction of forest encroachments Manage and regulate tourism activities <i>Note: All the activities should be developed according to State Land Use Plan</i>
Planning of development activities to avoid biodiversity rich areas (moist broadleaved evergreen trees) and hot-spots	Conservation of biodiversity hotspots	<ul style="list-style-type: none"> Identification & documentation of biodiversity rich areas and hot-spots Implementation of State Biodiversity Action Plan Streamline diversion of land for developmental activities Creating alternate land banks for developmental activities
Incentivising agroforestry and horticulture with appropriate agriculture technologies to discourage tree felling	Increased area of agroforestry and horticulture practice using appropriate technologies	<ul style="list-style-type: none"> Use appropriate agriculture technology for increased agricultural productivity Apply improved pasture management technology and restrict livestock as per carrying capacity Promote modern livestock as an enterprise Encourage agriculture cooperatives Capacity development for additional income generation and diversification of livelihood option
Sustainable management of forest products such as timber, fuel wood, fodder collection & NTFPs and grazing	Increased production of timber, fuelwood, fodder, NTFPs and grass	<ul style="list-style-type: none"> Promote alternative and renewable energy technologies for forest dependent local communities Promote high density plantation of small timber, fuel wood and fodder Promote cultivation of medicinal & aromatic plants as income generation activities Introduce high yielding fodder varieties in farmlands Provide access to credit finance to farmers Value addition and marketing of agriculture residue Designate grazing areas Improve management of grazing areas
Prevention of forest fire with provision of rewards	Frequency and area of forest fire reduced	<ul style="list-style-type: none"> Awareness campaign Develop forest fire communication strategy Identification and mapping of forest fire vulnerable areas Zero forest fire reward to <i>Van Panchayat, Sarpanch, Pradhan</i> and community member Life insurance cover for local fire fighters Training and distribution of modern firefighting tools Fire control measures such as construction of trenches & ponds, creation & maintenance of fire lines, control burning, etc. Training and mobilization of local youth and eco clubs Making use of biomass such as invasive species and pine needles, etc.



Name of IPs	Strategies	Activities
Adaptation to extreme climatic conditions	Providing training to the local communities	<ul style="list-style-type: none"> • Listing of prevalent pest & diseases and their remedial measures • Identification of vulnerable spots • Implementation of State Action Plan on Climate Change • Implementation of site specific soil and water conservation measures • Adoption of disaster risk reduction measures
Simplified approaches for promoting enhancement activities	Forest quality improved through TOF (urban, roadside, farmland); agroforestry (farmland) and enrichment plantation (within degraded forest) Enhancement of forest carbon stocks	<ul style="list-style-type: none"> • Identify barren or degraded areas for afforestation, reforestation and enrichment plantation • Developing quality planting material • Training of manpower • Promoting urban forestry and roadside forestry • Incentivize farmers for horticulture and agroforestry expansion on farm lands • Making available financial resources for promotion of TOF, agroforestry and enrichment plantation • Simplification of harvesting & transit procedures for TOF • Value addition for timber and other products • Development of minimum support price & marketing linkages with wood based and other allied industries • Development of monitoring and evaluation systems for enhancement activities

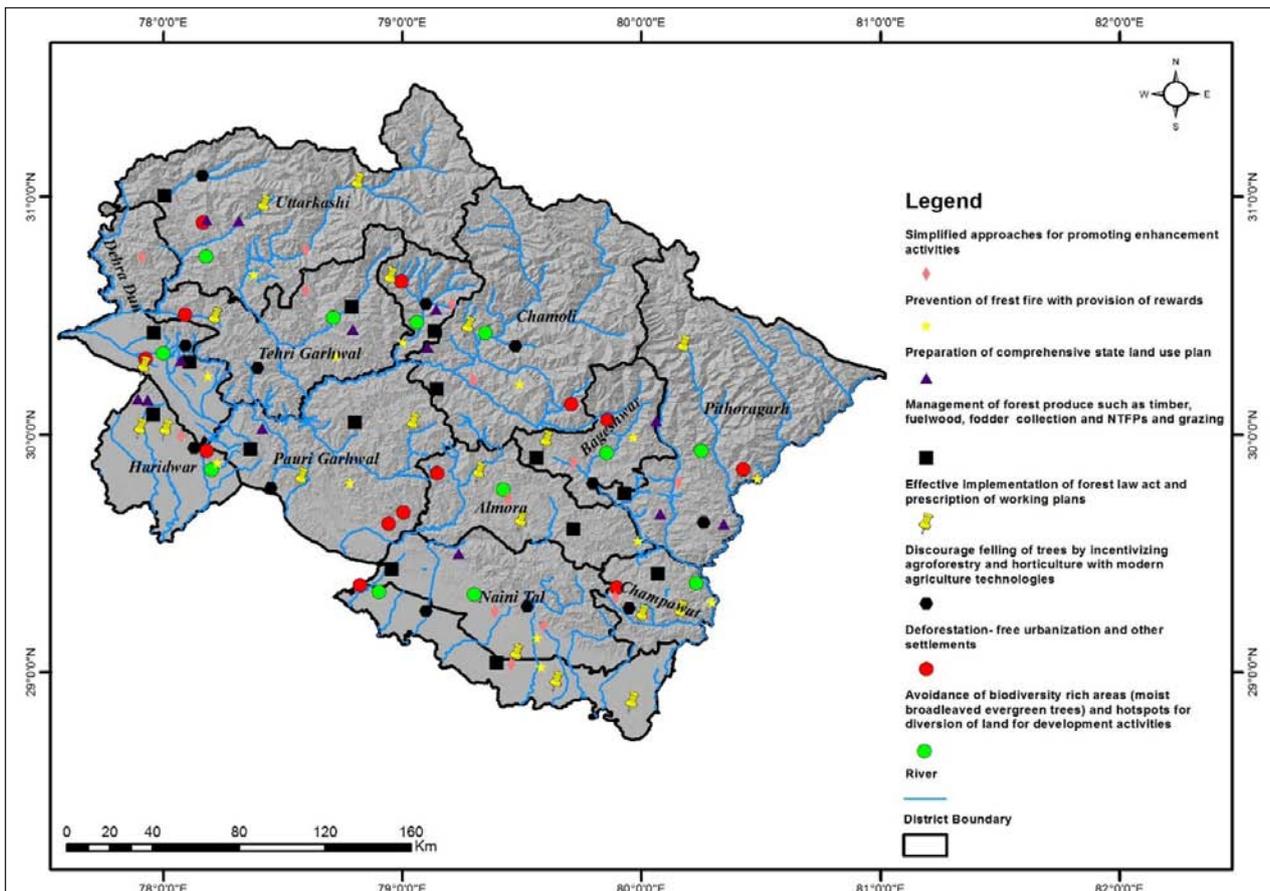


Figure 10: Hotspots and identified sites for implementation of activities



4.5 Feasibility Analysis of Intervention Packages

Analysis and evaluation of the IPs were carried out to determine if it was (1) technically feasible, (2) feasible within the estimated cost, and (3) would provide a sufficient economic incentive to cause a change in land use that would reduce emissions or capture carbon. Feasibility analysis provides a basis for deciding which IPs are more practical and cost-effective, and which ones it may be better to leave out of the SRAP since they are less feasible and cost-effective.

In the SRAP planning process feasibility analysis can be conducted in small expert groups which assess the strengths and weakness of each IP. The first main step in feasibility analysis is to analyze the risks and obstacles of implementing each IP, noting that these risks or obstacles should not include lack of finance

or resources since it is assumed that these will be covered by REDD+ finance. At the same time cost-effectiveness is considered to be a vital criterion in feasibility analysis.

Table 7 shows the overall feasibility of each IP. The scores indicate that there are few IPs which are feasible as scores range is quite different and high. The most feasible IPs were: simplified approaches for promoting enhancement activities, prevention of forest fire with provision of rewards, incentivizing agroforestry and horticulture with appropriate agriculture technologies to discourage tree felling, and effective implementation of forest legislation/policies and prescription of working plans.

Table-7: Feasibility analysis of intervention packages

Intervention Packages	Implement- ation risks/ obstacles (L=3, M=2, H=1)	Cost-effec- tiveness of risk reduc- tion mea- sures (L=1, M=2, H=3)	Implem- entation cost (L=3, M=2, H=1)	Opport- unity cost (L=3, M=2, H=1)	Incentive measures (L=1, M=2, H=3)	Total score
Effective implementation of forest legislation/policies and prescription of forest working plans	1	3	1	3	2	10
Preparation of a comprehensive State Land use Plan	3	2	1	2	1	9
Deforestation- free urbanization and other settlements	1	2	1	1	3	8
Planning of development activities to avoid biodiversity rich areas (moist broadleaved evergreen trees) and hot-spots	1	2	1	1	1	6
Incentivizing agroforestry and horticulture with modern agriculture technologies to discourage tree planting	3	2	2	1	3	11
Sustainable management of forest products such as timber, fuel wood, fodder collection & NTFPs and grazing	2	1	3	1	3	10
Prevention of forest fire with provision of rewards	1	3	2	3	3	12
Adaptation to extreme climatic conditions	2	1	1	2	1	7
Simplified approaches for promoting enhancement activities	2	3	3	3	3	14



4.6 Safeguard Analysis

Safeguard analysis mainly refers to the identification of risks or threats as regards the “Cancun Safeguards” and other social and environmental or biodiversity-related risks. The analysis also refers to the contribution made by the IPs to the enhancement of social and environmental benefits. A crucial criterion for social risk is whether the IPs negatively impact a vulnerable stakeholder group, and for an environmental risk whether it negatively impacts biodiversity and ecosystem services.

For the Uttarakhand SRAP, safeguard analysis was conducted through an exchange of working groups in order to refine and improve the analysis made

by the first working group of stakeholders (in other words, a second working group identified social and environmental risks and threats associated with the activities/strategies of each IP).

Table 8 presents the implementation risks or threats identified for each IP, including the risk reduction measures. Similarly, Tables 9 & 11 shows the social and environmental risks of the individual IPs which also includes the risk reduction measures. Finally, Tables 10 & 12 depict the social and environmental benefits of the IPs, including the benefit enhancement measures. In this way, both risks and benefits of the IPs were assessed and addressed.

