



Project Identification Form (PIF) entry – Full Sized Project – GEF - 7

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## Sustainable Management and Restoration of Degraded Landscapes for Achieving Land Degradation Neutrality (LDN) in India

### Part I: Project Information

**GEF ID**

10876

**Project Type**

FSP

**Type of Trust Fund**

GET

**CBIT/NGI**

CBIT No

NGI No

**Project Title**

Sustainable Management and Restoration of Degraded Landscapes for Achieving Land Degradation Neutrality (LDN) in India

**Countries**

India

**Agency(ies)**

UNDP

**Other Executing Partner(s)**

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

**Executing Partner Type**

Government

**GEF Focal Area**

Land Degradation

**Taxonomy**

United Nations Framework Convention on Climate Change, Climate Change, Focal Areas, Influencing models, Stakeholders, Gender Equality, Capacity, Knowledge and Research, Land Degradation, Sustainable Land Management, Sustainable Pasture Management, Restoration and Rehabilitation of Degraded Lands, Sustainable Livelihoods, Community-Based Natural Resource Management, Income Generating Activities, Ecosystem Approach, Sustainable Agriculture, Improved Soil and Water Management Techniques, Land Degradation Neutrality, Land Productivity, Land Cover and Land cover change, Carbon stocks above or below ground, Sustainable Development Goals, Climate Change Mitigation, Agriculture, Forestry, and Other Land Use, Nationally Determined Contribution, Climate Change Adaptation, Climate resilience, Ecosystem-based Adaptation, Convene multi-stakeholder alliances, Deploy innovative financial instruments, Transform policy and regulatory environments, Strengthen institutional capacity and decision-making, Demonstrate innovative approaches, Beneficiaries, Private Sector, SMEs, Financial intermediaries and market facilitators, Individuals/Entrepreneurs, Civil Society, Academia, Community Based Organization, Non-Governmental Organization, Type of Engagement, Participation, Partnership, Information Dissemination, Consultation, Indigenous Peoples, Local Communities, Communications, Public Campaigns, Behavior change, Awareness Raising, Education, Gender Mainstreaming, Women groups, Gender-sensitive indicators, Sex-disaggregated indicators, Gender results areas, Access and control over natural resources, Participation and leadership, Capacity Development, Knowledge Generation and Exchange, Access to benefits and services, Enabling Activities, Knowledge Generation, Learning, Theory of change, Indicators to measure change, Adaptive management, Innovation, Knowledge Exchange

**Rio Markers****Climate Change Mitigation**

Climate Change Mitigation 1

**Climate Change Adaptation**

Climate Change Adaptation 1

**Duration**

60 In Months

**Agency Fee(\$)**

627,000.00

**Submission Date**

9/15/2021

## A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
LD-1-1	GET	3,600,000.00	25,200,000.00
LD-2-5	GET	3,000,000.00	21,000,000.00
	<b>Total Project Cost (\$)</b>	<b>6,600,000.00</b>	<b>46,200,000.00</b>

## B. Indicative Project description summary

### Project Objective

To achieve land degradation neutrality (LDN) through sustainable ecosystem-based management and restoration of degraded landscapes across agricultural, forest, pastoral lands and surface water bodies.

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
1. Enabling institutional, strategic frameworks and policies for integrated sustainable land management (SLM) practices and restoration of degraded production landscapes	Technical Assistance	<p>1. Enhanced national, state and district-level enabling frameworks incentivizing SLM practices and supporting participatory multi-sector platforms to avoid, reduce and reverse land degradation, biodiversity loss and climate mitigation as indicated by:</p> <p><i>(i) institutional arrangements in place at national, state and district level to promote up-scaling of SLM practices through evidence-based and locally relevant information on land degradation and restoration status.</i></p> <p><i>(ii) At least 5 government development schemes mainstreaming complementary SLM and restoration of degraded landscape activities in the six pilot districts</i></p>	<p>1.1. National and State -level development and land use planning processes assessed for gaps, opportunities, convergence and cooperative implementation to reduce land degradation, biodiversity loss and negative impacts of climate change identified and barriers to LDN removed.</p> <p>1.2. Complementary mainstreaming actions developed to enhance LDN, NDC and biodiversity outcomes in existing government schemes in production landscapes where agricultural, forestry and rangeland management practices underpin the livelihoods of poor rural farmers and pastoralists.</p>	GET	1,000,000.00	7,000,000.00

*(iii) At least 3 state-level and 6 district-level multi-stakeholders participatory platforms, involving local governments, communities and indigenous peoples, established and LDN strategy 2030 negotiated and adopted by these platforms;*

*(iv) Awareness and capacity building programmes designed and at least 35 trainers training programs (10 in each state and 5 national and global) on SLM practices (watershed management, climate resilient agriculture, value addition, agro horticulture models) conducted*

*(v) Capacity building programs for internalizing LDN designed and implemented in 3 states for indigenous and local communities (at least 50% women participation).*

*Note: Proposed targets and indicators to be confirmed/ revised during PPG*

1.3. Participatory platform, involving public-private agencies, communities and indigenous peoples, established at State and district level and strategies and action plans at vertical and horizontal co-ordination mechanisms established and strengthened for integrating LDN in land use planning frameworks.

1.4. Institutional capacity of related academic /research institutes/organizations/ authorities; non-governmental organizations; extension agencies for carrying out transformative projects resulting in land restoration, climate change mitigation and biodiversity conservation strengthened.

1.5. Programs to enable participation of indigenous peoples and local communities, especially women, aimed at internalizing LDN implemented in relevant state in partnership with local agencies with State and District administration.

2. Implementing and up-scaling landscape-	Investme nt	2. Integrated participatory landscape design and financing models established in support of	2.1. Drivers of land degradation (land cover, land cover change and land productivity trends) identified and participatory	GET	3,785,714.00	26,600,000.00
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wide integrated sustainable ecosystem management practices to avoid, reduce and reverse degraded production landscapes

avoidance, reduction and reversal of land degradation, desertification, biodiversity loss and negative impacts of climate change to generate multiple sustained environmental and economic benefits as indicated by:

*(i) Improved land and forest management covering 317,000 ha<sup>[1]</sup> including: (a) adverse changes in the quality of non-degraded land and forest avoided on 209,000 ha through improved practices and technologies and (b) land currently undergoing degradation or degraded restored on 108,000 ha) benefitting 178,000 people with GEF and co-financing support*

*(ii) Diversified farm and forest landscapes through increase in species richness, both at inter- and intra-species level, conserving indigenous biodiversity of global significance;*

district and village land use plans and evidence-based innovative practices and technologies developed.

2.2 Protection and mitigation applied for drought management, food security, water scarcity management, invasive species, wind erosion, through plantation of native and water efficient tree and grassland species, agroforestry and agrohorticulture models, integrated soil nutrient management, drought mitigation measures for restoration of high conservation value degraded forest, pasture and agricultural lands, including rejuvenating surface water bodies.

2.3. Improved alternative sustainable land management practices and technologies under implementation across three states, benefiting farmers and forest dependant community members across diverse landscapes and villages.

2.4 Green, resilient and inclusive recovery strategies developed and implemented facilitating the establishment of Small and medium-sized enterprises (SMEs)

*(iii) Climate smart agricultural practices adopted leading to increase in soil fertility, water table rejuvenation and restoration of vegetation cover across degraded productive landscapes;*

*(iv) At least 6 (2 in each state) SLM resource management centers established in partnership with ICAR-KVKs (Krishi Vigyan Kendra) to demonstrate land restoration practices covering 50 villages*

*(v) 75 Self-help groups (SHGs) established with 50% women participation.*

*(vi) Diversified and green livelihood across all landscapes by engaging in various government schemes; and new and innovative financing mechanism established through SMEs, PPPs, small grants and ABS agreements, directly benefitting 2,000 community members,*

focused on agriculture, animal husbandry and forest products at village and district level.

2.5 New and innovative financing mechanism identified and LDN funding opportunities strengthened through engagement of corporates/industries, using best practices, cutting-edge technologies and innovative business models.

*especially women and youth, leading to 15% income enhancement*

Note: Proposed targets and indicators to be confirmed/revised during PPG

[1] The adverse changes in the quality of non-degraded land avoided on 209,000 ha through improved practices (includes 114,000 ha of agricultural land, 50,000 ha of grasslands and 45,000 ha of forest lands) and 108,000 ha degraded lands restored (includes 76,000 ha of degraded agricultural land and 32,000 ha of degraded grasslands)

3. Monitoring system for SLM and LDN indicators; gender-mainstreaming, knowledge management, evaluation and project reporting, national outreach; and	Technical Assistance	3. Improved monitoring system, gender mainstreaming and capacity for LDN monitoring, assessment and reporting to UNCCD, and support government institutions and other agencies to better document, analyse and disseminate effective intervention strategies for restoring productive landscapes and replication	3.1. Information systems to document realtime data on impacts, trade-offs, costs-benefit analysis of restoration, and identifying incremental synergies through dashboard and web portal developed and insituationalized.  3.2 knowledge sharing platforms established, and decision support and management capacities of	GET	1,500,000.00	10,500,000.00
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South-South  
cooperation

of best practices at  
national and state level as  
indicated by:

local champions in the principles  
of agroecological intensification  
enhanced.

*(i) Improvement in  
knowledge management  
through effective  
monitoring of data  
gathered through the  
establishment of a real  
time dashboard detailing  
targeted interventions on  
water, soil and land  
restored using localized  
data, as well as mapping  
and assessment of existing  
government schemes on  
land degradation, and  
financial gap assessment  
data.*

*(ii) Mainstreaming and  
strengthening  
institutionalization of SLM  
capacities within the Krishi  
Vigyan Kendra and  
Biodiversity Resource  
Centres and outreach  
support for achieving LDN,  
NDCs and Biodiversity  
Targets at global and  
national level.*

*(iii) District-level  
communication strategy  
operational in 6 districts for*

3.3. District-level communication  
strategies and knowledge  
management platform designed  
and implemented, comprising  
methods, tools and approaches,  
operational for disseminating  
success stories/news /results in  
local languages.

3.4. South-South cooperation  
promoted through establishment  
of "*Centre of excellence on  
Sustainable Land Management*"  
under the overall guidance and  
support from MoEFCC for  
international capacity building  
programmes

developed and implemented in  
coordination with international  
alliances to address UNCCD  
global agenda.

3.5. M&E system, incorporating  
gender mainstreaming  
implemented for adaptive project  
management.

*disseminating success stories/news /results in*

*local languages leading to enhanced knowledge (25%) of participating grassroots stakeholders as measured by KAP surveys.*

*(iv) Centre of Excellence for South-South Cooperation operational.*

*(v) Dissemination of at least 10 project best practices via community of practice, SLM and biodiversity knowledge platforms and grassroots outreach, including best practices on gender empowerment and women's leadership in SLM.*

*(vi) Replication uptake of project best practices initiated in at least 5 additional districts, including both across and outside of the target states.*

*Note: Proposed targets and indicators to be confirmed/revised during PPG*

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	<b>Sub Total (\$)</b>	<b>6,285,714.00</b>	<b>44,100,000.00</b>
<b>Project Management Cost (PMC)</b>			
	GET	314,286.00	2,100,000.00
	<b>Sub Total(\$)</b>	<b>314,286.00</b>	<b>2,100,000.00</b>
	<b>Total Project Cost(\$)</b>	<b>6,600,000.00</b>	<b>46,200,000.00</b>

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**C. Indicative sources of Co-financing for the Project by name and by type**

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Recipient Country Government	Ministry of Environment, Forest and Climate Change	Public Investment	Investment mobilized	20,200,000.00
Recipient Country Government	Ministry of Environment, Forest and Climate Change	In-kind	Recurrent expenditures	1,900,000.00
Recipient Country Government	Ministry of Jal Shakti	Public Investment	Investment mobilized	10,000,000.00
Recipient Country Government	Ministry of Jal Shakti	In-kind	Recurrent expenditures	2,000,000.00
Recipient Country Government	Ministry of Agriculture and Farmers Welfare	Public Investment	Investment mobilized	1,000,000.00
Recipient Country Government	Ministry of Agriculture and Farmers Welfare	In-kind	Recurrent expenditures	100,000.00
Recipient Country Government	State Governments	Public Investment	Investment mobilized	9,000,000.00
Private Sector	NABARD, Rural Banks and other NBFCs	In-kind	Recurrent expenditures	1,500,000.00
Private Sector	UPL, Jain Irrigation and other corporates	Grant	Investment mobilized	300,000.00
GEF Agency	UNDP	In-kind	Recurrent expenditures	200,000.00
			<b>Total Project Cost(\$)</b>	<b>46,200,000.00</b>

**Describe how any "Investment Mobilized" was identified**

Expected investments to be made by government are indicated as follows: • Ministry of Environment, Forest and Climate Change will be making investments under the following programs: (i) Green India Mission that supports the protection, restoration and enhancement of India's forest cover; (ii) Compensatory Afforestation that will support ANR, forest protection and management; and (iii) National Afforestation and Eco-Development Board (NAEB) that will support afforestation, ecological restoration and community management of forests. Recurrent/in-kind expenditure in the form of staff time. • Ministry of Jal Shakti and Ministry of Rural Development will be making investments under (i) "Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)" irrigation program, watershed management and agricultural land development; Ministry of Rural Development will be making investments under (ii) "Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)" program that supports soil and water conservation, afforestation and agricultural land development. Recurrent/in-kind expenditure in the form of staff time. • Ministry of Agriculture and Farmers Welfare will be making investments under the following programs: (i) Sub-mission

on Agroforestry under the National Mission for Sustainable Agriculture that will support tree planting on farmlands; (ii) Soil Health Card that will address soil health and fertility improvements; (iii) Remunerative Approach for Agriculture and Allied Sector Rejuvenation (RAFTAAR) that will made investments in agriculture; (iv) National Food Security Mission. Recurrent/in-kind expenditure in the form of staff time. • State Governments: Support through a number of national and state schemes at the local level, including the following: o Rural Development support programs such as (i) Rural Livelihood mission creating institutional platforms of the rural poor to enable sustainable livelihood enhancement and improved access to financial services; (ii) integrated watershed management programs that focuses on raifed and degraded area development; (iii) Dairy Entrepreneurship Development Scheme; (iii) Entrepreneurship Development and Employment Generation Scheme; (iv) The National Livestock Mission (NLM); (v) Rashtriya Gokul mission for conservation of indigenous livestock breeds; (vi) “Van Dhan Vikas Karyakram of TRIFED” scheme that supports value addition, livelihoods, etc. (vii) State Scheduled Tribes Finance and development scheme for grant-in-aids, (viii) Rashtriya Gram Swaraj Abhiyan scheme to strengthen PRI institutions for achieving SDGs, etc. Recurrent/in-kind expenditure in the form of staff time. • Private sector co-financing at PIF stage includes: NABARD, Rural Banks and other NBFCs will be making investments under “Rural financing and lending to Self-Help Groups” program; UPL and Jain Irrigation will be providing co-financing for demonstrating innovative and improved technologies in water management in agriculture, fighting soil degradation and desertification, afforestation and agroforestry • UNDP in-kind contribution through staff time to support the program.

## D. Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
UNDP	GET	India	Land Degradation	LD STAR Allocation	6,600,000	627,000	7,227,000.00
<b>Total GEF Resources(\$)</b>					<b>6,600,000.00</b>	<b>627,000.00</b>	<b>7,227,000.00</b>

**E. Project Preparation Grant (PPG)**PPG Required **true**

PPG Amount (\$)

200,000

PPG Agency Fee (\$)

19,000

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
UNDP	GET	India	Land Degradation	LD STAR Allocation	200,000	19,000	<b>219,000.00</b>
<b>Total Project Costs(\$)</b>					<b>200,000.00</b>	<b>19,000.00</b>	<b>219,000.00</b>

## Core Indicators

### Indicator 3 Area of land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
108000.00	0.00	0.00	0.00

### Indicator 3.1 Area of degraded agricultural land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
76,000.00			

### Indicator 3.2 Area of Forest and Forest Land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

**Indicator 3.3 Area of natural grass and shrublands restored**

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
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32,000.00			
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**Indicator 3.4 Area of wetlands (incl. estuaries, mangroves) restored**

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
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**Indicator 4 Area of landscapes under improved practices (hectares; excluding protected areas)**

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
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209000.00	0.00	0.00	0.00
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**Indicator 4.1 Area of landscapes under improved management to benefit biodiversity (hectares, qualitative assessment, non-certified)**

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 4.2 Area of landscapes that meets national or international third party certification that incorporates biodiversity considerations (hectares)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Type/Name of Third Party Certification

Indicator 4.3 Area of landscapes under sustainable land management in production systems

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
164,000.00			

## Indicator 4.4 Area of High Conservation Value Forest (HCVF) loss avoided

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
45,000.00			

## Documents (Please upload document(s) that justifies the HCVF)

Title	Submitted

## Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)	6793648	0	0	0
Expected metric tons of CO <sub>2</sub> e (indirect)	0	0	0	0

## Indicator 6.1 Carbon Sequestered or Emissions Avoided in the AFOLU (Agriculture, Forestry and Other Land Use) sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)	6,793,648			

<b>Expected metric tons of CO<sub>2</sub>e (indirect)</b>	
<b>Anticipated start year of accounting</b>	2022
<b>Duration of accounting</b>	20

**Indicator 6.2 Emissions Avoided Outside AFOLU (Agriculture, Forestry and Other Land Use) Sector**

**Total Target Benefit** (At PIF) (At CEO Endorsement) (Achieved at MTR) (Achieved at TE)

<b>Expected metric tons of CO<sub>2</sub>e (direct)</b>
<b>Expected metric tons of CO<sub>2</sub>e (indirect)</b>
<b>Anticipated start year of accounting</b>
<b>Duration of accounting</b>

**Indicator 6.3 Energy Saved (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)**

**Total Target Benefit** Energy (MJ) (At PIF) Energy (MJ) (At CEO Endorsement) Energy (MJ) (Achieved at MTR) Energy (MJ) (Achieved at TE)

<b>Target Energy Saved (MJ)</b>
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Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Technology	Capacity (MW) (Expected at PIF)	Capacity (MW) (Expected at CEO Endorsement)	Capacity (MW) (Achieved at MTR)	Capacity (MW) (Achieved at TE)
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Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	108,000			
Male	72,000			
<b>Total</b>	180000	0	0	0

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

- Core Indicator 3 includes 76,000 ha of degraded agricultural land and 32,000 ha of degraded natural grass and shrublands restored
- Core Indicator 4: This includes 114,000 ha of agricultural lands, 50,000 ha of grasslands and shrub and 45,000 ha of forests under improved practices
- Core Indicator 6: Greenhouse gas mitigation amounting to around 6,793,648 metric tons of CO<sub>2</sub>e over 20 year period from avoided forest loss in 45,000 ha and 114,000 ha of agricultural lands, 50,000 ha of grasslands and shrub under improved practices and 76,000 ha of degraded agricultural land and 32,000 ha of degraded natural grass and shrublands restored
- Core Indicator 11: This includes 178,000 direct beneficiaries from improved agricultural and grassland management and forest loss avoided and 2,000 community members benefiting from green livelihoods (with 60:40 men/women beneficiaries) These estimate will be clarified during the PPG phase as activities are further defined and districts confirmed.