Table-8: Implementation risks and obstacles analysis of IPs

Key Results/IPs	Implementation Risk or Obstacles	Likelihood of Risk (H/M/L)	Impact of Risk (H/M/L)	Risk Reduction Measures
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
Preparation of comprehensive State Land Use Plan	Data deficit	L	H	Proper data collection; field sites visit, proper demarcations
Deforestation-free urbanization and other settlements	Unwillingness, unaware of the local population	H	M	Proper planning with priority on environment, awareness of local population and private sector builders
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
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
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



Key Results/IPs	Implementation Risk or Obstacles	Likelihood of Risk (H/M/L)	Impact of Risk (H/M/L)	Risk Reduction Measures
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
Adaptation to extreme climatic conditions	Low understanding of climate impacts	L	M	Develop comprehensive plan on ecosystem based adaptation based on climate impacts
Simplified approaches for promoting enhancement activities	Enhancement of forest is less of a priority	L	M	Identify enhancement activities on government forest, protected forest and private forest including agroforestry

Table-9: Social Risk Analysis

Key Results/IPs	Risks	Likelihood of risk (H/M/L)	Impact of risk (H/M/L)	Risk reduction measures
Effective implementation of forest Law/Act and prescription of forest working plans	More strict compliance for poor people that are forest dependent and who are mainly landless. Women could be marginalized	H	M	Participation of the poorest of the poor must be ensured in the local forestry plans. Pay special attention to women's participation and engagement
Preparation of comprehensive State Land use Plan	Illegal settlers in forests can be evicted	H	M	Alternative livelihood options must be provided. Proper demarcation of state owned forest resources
Deforestation- free urbanization and other settlements	Illegal settlers in forests can be evicted	H	M	Provide alternative livelihoods, strict enforcement of law/policy
Planning of development activities to avoid biodiversity rich areas (moist broadleaved evergreen trees) and hot-spots	Increased human wildlife conflict. Increased risk to women from human wildlife conflict	H	H	Implementation of State Biodiversity Action Plan. Ensure safety of women that go to cut grass and collect fuelwood
Incentivizing agroforestry and horticulture with appropriate agriculture technologies to discourage felling	Landless have no incentive	M	M	Targeting households with small landholding and or community agroforestry
Sustainable management of forestproducts such as timber, fuel wood, fodder collection & NTFPs and grazing	Women can have restricted access	L	L	Identify household needs with special focus on women and the poor households
Prevention of forest fire with provision of rewards	Reward system may not be transparent	M	M	Public hearing and awareness



Adaptation to extreme climatic conditions	The poor are more vulnerable to climate change impacts	H	M	Identify climate change vulnerable communities; implements State Climate Change Action Plan (section on biodiversity and forest)
Simplified approaches to promoting enhancement activities	Landless and women may get excluded	M	M	Maintain special focus on low income households and households with women

Table-10: Social Benefit Analysis

Key Results/IPs	Benefits	Likelihood of benefit (H/M/L)	Impact of benefit (H/M/L)	Benefit enhancement Measures
Effective implementation of forest legislation/ policies and prescription of forest working plans.	Society benefits from better law enforcement	H	H	Benefits to accrue at state level
Preparation of comprehensive State Land use Plan	Communities have better forest through proper planning	H	H	Enforce state land use plan
Deforestation- free urbanization and other settlements			Not Applicable	
Avoidance of biodiversity rich areas (moist broadleaved evergreen trees) and hot-spots for diversion of land for developmental activities			Not Applicable	
Discourage felling of trees by incentivizing agroforestry and horticulture with appropriate agriculture technologies	Communities receive incentive; better livelihood options	M	M	Ensure the participation of low income households and women headed households
Sustainable management of forest products such as timber, fuel wood, fodder collection & NTFPs and grazing	Increased supply of forest products, reduce the drudgery of women	M	M	Management plans that increase the benefit to a wider population with special emphasis on marginalized households and women
Prevention of forest fire with provision of rewards	Reduced risk of fire hazard	H	H	Local participation and fair reward system
Adaptation to extreme climatic conditions	Vulnerable households made less vulnerable	H	H	Enhanced soil fertility will benefit the wider community
Simplified approaches for promoting enhancement activities	Increased incentive and income generation	H	H	Ensure participation of landless and women

Table-11: Environmental Risk Analysis

Key Results/IPs	Environmental risks	Likelihood of Risk (H/M/L)	Impact of Risk (H/M/L)	Risk Reduction Measures
Effective implementation of forest Law/Act and prescription of forest working plans				



Key Results/IPs	Environmental risks	Likelihood of Risk (H/M/L)	Impact of Risk (H/M/L)	Risk Reduction Measures
Preparation of comprehensive State Land use Plan	Some conflicts in land use may develop	M	H	State must own the plan; identification of lands under conflict
Deforestation- free urbanization and other settlements		Not Applicable		
Planning of development activities to avoid biodiversity rich areas (moist broadleaved evergreen trees) and hot-spots		Not Applicable		
Incentivizing agroforestry and horticulture with appropriate agriculture technologies to discourage tree felling	Local species replaced with exotic species	L	L	Promote native species
Sustainable management of forest products such as timber, fuel wood, fodder collection & NTFPs and grazing		Not Applicable		
Prevention of forest fire with provision of rewards		Not Applicable		
Adaptation to extreme climatic conditions		Not Applicable		
Simplified approaches to promoting enhancement activities		Not Applicable		

Table-12: Environmental benefit analysis

Key Results/IPs	Environmental benefits	Likelihood of benefit (H/M/L)	Impact of benefit (H/M/L)	Benefit enhancement Measures
Effective implementation of forest Law/Act and prescription of forest working plans	Better forest cover and biodiversity	H	H	Periodic monitoring
Preparation of comprehensive State Land use Plan	Better forest cover and well planned land use	H	H	Development and enforcement of land use plan
Deforestation- free urbanization and other settlements	More trees, less air pollution	M	M	Awareness raining
Planning development activities to avoid biodiversity rich areas (moist broadleaved evergreen trees) and hot-spots	Better forest corridor and biodiversity conservation	H	H	Synchronize 1) Land use plan, 2) Climate Change Action Plan, 3) Biodiversity Action Plan 4) development plan
Incentivizing agroforestry and horticulture with appropriate agriculture technologies to discourage tree felling	More trees on farms	M	M	Incentivize farmers for maintaining more trees
Sustainable management of forest products such as timber, fuel wood, fodder collection & NTFPs and grazing	Strengthen sustainable harvesting	H	H	Awareness and capacity building for local communities



Prevention of forest fire with provision of rewards	Forest fire mitigated	H	H	Community awareness, mobilization and trainings
Adaptation to extreme climatic conditions	Ecosystem based adaptation	M	M	Identify climate vulnerable ecosystems
Simplified approaches for promoting enhancement activities	More trees grown and reduced pressure on forest	M	H	Identify areas for enhancement activities

4.7 Gaps Analysis

The Forest Department, local authorities, other state departments/ organizations and NGOs currently implement a range of activities or measures that address D&FD drivers. However, the following major gaps (between current practice and what is needed for success of the SRAP) or challenges have been observed for implementing SRAP activities in Uttarakhand:

- Difficulties in estimating emission reductions and removals at the state level as a result of implementing the SRAP.
- There is a dearth of capacity at different levels to comprehend and articulate the compliance process of REDD+.

4.8 Monitoring

The UNFCCC does not require measurement, reporting and verification (MRV) of emission reductions and removals at the sub-national level, but it is essential to monitor the SRAP implementation, both for adaptive management of the SRAP and to be able to compensate or incentivize local stakeholders for their contribution to positive outcomes. Therefore, a monitoring plan forms a vital part of the SRAP, including the description of an institutional framework to carry out monitoring activities. The SRAP review workshop revealed that

the development of the monitoring plan for the SRAP is a challenging task, both technically and institutionally. It is important to build, to the extent possible, on pre-existing monitoring frameworks to assess the implementation of IPs and the impact of the SRAP as a whole on forest-related indicators. Training the State Forest Department together with local stakeholders in basic data collection can also improve cost-effectiveness of monitoring approaches and provide a means for validation of data generated at the state or local level.



5

BUDGET AND OPERATIONAL PLAN

Based on detailed and transparent budgeting of the IPs, a five-year operational plan (or SRAP) has been developed for presenting to the National/State Government and potential donors (Table 13). The quantitative implementation targets defined in the planning stage (and that are also required for the monitoring plan) are the starting point for the budgeting process, followed by a detailed analysis of the activities, tasks (within each activity) and resources needed. The budgeting stage also involved “gaps analysis” to identify activities in the IPs that are already planned and budgeted since the SRAP budget and operational plan is only for additional resource requirements.





Table-13: Estimated Budget for Five Years Operational Plan

Intervention Packages	Estimated Budget (in Rupees)					
	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Effective implementation of forest Law/Act and prescription of forest working plans.	80,00,000	1,80,00,000	1,20,00,000	40,00,000	40,00,000	4,60,00,000
Preparation of comprehensive State Land use Plan	1,50,00,000	3,00,00,000	2,50,00,000	100,00,000	35,00,000	8,35,00,000
Deforestation- free urbanization and other settlements	75,00,000	2,50,00,000	1,50,00,000	1,50,00,000	75,00,000	7,00,00,000
Planning of development activities to avoid biodiversity rich areas (moist broadleaved evergreen trees) and hot-spots	60,00,000	80,00,000	60,00,000	30,00,000	30,00,000	2,60,00,000
Incentivizing agroforestry and horticulture with appropriate agriculture technologies to discourage tree felling	80,00,000	1,70,00,000	1,70,00,000	30,00,000	30,00,000	4,80,00,000
Sustainable management of forest products such as timber, fuel wood, fodder collection & NTFPs and grazing.	6,00,00,000	8,00,00,000	8,00,00,000	6,00,00,000	4,00,00,000	32,00,00,000
Prevention of forest fire with provision of rewards	8,25,00,000	12,40,00,000	5,00,00,000	4,00,00,000	1,00,00,000	30,65,00,000
Simplified approaches for promoting enhancement activities	6,00,00,000	12,00,00,000	7,00,00,000	2,00,00,000	2,00,00,000	29,00,00,000
Total in Rs.	24,70,00,000	42,20,00,000	27,50,00,000	15,50,00,000	9,10,00,000	119,00,00,000
Total in US\$ (exchange rate, 1 USD=71.86 INR)	3437239	5872530	3826886	2156972	1266351	16559977.73





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ANNEX 2

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ANNEX 3

Relevant state level stakeholders of Uttarakhand

Government Institutions:

Agriculture Department

Agriculture Department

Animal Husbandry Department

Department of Revenue & Board of Revenue

Directorate of Urban Development

Disaster Mitigation and Management Centre

Forest Department

Horticulture and Food Processing Department

Public Works Department

Rural Development Department

State Planning Department

State Climate Change Centre under Uttarakhand Forest Department

Town & Country Planning Department

Uttarakhand Renewable Energy Department

Uttarakhand Renewable Energy Development Agency

Uttarakhand Watershed Management Directorate

Non-Government Organisations:

Central Himalayan Environment Association

Dasholi Gram Swarajya Sangh

Himalayan Action Research Centre

Himalayan Environmental Studies and Conservation Organization

Himalayan Sewa Samiti

Maiti Andolan etc.

Science & Technology Institutions:

Forest Research Institute

Forest Survey of India

G.B. Pant National Institute of Himalayan Environment & Sustainable Development

HNB Garhwal University, Srinagar

Indian Council of Forestry Research and Education

Indian Institute of Remote Sensing

Indian Institute of Soil Science and Water Conservation

Kumaon University, Nainital

Uttarakhand Space Application Centre

Uttarakhand State Biodiversity Board

Uttarakhand State Council for Science and Technology

Uttarakhand University of Horticulture & Forestry

Wildlife Institute of India

Other:

Uttarakhand Van Panchayat



ANNEX 4

Ranking of deforestation and forest degradation drivers and enhancement activities

Prioritization of deforestation drivers

Direct Driver	Locations	Future threat (1-5)	Future biomass impact (1-5)	Future forest area impacted (1-5)	Total Score
Diversion of forest land for non-forestry purpose	All districts of the State	4	5	5	14
Deforestation due to encroachment	Haldwani, Dehradun, Haridwar, Rudrapur, Nainital, Uttarkashi, Tehri, Ruchaprayag	3	3	3	9
Rapid Urbanization	Haridwar, Dehradun, Udham-Singh Nagar, Haldwani, Nainital, Pauri	4	4	4	12
Mining or quarrying	Haldwani, Ramnagar, Haridwar, Pithoragarh, Dehradun, Udham Singh Nagar, Bageshwar, Mussoorie, Pauri	2	2	2	6
Illicit felling	Haldwani, Ramnagar, Nanital, Dehradun, Uttarkashi, Tehri, Kotdwar, Chakrata	2	2	2	6
Loss of regeneration due to forest fire & grazing	Almora, Bageshwar, Chamoli, Nanital, Pauri, Tehri, Dehradun, Haridwar, Pithoragarh, Rudraprayag, Uttarkashi	5	5	5	15

Prioritization of forest degradation drivers

Direct Driver	Locations	Future threat (1-5)	Future biomass impact (1-5)	Future forest area impacted (1-5)	Total Score
Illegal felling	Whole Uttarakhand except above tree line	4	2	4	10
Landslide hazards/ soil erosion	All hill districts	3	1	4	8
Forest fire	All hill districts	5	5	5	15
Invasive species	All districts	4	4	4	12
Non-adoption of silvicultural practices	All districts	4	5	4	13
Overgrazing or free grazing of livestock	All districts	3	4	4	11

**Barriers to improved forest management, Uttarakhand**

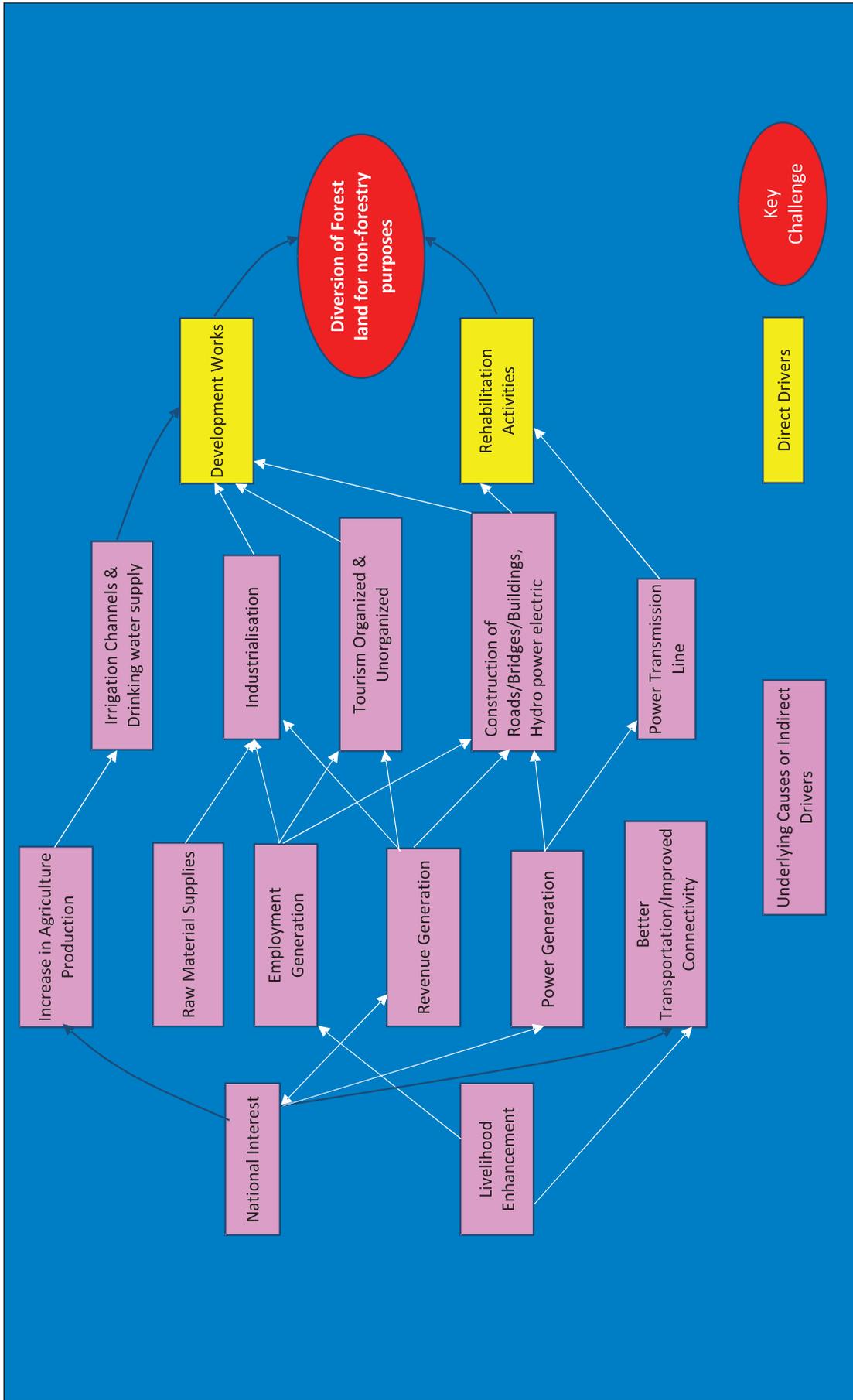
Locations	Future potential area	Future biomass impact	Total score	Significant barriers/challenges
Dehradun, Udham Singh Nagar, Haridwar, Charbmussorie (Tehri), Uttarkashi, Nainital	4	4	8	Lack of proper approach (scientific) for agroforestry/Horticulture
Whole state	4	5	9	Unavailability of suitable land
Whole state	5	5	10	Unavailability or delayed availability of finance
Whole state	4	4.5	8.5	Inadequate nursery practices and planting stock
Whole state	4	3.5	7.5	Lack of capacity building for forestry stakeholders
Whole state	4	4	8	Lack of trained manpower/human resources





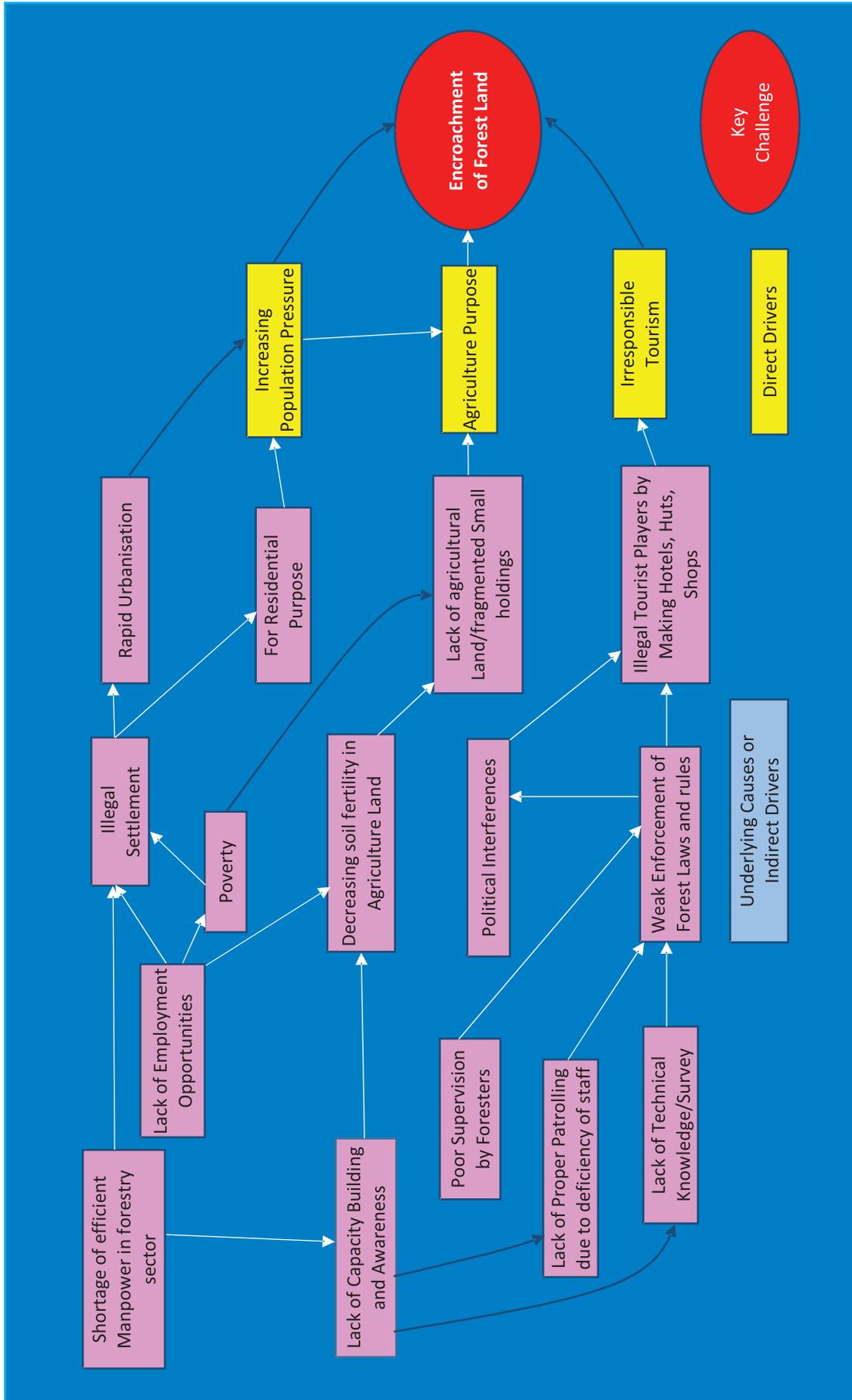
ANNEX 5

Problem tree for Deforestation :
Diversion of forest land for non-forestry purposes