## Part II. Project Justification

### 1a. Project Description

#### *1a. Project Description*

#### **The global environmental and/or adaptation problems, root causes and barriers that need to be addressed (systems description)**

India, seventh largest country in the world with 328.72 mha area is endowed with a wide variety of climate, ecological regions, land and water resources. However, with barely 2.4% of the total land area of the world, the country has to support 16.7% of the total human population. India also has only 0.5% of the world's grazing area but supports 18% of the world's cattle population (Source: National Action Plan to Combat Desertification, MoEF&CC, 2001). About 228 mha (69%) of its geographical area fall within the dryland (arid, semi-arid and dry sub-humid) as per Thornthwaite classification. The Thar Desert lies in the hot arid region of Western Rajasthan and is one of the most densely populated deserts of the world. Agriculture is the major sector of growth of the Indian economy. A large percent of the population is still dependent on agriculture for its sustenance. Of the total cultivated area of 142 m ha, major part of agriculture in the country is rainfed, extending to over 97 mha and constituting nearly 68% of the net cultivated area. About a third of the total feed intake of the ruminants in India is by grazing on common property resources (CPRs). Overgrazing by herds far larger than what the land can sustain, year after year, has progressively rendered them marginal or waste lands, due to erosion of top soil and changing plant association, making them unsuitable for bovines and fit only for sheep and goats.

Currently unsustainable land management practices in India are causing significant environmental problems including, soil erosion, loss of soil fertility and associated crop productivity, flash floods, sedimentation of water courses, deforestation and the associated loss of carbon sequestration capacity, loss of biodiversity assets, which are impacting the living conditions of humans and wildlife. The country with about 32% of its land under degradation and 25% undergoing desertification (MoEF&CC), therefore, has a huge task to ensure sustainable land management as well as food, water and livelihood security by adopting both preventive and curative strategies for moving towards Land Degradation Neutrality (LDN) in a realistic time-frame. To achieve its target of LDN, on-going effort needs to be supported by adequate financial resources, robust scientific base, effective policies, strong institutional mechanism and elaborate monitoring systems, which will have huge implications for overcoming poverty in the affected areas. The World Resources Institute (WRI India) has produced a Restoration Opportunities Atlas, which shows that India has nearly 140 Mha of potential for landscape restoration that can sequester 3 to 4.3 billion tonnes of carbon by 2040 (Chaturvedi et al. 2018). Restoration is an excellent economic and environmental investment in India. Global research indicates for every USD 1 (INR 70), restored landscapes can deliver up to USD 30 (INR 2,100) in economic benefits. In India, WRI estimates that every \$1 million (INR 7 crores) allocated to landscape restoration related activities has generated 414,013 wage-days of employment. WRI India's assessment of landscape restoration opportunity for the Sidhi district of Madhya Pradesh indicates that landscape restoration could generate jobs for 30,000 persons, including women, unemployed youth and landless. Additionally, INR 710 million in wage income from 3.75 million person-days of employment could be generated (Singh et. al. 2019).

Desertification/ land degradation analysis of India (SAC, ISRO, 2016) reveal that 96.4 million ha of the country is affected by land degradation, representing 29.32% of the Total Geographic Area (TGA) of the country, of which 73.42% is contributed by the states of Rajasthan, Maharashtra, Gujarat, Jammu & Kashmir, Ladakh, Karnataka, Jharkhand, Odisha, Madhya Pradesh and Telangana, in that order, affecting livelihood of people living in rural India who mainly dependent on forest and agriculture based farming systems, including tribal communities, women and small holder famers. The most significant processes of desertification/ land

degradation are water erosion (10.98%), vegetation degradation (8.91%) and wind erosion (5.55%; see Figure 1). Using these baseline information, the project will be using three elements of degradation, viz., land use, process of degradation and severity level, mainly caused by vegetation degradation, water erosion, wind erosion, salinity and water logging as shown in Table below. The target landscape proposed to include degraded: agriculture irrigated, agriculture unirrigated, forest/ plantation, grassland/ grazing land, land with scrub, as well as to some extent dune/ sandy area and barren. In selecting target states and their respective districts, care was taken to include all kind of landscapes as described and such sites are replicated at least twice so that results across sites can be replicable. Accordingly, the project will target implementing its activities across three states (Gujarat, Karnataka and Maharashtra) as described below:

State Name	Vegetation Degradation	Water Erosion	Wind Erosion	Salinity	Water Logging
<b>Gujarat</b>	2,319,826	3,859,497	1,177,105	2,645,405	3,375
<b>Karnataka</b>	1,712,386	5,043,041	2,159	86,740	Not available
<b>Maharashtra</b>	4,884,005	8,060,753	Not available	29,089	Not available
<b>Country Total</b>	<b>29,298,553</b>	<b>36,099,042</b>	<b>18,233,594</b>	<b>3,674,759</b>	<b>653,908</b>

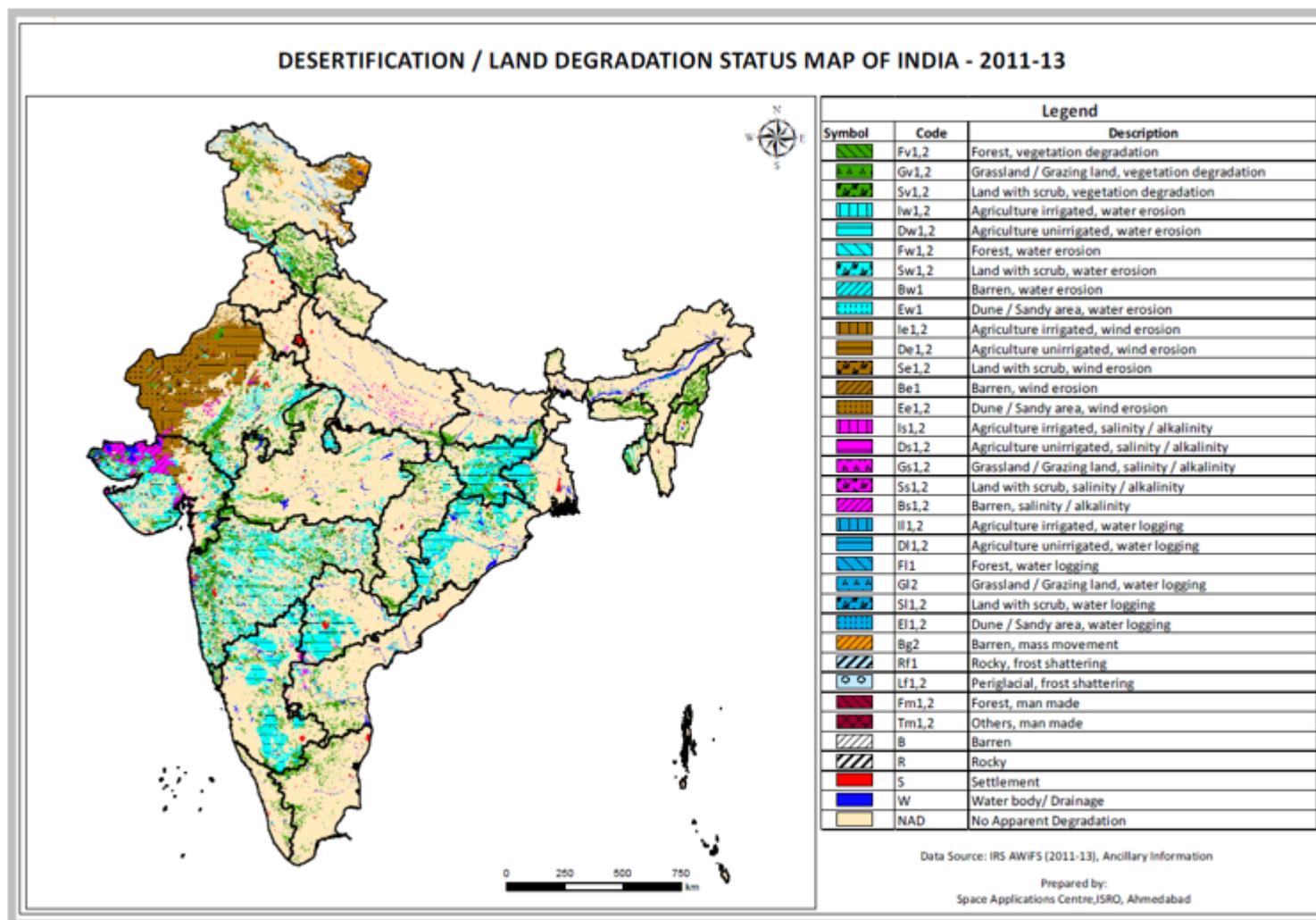
**Gujarat:** Gujarat is the state with third highest area under desertification/ land degradation with respect to country TGA and fourth highest with respect to state TGA. The state is observed with 52.29% of the total geographical area under desertification/land degradation for the period of 2011-13. The desertification/land degradation area in Gujarat has increased about 0.94% since 2003-05. The most significant process of desertification/land degradation in the state is water erosion (19.67%), followed by salinity (13.48%), vegetation degradation (11.82%) and wind erosion (6.00%). Gujarat accounted for as much as 56.8% of the country-wide area affected by exclusively saline soils and 20.9% affected by sodic soils (ICAR, 2010). Five types of landforms are found in Gujarat, namely alluvial plains, hilly areas, highlands, desert areas and coastline areas. The alluvial plains extend from Banaskantha in north Gujarat to Valsad in the south and westward to the little Rann and Banni area of Kutch. Hilly tracts form a major divide in the State and most of the rivers originate from the hills in the east and flow towards the south and southwest except the Narmada and Tapi (interstate rivers). The Highland of Kutch (Saurashtra) with an elevation of about 150 to 500 m. comprises of sedimentary and volcanic rocks. Marshy and saline deserts of Rann of Kutch and little Rann of Kutch extend into the saline tracts around the Gulf of Kutch. The coastal areas extend from Rann of Kutch through the little Rann of Kutch and low-lying delta region of Bhadar, Bhogavo, Sabarmati, Mahi Dhadar, Narmada and Tapi rivers. With vast coastline of approximately 1663 km, which is highly vivid and distinct from others in terms of geomorphology, natural resources and human activities, makes Gujarat even more sensitive to impacts due to climate changes, including changes in temperatures, rainfall variability, sea surface temperatures, rainfall extremes, variation in sea levels, storm surge occurrences and cyclonic activity in the Arabian Sea. Two districts have been identified for project interventions viz., Kachchh and Banaskantha. The major focus in Kachchh will be restoration of degraded grassland and in Banaskantha the focus will be on degraded agricultural and forest landscapes.

**Maharashtra:** Maharashtra is the state with second highest area under desertification/ land degradation with respect to country TGA, i.e., 44.93% for period 2011-13. The desertification/ land degradation area in Maharashtra has increased about 1.55% since 2003-05. The most significant process of desertification/ land degradation in the state is water erosion (26.20% in 2011-13 and 24.77% in 2003-05) followed by vegetation degradation (15.87% in 2011-13 and 15.89% in 2003-05). About 40% of the area in Maharashtra is drought prone and 7% is flood prone. About 90% of the land in the State has basaltic rock, which is nonporous and prevents rainwater percolation into the ground, thus making the area prone to droughts. Floods are a result of damage to the dam embankments, excessive water release from dams, improper storm-water drainage systems and unplanned urbanization. About a quarter of India's drought-prone districts are in Maharashtra, with 73% of its geographic area classified as semi-arid, and experienced severe and successive years of drought in 1970-1974 and 2000- 2004. Target project sites in Maharashtra include forest and agricultural (irrigated and unirrigated) landscapes and to some extent grasslands, covering the states of Nandurbar and Aurangabad.

**Karnataka:** About 20% of Karnataka's geographical area is under forest cover. Forests declined by about 2% between 2001 and 2007, especially dense forests were affected (-16%). The Western Ghats are among the 25 global biodiversity hotspots. Likewise, the coastal area has a rich and diverse biodiversity. A large number of species are identified as rare, endemic or threatened in both biota and loss of agricultural biodiversity is a serious concern. Karnataka is observed with 36.24% of the total geographical area under desertification/ land degradation for the period of 2011-13. The desertification/ land degradation area in Karnataka has increased about 0.05% since 2003-05. The most significant process of desertification/ land degradation in the state is water erosion (26.29%) followed by vegetation degradation (8.93%). Target project sites in Karnataka includes Kodagu (Coorg) and Bagalkot districts. Several temporal LU analyses of Kodagu district highlight the loss of evergreen forest cover from 40 (1973) to 24% (2018) with the increase in other LU. The reduction of contiguous or intact/interior forest cover from 31 to 19% (2018) highlight the seriousness of the prevailing LU transitions (Ramachandra et al., 2019). The native forests are being replaced with the monoculture plantations (of exotic species) and are responsible for microclimate alterations threatening the sustenance of horticulture crops. Whereas, Bagalkot District is predominantly agriculture district as more than 70% of the population is dependent on agriculture. Bagalkot was also chosen as the district is known for its rich horticultural production.

***Threats to sustainable land management.*** More than 800 million rural population of the country is dependent on climate-sensitive sectors (agriculture, forests and fisheries) for their livelihoods. The climate induced impacts such as crop suitability and decline in crop yields, land degradation, water shortages and ill health have been witnessed in these sectors. Many endemic plant and animal species of global significance are threatened due to unsustainable and competing natural resource uses. Land degradation is depleting the gene pool of native plant species while clearing a path for invasive species. It is undermining ecosystem functions and services and reducing the household income of rural people. Further, land degradation is upsetting traditional land management practices with forced migrations resulting in conflicts between nomadic and sedentary populations competing for limited water and grazing land. Climate change and population growth have emerged as the major drivers of large-scale land degradation, posing great threats to food and economic security in the country. Heavy dependence of dryland communities on slow growing xerophytic vegetation in arid and semi-arid areas has rendered many areas devoid of vegetation, triggering the threat of shifting sand dunes. Underground water resources in the country are shrinking due to heavy exploitation of aquifers without any natural recharge. Irrigated areas are plagued with water logging, salinity and sodicity, reducing the productive capacity of soils and consequently leading to loss of soil fertility, crop yields, and agro-biodiversity. Therefore, continued interference and relentless pressures on utilisation of resources leads to an upset of ecosystem balances. If these issues are not effectively and adequately addressed in a holistic manner, they can lead to major environmental problems all of which directly impact our very survival. Further, India's structural transformation challenges of shrinking per capita land availability, employment issues for a young workforce and worrisome trends in land, water and biodiversity degradation.

Thus, measures for conservation of soil and other natural resources, watershed development and efficient water management are the key to sustainable development of the country. The socio-economic aspects of human activities form an important dimension to the issue of conservation and protection of natural resources. The measures should not only include rehabilitation of degraded lands but to also ensure that the living conditions of the local communities are improved.



**Map. 1.** Status of desertification and land degradation in India (SAC, ISRO, 2016).

*(Map disclaimer: The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations or UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.)*

**Government's institutional framework for sustainable land management:** India has strong commitment to enhance the ability to adapt to the adverse impact of climate change and foster climate resilience and low emission development. India's requirement for adaptation actions in agriculture, forestry, fisheries, water resources and ecosystems will be around USD 206 billion between 2015 and 2030. However, India's adaptation efforts are being scuttled due to the paucity of financial resources and knowledge about adaptation requirements as well as the lack of coordination between various governmental agencies (including the lack of clarity in the role of states in implementing NDCs).

India has had a long journey in addressing degraded lands and has also recorded some remarkable success. India is a signatory to the Kyoto Protocol and Paris Agreement and therefore has also declared its Intended Nationally Determined Contribution (INDC). India has developed 12 National Biodiversity Targets (NBTs) in line with the global Strategic Plan for Biodiversity. At the national level, the Ministry of Environment, Forest and Climate Change (MoEF&CC) is the nodal ministry for implementation of the UNCCD, CBD and UNFCCC. It is also responsible for the alignment of the National Action Plan (NAP) with the 10-Year Strategic Plan and indicator-based UNCCD reporting process, the Plan for Combating Desertification as well the Biodiversity Action Plan for India. It has the overall responsibility for coordinating efforts related to natural resources and environmental management. The Desertification Cell of Ministry undertakes activities to help strengthen inter-ministerial coordination, build scientific and technical capacity, and facilitate knowledge sharing by bringing diverse stakeholder groups together that will lay the foundation for undertaking activities for combating desertification and mitigating the effects of droughts.

Further, state and district authorities are empowered to decide on the composition of local development plans and resource allocations to different elements of the plan. This provides a tremendous opportunity to directly engage with planning and financing agencies at the states level to mainstream SLM into local plans and programmes. The state forestry departments are responsible for sustainable management of forest resources, regulating the commercial harvest of trees, afforestation and reforestation programmes, regulating the use of rangelands and overseeing the extraction of non-timber forest products. Similarly, state agriculture departments provide agriculture extension services (including research), while state livestock departments provide advice for raising livestock, veterinary services, control disease outbreak. The state irrigation departments are charged with managing the network of irrigation head-works, canals, small dams and other irrigation works in the country.

Many of the present schemes and programmes of Ministry of Rural Development, Department of Land Resources, Ministry of Environment, Forest and Climate Change, Ministry of Agriculture, Ministry of Water Resources, Ministry of Tribal Affairs, Ministry of Panchayati Raj, Dept. of Science and Technology, Dept. of Space have significant bearing for addressing the DLDD challenges. Though India does not have a specific policy or legislative framework for combating desertification as such, the concern for arresting and reversing land degradation and desertification gets reflected in many of the national policies (for e.g., National Water Policy 2012; National Forest Policy 1988; National Agricultural Policy 2000; Forest (Conservation) Act 1980; Environment (Protection) Act 1986; National Environmental Policy 2006; National Policy for Farmers 2007; National Rainfed Area Authority (NRAA)- 2007) which have enabling provisions for addressing these problems. It is also implicit in the goals of sustainable forest management (SFM), sustainable agriculture, sustainable land management and the overarching goal of sustainable development which the country has been pursuing. The subject has in fact been engaging the attention of our planners and policy makers since the inception of planning. The first five year plan (1951-1956) had 'land rehabilitation' as one of the thrust areas. In the subsequent plans too, high priority has been consistently attached to development of the drylands.

***Long-term solution and barriers to achieve the solution:*** The long-term solution to the above issues proposed by this project is to promote the sustainable management of land and natural resources in the arid and semi-arid regions of India in order to restore degraded ecosystems and their essential services, reduce poverty and increase resilience to climate change. The project is organised on the general assumption that: (1) there is a strong enabling environment at national and state/district levels that supports up-scaling of SLM practices; (2) there is effective, targeted, and adaptive implementation of SLM Land Use Planning & Decision Support System; and (3) on-the-ground implementation of climate-resilient SLM activities is up-scaled across landscapes.

Though, India, being party to the three Rio Conventions, has a strong legal and policy framework for the conservation of rich biological resources, still removing several barriers can greatly improve the effectiveness of multi-stakeholder action for addressing land degradation, climate change, achieving land degradation neutrality and biodiversity loss. Key barriers include the following:

- Lack of landscape level policy coherence across sectors to provide a supportive enabling environment for achieving LDN, NDCs and Biodiversity targets.

- Weak institutional platforms, insufficient coordination and governance mechanisms for stakeholder negotiation and collective action across sectors and landscape-wide geographies to identify and resolve LDN challenges.
- Lack of adopted and proven technical methodologies and practices to support LDN across a range of land types and contexts.
- Gaps in evidence to inform the design of action and investment to implement landscape approaches at scale.
- Inadequate institutional capacity, tools and system gaps for implementing integrated landscape management, among landscape stakeholders and in key institutions.
- Lack of sufficient information and knowledge of farming communities regarding sustainable land management.
- Insufficient documentation and sharing of knowledge gained from demonstrations including South-South cooperation on best practices and lessons learned.
- Land fragmentation, that has caused low productivity and poverty and preventing application of new techniques and farm machinery.
- Weak political support for cross-sector approaches to address agriculture-environment-livelihood conflicts.
- Policy, finance and business institutions that operate in ways that make SLM more difficult.
- Lack of government funds for sustainable land management/improvement related projects.

The project will target the following four broad barriers, which are preventing the proposed long-term solution:

***Barrier 1. Lack of landscape level policy coherence across sectors to provide a supportive enabling environment for achieving LDN, NDCs and Biodiversity targets***

India has committed to achieving LDN, NDCs and Biodiversity targets by 2030 aligned to the Agenda 2020 of Sustainable Development Goals. Since then, India has progressed target setting that contribute towards national priorities of climate resilience, biodiversity conservation, energy, water and food security and the national ambition of increasing the income of farmers and alleviation of poverty. However, bringing together all of these policy areas and sectors in practice will be challenging. As LDN is a newly introduced concept, significant effort will be required to mainstream its methodologies, monitoring and objectives into existing plans, policies and programs. Current policies and plans are based along sector boundaries and there is a lack of coherence in policies focused on or related to sustainable land management and achievement of LDN. Subsidies can have unintended impacts on land condition and lead farmers towards unsustainable practices, while also being a substantial drain on government budgets. Fertilizer subsidies are the most dominant, expected to be at over US\$11.11 billion in 2019-20.

One case study from Andhra Pradesh indicates the potential for fertilizer subsidy savings from transition to 100% chemical free and nature-friendly farming (e.g. through a method such as Zero Budget Natural Farming (ZBNF)) could deliver US\$72-300 million annual saving to government in one State. There is a need to better assess these potential policy conflicts and the current subsidy and extension system to identify better ways to incentivize improved farming practices and achieve long- term environmental and livelihood benefits. Increasing this coherence is essential to resolve policy fragmentation, lack of connectivity, and balance competing interests and potential disincentives/incentives. Without doing so, it will be difficult to achieve a significant improvement on baseline conditions and broad scale, sustainable uptake of improved farming practices.

***Barrier 2. Insufficient coordination across sectors and landscape-wide geographies to identify and resolve LDN challenges***

A number of governmental agencies are managing programmes with implications for land degradation and desertification (see description of baseline projects under 2) below. Coordination among these agencies and even between programs managed by the same agency, is essential when pursuing a multi-faceted objective like LDN. Similarly, there is a need to pull together related agencies and stakeholders at district and State level, to align individual work plans to support sustainable land management. There is currently a lack of agreed coordination mechanisms for agencies and stakeholders to work together on achieving LDN. Given the need cross-cutting, landscape-level action, insufficient coordination will pose an important barrier to addressing land degradation and achieving LDN.

***Barrier 3. Lack of adopted and proven technical methodologies and practices to support LDN across a range of land types and contexts***

There is a wide variety of technical constraints / barriers limiting the ability of land users and land managers to pursue productive ventures sustainably, whether such activities take place on agricultural, grazing or forest lands. Technical challenges range from market issues to demonstration of effective and practical techniques that can be adopted by farmers, particularly small and marginal farmers. Uptake of sustainable land management practices is also impeded by limited extension and capacity development, low access to technology, and absence of programs supporting entrepreneurship /empowerment of farmers. Overall, there is an absence of demonstrated practical and sustainable agro-economic models that will be viable for small and marginal farmers. These result in use of inappropriate agricultural practices, low survival of tree crops due to inappropriate management of pests and diseases and grazing damage to saplings from stray animals after the crop- harvesting period, poor irrigation and water management, improper management of industrial effluents and wastes, pesticide and fertilizer overuse, poor crop cycle planning and reduced crop production, and inappropriate management of forests.

New techniques are emerging that offer both environmental and economic benefits but need more demonstration and confirmation of viability. One example is ZBNF, an agro-ecological method which has attracted success in Southern India and recognized for its potential to improve farmer incomes through savings on input costs. However, it is yet to be a widely-accepted practice supported by State budgets as questions remain about its viability/replicability and the conditions under which it will be successful at achieving environmental and livelihood benefits. The Department of Agricultural Research and Education (DARE) is currently conducting experiments at multiple locations to establish the viability of ZBNF. There is an urgent need to pilot and demonstrate a range of techniques across different conditions, and show viability for small and medium farmers, to support the adoption and scaling up of SLM practices.

***Barrier 4. Insufficient documentation and sharing of knowledge gained from demonstrations including South- South cooperation on best practices and lessons learned***

In a context where multiple institutions are developing local, on-the-ground interventions, there are ample, largely untapped opportunities to capture and share experience and lessons learned and to apply these to the development of LDN strategies as well as to more localized situations. Knowledge regarding successful approaches is limited based on a combination of factors, including limited lesson capture and poor communication/ dissemination of successful and efficient outcomes. Knowledge of successful approaches, techniques, tools and strategies often fail to be applied to potentially analogous situations. Such knowledge transfer will be essential to achieve the type of scaling up and grassroots support that will be needed to ramp up sustainable land

management across India. Limited knowledge transfer also impedes the potential for learning and cooperation between countries facing similar land degradation challenges – an area of South-South cooperation identified by the Prime Minister of India as important to develop land restoration strategies and address climate change, biodiversity and land degradation[1].

**Project conceptual model:** The complex interacting web of factors that threaten achievement of LDN in India is illustrated in a Problem Analysis model in **Figure 1**. This indicates the key areas (indirect and direct factors) and the points where project intervention can contribute towards a reduction in the level of development and economic-related threats, and therefore, contribute towards the conservation of land, and land and water resources - and the integrity of the ecosystems. The main project intervention strategies are shown as yellow hexagons in Figure 1. The main elements of these strategies are summarized in the Theory of Change diagram (**Figure 2**).

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[1] India plans to restore 2.6 crore hectares of Degraded Land by 2030: PM Modi - [https://www.ndtv.com/india-news/prime-minister-narendra-modi-at-un-india-plans-to-restore-2-6-crore-hectares-of-degraded-land-by-2030-2463798?pfrom=home-ndtv\\_topscroll](https://www.ndtv.com/india-news/prime-minister-narendra-modi-at-un-india-plans-to-restore-2-6-crore-hectares-of-degraded-land-by-2030-2463798?pfrom=home-ndtv_topscroll)

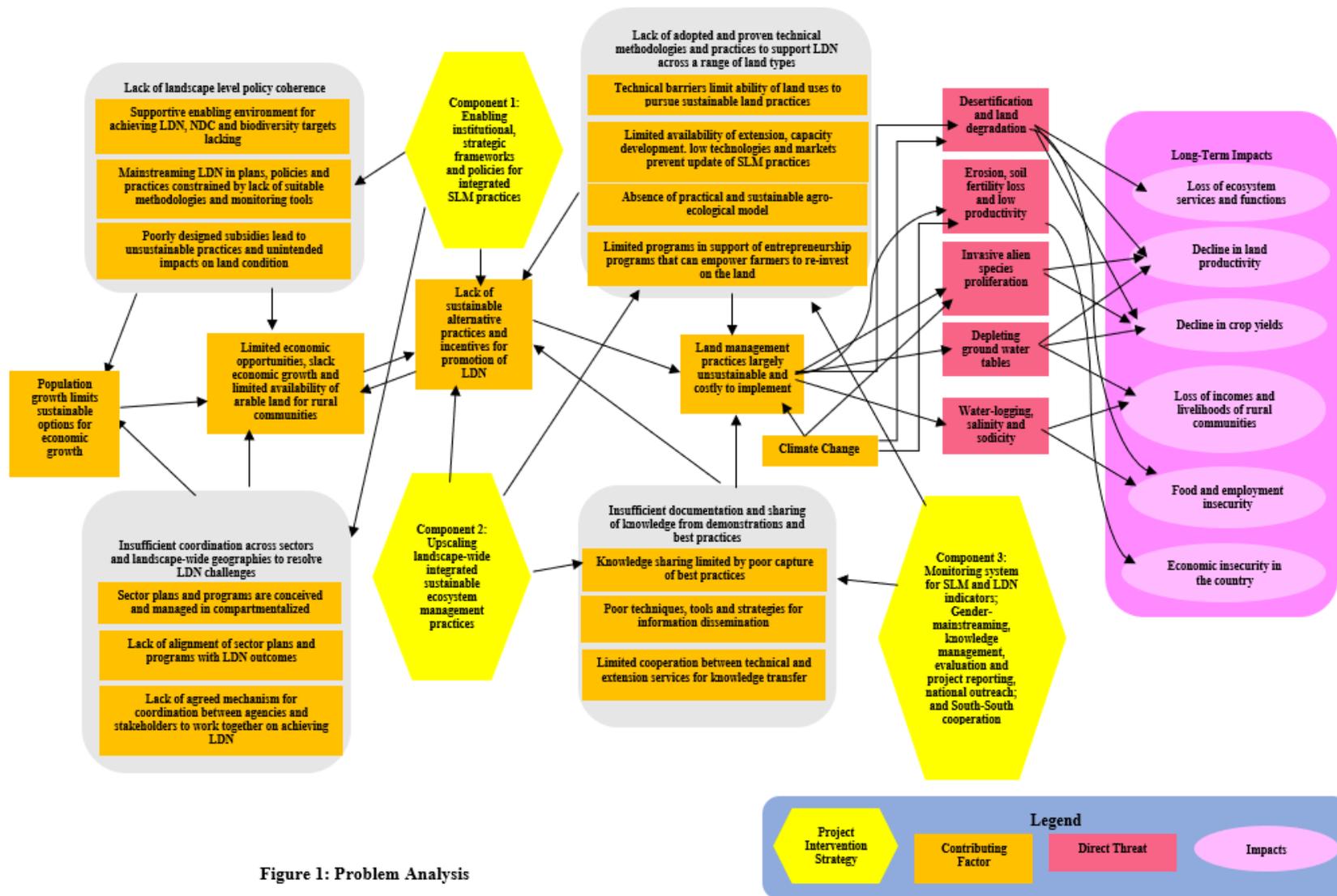


Figure 1: Problem Analysis

1) Baseline scenario and Associated baseline projects

India has demonstrated strong commitment to achieving sustainable food systems and effective environmental management. The “National Strategy for New India” (NITI Aayog, 2018) prioritizes ‘Doubling farmers’ income’ through sustainable agriculture and livelihood diversification; maintaining ecosystems and resilience to climate change and disasters. It is also coherent with the Ministry of Agriculture and Farmers’ Welfare’s “Specific Strategies for Sustainability in Agriculture”. Other relevant enablers in India are the National Mission for Sustainable Agriculture (2014), National policies on Forestry (1988), Agroforestry

(2014); Agricultural (2000); Seed (2002), Horticulture (2014) Food Security (2013), Environment (2006), and Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) (2006); and National Wildlife Action Plan and Integrated Watershed Management Plan. The Forest Rights Act allows for forest land use plans. India's Constitution (74<sup>th</sup> Amendment), gives responsibilities to State Governments on spatial planning. The Green Revolution has enabled great strides in domestic food security, but government's focus is now on innovative models that tackle social and environmental externalities and prioritize safe and sustainable diets, which presents a strategic opportunity for the proposed project to capitalize on. State organic farming policies and agroecology innovations such as Zero Budget Natural Farming illustrate increasing sub-national support for sustainable food systems. Public-private partnerships are emerging to promote sustainable food systems for the promotion of traditional varieties/breeds of flagship crops/livestock and organic products.

India has made several international commitments and set national targets for landscape restoration and sustainable land management and is in the process of setting post 2020 targets for biodiversity conservation. Among the international commitments, most relevant to the present project are: i) the Nationally Determined Contribution (NDC) under the UN Framework Convention on Climate Change (UNFCCC) Paris Agreement to sequester 2.5 to 3 billion tons CO<sub>2</sub>e by 2030 through improved forest and tree cover; ii) Bonn Challenge to restore 21 Mha of degraded and deforested lands and achieve Land Degradation Neutrality (LDN), and; iii) the Sustainable Development Goals (SDGs) – particularly no poverty (SDG 1), zero hunger (2), good health and well-being (3), clean water and sanitation (6), decent work and economic growth (8), climate action (13), and life on land (15). Key domestic targets include - doubling of farmer income by 2022, national mission on sustainable agriculture, sub-mission on agroforestry, national mission for a Green India, national biodiversity strategy action plan and the national clean air programme. Achieving these targets requires avoiding and reducing land degradation, while identifying land restoration opportunities, planning for restoration with multiple ecosystem services and monitoring results/outcomes.

India committed to achieve Land Degradation Neutrality by 2030, which indicates that no more land would be degraded as compared to the degraded land of baseline year, that is 96.40 M Ha. At the 2019 Conference of Parties for the UN Convention on Combating Desertification (UNCCD), India's Prime Minister announced an increase in the country's ambition for land restoration from 21 million ha to 26 million ha between now and 2030. This ambitious task will involve restoring land productivity and ecosystem services to degraded agricultural, forest and other wetlands through a landscape restoration approach. Also, at the CoP14, the Prime Minister announced India's intention to set up a global technical support institute for member countries of the UNCCD for capacity building and support in order to help countries achieve the goal of Land Degradation Neutrality (LDN), to further develop a scientific approach and to facilitate the use of technology to address land degradation issues. This centre of excellence is expected to be established within the Dehradun-based Indian Council of Forestry Research and Education (ICRFE). The main role of the centre would be to share knowledge and technology among developing country Parties of UNCCD to arrest further land degradation and restoration of degraded lands aiming at conserving biodiversity, food and water security, support livelihoods along with maintaining the flow of ecosystem goods and services for posterity. It will facilitate networking of national and international institutions working on sustainable land and ecosystem management for knowledge sharing, capacity building of the stakeholders in LDN target setting and provide technical support for land degradation mapping. It will also be engaged in developing planning, M&E systems for interventions to combat land degradation. The Centre will network all the national and international institutions working in the domain and draw together their expertise. It will contribute globally in terms of capacity building in restoration of degraded lands, conceptualizing and implementation of transformative projects and their M&E, along with leveraging financial support from potential investors and private sector. The Centre shall provide all the technical support to the MoEFCC in achieving the LDN targets.

In 2009, the Government of India directed all state governments and union territories to prepare State Action Plans on Climate Change (SAPCC), consistent with the strategy outlined in the National Action Plan on Climate Change (NAPCC). The formulation of SAPCCs have put in motion a dynamic process involving tie-ups with multiple stakeholders, cross sectoral deliberations, workshops, and convergence between existing schemes and programmes. The

approach and strategies of the SAPCC are oriented for reducing exposure, hazards and vulnerability, and building preparedness and capability for timely and effective response systems, augmenting capacity to cope with unforeseen events and for pooling and sharing of risks. UNDP also supported the preparation of SAPCCs in eight states (Jharkhand, Chhattisgarh, Bihar, Uttarakhand, Madhya Pradesh, Andaman & Nicobar Islands and Kerala), and its implementation in Manipur, Sikkim, Madhya Pradesh, Uttarakhand and Jharkhand. The project will facilitate mainstreaming of SAPCC with other line departments and strategies including State Biodiversity Strategy and Action Plans (SBSAPs), increase focus on institutional and human capacities, and not only build upscaling in pilot projects, but also downscale the SAPCC at the district levels as a first point of convergence for state and national programmes.