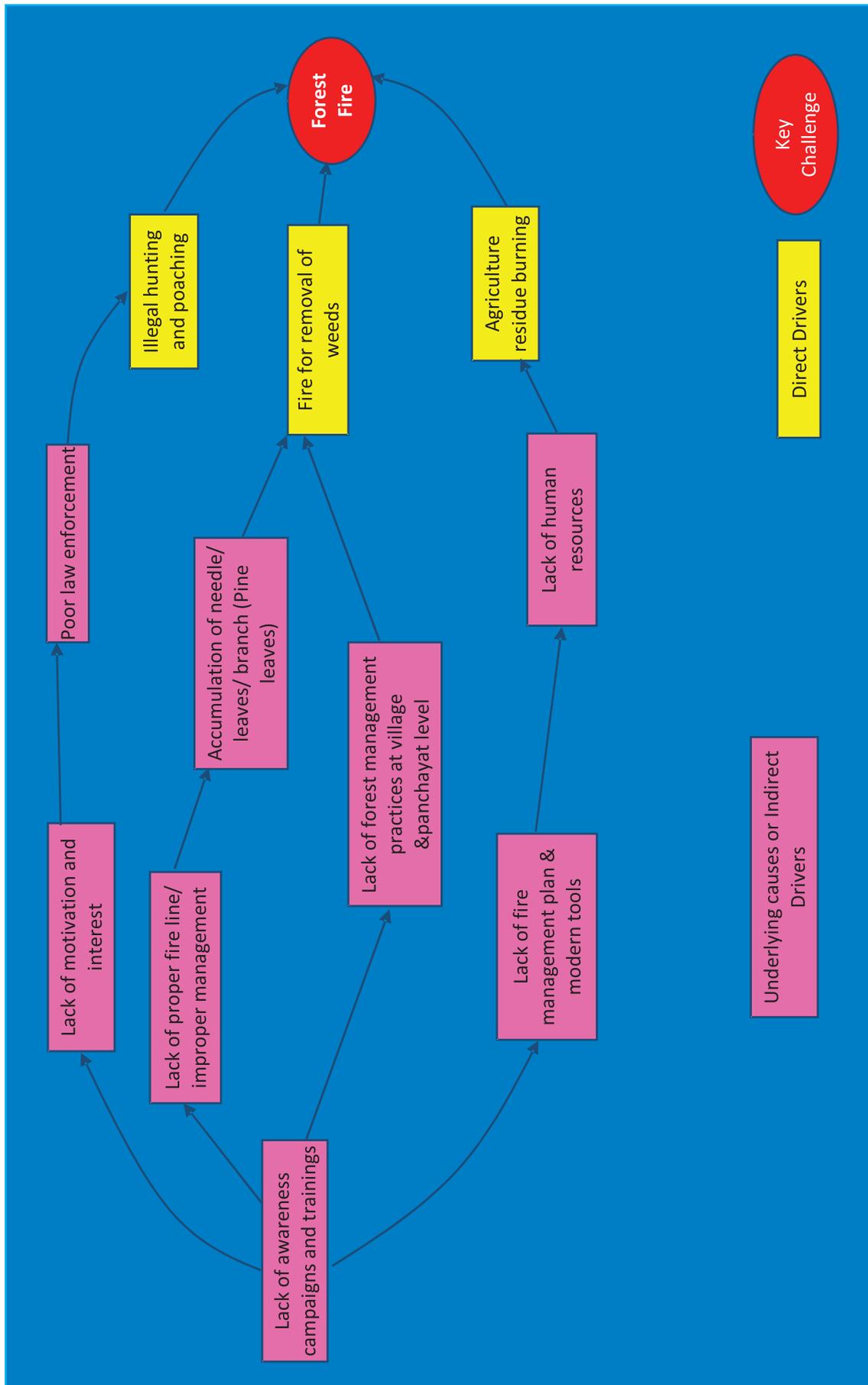


Problem tree for Deforestation : Encroachment of Forest Land



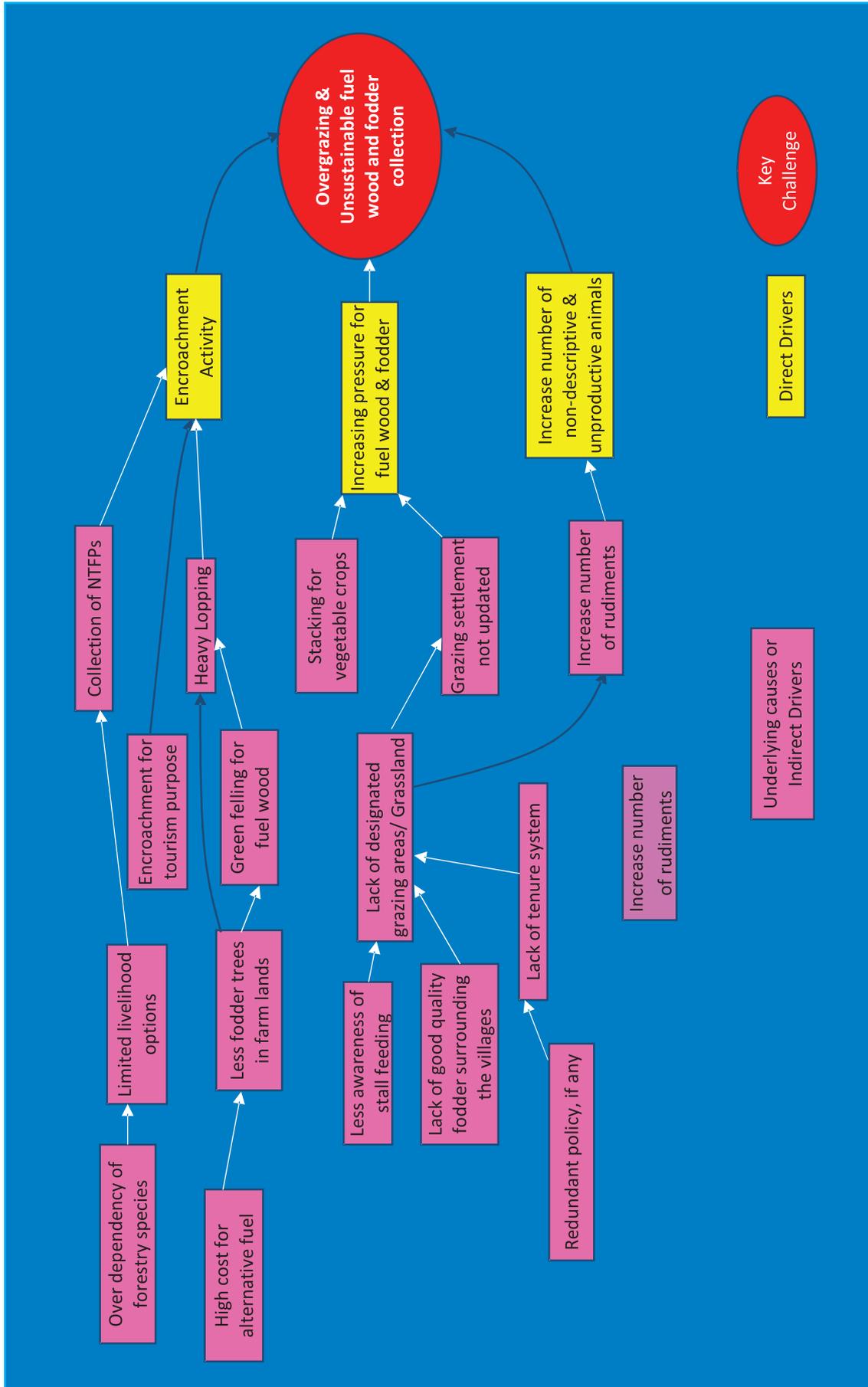


Problem tree for Degradation : Forest Fire



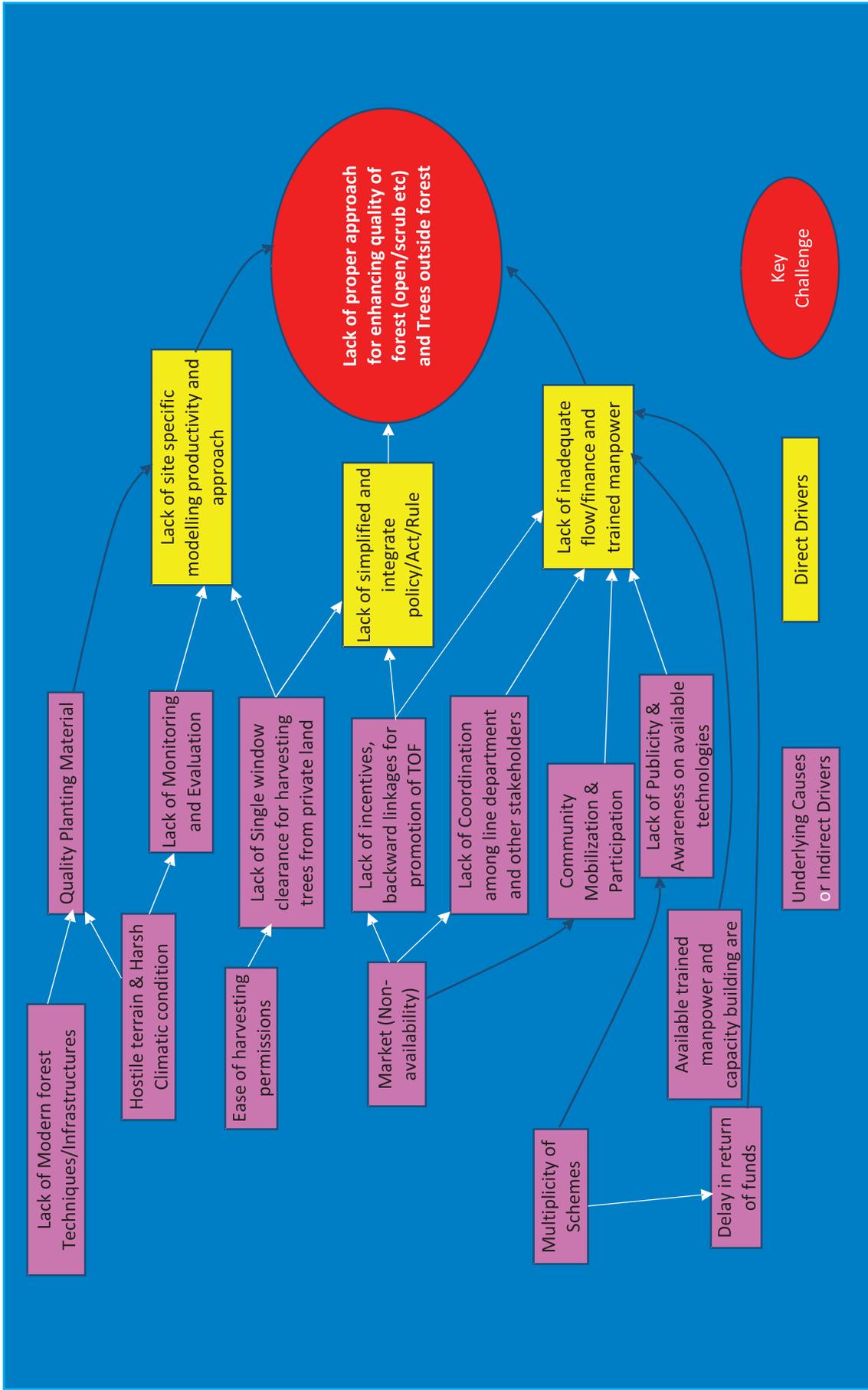


Problem tree for Degradation : Overgrazing & Unsustainable fuel wood and fodder collection





**Problem tree for Barriers for forest enhancement:
Lack of proper approach for enhancing quality of forest (open/scrub, etc) and trees outside forest**





ANNEX 6

Detailed Intervention Packages with Monitoring Plan and Budget

Intervention Package 1: Effective implementation of forest legislation/policies and prescription of forest working plans

A. General Information				
IP Name	Effective implementation of forest legislation/policies and prescription of forest working plans.			
Drivers or barriers addressed	All drivers of deforestation and forest degradation will be addressed.			
IP description	Effective implementation of forest legislation/policies would reduce the rate of deforestation and forest degradation. In addition, if all forests have working plans it will act as a guiding document for the forest protection and harvesting.			
Objectives	The main objective of this IP is to control illegal logging of trees, fodder collection, grazing and encroachment.			
Strategies	Conservation of forest by building the capacity of forest user groups and forest staffs.			
Incentives for participation & changing stakeholder practices	Stakeholder consultation while formulating the working plans. Ensuring participation of stakeholders in forest monitoring activities. Allocation of adequate budget for formulation of working plans.			
Outputs and activities/ tasks	<ul style="list-style-type: none"> • Quality and health of forest improved • Capacity building and awareness campaigns amongst stakeholders • Timely preparation/revision and effective implementation of working plans • Technical and financial assistance • Monitoring prescriptions of working plans and forest legislation/policies 			
B. Feasibility Analysis				
Outputs/activities	Risks or obstacles	Risk reduction measures	Risk reduction targets	Indicators
Quality and health of forest improved	Low motivation in capacity building program amongst stakeholders	Provision of incentives Providing incentives for the forest staffs	At least 30% of stakeholders received incentives All forest staffs involved in implementation received incentives	Number of stakeholders receiving incentives Number of forest staff receiving incentives
	Low motivation for implementation amongst forest staff			
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	1	3	2



C. Safeguards Analysis			
Serious risks	Risk reduction measures	Risk reduction targets	Indicators
More strict compliance for poor people that are forest dependent and who are mainly landless	Representation of poorest of poor must be ensured participation in the local forestry plans	At least 10 poorest of poor representatives took part in preparation of local forestry plans	Number of poorest of poor representatives taking part in preparation of local forestry plans
Women could be marginalized	Pay special attention to women participation and engagement	At least 33% women participated and engaged in forest related activities	% of women participated and engaged in forest related activities
Benefits	Benefit enhancement measures	Benefit enhancement targets	Indicators
Society benefits from better law enforcement	Benefits to accrue at state level	Working plans for at 80% forest area formulated	Number of working plans formulated Number of capacity/awareness program conducted each year
Better forest cover and biodiversity and other goods and services	Periodical monitoring	Four capacity building/awareness program conducted each year At least two monitoring activities per year	Number of monitoring activities per year
D. Monitoring Protocol			
How does the IP ensure effective provision for monitoring	Regular monitoring by Forest Department, academic and research institutions and stakeholders Allocation of adequate budget for monitoring		
Implementing partners	State Government, Forest Department and local communities		
Proxy indicators for impact on forest area or condition	Proxy impact indicators	Target	
	Forest quality (after effective implementation of forest legislation/policies and prescription of working plans) (Note: Forest quality measured on the basis of density of trees, canopy cover, species diversity, regeneration and biodiversity)	Forest quality improved at least by 10%	
IP implementation targets	At least six capacity building and awareness campaigns amongst stakeholders per year. Two monitoring activities per year for the prescriptions of working plans and forest legislation/policies		
Monitoring Protocol		Indicators	Source of data or data collection methods
	Proxy indicators	Forest quality (after effective implementation of forest legislation/policies and prescription of working plans)	Field survey, Remote sensing and GIS applications, completion report
	Intervention indicators	Number of capacity building and awareness campaigns amongst stakeholders per year	Registration sheet, field observation and completion report



Risk reduction indicators	Number of poorest of poor took part in preparation of local forestry plans Percent of women participated and engaged in forest related activities	Participants list, observation and final forestry plan Field survey and completion report
E. Budget Plan (5 years)		
Introduction	Standard government price norms are used Annual increase in costs by 15% to allow for inflation factored in	
Implementation cost including monitoring	Activity	Budget (INR)
	Capacity building and awareness campaigns	1,00,00,000
	Monitoring and revisions of forest working plans	3,60,00,000
Total Budget:		4,60,00,000





Intervention Package 2: Preparation of comprehensive State Land Use Plan

A. General Information				
IP Name	Preparation of comprehensive State Land Use Plan			
Drivers or barriers addressed	Deforestation and forest degradation: the main anthropogenic driver of D&FD in the state is encroachment.			
IP description	A clear state land use plan consisting of forest boundaries and dealing with encroached areas will reduce the rate of deforestation and explores the areas where degradation can be minimized.			
Objectives	To guide the future actions for the state which presents vision for the future, with long range goals ultimately helping to check deforestation and forest degradation.			
Strategies	Effective protection of forest by demarcation of forest areas and encroached areas.			
Incentives for participation & changing stakeholder practices	<ul style="list-style-type: none"> Stakeholders participation from planning phase to implementation phase of State Land Use Plan. Inclusion of local people while conducting the demarcation of forest areas as well as encroached areas. A strong awareness campaign. 			
Outputs and activities/tasks	<p>Output 1: Clearly defined land use plan developed, adopted and executed</p> <ul style="list-style-type: none"> Develop State Land Use Plan <ul style="list-style-type: none"> Baseline assessment of land resource map Mapping of current land use with clear demarcation of boundaries Analysis of land capability, focusing on deforestation and reforestation Participatory resource mapping and development potential <p>Output 2: State land use plan implemented</p> <ul style="list-style-type: none"> Demarcation of forest and encroached areas Field survey and mapping using GPS Establish REDD+ Cell and state level working group under Principal Chief Conservator of Forests & Head of Forest Force Improve coordination between line departments and other agencies 			
B. Feasibility Analysis				
Outputs/activities	Risks or obstacles	Risk reduction measures	Risk reduction targets	Indicators
Preparation of comprehensive State Land use Plan	Data deficiency	Proper data collection; field sites visit, proper demarcations and stakeholders consultation	One coordination committee in all hotspots for coordinating in data collection, field visit and monitoring of demarcations	Number of operational coordination committees Number of field monitoring visits with field reports
Demarcation of forest and encroached areas	Political pressure and unwillingness of encroachers to participate in demarcation	Good coordination & commitment with local people, political will and concerned government organizations	One coordination committee in all hotspots. At least 4 coordination meetings per year	Number of operational coordination committees Number of meetings conducted with minutes of meetings



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
3	2	1	2	1
C. Safeguards Analysis				
Serious risks	Risk reduction measures	Risk reduction targets		Indicators
Illegal settlers in forests can be evicted	Alternative livelihood options may be provided Proper demarcation of state owned forest resources	All affected households supported with alternative livelihood options At least 80% of state owned forest demarcated		Number of affected households supported with alternative livelihood options % of demarcated state owned forest
Some conflicts in land use may develop	State must own this land use plan; Identification of lands under conflict/encroachment	Endorsement letter from the State Government All encroached/conflict land identified		Signed endorsement letter from State government % of encroached/conflict land identified
Benefits	Benefit enhancement measures	Benefit enhancement targets		Indicators
Communities have better forest through proper planning	Enforce state land use plan	At least 10% of activities guided by State Land Use Plan implemented each year		Number of activities implemented per year
Improved forest quality and well planned land use	Land use plan developed and enforced	Local people made aware on land use plan Better income generation activities, livelihood options and environment Reduction of natural disasters		Number of awareness activities for local people Number of households with income generation activities, better livelihood options and environment Number of communities protected from natural disasters
D. Monitoring Protocol				
How does the IP ensure effective provision for monitoring	Regular monitoring by State Government, Department of Revenue and Board of Revenue, Forest Department, State Planning Department and local communities Allocation of adequate budget for monitoring			
Implementing partners	State government, Land and revenue department, forest department and local communities			
Proxy indicators for impact on forest area or condition	Proxy impact indicators		Target	
	Length of boundary between forest and encroached land in conflict areas demarcated Area of forest land recovered after demarcation		100 % boundary between forest and encroached land in conflict areas demarcated At least 30% of encroached forest in conflict areas restored	



IP implementation targets	State land use plan prepared 100 % boundary between forest and encroached land in conflict areas demarcated 50% of encroached forest in conflict areas restored			
Monitoring Protocol	Indicators	Source of data or data collection methods		
	Proxy indicators	Length of boundary between forest and encroached land in conflict areas demarcated Area of forest land recovered after demarcation	Division Forest Office/ Range Forest Office and completion report	
	Intervention indicators	Length of forest & encroached land in conflict areas demarcated Area of restored encroached forest in conflicted areas	Field observation and completion report	
	Risk reduction indicators	Number of affected households supported with alternative livelihood options % of demarcated state owned forest. Signed endorsement letter from State government % of conflict land identified	Household survey and survey report Field observation and completion report Signed endorsement letter Field observation and completion report	
E. Budget Plan (5 years)				
Introduction	Standard government price norms are used Annual increase in costs by 15% to allow for inflation factored in			
Implementation cost including monitoring	Activity	Budget (INR)	Remarks	
	Field survey, coordination meetings and documentation	1,75,00,000		
	Demarcation of forests and encroached areas, Development and implementation of State Land Use Plan	5,00,00,000	50000 ha	
	Establishment of State REDD+ Cell	1,60,00,000		
Total Budget:	8,35,00,000			



Intervention Package 3: Deforestation- free urbanization and other settlements

A. General Information				
IP Name	Deforestation- free urbanization and other settlements			
Drivers or barriers addressed	Deforestation: Forest encroachment for urbanization and settlements.			
IP description	Increase in population and trend of people migrating to town /cities for acquiring better opportunities, challenging the remaining land in urban areas. Forests have been cleared to establish the settlement.			
Objectives	To reduce the rate of deforestation, by controlling rapid expansion of urbanization and development activities and clarifying the forest and encroached land.			
Strategies	Planned urbanization and settlements in forest fringe areas.			
Incentives for participation & changing stakeholder practices	<ul style="list-style-type: none"> • Self-interest of non-encroachers in favour of protecting public land which increases the security for long term land productivity investment. • Demarcation of forest and encroached area boundaries in coordination and consultation with local communities. • Awareness raising. 			
Outputs and activities/tasks	<p>Output : Reduced forest area encroachment from rapid expanding urbanization and developmental activities</p> <ul style="list-style-type: none"> • Demarcation of urban with forest boundaries <ul style="list-style-type: none"> ○ Awareness campaign on need to delineate forest and urban boundaries • Permanent settlements for nomadic communities <ul style="list-style-type: none"> ○ Identification of site(s) for settlements ○ Preparation of settlement development plan ○ Infrastructure (transportation, water and sanitation, communication and others) ○ Public services (Education, health, security and others) ○ Livelihood options • Eviction of forest encroachers • Manage and regulate tourism activities within forest areas <ul style="list-style-type: none"> ○ Identify the places for campaigns ○ Keep clear and understandable notice regarding rules ○ Keep trash bins in different sections to manage trash ○ Strict penalties for tourist who disobey the rules. ○ Regular monitoring of tourism activities ○ Awareness programs <p>Note: All the activities should be developed according to the State Land Use Plan</p>			
B. Feasibility Analysis				
Outputs/ activities	Risks or obstacles	Risk reduction measures	Risk reduction targets	Indicators
Reduced forest area encroachment from rapid expanding urbanization and development activities	Unwillingness and/or lack of availability of land for settlement opportunities in urban areas	<p>Awareness campaigns for local communities and private sector builders</p> <p>Measures to check migration from rural areas</p>	<p>12 awareness campaigns per year in each hotspots to local communities and private sector builders</p> <p>Provide basic amenities of life (job, health, communication, school and others)</p>	<p>Number of awareness campaigns per year in each hotspots to local communities and private sector builders</p> <p>Number of basic amenities established</p>