India also participates in global scientific research through CGIAR Centres. Indian institutions are members of the Global Agribusiness Alliance, and the Global Alliance for Climate Smart Agriculture. Private companies like Godrej, Tata Group, ITC, Jain Irrigation and Vedanta are involved in World Business Council for Sustainable Development, which is a part of the Food and Land Use Coalition. India has several emerging national platforms related to food and sustainable agriculture. It is an active Board member of the International Federation of Organic Agriculture Movement and hosted the Organic World Congress 2018. On India's proposal, FAO has proposed 2023 to be the International Year of Millets, a climate smart nutria-cereal. India's diplomatic work includes the India-Africa Cooperation in Agricultural Sector for Food Security.

**Government of India initiatives related to land restoration efforts:** There are several ongoing and planned policies and national initiatives to combat land degradation and restoration of different landscapes that will contribute to successful implementation of the project. These are presented below, grouped by institutional lead:

i) **Ministry of Environment, Forest and Climate Change**

- **National Mission for a Green India or 'Green India Mission'**, is one of eight missions launched under the National Action Plan on Climate Change (NAPCC). It aims at "protecting, restoring and enhancing India's diminishing forest cover and responding to climate change" by increasing green cover across India by five million hectares (mha) and improve the quality of existing green cover on another five mha, while improving ecosystem services like carbon sequestration, hydrological services and biodiversity and provisioning services like fuel, fodder, and timber and non-timber forest products (NTFPs). The mission is also charged with increasing forest-based livelihood incomes for about three million households. In 2012, the total outlay for treatment of 10 million ha over the next ten years was pegged at Rs 46,000 crore (US\$ 6.8 billion). The budgetary allocation for National Mission for Green India has been raised from Rs 210 crores (US\$29.58 million) in financial year (F.Y.) 2018-19 to Rs 240 crore (US\$33.8 million) in F.Y. 2019-20.
- **The Compensatory Afforestation Fund Act (2016)** will mitigate the impact of diversion of forest land for non-forest purpose such as industry or commercial purposes. It will support artificial regeneration (plantation), assisted natural regeneration, forest management, forest protection, forest and wildlife-related infrastructure development, wildlife protection and management, supply of wood and other forest produce saving devices and other allied activities. The money collected by way of compensatory afforestation funds and NPV (net present value) of forests amounts to almost Rs 54,000 crore (US\$7.6 billion).
- **The National Afforestation and Eco-Development Board (NAEB)** is responsible for promoting afforestation, tree planting, ecological restoration and eco-development activities in the country, with special attention to the degraded forest areas and lands adjoining the forest areas, national parks, sanctuaries and other protected areas as well as in ecologically fragile areas.
- **National Mission on Himalayan Studies (NMHS)** was launched in line with the National Environment Policy, 2006 of the Government, with a strategy to focus on enhancing livelihoods of local communities with a basic premise that the most secured and effective basis for conservation is to ensure that people dependent on particular resources obtain better livelihoods from the act of conservation than from the degradation of the resources. The NMHS has identified a list of 7 Broad Thematic Areas like: (i) Water Resource Management, (ii) Livelihood Options and Employment Generation, (iii) Biodiversity Conservation and Management, (iv) Skill Development and Capacity Building, (v) Infrastructure Development, (vi) Physical Connectivity, (vii) Handling of Hazardous Substances strategy is to focus on enhancing livelihoods of local communities. The NMHS envisages to work towards a set of linked and complementary goals to: (a) Foster conservation and sustainable management of natural resources, (b) Enhance supplementary and/or alternative livelihoods and overall economic well-being of the region, (c) Control and prevent pollution in the region, (d) Foster increased/augmented human and institutional capacities and the knowledge and policy environment in the region and (e) Strengthen, greening, and fostering development of climate-resilient core infrastructure and basic services assets.

ii) **Ministry of Agriculture and Farmers Welfare**

- **National Mission for Sustainable Agriculture (NMSA) – Sub-mission on Agro Forestry** - Sub-Mission on Agroforestry has been launched in 2016-17 to encourage tree plantation on farm land “Har Medh Par Ped”, along with crops/ cropping system. The scheme is being implemented in the States which have liberalized transit regulations for selected tree species. The implementation of the sub-mission will result in providing additional income opportunities for farmers, increase in tree cover through will lead to higher carbon sequestration and compliment the national initiatives on climate change adaptation and mitigation and trees grown on farm land will help in enriching soil organic matter.
- **NMSA - Rainfed Area Development and Climate Change** - This programme focuses on Integrated farming system in which crops/cropping system is integrated with activities like horticulture, livestock, fishery, agro-forestry, apiculture, etc. to enable farmers not only in maximizing farm returns for sustaining livelihood, but also to mitigate the impacts of climate change.
- **NMSA – National bamboo Mission** – Focuses on boosting of domestic cultivation of quality and appropriate species of bamboo for providing adequate supply to Indian industry. It would create bamboo based improved livelihoods and employment to rejuvenate rural economy and provide support in doubling farmers’ income.
- **Soil Health Card (SHC)** - This program will address soil health for the first time in a consistent manner by working with state governments to evaluate soil fertility across India. SHCs will describe the status of soils with respect to 12 parameters, will provide crop-specific fertilizer recommendations and will help farmers improve productivity by maintaining soil health.
- **Remunerative Approach for Agriculture and Allied Sector Rejuvenation (RAFTAAR)** - previously ‘*Rashtriya Krishi Vikas Yojana*’. This programme will provide States and Territories with autonomy to draw up plans for increased public investment in agriculture by incorporating information on local requirements, geographical/climatic conditions, available natural resources / technology and cropping patterns in their districts in order to increase agricultural productivity.
- **Green Revolution-National Food Security Mission** - The National Development Council has launched a Food Security Mission during the 12<sup>th</sup> Five Year Plan with targets of additional production of food grains of 25 million tonnes of food grains, including 10 million tonnes rice, 8 million tonnes of wheat, 4 million tonnes of pulses and 3 million tonnes of coarse cereals.
- **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)** - will extend the coverage of irrigation and improve water use efficiency with end-to-end solutions for source creation, distribution, management, field application and extension, helping also address demand supply for groundwater resources. PMKSY has been approved for implementation across the country with an outlay of Rs 50,000 crore (US\$7 billion) over five years.

iii) **Ministry of Jal Shakti:** The Ministry of Jal Shakti is implementing several missions and programme for sustainable conservation and use of water resources, some these include:

- Government of India has established “**National Water Mission (NWM)**”, as one of the eight National Missions under the National Action Plan on Climate Change (NAPCC). The main objective of NWM is “*conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources development and management*”. The mission has five goals: (i) Comprehensive water data base in public domain and assessment of the impact of climate change on water resource; (ii) Promotion of citizen and state actions for water conservation, augmentation and preservation; (iii) Focused attention to vulnerable areas including over-exploited areas; (iv) Increasing water use efficiency by 20%; and (v) Promotion of basin level integrated water resources management.
- “**Jal Shakti Abhiyan: Catch the Rain**” – One of the National Water Mission’s (NWM) campaign “**Catch The Rain**” with the tagline “*Catch the rain, where it falls, when it falls*” was launched by The Prime Minister of India on 22 March 202 to nudge the states and stake-holders to create appropriate Rain Water Harvesting Structures (RWHS) suitable to the climatic conditions and sub-soil strata with the active participation of people.
- ‘**Sahi Fasal**’ campaign was launched by National Water Mission on 14.11.2019 to nudge farmers in the water stressed areas to grow crops which are not water intensive, but use water very efficiently; and are economically remunerative; are healthy and nutritious; suited to the agro-climatic-hydro characteristics of the area; and are environmentally friendly. Creating awareness among farmers on appropriate crops, micro-irrigation, soil moisture conservation; assisting policy makers to frame policies that make effective pricing of inputs; improve procurement and market for these alternate crops; create appropriate storage facilities and ultimately leading to increase in the income of farmers are the key elements of this campaign.
- ‘**Namami Gange Programme**’ is an Integrated Conservation Mission, approved as ‘Flagship Programme’ by the Union Government in June 2014 with budget outlay of Rs.20,000 Crore to accomplish the twin objectives of effective abatement of pollution, conservation and rejuvenation of National River Ganga. National Ganga Plan (Afforestation) is a Central Sector Scheme of Government of India with an outlay of Rs. 6000 crores, with focus on community

participation and demand side interventions for sustainable ground water management in identified water stressed areas of seven States in the country viz. Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. The scheme, partly funded by the World Bank, was launched by the Hon'ble Prime Minister on 25.12.2019 and is being implemented from 1.04.2020 for a period of 5 years.

- **Flood Management and Border Areas Program (FMBAP) and Flood Management Program (FMP)** - The projects for flood management and control are formulated and implemented by respective state governments/Union Territories from their own resources and as per their priority. Central Government provides financial assistance to states/UTs for implementing some projects targeting Flood/ Erosion/ Drainage management in critical areas.

iv) **Ministry of Rural Development:** Being the nodal Ministry for most of the development and welfare activities in the rural areas, the Ministry plays a pivotal role in the overall development strategy of the country through sustainable and inclusive growth of rural India. Many of the schemes launched by the Ministry for improved livelihood includes with a total budget outlay of Rs. 120147.19 crores for the Financial Year 2021-22:

- **Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)**, which aims at enhancing livelihood security in rural areas by providing at least 100 days of guaranteed wage employment a year to every household whose adult members volunteer to do unskilled manual work (e.g., soil and water conservation, afforestation, and land development).
- **Watershed Development Component (WDC)** of the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) - Department of Land Resources (DoLR) in Ministry of Rural Development is implementing erstwhile Integrated Watershed Management Programme (IWMP), which has been amalgamated as the Watershed Development Component (WDC) of the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) with effect from 2015-16. The primary focus has been on rainfed and degraded area development, in particular rainfed cultivated areas and culturable wastelands. It involves measures like ridge area treatment, drainage line treatment, soil and moisture conservation, rainwater harvesting, nursery raising, afforestation, horticulture, pasture development, livelihoods for asset less persons, etc.
- **'Aajeevika - National Rural Livelihoods Mission (NRLM)'** was launched in June 2011 and was renamed as **'Deendayal Antayodaya Yojana (DAY-NRLM)'** in November 2015. With support from World Bank, the Mission aims at creating efficient and effective institutional platforms of the rural poor, enabling them to increase household income through sustainable livelihood enhancements and improved access to financial services targeting 7 Crore rural poor households, across 600 districts, 6000 blocks, 2.5 lakh Gram Panchayats and 6 lakh villages in the country through self-managed Self Help Groups (SHGs) and federated institutions and support them for livelihoods collectives in a period of 8-10 years.

v) **Ministry of Fisheries, Animal Husbandry and Dairying:**

- The Government envisions livestock as the way forward for doubling farmers' income, as income from crop production is seasonal, whereas dairying provides year-round income and generates gainful employment in the rural sector. The **'National Livestock Mission (NLM)'** supports activities required to ensure quantitative and qualitative improvement in livestock production systems and capacity building of all stakeholders. The Mission objective is the sustainable development of the livestock sector in the country. The **Sub-Mission on Fodder and Feed Development** will address the problems of scarcity of animal feed resources, in order to give a push to the livestock sector making it a competitive enterprise for India, and also to harness its export potential. There are provisions for productivity enhancement, entrepreneurship development and employment generation, strengthening of infrastructure of state farms with respect to modernization, automation and biosecurity, conservation of threatened breeds, minor livestock development, and livestock insurance. Whereas, Sub-Mission on Skill Development, Technology Transfer and Extension will enable a wider outreach to the farmers.

- A Scheme named “**Supporting Dairy Cooperatives and Farmer Producer Organizations** engaged in dairy activities (SDCFPO)” was launched during 2017-18. The scheme is being implemented by National Dairy Development Board. A corpus of Rs. 300 crore is kept in perpetuity with National Dairy Development Board to be used for providing soft loans for working capital to enable Cooperative Societies and farmer producer organizations engaged in dairy activities to provide a stable market access to farmers.
- ‘**Rashtriya Gokul Mission (RGM)**’ has been launched in December 2014 with an outlay of Rs 2025 crore for development and conservation of indigenous breeds through selective breeding in the breeding tract and genetic upgradation of nondescript bovine population. The scheme comprises of two components namely ‘National Programme for Bovine Breeding (NPBB)’ and ‘National Mission on Bovine Productivity (NMBP)’.
- The Ministry is implementing ‘**National Programme for Dairy Development**’ scheme since 2014-15, with the objective to create and strengthen dairy infrastructure for procurement, processing and marketing of milk and milk products by the State Implementing Agencies (SIAs), mainly focusing on two activities namely: (a) Village based milk procurement system and (b) Milk Quality Testing Facilities at Village/District/State Level.

vi) **Ministry of Tribal Affairs:**

- Ministry of Tribal Affairs has launched several schemes to improve livelihood of tribal communities and includes: (i) Institutional support for development and marketing of tribal products/produce, and marketing of **Minor Forest Produce (MFP)** through Minimum Support Price (MSP) and development of value chain for MFP; (ii) **Van Dhan Vikas Karyakram (VDVK)** - an initiative under the Scheme “Mechanism for Marketing of MFPs through MSP and development of value chain for MFP; and (iii) Equity support to **National/State Scheduled Tribes Finance and Development Corporation (NSTFDC/STFDCs)**. Grants-in-aid for the implementation of these schemes are released to State Tribal Development Cooperative Corporations (STDCCs) and Tribal Cooperative Marketing Development Federation of India Ltd. (TRIFED) which is a multi-State Cooperative under MoTA. These schemes has established a system to ensure fair monetary returns for their efforts in collection, primary processing, storage, packaging, transportation, etc. It also seeks to get them a share of revenue from the sales proceeds with cost deducted. Procurement and marketing operation at prefixed MSP are being undertaken by the designated State Agencies. Simultaneously, other medium and long-term issues like sustainable collection, value addition, infrastructure development, knowledge base expansion of MFP, market intelligence development, strengthening the bargaining power of Gram Sabha/ Panchayat are also being addressed. Implementation of these schemes also aims to tap into traditional knowledge and skill sets of tribals by adding technology and IT to upgrade it at each stage and to convert the tribal wisdom into a viable economic activity. Tribal community owned MFP centric multi-purpose Van Dhan Vikas Kendras (VDVKs) are also being established and transforming them into entrepreneurs. Entire cost of setting up of VDKs are to be borne by MoTA for which funds will be made available through TRIFED.

vii) **Ministry of Science and Technology:**

- Under its Department of Science and Technology, the Ministry is operating ‘**National Mission on Strategic Knowledge for Climate Change (NMSKCC)**’, which is one of the 8 sub-missions under the National Action Plan on Climate Change (NAPCC). The major focus of this mission is to (i) Formation of knowledge networks among the existing knowledge institutions engaged in research and development relating to climate science and facilitate data sharing and exchange through a suitable policy framework and institutional support; (ii) Establishment of global technology watch groups with institutional capacities to carry out research on risk minimized technology selection for developmental choices; (iii) Development of national capacity for modeling the regional impact of climate change on different ecological zones within the country for different seasons and living standards; (iv) Establishing research networks and encouraging research in the areas of climate change impacts on important socio-economic sectors like agriculture, health, natural ecosystem, bio-diversity, coastal zones; (v) Providing an improved understanding and awareness of the key climate processes and the resultant climate risks and associated

consequences; and (vi) Building alliances and partnerships through global collaboration in research and technology development on climate change under International and bilateral S&T cooperation arrangements.

- **'National Mission for Sustaining the Himalayan Ecosystem (NMSHE)**' with primary objective is to develop a sustainable national capacity to continuously assess the health status of the Himalayan Ecosystem and enable policy bodies in their policy-formulation functions and assist States in the Indian Himalayan Region with their implementation of actions selected for sustainable development. Accordingly, the following objectives have been identified for the Mission: (i) Building human and institutional capacities in the Himalayan region; (ii) Identification of national knowledge institutions and development of a self-sustaining knowledge network; (iii) Development and adoption of new methods for assessing the health of the Himalayan ecosystem; (iv) Assessment and quantification of the changes in the Himalayan ecosystem attributable to the climate change as a result of global emissions and human activities and model for future projections; and (v) Exploration of linking of traditional and formal knowledge systems through strategic mechanism of formalization for mutual benefit and value for the sustainability of the Himalayan ecosystem.

viii) **Ministry of AYUSH:**

- The Ministry of Ayush was formed in November 2014 with a vision of reviving the profound knowledge of our ancient systems of medicine and ensuring the optimal development and propagation of the Ayush systems of healthcare. The objective of National AYUSH Mission (NAM) is to promote AYUSH medical systems through cost effective services, strengthening of educational systems, facilitate the enforcement of quality control of Ayurveda, Siddha and Unani & Homoeopathy (ASU&H) drugs and sustainable availability of ASU&H raw materials. The mission envisages supporting cultivation of medicinal plants and converging cultivation, warehousing, value addition and marketing and development of infrastructure for entrepreneurs.

ix) **Ministry of Statistics and Programme Implementation:**

- Members of Parliament Local Area Development Scheme (MPLADS): Under the scheme, each Member of Parliament (MP) has the choice to suggest to the District Collector for works to the tune of Rs 5 Crores (US\$700,000) per annum to be taken up in his/her constituency. Whereas, the Rajya Sabha Members of Parliament can recommend works in one or more districts in the State from where he/she has been elected.

x) **Ministry of Industry and Commerce:**

- In order to realize the true economic potential of rural India and align it with that of the clarion call of the Prime Minister to make "*Aatmanirbhar Bharat*", the Ministry of Commerce and Industry is in process of putting in place an institutional mechanism to propagate 'One District One Product' as a movement in the country with the help of all the state governments and Union Territories. The objective is to identify one product per district based on the potential and strength of a district and national priorities, develop a cluster for that product in the district which is capable of producing world-class product with quality, scalability and a brand and also provide market linkages.

xi) **Ministry of Panchayati Raj:**

- **'Rashtriya Gram Swaraj Abhiyan (RGSA)**' was launched with the primary aim of strengthening Panchayati Raj Institutions (PRIs) for achieving Sustainable Development Goals (SDGs) with main thrust on convergence with Mission *Antyodaya* and emphasis on strengthening PRIs in the 117 Aspirational districts. The scheme has been approved with total budget outlay of Rs. 7255.50 crore. The scheme extends to all States and UTs.

Government initiatives are also supported by donor-funded efforts to strengthen enabling policy and institutional frameworks and facilitate behaviour change among farmers to embrace improved farming practices. These include multiple GEF-financed projects (see Section 6) supporting aligned objectives, such as the GEF-6 "Green Ag: Transforming Indian Agriculture for Global Environmental Benefits and the Conservation of Critical Biodiversity and Forest Landscapes"

supported by FAO, which is developing intersectoral mechanisms and policies to reform India's agricultural sector to support biodiversity conservation in five States, including the deployment of a 'green landscapes' approach that will provide useful lessons that this project can build upon. Also relevant is the UNEP-supported GEF-5 project "Building the Foundation for Forest Landscape Restoration at Scale" advancing progress towards achieving the Bonn Challenge to bring 150 million hectares into the process of restoration by 2020; and also GEF-5 project "Mainstreaming Agricultural Biodiversity Conservation and Utilization in Agricultural Sector to Ensure Ecosystem Services and Reduce Vulnerability.

### 3) The proposed alternative scenario with a brief description of expected outcomes and components of the project

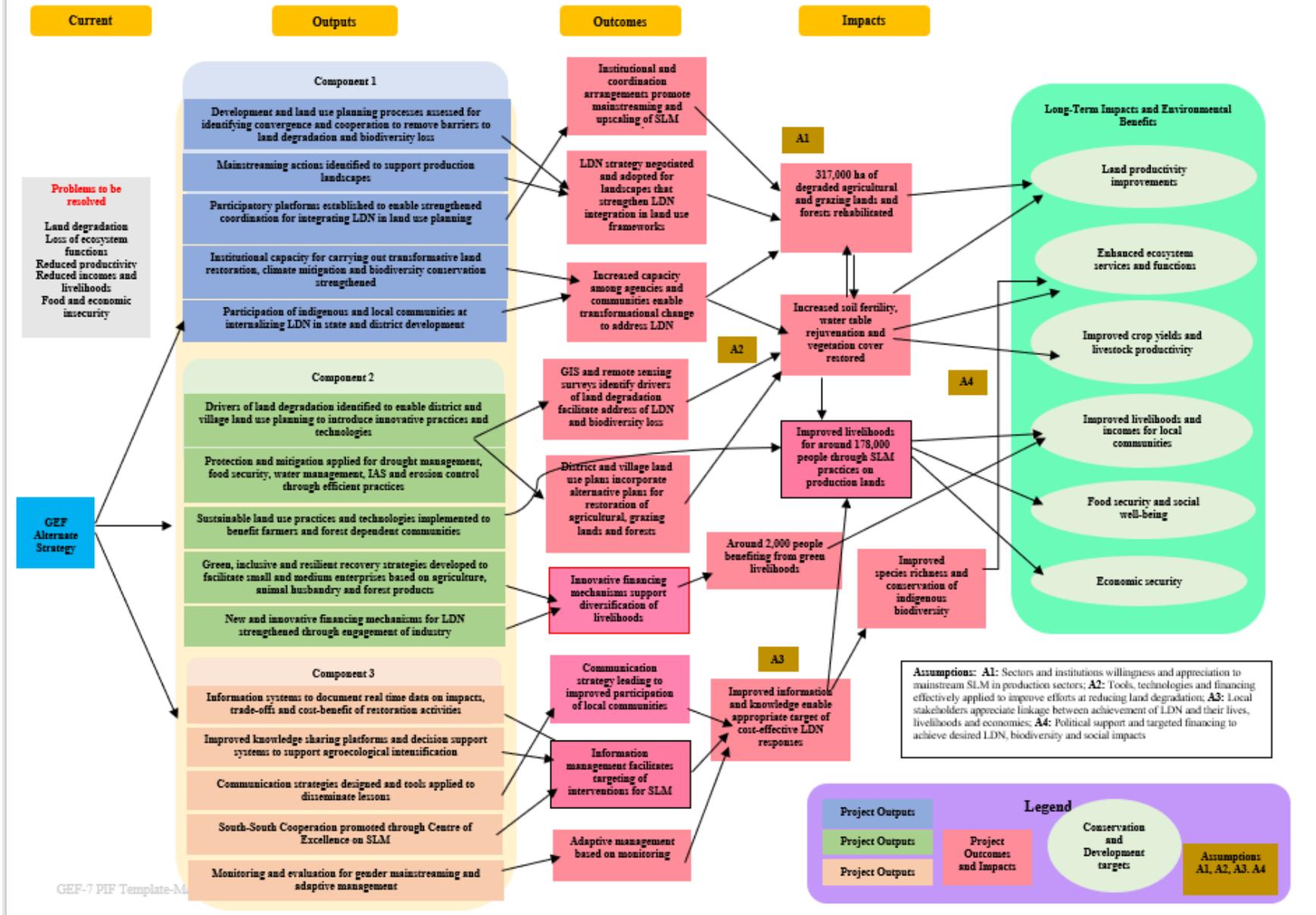
India has recorded some success to ensure sustainable land management as well as food, water and livelihood security by adopting both preventive and curative strategies for moving towards land degradation neutrality. Many of the present schemes and programmes of Ministry of Rural Development; Department of Land Resources; Ministry of Environment, Forest and Climate Change; Ministry of Agriculture and Farmers Welfare; Department of Water Resource, Ministry of Jal Shakti; Ministry of Tribal Affairs; Ministry of Panchayati Raj; Department of Science and Technology have significant bearing for addressing the DLDD challenges in the country. However, in light of the significant barriers outlined in the previous section, a number of challenges would be expected to persist in the absence of a GEF project, limiting achieving its LDN targets and uptake of SLM practices across India. Therefore, effort needs to be further supported by adequate financial resources, robust scientific base, effective policies, strong institutional mechanism and elaborate monitoring systems. By focusing attention and effort on policy and institutional barriers; multi-stakeholder participation; area-wide assessment, development and implementation of pilot-district-level strategies; and knowledge management; GEF incremental support is expected to bring significant incremental benefits to these initiatives.

The objective of the proposed project is to assist the Government of India to achieve its goal "to combat land degradation and desertification" with the primary objective *"to promote sustainable management of land and natural resources across different landscapes in order to restore degraded ecosystems and their essential services, reduce poverty, conserve biodiversity and increase resilience to climate change"*. The multiple regulatory and provisioning ecosystem services to be strengthened by the project include: carbon sequestration, improved water quality and flow (including groundwater resources), biodiversity conservation, improved soil health, and provisioning of food, fuelwood, fodder and non-timber forest produce.

The project theory of change is premised on arresting and reversing land degradation and desertification, and negative impacts of climate change and biodiversity loss across the degraded landscapes ultimately supporting the achievement of LDN, NDCs and Post-2020 Biodiversity commitments and will require interventions along the following pathways:

- Policy and planning reform to put in place incentives for sustainable land management, climate change mitigation and biodiversity conservation and remove disincentives, along with enhanced capacity of stakeholders at all levels to support a stronger enabling framework (Component 1);
- Multi-stakeholder processes to bring together all sectors with an impact or interest in LDN, NDCs and biodiversity conservation to jointly describe the landscape, vision and LDN, NDC and conservation priorities (Component 1);
- Technical demonstrations to support adoption of economically, ecologically and socially sensitive climate resilient sustainable land management and energy efficient practices by relevant stakeholders across agricultural, grazing and forest lands; and successful on-the-ground restoration and rehabilitation of degraded areas (Component 2);
- Knowledge exchange and outreach to disseminate project approaches and lessons across project districts and with other countries facing similar challenges (Component 3).

Figure 2: Theory of Change



In order to achieve the above objective, project's interventions are organised into three high-level 'outcomes' expected from the project. Outputs/activities under these three outcomes will build on the experiences and up-scale the results of the SLM programmes and activities under implementation in and outside of the country. At the national and (particularly) the state levels, the project will ensure a strong and sustainable enabling framework for

adopting/implementing SLM approaches to land degradation; develop cross-sectoral policy and planning tools for SLM, as well as integrating SLM approaches into sectoral policies at the state and landscape level. A high proportion of the project budget and effort will be given to develop, demonstrate and up-scaling successful SLM approaches and support the development of SLM land use planning and decision support system.

***Component 1.** Enabling institutional, strategic frameworks and policies for integrated sustainable land management (SLM) practices and restoration of degraded production landscapes.*

**Outcome:** Enhanced national, state and district-level enabling frameworks incentivizing SLM practices through participatory multi-sectoral platforms to avoid, reduce and reverse land degradation, biodiversity loss and climate mitigation.

Currently India does not have a specific policy or legislative framework for combating desertification. As such, the concern for arresting and reversing land degradation and desertification gets reflected in many of national policies (National Action Programme to Combat Desertification 2001; National Water Policy 2012; National Forest Policy 1988; National Agricultural Policy 2000; Forest (Conservation) Act 1980; Environment (Protection) Act 1986; National Environmental Policy 2006; National Policy for Farmers 2007; National Rainfed Area Authority 2007), which have enabling provisions for addressing these problems, and the Desertification Cell of the MoEF&CC undertakes activities to help strengthen inter-ministerial coordination to bringing diverse stakeholder groups together that will lay the foundation for undertaking activities for combating desertification and mitigating the effects of droughts. Though, identification of national sectors and policies that could benefit from synergistic planning/programming of the three Rio conventions and enhancement of the institutional and scientific capacities and awareness of relevant stakeholders is in progress, review of national policies to enhance cooperation and synergies as well evaluation of national plans and identification of gaps in synergies has not been fully undertaken.

Achieving LDN targets, NDCs and Post-2020 Biodiversity commitments will require thorough review of current national and state policies and regulatory frameworks related to the mainstreaming SLM practices and restoration of degraded farmland, grassland, forest land; and restoration and rejuvenation of water bodies. Accordingly, the project will assess all such planning policies and guidelines at national and state level currently under implementation to identify supporting institutional, technical and planning gaps at institutional and related arrangements at national, state and district level to promote up-scaling of SLM practices through evidence-based and locally relevant information on land degradation and restoration status (**Output 1.1**).

A preliminary review of policies for land governance, land use planning, climate action plans and natural resource (including groundwater) governance and management, including current subsidies and extension systems, will be completed during the PPG phase – to identify disincentives and incentives, and inform the detailed design of project activities and targets. Indicative policy actions to remove barriers to LDN will include addressing lack of knowledge/information about high value/growth products, limited exposure to high productivity practices, weak market linkages, and inefficient supply chains with high levels of food wastage. The project will seek to bring about incentives that address a higher value mix of farm output, capture greater value through

better storage and processing, and make market mechanisms more efficient for farm inputs, financing, and sale of outputs. Ensuring due diligence is observed to comply with guidelines set by Courts and Tribunals is another area for attention, along with mainstreaming LDN objectives and strategies into relevant state and district plans.

The Project shall identify and implement remedial measures (institutional, technical, knowledge and planning) to remove barriers to current ineffective implementation of existing agriculture and forestry sector policies to address LDN, NDCs and biodiversity target (**Output 1.2**). Accordingly, complementary mainstreaming actions will be identified across different Government schemes, which have significant components for SLM and restoration of degraded landscapes, with the intent of ensuring improved mainstreaming with LDN, NDC and biodiversity conservation outcomes. These will be the following schemes: (i) Rashtriya Krishi Vikas Yojana- Remunerative Approaches for Agriculture and Allied Sector Rejuvenation (RKVY-RAFTAAR) under Ministry of Agriculture and Farmers Welfare, (ii) Soil Health Card (SHC) and Soil Health Management (SHM) Schemes under Ministry of Agriculture and Farmers Welfare, (iii) Mission for Integrated Development of Horticulture (MIDH), under Ministry of Agriculture and Farmers Welfare; (iv) Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)- Per Drop More Crop; under Ministry of Jal Shakti; (v) Minimum Support Price for Minor Forest Produce (MSP for MFP), under Ministry of Tribal Affairs; and (vi) Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGA), under Ministry of Rural Development.

Project will establish state and district-level multi-stakeholder land use degradation and desertification alliances/platforms. These platforms will bring together government (State and Central Government) authorities, non-Government stakeholders, private sector, academia, civil society and community-based organizations for building synergised actions towards achieving targets for LDN, NDCs and biodiversity conservation. The platform would facilitate discussion and development of strategies towards addressing the threats due to land degradation, desertification, low crop productivity and water stress, including groundwater resources depletion and technologies for energy efficiency. The principles in the STAP LDN guidelines will be applied to support the characterization of the landscape and key processes and drivers of land degradation (**Output 1.3**).

The project will also strengthen institutional capacities at all levels for land restoration, climate change mitigation and biodiversity conservation at national, state and landscape levels. The institutions identified thus far include the India Council for Forestry Research and Education, State Forest Departments, State Nodal Departments for Energy Efficiency, National Biodiversity Authority, State Biodiversity Boards, Biodiversity Management Committees, Joint Forest Management Committees, Eco-development Committees, Krishi Vijayan Kendras of the Indian Council of Agricultural Research (ICAR), Van Vigyan Kendra (VVK) or Forest Science Centres (FSC) and Water User Groups. State and district level strategies will be developed based on integrated ecosystem- based approach for identifying key threats to land restoration and sustainable land management, climate change mitigation and conservation, and devising threat specific mitigation plans. Public-private partnerships (PPPs) will be developed to test new technologies and innovations for land restoration, climate change adaptation and biodiversity conservation. This will be achieved through strengthening and facilitating development of state and district - level landscape learning networks; organizing capacity-building workshops; establishment of community-based training centers and development of curriculum for SLM leaders, professionals and technical experts; and providing advisory input to on-going landscape initiatives and programs (**Output 1.4**).

Project will design and undertake specific capacity building programmes for Indigenous peoples and local communities as they tend to have deeper understanding of local ecosystems and their dynamics, and thus play an important role in long-term monitoring of ecosystems which can help make better-informed management decisions contributing to biodiversity conservation and to carry out ecological restoration of degraded lands. Such programmes will

enable them for their active participation in scientific assessments, recognizing territorial rights and creating partnerships between scientists, implementing agencies (both public and private) and among indigenous and local communities (**Output 1.5**).

***Component 2.** Implementing and up-scaling landscape-wide integrated sustainable ecosystem management practices to avoid, reduce and reverse of degraded production landscapes.*

**Outcome:** Integrated participatory landscape design and financing models established in support of avoidance, reduction and reversal of land degradation, desertification, biodiversity loss and negative impacts of climate change to generate multiple sustained environmental and economic benefits.

Identification, development and deployment of evidence-based SLM practices are essential to achieve LDN and targets of NDCs by practitioners and policymakers. Accordingly, under Component 2, and in line with the action strategies developed under Component 1, GEF funding will support pilot actions in select sites of three states (Gujarat, Karnataka and Maharashtra) of India. Selection of these states were based on baseline information provided in the Desertification and Land Degradation Atlas of India (SAC, ISRO, 2016). Two districts from each of these states have been tentatively identified and village level target project intervention sites will be confirmed during the PPG phase. Selection criteria include: existing levels of land degradation, presence of water stressed districts, restoration opportunities. Using the baseline information, the project will mainly target three elements of degradation, viz., land use, process of degradation and severity level. The target landscape proposed to includes degraded agriculture irrigated, agriculture unirrigated, forest and plantation, grassland, grazing land, land with scrub, as well as to some extent water bodies and barren land.

Project will undertake detailed GIS and remote sensing-based field studies together with Focal Group Discussion (FGD) to identify drivers of land degradation (land cover, land cover change, and land productivity trends) across project states/districts and will prepare district and village land use plans (**Output 2.1**). Actions will seek to maintain and strengthen flows of ecosystem services in a variety of ecosystem types and land use combinations. In particular, investments will focus on implementation by various stakeholders based on clearly defined short, medium and long-term roles, responsibilities, activities and timelines, financial and resource mobilisation plans and technical support packages covering forest lands, pasture lands and agricultural lands.

Evidence-based innovative practices and technologies will be developed and will support solutions for protection and restoration of high conservation value degraded agricultural and pasture lands, including rejuvenating surface water bodies, that can be scaled up and scaled out to maximize global and national benefits for ecosystem health and local livelihoods. In forest lands, this will include revitalizing traditional systems such as 'Orans' (sacred groves, i.e. patches of jungle preserved in the name of local deities or saints) and creation of shelter belts. In the case of pasture lands, the strategy is expected to include support for efforts to restore community grazing lands ('Gochars'). Developing sustainable approaches for forest protection and regeneration and/or avoided degradation will be through strengthening traditional forestry management systems and diversification of livelihood for forest dependant communities through Non Timber Forest Products (NTFPs) and Non Wood Forest Products (NWFPs) value chains, development of ecotourism models, sustainable harvesting of medicinal and aromatic plants. Approaches to protect and restore degraded farm land will include development/extension of climate resilient

agriculture practices, development/extension of agroforestry and integrated farming systems, development/extension of soil water conservation and watershed practices, selection/extension of crops and cropping systems for high yields, piloting of energy efficient and clean technologies in the agri-sector, and maintenance and/or recovery of ecosystem functions and services (**Output 2.2**).