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	2	1	1	3
C. Safeguards Analysis				
Serious risks	Risk reduction measures	Risk reduction targets		Indicators
Illegal settlers in forests can be evicted to ensure no further encroachment	Provide alternate livelihoods at source, strict enforcement of law/policy	All affected households receiving the alternate livelihoods options at source Regular monitoring		Number of households receiving alternate livelihood options at source Frequency of monitoring
Benefits	Benefit enhancement measures	Benefit enhancement targets		Indicators
More trees, less air pollution	Awareness raising	Prioritize the areas/hotspots where awareness campaigns are utmost.		Number of awareness activities
D. Monitoring Protocol				
How does the IP ensure effective provision for monitoring	Regular monitoring by State Government, Urban Development Directorate, Town and Country Planning Department and Forest Department Allocation of adequate budget for monitoring			
Implementing partners	State Government, Public Works Department, Department of Revenue & Board of Revenue, Rural Development Department, Urban Development Directorate, Town and Country Planning Department, Forest Department and Local communities			
Proxy indicators for impact on forest area or condition	Proxy impact indicators		Target	
	Length of demarcated urban boundaries with forest		At least 100 km boundary demarcated between urban and forest areas	
	Area of forest recovered after eviction of forest encroachers		At least 25% of encroached forest area recovered / recovered	
	Area designated for the settlement of nomadic communities		One designated site for settlement of nomadic communities	
IP implementation targets	At least 100km boundary demarcated between urban and forest areas At least 25% of encroached forest area recovered 1 designated site for settlement of nomadic communities Regular monitoring to manage and regulate tourism activities			
Monitoring Protocol	Indicators	Source of data or data collection methods		
	Proxy indicators	Length of demarcated urban boundaries with forest	Field survey, direct field observation, completion report	
		Area of forest recovered after eviction of forest encroachers	Field observation, direct field observation, completion report	
		Area designated for the settlement of nomadic communities	Site observation and field reports	



Intervention indicators	Length of boundary demarcated between urban and forest areas	Field observation, direct field observation, Local communities, and completion report
	% of forest area recovered after eviction of encroachers	Field observation, direct field observation, completion report
	Number of designated sites for nomadic communities	Field observation and completion report
	Number of monitoring activities to regulate tourism	Monitoring report and field observation activities
Risk reduction indicators	Number of households receiving alternative livelihood options	Household survey report, field observation and completion report
	Number of monitoring activities	Monitoring report and field observation

E. Budget Plan (5 years)

Introduction	Standard government price norms are used Annual increase in costs by 15% to allow for inflation factored in		
Implementation cost including monitoring	Activity	Budget (INR)	Remarks
	Demarcation of boundaries between urban and forest areas	80,00,000	
	Eviction of encroachers	10,00,000	
	Development of sites for nomadic communities	6,00,00,000	
	Monitoring for regulating tourism activities	10,00,000	
Total Budget:		7,00,00,000	





Intervention Package 4: Planning to avoid development in biodiversity rich areas (moist broadleaved evergreen trees) and hot-spots

A. General Information				
IP Name	Planning to avoid development in biodiversity rich areas (moist broadleaved evergreen trees) and hot-spots			
Drivers or barriers addressed	Deforestation and forest degradation.			
IP description	Development activities often cover large areas/distances or form widespread networks, affecting biodiversity rich areas. This not only affects biodiversity rich areas and hotspots but also reduces the area of natural habitat. There are many ways to avoid significant impacts on biodiversity rich areas and hot-spots& mitigate adverse effects.			
Objectives	To conserve biodiversity rich areas, mostly broadleaved evergreen forest, and consequently to conserve water sources. To reduce the rate of D&FD due to development, it is very important to consider this at the earliest stage of the planning and design process.			
Strategies	Conservation and regulation of water sources and biodiversity hotspots.			
Incentives for participation & changing stakeholder practices	<ul style="list-style-type: none"> Awareness campaigns on importance of moist broadleaved evergreen trees for water conservation. Awareness program on importance of biodiversity for livelihoods (ecotourism, trekking, guides and others). 			
Outputs and activities/tasks	<p>Output 1: High value biodiversity hot-spots conserved</p> <ul style="list-style-type: none"> Identification and documentation of biodiversity rich areas and hot-spots Implementation of the State Biodiversity Action Plan <ul style="list-style-type: none"> Coordination and frequent meeting with State Biodiversity Board Prepare clear monitoring plan Improved planning and regulation of development activities in biodiversity rich areas <p>Output 2: Alternate land bank for development activities created</p> <ul style="list-style-type: none"> Decision from the concerned agencies to create a land bank Land inventories of vacant and abandoned property 			
B. Feasibility Analysis				
Outputs/activities	Risks or obstacles	Risk reduction measures	Risk reduction targets	Indicators
High value biodiversity hot-spots conserved	National government and State government prioritize land use conservation has insufficiently considered biodiversity richness	Identification of biodiversity rich areas and hot spots Public and policy makers made aware on biodiversity conservation needs Conduct impact assessment studies.	One State level meeting held to identify the biodiversity rich areas and hotspots At least 1 awareness program conducted for policy makers on biodiversity conservation At least 1 impact assessment study conducted	Number of state level meeting held to identify the biodiversity rich areas and hotspots Number of awareness program for policy makers on biodiversity conservation. Number of impact assessment studies and their recommendations



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	2	1	1	1

C. Safeguards Analysis

Serious risks	Risk reduction measures	Risk reduction targets	Indicators
Increased human wildlife conflict	Implementation of State Biodiversity Action Plan	One state level meeting per year for better implementation of biodiversity action plan	Number of state level meeting per year for better implementation of biodiversity action plan
Increased risk to women from human wildlife conflict	Ensure safety of women	Awareness raising campaigns to avoid human wildlife conflict	Number of awareness raising campaigns to avoid human wildlife conflict
Loss of development benefits (jobs, communications and others)	Allow developmental projects with strict impact assessment only	Strict implementation of land use plan	Number of activities implemented as guided by land use plan
Benefits	Benefit enhancement measures	Benefit enhancement targets	Indicators
Better forest corridor and biodiversity conservation	Synchronize 1) Land use plan, 2) Climate Change Action Plan, 3) Biodiversity Action Plan 4) development plan	Identification of activities in line with land use plan, climate change action plan, biodiversity action plan and development plan	Number of activities in line with land use plan, climate change action plan, biodiversity action plan and development plan

D. Monitoring Protocol

How does the IP ensure effective provision for monitoring	Regular monitoring by State government, state planning department, state biodiversity board, climate change wing of forest department and local communities Allocation of adequate budget for monitoring	
Implementing partners	State government, State Planning Department, Rural Department and State Biodiversity Board, Climate change wing of Forest Department and Forest Department and Local communities	
Proxy indicators for impact on forest area or condition	Proxy impact indicators	Target
	Area of biodiversity rich areas and hotspots identified & documented	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 conserved after streamlining the development activities	At least 50 sq km of biodiversity rich areas and hotspots conserved after improved planning and regulation of development activities



IP implementation targets	All biodiversity rich areas and hot-spots with areas of at least 2 sq km identified & documented At least 50 sq km of biodiversity rich areas and hotspots conserved after the improved development planning and regulation		
Monitoring Protocol	Proxy indicators	Indicators	Source of data or data collection methods
		Area of biodiversity rich areas and hotspots identified & documented	Field survey, field data sheets, field report and completion report
	Area of biodiversity rich areas and hotspots conserved after improved planning and regulation of development activities	Site observation and final report	
	Intervention indicators	Number of biodiversity rich areas and hotspots identified and documented	Field survey, field data sheets, field report and completion report
Area of biodiversity rich areas and hotspots conserved after improved planning and regulation of development activities		Site observation and final report	
Risk reduction indicators	Number of state level meeting per year for better implementation of biodiversity action plan	Minutes of meeting	
	No of awareness raising campaigns for women that go to the forest to collect forest products	Registration sheet or attendance, completion report	

E. Budget Plan (5 years)

Introduction	Standard government price norms are used Annual increase in costs by 15% to allow for inflation factored in		
Implementation cost including monitoring	Activity	Budget (NPR)	Remarks
	Identification & documentation of biodiversity rich areas and hotspots	50,00,000	
	Implementation of biodiversity action plan	2,00,00,000	
	Identification of alternative land bank for development activities	10,00,000	
Total Budget:		2,60,00,000	



Intervention Package 5: Incentivizing agroforestry and horticulture with appropriate agricultural technologies to discourage tree felling

A. General Information				
IP Name	Incentivizing agroforestry and horticulture with appropriate agricultural technologies to discourage tree felling			
Drivers or barriers addressed	Forest degradation.			
IP description	Local communities are cutting trees for timber and fuelwood in the state for income generation and livelihood. This has been one of the causes of forest degradation. If communities can be incentivized to practice agroforestry and horticulture with the use of appropriate technologies, they could collect or cut more fodder and timber from their own land and it could also help income generation.			
Objectives	To minimize the problem of forest degradation by providing incentives to practice agroforestry and horticulture using appropriate technologies.			
Strategies	Increased area of agroforestry and horticulture practice using appropriate technologies.			
Incentives for participation & changing stakeholder practices	<ul style="list-style-type: none"> Financial and technical assistance to establish agroforestry and horticulture using appropriate technology. Capacity building and awareness program on the importance of agroforestry and horticulture for livelihood and income generation. 			
Outputs and activities/tasks	<p>Output: Loss of trees reduced through improved agroforestry and horticulture practices</p> <ul style="list-style-type: none"> Use of improved agriculture technologies/practices for increased agricultural productivity Introduction of improved and high yielding varieties of horticultural crops Introduction of multi-purpose trees for agroforestry practices Promote modern livestock and agriculture as an enterprise Capacity development for additional income generation and diversification of livelihood option 			
B. Feasibility Analysis				
Outputs/ activities	Risks or obstacles	Risk reduction measures	Risk reduction targets	Indicators
Loss of trees reduced through improved agroforestry and horticulture production	Unwillingness of local communities to adopt agroforestry and horticulture practices	Provision of incentives to the local communities to adopt agroforestry and horticulture. Develop appropriate models	At least 10% of the local communities received incentives to adopt agroforestry and horticulture practice. At least 1 appropriate model of agroforestry and horticulture developed	% of local communities receiving incentives to adopt agroforestry and horticulture practices. Number of appropriate models of agroforestry and horticulture developed
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
3	2	2	1	3



C. Safeguards Analysis			
Serious risks	Risk reduction measures	Risk reduction targets	Indicators
Poor/marginalized farmer might not access incentives	Easy access to soft loans	Over 50% of affected/marginalized households received soft loans	Percent of poor/marginalized households receiving soft loans
Locally adopted species replaced with exotic species	Promote high yielding native species	At least 50% of high yielding native species used for agroforestry and horticulture	Percent of high yielding native specie sused for agroforestry and horticulture
Benefits	Benefit enhancement measures	Benefit enhancement targets	Indicators
Communities receive incentives for better livelihood options and food security	Ensure the participation of low income households and women	PRA process followed resulting in consent of low income and women	Proportion of low income and women
More trees on farm	Improved soil productivity and soil conservation	Not applicable	
More trees on farm	Extraction of forest products reduced Reduced fuelwood/ fodder collection time of women	At least 20% reduction on collection of forest products 50% reduction in women’s fuelwood/ fodder collection time	Percent reduced collection of forest products Percent time saved due to fuelwood/ fodder collection from own field (agroforestry)
D. Monitoring Protocol			
How does the IP ensure effective provision for monitoring	Regular monitoring by State government, agriculture& livestock department, horticulture department, and forest department Allocation of adequate budget for monitoring		
Implementing partners	State government, agriculture & livestock department, horticulture department, forest department, soil and water conservation department and local communities		
Proxy indicators for impact on forest area or condition	Proxy impact indicators	Target	
	Number of households adopting agroforestry and horticulture using appropriate technologies	1000 households adopted agroforestry and horticulture using appropriate technologies	
IP implementation targets	Identification of available technologies for better yield of agricultural products Introduction of 3 models of agroforestry and horticulture One enterprise in each hotspot adopted improved agroforestry and horticulture technologies 2 capacity building trainings in each hotspot for income generation		
Monitoring Protocol	Indicators	Source of data or data collection methods	
	Proxy indicators	Number of households adopting agroforestry and horticulture using appropriate technologies	Household survey, field observation and completion report



Intervention indicators	<p>Number of available technologies for better yield of agriculture products</p> <p>Area of pasture managed for sustainable livestock grazing.</p> <p>Number of studies in each hotspots to identify the carrying capacity of pasture</p> <p>Number of agriculture cooperatives in each hotspot handling livestock and agricultural products</p> <p>Number of capacity building training in each hotspots for income generation</p>	<p>Field survey, observation and field report</p> <p>Field observation and report</p> <p>Field observation and study report</p> <p>Field observation and completion report</p> <p>Registration/attendance sheet and training completion report</p>
Risk reduction indicators	<p>Percent of poor/marginalized households receiving soft loans</p> <p>Percent of native species used for agroforestry and horticulture</p>	<p>Focus group discussions, key informant discussions, household survey and loan receipts</p> <p>Field observation, key informant discussion and field report</p>

E. Budget Plan (5 years)

Introduction	Standard government price norms are used Annual increase in costs by 15% to allow for inflation factored in		
Implementation cost including monitoring	Activity	Budget (NPR)	Remarks
	Identification of available technology for agricultural productivity	10,00,000	
	Introduction of improved agroforestry tree spp.	1,00,00,000	
	Establishment of agroforestry and horticulture enterprises	20,00,000	
	Capacity building and training program for income generation	50,00,000	
	Establishment of agroforestry and horticulture models	3,00,00,000	
Total Budget:		4,80,00,000	



Intervention Package 6: Sustainable management of forest products such as timber, fuel wood, fodder, NTFPs and grazing

A. General Information				
IP Name	Sustainable management of forest products such as timber, fuel wood, fodder, NTFPs and grazing			
Drivers or barriers addressed	Deforestation and forest degradation			
IP description	Local communities especially in remote areas are dependent on forest products and used to collect forest products regularly to fulfill their daily needs. But production levels will fall with unsustainable management practices. Sustainable management and off take levels would result in social, economic and environmental benefits.			
Objectives	Reduce unsustainable extraction of timber and fuelwood by increasing the supply of timber and fuelwood from sustainable forest management.			
Strategies	Sustainable long-term production of timber, fuelwood, fodder, NTFPs and grass.			
Incentives for participation & changing stakeholder practices	Alternative sources of energy and improved cook stoves to reduce fuelwood consumption by local communities. Improved availability of fuelwood and fodder. Increased income generation from medicinal and aromatic plants.			
Outputs and activities/tasks	Output: Sustainable and planned supply of forest products to local communities <ul style="list-style-type: none"> • Promote alternative and renewable energy technologies for forest dependent local communities • Promote high density plantation of small timber, fuel wood and fodder • Promote cultivation of medicinal & aromatic plants as income generation activities • Introduce high yielding fodder varieties in farmlands • Provide access to credit finance to farmers • Value addition and marketing of agriculture residue • Designate grazing areas and their management improved • Improve management of grazing areas 			
B. Feasibility Analysis				
Outputs/activities	Risks or obstacles	Risk reduction measures	Risk reduction targets	Indicators
Sustainable and planned supply of forest products to local communities	Lack of motivation and incentive for farmers to keep trees on farm.	Simplified procedures for harvesting and marketing of trees on farm	Process for harvesting forest products simplified Market access for forest products developed	Number of species for which harvesting process simplified Number of markets developed for forest products
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
3	2	2	1	3
C. Safeguards Analysis				
Serious risks	Risk reduction measures	Risk reduction targets	Indicators	



Low availability of home consumed products	Reserve a certain area for traditional cropping	At least 10% of farmland set aside for tradition cropping	Area of farmland set aside for traditional cropping
Genetic loss of crops		At least 5% area set aside for improved crops	Area of farmland set aside for improved crops
Benefits	Benefit enhancement measures	Benefit enhancement targets	Indicators
Sustainable supply of forest products, reduced drudgery of women	Local community trained on sustainable harvesting of forest products	All needy communities trained on sustainable harvesting of forest products	Number of communities trained on sustainable harvesting of forest products
Strengthen sustainable harvesting	Awareness and capacity building for local communities.	At least 3 awareness and capacity building campaigns per year for local communities	Number of awareness and capacity building campaigns per year for local communities.
Employment facility (nursery)	Green Skill Development (GSD) program	500 youths trained on GSD including women	Number of youth and women trained on GSD

D. Monitoring Protocol

How does the IP ensure effective provision for monitoring	Regular monitoring by State Government, Department of Renewable Energy (Uttarakhand Renewable Energy Development Agency) and Forest Department Allocation of adequate budget for monitoring		
Implementing partners	State government, Department of Renewable Energy (Uttarakhand Renewable Energy Development Agency), Forest Department and local communities		
Proxy indicators for impact on forest area or condition	Proxy impact indicators	Target	
	Number of alternative & renewable energy technologies for forest dependent communities	At least 2 alternative/renewable energy technologies for forest dependent communities	
	Number and area of fast growing fodder and fuelwood trees, medicinal and aromatic plants promoted	At least 5 species of fast growing fodder and fuelwood trees, medicinal and aromatic plants covering area of 100 ha promoted	
	Number of training programs for value addition of agricultural and NTFPs residue.	2 training program conducted for community people on value addition of agricultural and NTFPs residue.	
	Area of designated grazing lands in each hotspots	At least 10ha of designated grazing lands in each hotspots	
IP implementation targets	At least 5 species of fast growing fodder and fuelwood trees, medicinal and aromatic plants covering area of 100ha promoted At least 10ha of designated grazing lands in each hotspots At least 60% of poor and needy farmers accessed to credit finance At least 2 alternative /renewable energy technologies for forest dependent communities 2 awareness and training programs per year to community people for the management of grazing areas		



Monitoring Protocol	Indicators	Source of data or data collection methods
Proxy indicators	Number of alternative and renewable energy technologies for forest dependent communities	Household survey, survey report and completion report
	Number and area of fast growing fodder and fuelwood trees, medicinal and aromatic plants promoted	Field observation and completion report
	Number of training programs for value addition of agricultural residues.	Registration sheet/attendance sheet and training completion report
	Area of designated grazing lands in each hotspots	Field observation and completion report
Intervention indicators	Number of fast growing fodder and fuelwood trees, medicinal and aromatic plants promoted	Field survey and field report
	Area of designated grazing lands in each hotspots	Field survey and measurement, completion report
	Percent of poor and needy farmers accessed to credit finance	Household survey, bank receipt/vouchers, credit finance report from bank
	Number of awareness and training program per year to community people for the management of grazing areas	Registration sheet/Attendance sheet and training/awareness completion report
Risk reduction indicators	Number of women & households covered in needs assessment survey	Field survey, household survey, data sheets and completion report

E. Budget Plan (5 years)

Introduction	Standard government price norms are used Annual increase in costs by 15% to allow for inflation factored in		
Implementation cost including monitoring	Activity	Budget (INR)	Remarks
	Promotion of alternative and renewable energy technologies for forest dependent communities	5,00,00,000	
	Promotion of high density plantation of small timber, fuel wood and fodder	20,25,00,000	1000 ha
	Promotion of cultivation of medicinal and aromatic plants as income generation activities	6,00,00,000	300 ha
	Designation and management of grazing areas	50,00,000	
	Value addition of agricultural residues	25,00,000	
Total Budget:	32,00,00,000		