Whereas, actions for restoration of degraded pasture lands will include restoration of community grazing lands through grassland and rangeland development; silvi-pasture package of practices (species mix, efficient land and water management practices) and other support including technology transfer for maintenance and/or recovery of ecosystem functions and services. Project will also target public and community owned water bodies across target sites for groundwater recharge and improvement in catchment areas of tank commands to facilitate irrigation for farm, forest and pasture lands through community participation. Actions such as moisture and aquifer recharge management will also be incorporated as a key component of preventing land degradation. With support from UNDP's newly established India Accelerator Lab in collaboration with other international platforms for SLM and all relevant stakeholders, the project will mainstream improved alternative sustainable land management practices and technologies to validate their potential to accelerate development. Sense-making, collective intelligence, solutions mapping, and experimentation will be part of a process designed to harness the potential of real time data to respond to rapidly evolving challenges facing land users and managers. Building on these locally sourced solutions, the labs will rapidly test and iterate new ideas to learn which ones work, which ones can grow, and which ones don't, bringing an applied experimental approach to the effort to achieve LDN and NDCs. The project will also identify, demonstrate and upscale effective and equitably managed, ecologically representative and well-connected systems of other effective area-based conservation measures for achieving LDN 2030, NDCs 2030 and biodiversity targets 2030 (**Output 2.3**).

Through development of the comprehensive SLM policies for the three state governments and in alignment with NDC Goal 7, project will catalyse new policy commitments through an appropriate mix of investments (public, philanthropic, private) to support the sustainable landscape approach through undertaking business, policy and financial analyses; facilitate dialogue, and provide advisory input and strategic outreach based on good practices, cutting-edge technologies and innovative business models that advance green, resilient and inclusive recovery strategies to meet the commitments for LDN. The output will be aimed at supporting community-based environmental-friendly small enterprise and livelihood improvements using financial instruments to avoid biodiversity loss and promote sustainable land management. Development and facilitating the establishment of small and medium enterprises (SMEs) focused on agriculture, animal husbandry and forest products, at village and district level including organic farming, NTFP-based enterprises, community-based ecotourism, forest and wetland-based livelihoods and sustainable fisheries-related activities, etc. (**Output 2.4**).

It will also support the preparation of a database of biodiversity and environmental -friendly enterprises that might be promising across landscapes that will be updated as new and innovative value chain opportunities become available. To ensure that biological and other risks in terms of selected value chains are managed, an assessment will be undertaken for each proposed enterprise, including the value chain feasibility assessment, supply and demand, availability of raw materials and the feasibility of the intermediary processes, marketing and linkages with service providers. Capacity building and skills development for a selected number of small-scale community enterprises and micro-grants will support this effort. Development of backward and forward linkages with Farmer Producer Organizations (FPOs) will be established to enhance smallholder access to public and private markets, and to pro-poor finance systems, link to technology-based market information platform such as E-NAM and *Jaivik Kheti* (organic farming) market portal for organic produce. Advocacy campaign will be launched for including support to environmentally oriented FPOs in the "Start-up India Mission" which aims to nurture youth and women entrepreneurs. Strengthening the opportunities to mobilize funding through engagement of corporates and industries, through utilization and adoption of global and national

best practices and innovative technological solutions for achievement of LDN (**Output 2.5**). The feasibility of these enterprises, the interest of the community, capacity needs and availability of service providers will be assessed during the PPG stage and a number of suitable value chains will be identified and developed.

***Component 3. Monitoring system for SLM and LDN indicators, gender-mainstreaming, knowledge management, evaluation and project reporting, national outreach, and South-South cooperation***

**Outcome:** Improved monitoring system, gender mainstreaming and capacity for LDN monitoring, assessment and reporting to UNCCD in support of LDN target setting and evaluation of capacities of partners; allowing government institutions and other agencies to better document, analyse and disseminate effective intervention strategies for restoring productive landscapes and replication of best practices at national and state level, and at international level through improved South-South cooperation.

Under Component 3, the project will support learning, including through South-South cooperation. For monitoring and knowledge management of the project components, a web portal will be created using Realtime and localized data detailing progress, impact and interventions on water, soil and land restored. The portal would feature mapping assessment of existing government schemes on land degradation and financial gap assessment outlined to elucidate available resources and information on land degradation in a collated and cohesive manner to determine solutions for government partners, research institutions, etc. (**Output 3.1**). Local knowledge and scientific-based evidences related to land management and use will be documented and improved, knowledge sharing and capacity building resource centers will be established at state and district level (**Output 3.2**). Project's innovative practices, lessons and knowledge generated will be codified, documented and disseminated under this output that will contribute to learning and facilitate replication and scaling up in other parts of the country and beyond in terms of mainstreaming biodiversity and sustainable land use practices.

Communication, education and public awareness are the key to mainstreaming biodiversity across sectors and implement priority biodiversity actions with involvement of all stakeholders. This would also ensure that concerns of sustainable land management and ecosystem services are mainstreamed in decision making at all levels. In order to ensure awareness and enhance understanding among range of stakeholders, a communication strategy and awareness programmes, comprising of methods, tools and approaches for raising awareness of relevant stakeholders on SLM, biodiversity conservation and climate change mitigation will be developed (**Output 3.3**). Special action will be targeted towards youth, where youth interns including 50% of which would be women, will be trained. A web-based portal will be established at national level with pages for each state to ensure maximum coordination and sharing of information about the overall SLM programme. This will have access to all policies, plans, guidelines, technical documentation, as well as information on capacity building and events. Potential partnerships with people's movements/grassroots movements (e.g. Art of Living, Isha Foundation), will be explored during the PPG phase, as a potential mechanism to amplify project reach and impact through outreach/social awareness-raising dialogues and extension support to recognize and empower local farmer leaders, including the role of women farmers as champions of sustainable land management.

Replication and uptake will also be supported by the development of partnerships and outreach to strengthen grassroots adoption of climate resilient SLM practices and support scaling up across India. Gender mainstreaming will be explicitly considered within project knowledge management. In addition to the formal training proposed under the previous Output, project will develop a strong knowledge base and knowledge sharing mechanism among professionals and practitioners, and to ensure maximum outreach of the knowledge that has been gained. During the inception phase, the project will develop a monitoring and information systems for knowledge management and outreach plan documenting targeted research on impacts, trade-offs, costs-benefit analysis of restoration, and identifying incremental synergies. Replication and uptake will also be supported by the development of partnerships and outreach to strengthen grassroots adoption of climate resilient SLM practices addressing country's commitments to LDN targets and support scaling up experiences under Component 2 and amplify them within and outside of target states. This will be facilitated through multi-media communications, outreach and social media to reach influential actors involved in Sustainable Development Goals, international environment conventions, food security and agricultural development initiatives; and will provide support for national participation in national and international meetings and conferences for cross-learning (Output 3.3).

In order to further develop scientific approach and facilitate induction of technology to land degradation issues, India has decided to set up a "Centre of excellence on Sustainable Land Management" at Dehradun-based Indian Council of Forestry Research and Education (ICRFRE), under the overall guidance and support from MoEF&CC (as announced by The Honourable Prime Minister of India, Shri Narendra Modi, while inaugurating the High-Level Segment of Conference of Parties to the UNCCD, on the 9<sup>th</sup> of September, 2019). Accordingly, GEF funds will be contributing to facilitate the establishment of a Centre of Excellence for South-South cooperation for capacity building and dissemination of best practices for cross-learning through exposure visits, development of course curriculum and its implementation in coordination with international alliances and engagement and contributions to global knowledge platforms (e.g., participation in virtual and physical knowledge and learning events of Global Landscapes Forum and GEF Sustainable Forest Management drylands impact program), to address UNCCD global agenda (**Output 3.4**).

The project will also establish an effective M&E system that adheres to GEF requirements, enables effective evaluation of project progress and impact that is inclusive of the needs of women and opportunities to strengthen gender mainstreaming through project activities. Monitoring and evaluation plans will be developed to assess project impacts (**Output 3.5**).

#### 4) **Alignment with GEF focal area and/or Impact Program strategies**

The LD Focal Area strategy in GEF-7 has three main goals, the first of which is described as "aligning GEF support to promote UNCCD's Land Degradation Neutrality (LDN) concept through an appropriate mix of investments". The project will support this goal through close alignment with the UNCCD Scientific-Conceptual Framework for Land Degradation Neutrality and as summarized in the Checklist for Land Degradation Neutrality Transformative Projects and Programmes (LDN TPP). Specific elements of the latter, and corresponding aspects of project design, are presented in the section on Consistency with national priorities.

In alignment with *LD-1-1 Maintain or improve flow of agro-ecosystem services to sustain food production and livelihoods through Sustainable Land Management*, the project will focus on production landscapes where agricultural and rangeland management practices underpin the livelihoods of poor rural farmers and pastoralists. The Strategy's emphasis on sustainable management of drylands in arid and semi-arid zones addressing, among other issues, drought-prone ecosystems and populations, is met by various project activities and by the project's placement at the interface of arid and semi-arid zones. In line with the GEF-7 strategy, the project will include support and access to finance and technical assistance for smallholders and small businesses. Strategies pursued with the private sector will target SMEs that are promoting innovations in agriculture and livestock production systems.

Finally, the project will include support for South-South cooperation, in line with GEF guidance on this subject and *LD-2-5 Create enabling environments to support scaling up and mainstreaming of SLM and LDN*. This will be primarily through support for the centre of excellence which will facilitate and enhance South-South cooperation, and through partnerships with grassroots champions and people's movements allowing transfer of knowledge and techniques across India and beyond.

*The STAP LDN: guidelines for GEF projects* have been used to inform the development of this PIF and will be used during the PPG phase, in particular for (i) the need for concerted and coordination effort to integrate LDN into land use and land management (Outputs 1.1 and 1.3); (ii) maintenance or enhance land-based natural capital (Outputs 2.2 and 2.3); (iii) protecting the rights of marginalized and vulnerable land users (Output 1.5); (iv) integrating planning and implementation of LDN into existing land-use planning processes (Output 2.1); (v) seek solutions that provide multiple environmental economic and social benefits (Outputs 2.2 and 2.3); (vi) apply a participatory process in designing and implementing LDN interventions (Output 1.3); (vii) apply local knowledge and data to validate and interpret data (Outputs 3.1 and 3.2) and (viii) apply a continuous learning approach to review and adjust plans (Output 3.5). This will inform subsequent assessments and the detailed design of project activities. Refer Section 7 (national priorities) for further discussion of alignment with LDN guidelines.

The project will also pilot solutions and actions for biodiversity conservation through restoration and protection of degraded agriculture lands, forests and pasture lands. This will be achieved through a range of practices including (i) strengthening of Biodiversity Management Committees (BMCs) across project villages, developing and strengthening electronic Peoples' Biodiversity Registers (e-PBR), establishment of People's Biodiversity Groves (PBGs).

##### 5) Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing:

**Table 1: Incremental cost reasoning**

Baseline practices	Alternative to be put in place	Global environmental benefit
<i>Policy, planning and institutional shortcomings: LDN is a newly introduced concept and significant effort will be re</i>	Improved state and district-level development and land use planning proce	317,000 ha under improved management practices including: (a) advers

quired to mainstream its methodologies, monitoring and objectives into existing plans, policies and programs. Current policies and plans are based along sector boundaries and there is a lack of coherence in policies focused on or related to sustainable land management and achievement of LDN.

*Coordination issues:* Several governmental agencies are managing programmes with implications for land degradation and desertification (see description of baseline projects under 2 below). Coordination amongst these agencies and even between programs managed by the same agency, is essential when pursuing a multi-faceted objective like LDN. Related issues may involve coordination among districts and in some cases, states. Given the project's cross-cutting, landscape-level remit, insufficient coordination poses an important barrier to achieving LDN

*Technical constraints:* There is a wide variety of technical constraints / barriers limiting the ability of land users and land managers to pursue productive ventures sustainably - whether such activities take place on agricultural, grazing or forest lands. Box 1 below presents examples in the case of agro-forestry pursuits

*Knowledge constraints:* In a context where multiple institutions are developing local, on-the-ground interventions, there are ample, largely untapped opportunities to capture and share experience and lessons learned and to apply these to

assessments based on mainstreaming of Land Degradation Neutrality (LDN) targets and a landscape-level monitoring system.

- Multi-stakeholder coordination platforms will ensure enhanced coordination and rationalization of efforts by private and public sectors and civil society.

- Improved practices are being applied to land use management of croplands, pastures and forest lands within the landscape, under the overall guidance of participatory LDN strategies

- Technical and practical data, information, knowledge and innovation is moving rapidly at multiple geographic levels and is thus increasingly available for uptake, and application in ways that reduce land degradation and desertification.

changes in the quality of non-degraded land and forest avoided on 209,000 ha through improved practices and technologies (114,000 ha of agricultural lands, 50,000 ha of grasslands and shrub and 45,000 ha of forests) and (b) 108,000 ha of land currently undergoing degradation or degraded restored (76,000 ha of agricultural land and 32,000 ha of natural grass and shrublands). Direct carbon sequestration benefits estimated at 6,793,648 tCO<sub>2</sub>eq over a 20-year period, with indirect benefits to flow from replication and policy uptake

- Biodiversity benefits associated with management of existing forests

- Additional areas of land brought under improved management practices through replication and local outreach – at least 5 further districts targeted – and through project engagement in global knowledge platforms for restoration to share/exchange lessons and best practices with other countries, facilitating south-south cooperation and global learning.

<p>the development of national strategies as well as to more localized situations. Knowledge regarding successful approaches is limited based on a combination of factors, including limited lesson capture and poor communication/ dissemination of successful and efficient outcomes. In addition, knowledge of successful approaches, techniques, tools and strategies often fail to be applied to potentially analogous situations</p>		
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#### 6) Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF):

The proposed project has global, national and local benefits and these benefits are closely linked. The project will demonstrate synergy between the goals and targets of UNCCD, CBD, UNFCCC and Sustainable Development Goals (SDGs), promoting the achievement of LDN and NDCs in three states in India (Gujarat, Karnataka and Maharashtra) across degraded forest land, pastureland and cropland that are important to meet commitments under these conventions. Project's global environmental benefits will include: (i) improved ecosystem stability and productivity, by adopting sustainable land management practices, and the restoration and subsequent protection of degraded ecosystems for enhancing their structural and functional stability, while improving the livelihood of local communities; (ii) improved carbon sequestration, which would be achieved through the adoption of sustainable agriculture and rangeland/pasture management practices and the restoration of degraded vegetation in areas currently used for livestock production, as well as through promoting afforestation; (iii) conservation of existing forests that could benefit biodiversity and watershed functions and ameliorate climate impacts; and (iv) meeting India's obligations under UNCCD as well as CBD, UNFCCC and multiple SDGs and Aichi targets through cross-sectoral interventions and integrated management of land resources (see Section 7).

This proposed project will deliver the following global environmental benefits

- Area of landscapes under improved management practices on 209,000 ha in select districts including, 114,000 ha of agricultural lands, 50,000 ha of grasslands and shrub and 45,000 ha of forests
- Area of degraded or degrading land restored covering 108,000 ha, including 76,000 ha of agricultural land and 32,000 ha of natural grass and shrublands
- Carbon sequestration benefits calculated at an estimated 6,793,648 tCO<sub>2</sub>e (tbc) over a 20-year period;
- Via Component 2 the project is likely to result in replication of project approaches across India, resulting in additional achievement of land under improved management, and associated tCO<sub>2</sub>e – across at least an additional 5 districts. The project will also seek to contribute technical best practices and lessons learned to global knowledge platforms to strengthen global knowledge exchange and replication on restoration. These replication contributions will be quantified during the PPG phase and reported at the time of CEO Endorsement;
- Biodiversity benefits associated with management of existing forests; and
- The restoration potential of the proposed interventions in the diverse landscapes of agricultural lands, grasslands and forestlands would contribute to global LDN targets.

The National Benefits generated from the project will include:

- Implementation of National Action Programme (NAP) to combat desertification and mainstreaming SLM principles into national policies and plans;
- Improved economic productivity through sustainable management practices, including efficient use of water resources which would lead to rise in water table, introduction of soil conservation measures to improve soil fertility, introduction of integrated management of land resources to secure sustainability of restored landscapes, and introduction of land use planning to mitigate the drivers of land degradation such as agriculture, overgrazing, wastelands, and deforestation;
- Conservation and enhance use of local agrobiodiversity in production systems
- Sustainable livelihood opportunities for rural communities and reduced poverty through benefits derived from ecosystem “goods and services” associated with improvement in land management;
- Improved policy and planning framework to support sustainable land management concepts and practices;
- Enhanced institutional strengths and human-resource capacity to promote sustainable use of natural resources; and
- Improved management skills at the local level through participatory learning and actions and involvement of local communities in decision-making processes for making on-the-ground investments for building social infrastructure and promoting SLM practices.
- Interventions would contribute to the achievement of India’s LDN target to restore 26 million hectares by 2030.

## 7) Innovation, sustainability and potential for scaling up

**Innovation:** Project strategies are based on a novel approach of multi-stakeholder engagement and stewardship that have not been adequately applied before in India for sustainable land management and combating land degradation and desertification. The project will engage communities in achieving LDN and NDCs by empowering community-level institutions as well as governmental stakeholders from different administrative levels (States, districts) and institutional mandates (see Section above on baseline projects for key institutions) that are directly or indirectly involved in achieving LDN and NDCs but which in many cases work within institutional silos. In addition, with support from UNDP’s newly established India Accelerator Lab in collaboration with other international platforms for SLM and all relevant stakeholders, the project will mainstream improved alternative sustainable land management practices and technologies to validate their potential to accelerate development.

**Sustainability:** The project has been designed to promote social, environmental and economic sustainability. Environmental and social sustainability are the main objective of the project, and were assessed through application of UNDP’s “Environmental and Social Screening procedure”. Socially, it will increase access for large number of farmers to extension/information services and best practices, empowering them to make decisions about their land use planning and management/implementation of SLM/CSA practices. The project will strengthen the capacities of organizations, including cooperatives and producer associations with the training of their field agents as facilitators (at least 30% women) and youth on SLM/CSA practices and synergies with biodiversity, storage of organic carbon, rational use of water and its importance to improve local livelihoods. Economically, the project will promote the beneficiaries’ access to innovative financing/mechanisms to adopt/replicate SLM/CSA practices for key crop production systems and livestock systems as well as it will provide assistance to improve the productive capacity of the land, as well as advice, information and guidance that will help integrate sustainable food value chains, so as to strengthen business capacity in the areas of implementation and consequently increase income of the beneficiaries. As such, it will generate

new and innovative approaches to multi-sector land use planning based on testing activities of MOAFW and MOEFCC and opportunities for scaling up best practices will also be explored in the context of India's sharing of experiences with other countries and UNCCD, through strengthening "Center of Excellence". The joint efforts of GoI, UNCCD and the Global Mechanism will make the know-how and financial tools available to countries in need of such support.

Extensive multi-stakeholder participation through district and area-wide platforms will further support sustainability by helping to create multiple institutional champions. In order to ensure long-term sustainability, the up-scaling SLM program envisages supporting collaboration and linkages between the Desertification cells in each of the three State Planning and Development Departments under the overall coordination of the national Desertification cell of the MOEFCC. A provision has been made to establish these cells towards the end of the 1<sup>st</sup> year of the project implementation so that the units are fully embedded in the system and are able to run effectively after the close of the programme. Capacity building is a major thrust of the project, so both short-term and long-term plans to strengthen technical expertise and capability for all involved, have been recommended. Capacity building of government staff and others is expected to be institutionalized and continued after the project. Securing the institutional sustainability of the project's impacts will be promoted by developing the technical capacities at relevant levels, in all the participating institutions. The capacity building activities, networking and continuous field-level presence by the management agencies (state, private and civil society) will help achieve social sustainability of the project. The build-up of trust through dialogues and stakeholder consultations, and stakeholder mobilization through capacity building by the project will assist in achieving this long-term objective. The strong focus on building local knowledge, capacities and incentives and ensuring gender equity are expected to lead to social sustainability. Finally, efforts to demonstrate the cost effectiveness of investments (particularly in prevention) and the viability of different SLM techniques and technology-based energy efficient solutions will provide an economic logic in support of sustainability and facilitate enhanced State government adoption and investment in providing incentives for SLM including transitional support for smallholder farmers to adopt improved land management practices. The financial sustainability of the project's impacts will be further assured by the project's focus on a business-based approach to SLM. The ideal situation is to develop the business aspect of the project into activities so that in the long-term, these same activities will become self-supporting and independent of external funding.

**Scaling up:** The project has been designed to ensure that its actions can be widely replicated within India. The cost-effectiveness, as well as institutional, social and environmental sustainability factors mentioned above is expected to contribute to the replication of the project's approaches. In addition, the project will ensure that activities, impacts and lessons learnt are recorded and disseminated widely within the country (and internationally through GEF and UNDP knowledge management mechanisms) to generate a bottom-up demand for similar activities throughout the country. The involvement of NGOs and the private sector in the project activities are also expected to lead to further replication of the project's actions in India. One of the strongest mechanisms for wider replication of the project's activities nationally will be through the incorporation of SLM consideration in the development of participatory community development plans through '*Gram Panchayat*' development programme. GEF support under Component 2 is focused on demonstrating technical solutions to achieving LDN and NDCs within select pilot districts of the three states (Gujarat, Karnataka and Maharashtra). Project success will therefore require a careful, ongoing process of lesson learning and scaling up, to ensure that the hopefully positive aspects across the demonstration landscape of selected districts can be quickly taken up by remaining districts, as well as to other states. The role of district-level platforms in this regard will be critical. In addition, Component 3 is focused on using knowledge exchange and outreach to facilitate wide replication and uptake of SLM and climate mitigation practices. Through support of the Centre of Excellence, the project will be able to draw on pre-existing experiences in order to amplify and accelerate their uptake. This will focus on supporting replication across India with some targeted South-South Cooperation in thematic areas relevant to the project, e.g. knowledge exchange across drylands systems. The project will also seek to engage and contribute to existing SLM/restoration global knowledge platforms (e.g. webinars, virtual learning events, contribution of best practices and technical studies to knowledge databases) to help replicate project best practices and approaches in other dryland

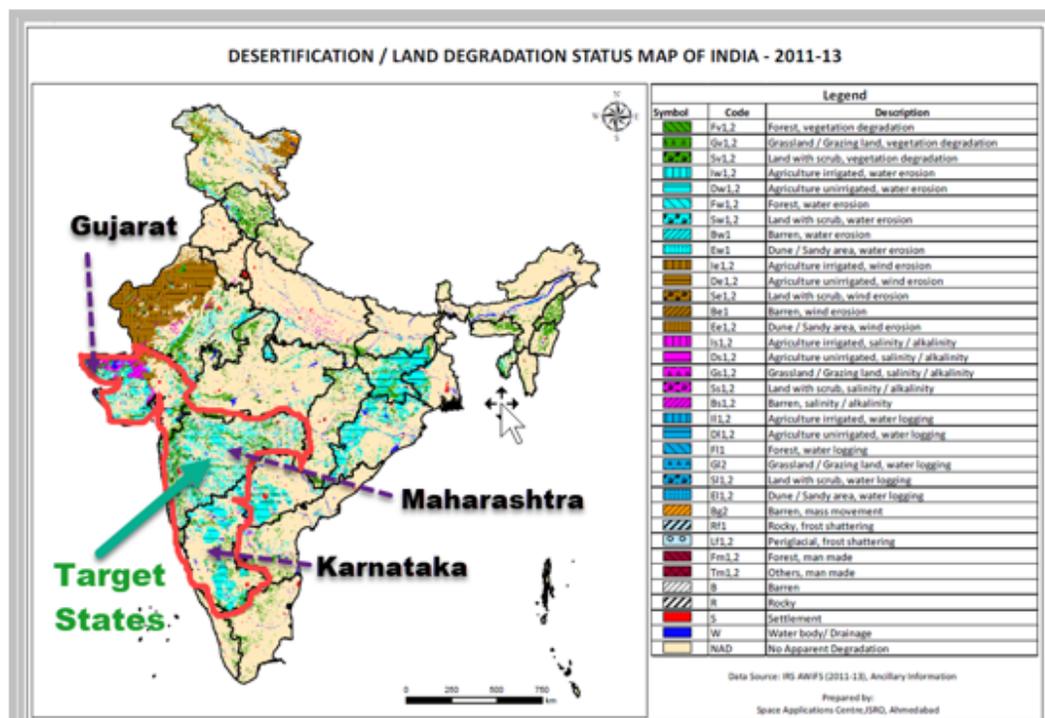
systems. Specific opportunities for coordination with the GEF SFM drylands impact program global knowledge platform and with the Global Landscapes Forum will be determined during PPG. Replication across India will also be supported by the use of grassroots champions and people's movement partnerships to help build a groundswell of farmer support for SLM and restoration and climate mitigation, offering further project impact and land under improved management practices.

**1b. Project Map and Coordinates**

**Please provide geo-referenced information and map where the project interventions will take place.**

Geo-referenced information and maps (Fig 2 to 5) where the project interventions will take place are shown below. More details about the specific site details at landscape level are presented in Annex A.

Project target sites	Latitude	Longitude
Country - India	8°4' to 37°6' North	68°7' to 97°25' East
State - Gujarat	23.00 North	72.00 East
District - Kachchh	23°25' North	71°20' East
District - <u>Banaskantha</u>	24° 12' North	72° 28' East
State - Maharashtra	20° 00' North	76° 00' East
District - <u>Nandubar</u>	21° 23' North	74° 19' East
District - Aurangabad	19° 53' North	75° 23' East
State - Karnataka	15° 00' North	75° 00' East
District - Bagalkot	16° 12' North	75° 45' East
District - Kodagu	14° 49' North	76° 16' East



**Fig 2.** Country map indicating status of land degradation across three selected states (Gujarat, Maharashtra and Karnataka).

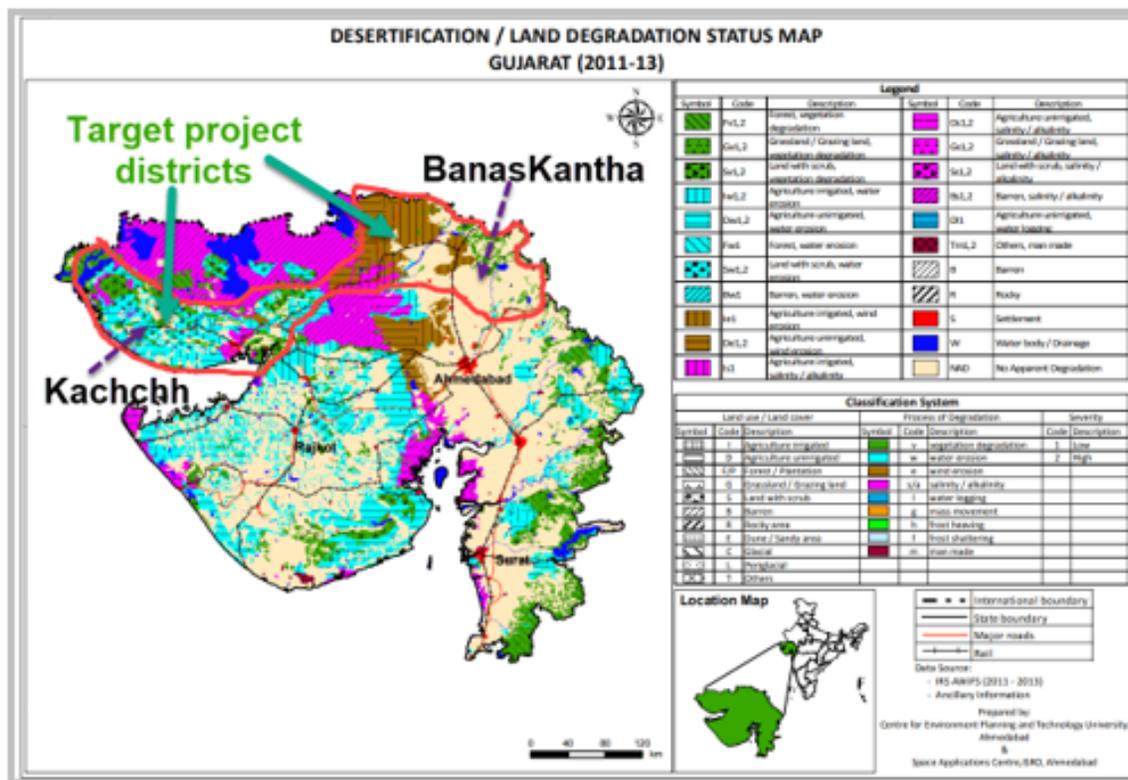
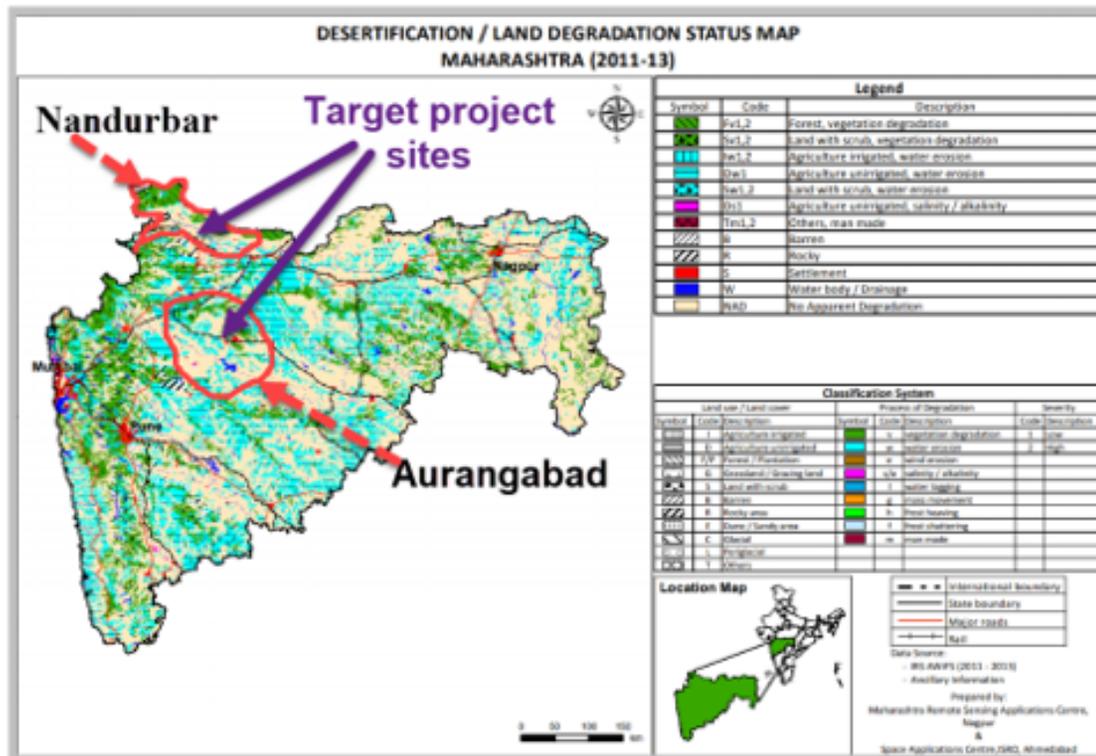


Fig 3. State map of Gujarat indicating status of land degradation across two selected districts (Kachchh and Banaskantha).



**Fig 4.** State map of Maharashtra indicating status of land degradation across two selected districts (Nandurbar and Aurangabad).

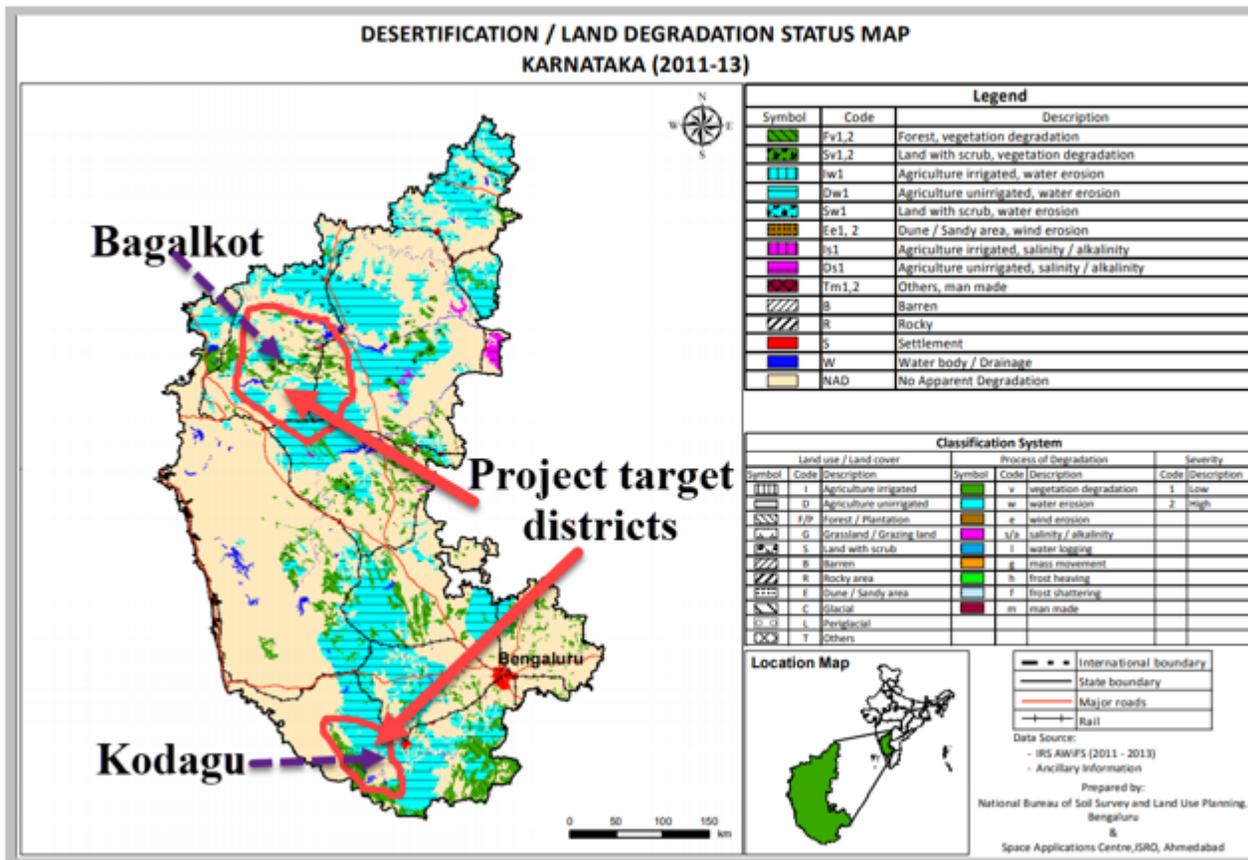


Fig 5. State map of Karnataka indicating status of land degradation across two selected districts (Bagalkot and Kodagu).

## 2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

**Indigenous Peoples and Local Communities**

**Civil Society Organizations** Yes

**Private Sector Entities** Yes

If none of the above, please explain why:

**In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement**

The proposed project follows a cross-sectoral and participatory approach, requiring involvement of different stakeholders in implementation at national, state, district and local levels. Accordingly, a wide range of stakeholders will be involved in the implementation of the Project, including relevant central and state ministries, state planning and development departments and line departments, local communities (farmers, livestock herders, and forest communities), research institutions, NGOs, Community Based Organizations (CBOs), private sector and the donor community. Several NGOs and CBOs also operate on the ground across the target project states and have been active in creating awareness among local communities on land degradation and desertification and providing assistance for various SLM-related initiatives. Some of these organizations could also be involved in the field implementation of project interventions in the selected districts under the up-scaling project.

Discussions have been held with the Ashoka Trust for Research in Ecology and the Environment (ATREE), EDF Group, Bioversity International, World Resources Institute (WRI), Bharatiya Agro Industries Foundation (BAIF), Central Arid Zone Research Institute (ICAR-CAZRI), Central Research Institute for Dryland Agriculture (CRIDA), Indian Institute of Science (IIS), National Remote Sensing Centre (NRSC), GIZ, Federation of Indian Chambers of Commerce & Industry (FICCI), Confederation of Indian Industries (CII), Ministry of Rural Development (MoRD), SM Sehgal Foundation, ICFRE, National Bureau of Soil Survey and Land Use Planning (NBSS &LUP), National Bureau of Plant Genetic Resources (ICAR-NBPGR), National Bank for Agriculture and Rural Development (NABARD), Watershed Organisation Trust (WOTR) and the Ministry of Tourism. Within the private sector, UPL and Jain irrigation have already shown interest in partnering on the project. Outreach has already been made to State departments in order to ensure connection with the targeted groups & beneficiaries involved. Bilateral consultations have continued as the PIF was drafted and reviewed.

At the PIF stage, consultations with indigenous peoples/tribal communities and local communities couldn't be undertaken because of the series of covid waves that India has experienced in 2020 and 2021, and has interrupted the bottom up process. UNDP is well aware of, and fully committed to, having meaningful, timely, accessible and understandable consultations with indigenous people and local communities, as well as establishing FPIC with indigenous people, when it is safe to do so. Preliminary consultation with the local communities are planned during the PIF review stage, and a detailed consultations will be undertaken at the PPG stage.

A preliminary assessment of project stakeholders that have potential interest in the project and will be consulted during the PPG is provided in Table 3 below:

Table 3: Stakeholder Engagement Plan

Stakeholder	Proposed roles in the Project
<b>Government (Centre and State)</b>	
Ministry of Environment, Forest and Climate Change (MoEFCC) (Executing/Implementing Partner)	The project will be executed by the Ministry of Environment, Forest and Climate Change (MoEFCC). The MoEF&CC has committed to increasing forest cover on 26 million hectares of degraded land under the Bonn Challenge and to create an additional carbon sink for 2.5 to 3 billion tonnes of CO <sub>2</sub> eq by 2030. The function of the Mo

	EF&CC in the project will be focused on increasing forest cover and securing wildlife corridors along with eco-sensitive zones.
National Biodiversity Authority	The National Biodiversity Authority (NBA) was established in 2003 by the Central Government to implement India's Biological Diversity Act (2002). The NBA is a statutory body that performs facilitative, regulatory and advisory functions for Government of India on the issues of conservation, sustainable use of biological resource and fair equitable sharing of benefits of use. The NBA will be one of the responsible parties for successful implementation of various components of the project including establishment of knowledge resource centres and development of a national framework for e-PBRs.
Ministry of Jal Shakti (MoJS) earlier known as Ministry of Water Resources	MoJS was formed to support the movement towards water conservation at the grassroots level. MoJS will provide support under the irrigation programs, including micro-irrigation (drip and sprinklers) under Pradhan Mantri Krishi Sinchayee Yojana (PMKSY). MoJS will also provide support through its role on increased security in prioritized water stressed districts of India and providing sewage to energy services.
Ministry of Rural Development (MoRD)	Department of Land Resources, Ministry of Rural Development, will support the project through the watershed development component of the Pradhan Mantri Krishi Sinchayee Yojana. The MoRD is also the implementing agency for the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), which aims to enhance livelihood security in rural areas by providing at least 100 days of guaranteed wage employment a year to every household whose adult members volunteer to do unskilled manual work (e.g. soil and water conservation, afforestation, and land development).
Ministry of Tribal Affairs (MoTA)	MoTA will support the project through Van Dhan Vikas Karyakram of TRIFED program. Van Dhan Vikas Karyakram of TRIFED seeks to improve tribal incomes through value addition of tribal products. Under the scheme, ten Self Help Groups of 30 Tribal gatherers are trained and provided with working capital to add value to the products, which they collect from the forests. Working under the leadership of Collector these groups can then market their products not only within the States but also outside the States. Training and technical support is provided by TRIFED. It is proposed to develop 3,000 such centres in the country during the Financial Year April 2019 to March 2020 (F.Y.2019-20).
The Ministry of Agriculture and Farmers Welfares (MoA&FW)	The MoA&FW is the authority issuing the Soil Health Card, one of the tools being used to address challenges in the agricultural sector. The MoA&FW commits to doubling farmers' incomes through farm-linked activities and secondary agriculture income generation tools such as agroforestry, bamboo cultivation and agro-tourism

	activities.
Ministry of Fisheries, Animal Husbandry and Dairying	<p>The Ministry is responsible for matters relating to livestock production, preservation, protection from diseases and improvement of stocks and dairy development. Advises State Governments/Union Territories in the formulation of policies and programs in the field of Animal Husbandry and Dairy Development. The main thrust areas are: (i) Development of requisite infrastructure in States/UTs for improving productivity,</p> <p>(ii) Preservation and protection of livestock through provision of health care and,</p> <p>(iii) Strengthening of Central livestock farms (Cattle, Sheep and Poultry) for development of superior germ plasm for distribution to States.</p>
Ministry of Science and Technology	Objective of the Ministry is promoting new areas of Science & Technology, including in the field of agriculture, and to play the role of a nodal department for organizing, coordinating and promoting S&T activities in the country.
The Ministry of Ayurveda, Yoga & Naturopathy, Unani, Siddha, Sowa Rigpa and Homoeopathy (MoAYUSH)	MoAYUSH promotes primary healthcare on AYUSH and increasing sustainable supply of AYUSH raw materials. More than 80% of the raw materials used in the A, U, S and H systems of medicine come from the wild. Accordingly, medicinal plants cultivation in farms, or on farm bunds and in forest areas, can lead to carbon sequestration through increased afforestation while providing additional livelihoods to the locals. MoAYUSH will support the project through its National AYUSH Mission.
Ministry of Statistics and Programme Implementation	The Ministry of Statistics and Programme Implementation attaches considerable importance to coverage and quality aspects of statistics released in the country. The statistics released are based on administrative sources, surveys and censuses conducted by the center and State Governments and non-official sources and studies. The surveys conducted by the Ministry are based on scientific sampling methods.
Ministry of Commerce and Industry	The Ministry of Commerce and Industry administers two departments, the Department of Commerce and the Department for Promotion of Industry & Internal Trade. The Ministry formulates, implements and monitors the Foreign Trade Policy (FTP) which provides the basic framework of policy and strategy to be followed for promoting exports and trade. The Trade Policy is periodically reviewed to incorporate changes necessary to take care of emerging economic scenarios both in the domestic and international economy. Besides, the Department is also entrusted with responsibilities relating to multilateral and bilateral commercial relations, Special Economic Zones, state trading, export promotion and trade facilitation, and development and regulation of certain export oriented industries and commodities.

MINISTRY OF Panchayati Raj	MINISTRY OF Panchayati Raj is responsible for the work of advocacy for and monitoring of the implementation of Constitution 73rd Amendment Act the Provisions of the Panchayats (Extension to Scheduled Areas) Act 1996. The Ministry functions with an intention to transform the governance landscape by ensuring participation of citizens in policy making and providing ease of access to information to the citizens, through the introduced the National e-Governance Plan (NeGP) in 2006. The vision of the NeGP was to "Make all Government services accessible to the common man in his locality, through common service delivery outlets and ensure efficiency, transparency & reliability of such services at affordable costs to realise the basic needs of the common man." e- Panchayat is one of the Mission Mode Project (MMP), currently being implemented with a vision to empower and transform rural India.
National Bank for Agriculture and Rural Development (NABARD)	NABARD is India's apex development bank. NABARD will support the project providing a representative to state-level expert consultative group to steer/guide implementation of assessment findings. Moreover, NABARD will provide co-finance through rural financing and lending to Self-Help Groups especially women self-help groups.
Local State Institutions for Gujarat, Karnataka and Maharashtra	<p>Since the project will be anchored in three states, partnership will be forged with the relevant departments in each state and district government. State actors may include the following:</p> <ol style="list-style-type: none"> <li>1. State Biodiversity Boards</li> <li>2. Directorate of Economics and Statistics</li> <li>3. Agriculture &amp; Co-operation Department</li> <li>4. Climate Change Department</li> <li>5. Forests and Environment Department</li> <li>6. Industries and Mines Department</li> <li>7. Narmada and Water Resources, Water Supply and Kalpsar Department</li> <li>8. Panchayats and Rural Housing Department</li> <li>9. Ports and Transport</li> <li>10. Roads and Buildings Department</li> <li>11. Science and Technology Department</li> <li>12. Urban Development Department</li> </ol>
<b>Research Organisations and Institutes (under the Central Government)</b>	
Indian Council of Agricultural Research (ICAR)	ICAR coordinates agricultural education and research activities as an autonomous body. Their mandate is to undertake, coordinate and promote research and technology development for sustainable agriculture. They can engage with the local populace for

	frontline extension for technology application, adoption, knowledge management and capacity development for agri-based rural development.
Indian Council of Forest Research and Education (ICFRE)	ICFRE conducts forestry research; transfers the technologies developed to the states of India and other user agencies and delivers forestry education. The council has nine research institutes and four advanced centres catering to the research needs of different bio-geographical regions.
Forest Research Institute (FRI)	Forest Research Institute Dehradun is among the oldest institutions of its kind and acclaimed the world over. The institute's history is virtually synonymous with the evolution and development of scientific forestry, not only in India, but over the entire sub-continent. It is an institute of the Indian Council of Forestry Research and Education and is a premier institution in the field of forestry research in India. Will be consulted and invited to provide technical inputs to PPG.
Arid Forest Research Institute (AFRI)	Arid Forest Research Institute (AFRI) is a research institute situated in Jodhpur, Rajasthan, India. The institute conducts scientific research in forestry in order to provide technologies to increase the vegetative cover and to conserve biodiversity in the hot arid and semi-arid regions of Rajasthan and Gujarat. It operates under the Indian Council of Forestry Research and Education (ICFRE) of the Ministry of Environment and Forests, Government of India. Will be consulted and invited to provide technical inputs to PPG.
National Bureau of Soil Survey and Land Use Planning (ICAR-NBSSLUP)	Under Indian Council of Agricultural Research (ICAR). It undertakes research & development in soil resource inventory and land use planning at different levels.
Central Arid Zone Research Institute (ICAR-CAZRI)	CAZRI's mandate is to conduct basic and applied research on sustainable farming systems in arid ecosystems. CAZRI maintains a repository of information on the state of natural resources and desertification processes and supports transfer of location-specific technologies infrastructure.
Indian Grassland and Fodder Research Institute (ICAR-IGFRI)	IGFRI, a national Institute under the administrative control of ICAR, is mandated to conduct basic, strategic, applied and adaptive research; development and training in forage production and its utilization. The Institute has highly experienced and internationally trained human resources engaged in need-led, participatory, inter-disciplinary approaches. With more than 50 years of experience in forage research and development, IGFRI today stands as the premier R&D institution in South Asia for sustaina

	ble agriculture through quality forage production for improved animal productivity.
Central Agroforestry Research Institute (ICAR-CARI)	To conduct basic, strategic and applied research on agroforestry National Research Centre for Agroforestry (NRCAF) was established in the year 1988 at Jhansi, which was upgraded as ICAR-Central Agroforestry Research Institute (ICAR-CAFRI), as agroforestry has the potential to achieve sustainability in agriculture, while optimizing its productivity and mitigating climate change impact. The Institute has strengthened its research activities and significant achievements of agroforestry research undertaken through the in house and external funded projects, network and inter-institutional collaboration, technology demonstrations and capacity building has paved the way for its recognition and upgradation.
Indian Institute of Soil and Water Conservation (ICAR-IISWC)	The ICAR-Indian Institute of Soil and Water Conservation (ICAR-IISWC), (Formerly CSWCRTI) was established in 1974 with Headquarters at Dehradun. The Institute and its Research Centres have focused on evolving strategies for controlling land degradation following watershed approach, tackling special problems such as ravines, landslides, mine spoils and torrents, demonstration of technologies for popularization and imparting training besides developing technologies for water harvesting and recycling. Major focus on: (i) Research for management of land degradation in a primary production systems and rehabilitation of degraded lands in different agro-ecological regions of the country; (ii) Co-ordinate research network for developing location-specific technologies in the area of soil and water conservation; and (iii) Centre for training in research methodologies and updated technology in soil and water conservation and watershed management.
State Agricultural Universities (SAUs): will be closely involved for various research and extension activities of the project.	In India, the first SAU was established in 1960 at Pantnagar in Uttar Pradesh. The SAUs were given autonomous status and direct funding from the state governments. They were autonomous organizations with state-wide responsibility for agricultural research, education and training or extension education. The establishment of the SAUs, based on a pattern similar to that of the land-grant universities in the United States, was a landmark in reorganizing and strengthening the agricultural education system in India. These universities became the branches of research under the ICAR and became the partners of the National Agricultural Research System (NARS). The green revolution, with its impressive social and economic impact, witnessed significant contributions from the SAUs, both in terms of trained, scientific work force and the generation of new technologies. The project will work with the following SAUs: <ul style="list-style-type: none"> <li>· Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Banaskantha, Gujarat</li> </ul>

	<ul style="list-style-type: none"> <li>· Navsari Agricultural University, Navsari, Gujarat</li> <li>· Junagadh Agricultural University, Junagadh, Gujarat</li> <li>· University of Agricultural Sciences, Bengaluru, Karnataka</li> <li>· University of Agricultural Science, Dharwad, Karnataka</li> <li>· University of Horticultural Science, Bagalkot, Karnataka</li> <li>· Mahatma Phule Krishi Vidyapeeth (MPKV), Rahuri, Maharashtra</li> <li>· Vasantnao Naik Marathwada Krishi Vidyapeeth, Parbhani (VNMKV), Maharashtra</li> </ul>
<b>Private Sector</b>	
Entrepreneurs, companies and corporates	Entrepreneurs (individuals, partnerships, CSOs) – raw material availability, market linkages, market access, infra-structure Companies – meeting Environmental norms, raw materials, trained/skilled labour and access to infrastructure. Corporates – meeting Environmental norms, excess land management, raw materials and trained/skilled labour and avenues for investment and CSR funding.
Banks and NBFCs	Provide avenues for investments and access to credit worthy entrepreneurs
United Phosphorus Limited (UPL)	The project will partner with United Phosphorus Limited (UPL), which is a well-known Crop Protection company with PAN India presence. UPL works to improve farmers' lives across the country in almost all districts. UPL has extensive experience is managing Public-Private projects with Governments in states and in the country. UPL has pioneered into "Climate Smart Technologies" which enable agriculture in stressed environment – drought, high temperatures, poor soil conditions and other adverse conditions. UPL believes in an Integrated Pest Management approach to crop protection which in sense is striking balance between organic biological interventions with bio stimulants, biological controls and as well as specific optimal chemical control. UPL's involvement in the agricultural value chain extends across - Seed & Crop Establishment Crop Protection Plant Health Crop Management & Services Harvest & Food Waste Reduction. The UPL will support the project for demonstrating innovative and improved technologies in water management in agriculture, fighting soil degradation and desertification, afforestation and agroforestry.
Jain Irrigation Systems	Jain Irrigation Systems Ltd. (JISL) develops, manufactures, supports and sells diversified agriculture related products, such as micro-irrigation systems and its components, PVC and PE piping systems, greenhouses, bio-fertilizers, solar power, solar water-heating systems, solar water pumps, turnkey biogas plants, photovoltaic sys

	tems and tissue culture plants. JISL also processes dehydrated vegetables, spices, concentrated & frozen fruits or pulp. The corporate will help in addressing water-stress through use of micro-irrigation systems and other agri-related activities.
<b>International Research organisations</b>	
International Union for Conservation of Nature (IUCN)	The International Union for Conservation of Nature (IUCN) is an international organization working in the field of nature conservation and sustainable use of natural resources. It is involved in data gathering and analysis, research, field projects, advocacy, and education. IUCN's mission is to "influence, encourage and assist societies throughout the world to conserve nature and to ensure that any use of natural resources is equitable and ecologically sustainable".
World Resources Institute (WRI) India	World Resources Institute India (WRI India) will be the key technical partner to the project. WRI India, an independent charity legally registered as the India Resources Trust (IRT), provides objective information and practical proposals to foster environmentally sound and socially equitable development. Through rigorous research, analysis and recommendations, WRI India puts ideas into action to build transformative solutions that protect the earth, promote livelihoods, and enhance human well-being. The IRT has a license from WRI to use the trademark "WRI India". WRI India will mobilize their three national level technical working group that has representation from more than thirty institutions (including Strand Life Sciences, IUCN, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), M.S. Swaminathan Research foundation, Wildlife Institute of India, WWF-India, FES, Indian Institute of Forest Management (IIFM)) with expertise in the field of mapping and monitoring, finance and economics, and land, policy, gender and governance.
Alliance of Bioversity International and CIAT	The Alliance of Bioversity International and CIAT, one of the center of CGIAR, fosters a dynamic, integrated vision on agriculture, addressing the food system as a whole, and accelerating impact towards a food and nutrition secure future that protects and enhances humans and nature. Their science-based, results-oriented approach, also builds on new and existing partnerships, by catalyzing shared solutions; activating internal networking and knowledge sharing opportunities; and rolling out new business models with investors, the private sector, and disruptive innovators. Working in regional and localized contexts, they are bringing tangible benefits to the agricultural landscapes and the livelihoods of millions of families.
WWF India	WWF-India is one of India's leading conservation organizations. Established as a Charitable Trust in 1969, it has massed almost five decades of experience in the field. Having started with modest beginnings, the organisation has come a long way helped by

	the efforts of its founders and associates who volunteered their efforts to lend momentum to this movement in its initial years.
<b>Global initiatives</b>	
GEF SFM Drylands Impact Program, led by FAO	<p>FAO is the lead agency for the SFM drylands impact program involving Angola, Botswana, Burkina Faso, Kazakhstan, Kenya, Malawi, Mongolia, Mozambique, Namibia, Tanzania, and Zimbabwe. FAO will lead on the global coordination project and knowledge exchange platforms. This includes a focus on knowledge management and outreach, dissemination of science and best practices, and linkages to regional and global knowledge hubs such as the Global Landscapes Forum, the Global Soil Partnership, the World