Intervention Package 7 : Prevention of forest fire with provision of rewards

A. General Information				
IP Name	Prevention of forest fire with provision of rewards			
Drivers or barriers addressed	Forest degradation.			
IP description	Frequent forest fire is very challenging for maintaining better forest health sustained supply of ecosystem services and goods. Almost all the fire incidence in the state are anthropogenic. For the conservation of forest it is crucial to control all the anthropogenic fires.			
Objectives	<p>To reduce frequent forest fire incidence through community participation.</p> <p>To build capacity and provide income generation opportunities to the communities in management of forest fire.</p> <p>To strengthen capacity of the SFDs, Van Panchayats and community members in forest fire control and management.</p>			
Strategies	Frequency and area of forest fire reduced			
Incentives for participation & changing stakeholder practices	<ul style="list-style-type: none"> • Providing and creating job opportunities for local communities by strengthening their capacity and involving them in fire management activities. • By preventing and controlling damages controlled caused by forest fire through effective coordination between local authorities and communities and awareness generation. • Provision of incentives/rewards to community for zero forest fire. 			
Outputs and activities/tasks	<p>Output: Forest fire related damage is minimized through community participation and incentive mechanism</p> <ul style="list-style-type: none"> • Awareness campaign • Develop forest fire communication strategy • Identification and mapping of forest fire vulnerable areas • Zero forest fire reward to Van Panchayat(s) and community member(s) • Life insurance cover for local fire fighters • Training of man power and distribution of modern forest fire fighting tools • Fire control measures such as construction of trenches & ponds, creation & maintenance of fire lines, control burning, etc. adopted • Training and mobilization of local youths and eco clubs • Sustainable use of biomass such as invasive species and pine needles 			
B. Feasibility Analysis				
Outputs/activities	Risks or obstacles	Risk reduction measures	Risk reduction targets	Indicators
Forest fire related damage is minimized through community participation and incentive mechanism.	<p>Low awareness and low interest of local community members and forest officials; anthropogenic fire for getting palatable grass from forest/ grassland and for clearing agriculture fields.</p> <p>Low knowledge on modern firefighting tools</p>	<p>Awareness campaigns and provision of rewards zero forest fire</p> <p>Capacity building in firefighting tools</p>	<p>At least 2 awareness campaigns per year in forest fire prone areas</p> <p>Communities /forest officials received reward for the conservation of forest and zero forest fire.</p> <p>At least 1 capacity building training on firefighting tools.</p>	<p>Number of awareness campaigns per year in forest fire prone areas</p> <p>Number of communities/ forest officials receiving reward for conservation of forest and zero forest fire.</p> <p>Number of capacity building trainings on firefighting tools</p>
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
Reward system may not be transparent	Public hearing and awareness for reward process	PRA process followed	Documentation or result of PRA process
Small forest fire are not reported	Awareness in voluntarily reporting to forest fire control rooms amongst communities	At least 50% of such small forest fires are reported	Number of forest fire reported
Benefits	Benefit enhancement measures	Benefit enhancement targets	Indicators
Reduced risk of fire hazard	Increase local community participation with provision of better rewards	Increased participation of local communities for controlling/minimizing frequent forest fire	Number of local communities increased for controlling/ minimizing frequent forest fire
Biodiversity conservation		At least 1 <i>Van Panchayat</i> /JFM received reward	Number of <i>Van Panchayat</i> /JFM received rewards
Forest fire mitigated	Community awareness, mobilization and trainings in the fire prone areas	At least 2 community awareness, mobilization and trainings per year in fire prone areas	Number of community awareness, mobilization and trainings per year in fire prone areas

D. Monitoring Protocol

How does the IP ensure effective provision for monitoring	Regular monitoring by State government, Forest Department, <i>Panchayat Raj</i> Institutions (PRI) and local communities. Allocation of adequate budget for monitoring	
Implementing partners	State government, forest department, PRI and local communities.	
Proxy indicators for impact on forest area or condition	Proxy impact indicators	Target
	Quality of forest after forest fire management (Note: Forest quality would be measured based on the density of trees, canopy cover, species diversity, regeneration and density of wild animals)	Quality of at least 35% of total forest area increased
IP implementation targets	<ul style="list-style-type: none"> • 10 awareness programs per year • At least 1 communication strategy for forest fire developed • Identification of forest fire vulnerable areas • At least 1 <i>Van Panchayat</i>/JFM rewarded for zero forest fire • Life insurance (group insurance) for all forest fire fighters (communities and forest staffs) • 2 training program on forest fire fighting techniques and handling the modern forest firefighting tools • Construction of fire controlling measures like trenches • Upgrading the fire control and communication rooms • At least 2 training program per year for local youths/eco clubs • 2 training program for sustainable use of biomass 	



Monitoring Protocol	Indicators	Source of data or data collection methods
Proxy indicators	Quality of forest after forest fire management	Remote sensing, field observation and completion report
Intervention indicators	Number of awareness and training programs	Registration /attendance, completion report
	Number of communication strategy developed	Field survey and final communication strategy
	Number of community <i>Van Panchayat</i> / JFM rewarded for zero forest fire	Field observation and reward receipts
	Area of forest fire vulnerable areas	Field survey, GIS/RS, PRA and completion report/maps Field observation and insurance documents
	Number of communities provided with insurance	Site visit, procurement database, invoices
	Number of equipment's upgraded in forest fire control rooms	Field observation and completion report
Risk reduction indicators	Area of fire controlling measures constructed	
	Documentation or result of PRA process	Field observation and completion report

E. Budget Plan (5 years)

Introduction	Standard government price norms are used Annual increase in costs by 15% to allow for inflation factored in		
Implementation cost including monitoring	Activity	Budget (INR)	Remarks
	Development of communication strategy, forest fire awareness campaign	1,25,00,000	
	Mapping of forest fire prone areas	65,00,000	
	Rewards for zero forest fire and insurance provision for fire fighters	6,25,00,000	50000000 (Rewards) 12500000 (Insurance)
	Construction of fire controlling measures such as trenches, ponds, creation of fire lines and control burning	12,50,00,000	
	Training, awareness campaigns, mobilization and distribution of modern fire fighting tools	3,75,00,000	
	Making use of biomass such as invasive species and pine needles	5,00,00,000	
	Implementation of site specific soil and water conservation measures	1,25,00,000	
Total Budget:	30,65,00,000		



Intervention Package 8: Simplified approaches to promoting enhancement activities

A. General Information				
IP Name	Simplified approaches go promoting enhancement activities			
Drivers or barriers addressed	Barriers to enhancement of forest cover.			
IP description	Increased population is demanding more forest products due to which the remaining forest is under pressure. In addition, due to government-imposed complex forest products trading procedures, people are discouraged from agroforestry, horticulture and keeping trees outside forest (TOF). If the trading rules were simplified with market linkages, people would establish agroforestry, horticulture and TOF and ultimately obtain economic and environmental benefits.			
Objectives	To increase the forest cover area by promoting agroforestry, TOF and enrichment plantations, and simplification of trade rules over marketing/ trading of forest products.			
Strategies	Forest quality improved through TOF (urban, roadside, farmland); agroforestry (farmland) and enrichment plantation (within degraded forest), enhancement of forest carbon stocks.			
Incentives for participation & changing stakeholder practices	<ul style="list-style-type: none"> • Better access to fodder, timber and fuelwood from agroforestry and TOF. • Financial and technical assistance to establish agroforestry and horticulture. • Capacity building and awareness program on the importance of agroforestry and horticulture for livelihood and income generation. 			
Outputs and activities/tasks	<p>Output: Increased area under ToF and agroforestry through enrichment plantation within degraded forest areas</p> <ul style="list-style-type: none"> • Identify degraded forest areas for afforestation, reforestation and enrichment plantation • Developing improved quality planting materials • Training • Promoting urban forestry and roadside forestry • Incentivize farmers for agroforestry expansion on farm lands • Access to financial resources for promotion of TOF, agroforestry and enrichment plantation • Simplification of harvesting & transit rules for TOF • Value addition of NTFPs and timber • Development of minimum support price & marketing linkages with wood based and other allied industries • Development of monitoring & evaluation systems for enhancement activities 			
B. Feasibility Analysis				
Outputs/ activities	Risks or obstacles	Risk reduction measures	Risk reduction targets	Indicators
Increased area under TOF, agroforestry and through enrichment plantation within degraded forest areas	Enhancement of forest less of a priority by government and concerned agencies Constraints and gaps in adopting technologies	Identify enhancement activities on government forest, protected forest and private forest including agroforestry Study and identification of gaps and constraints.	At least 5 enhancement activities identified on government forest, protected forest and private forest including agroforestry One study for identification of constraints' and gaps in different agro-climatic conditions	Number of enhancement activities on government forest, protected forest and private forest including agroforestry Number of studies for identification of constraints' and gaps in different agro-climatic conditions
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
2	3	3	3	3

C. Safeguards Analysis

Serious risks	Risk reduction measures	Risk reduction targets	Indicators
Poor/marginalized households might not get access to practice TOF and agroforestry	Maintain special focus on poor/marginalized households by providing some incentive measures	Poor/marginalized households received soft loans and training programs	% of poor/marginalized households receiving soft loans and training programs
Benefits	Benefit enhancement measures	Benefit enhancement targets	Indicators
Increased incentives and income generation	Ensure poor & marginalized households access to incentives	Poor & marginalized households accessed to incentives	Number of poor & marginalized households having access to incentives
	Priority selection of poor and marginalized households in training programs	At least 30% of trainee from poor & marginalized households for training programs	Number of poor & marginalized households in training programs
More trees grown and reduced pressure on forest	Identify areas for enhancement activities	Prioritize areas for enhancement activities in each hotspots	Number of prioritize areas for enhancement activities

D. Monitoring Protocol

How does the IP ensure effective provision for monitoring	Regular monitoring by State Government, Agriculture and Horticulture Department, Forest Department and local communities. Allocation of adequate budget for monitoring		
Implementing partners	State Government, Agriculture and Horticulture Department, housing and urban affairs, Forest Department, authority of land, National Highway (central govt.) public work department, country planning and local communities		
Proxy indicators for impact on forest area or condition	Proxy impact indicators	Target	
	Area of increased TOF, agroforestry. Increased area of degraded forest enriched and increased TOF (agroforestry, horticulture, roadside plantation and others)	At least 100 sq. km area of TOF, agroforestry and horticulture increased (in next 5 years). At least 50 sq km area of degraded forest enriched. At least 50 sq km area of TOF increased	
IP implementation targets	At least 50 sq km area of degraded land enriched 10 modernized nursery developed for quality planting material 2 training programs on nursery development and management per year Identification of degraded forest areas for afforestation, reforestation and enrichment plantation 5 sq.km urban forestry and roadside forestry developed 500 households incentivized for agroforestry expansion on farm lands One coordination meeting per year with government for simplification of harvesting and transit rules of TOF 2 training programs per year on value addition from forest products		



Monitoring Protocol	Indicators	Source of data or data collection methods
Proxy indicators	Area of increased TOF, agroforestry and horticulture	Field observation and survey, completion report
Intervention indicators	Area of degraded land enriched.	Field observation and completion report
	Number of modern nurseries developed for quality planting material	Field observation and completion report
	Number of trainings conducted on nursery development and management	Registration sheet/attendance and training completion report
	Area of identified sites for afforestation, reforestation and enrichment plantation	Field observation, survey and completion report
	Area of urban forestry and roadside forestry developed	Household survey, receipt and completion report
	Number of households incentivized for horticulture and agroforestry expansion on farm lands	Meeting minutes
	Number of coordination meetings per year with government for simplification of harvesting and transit procedures of TOF	Registration sheet/attendance and training report
Risk reduction indicators	Number of training programs per year on value addition from forest products	
Risk reduction indicators	% of poor/marginalized households receiving soft loans and training programs	Household survey, receipt and completion report

E. Budget Plan (5 years)

Introduction	Standard government price norms are used Annual increase in costs by 15% to allow for inflation factored in		
Implementation cost including monitoring	Activity	Budget (INR)	Remarks
	Identification of barren/degraded areas for afforestation, reforestation and enrichment plantation	20,25,00,000	1000 ha
	Development of advance nurseries and quality planting materials	2,50,00,000	
	Promotion of urban forestry and roadside forestry	5,00,00,000	
	Development of minimum support price and market linkages Training on value addition of timber and other forest products	1,25,00,000	
Total Budget:	29,00,00,000		



Multi stakeholder Consultation Workshop for formulation of Uttarakhand State REDD+ Action Plan









Expert Consultation Meeting for formulation of Uttarakhand State REDD+ Action Plan



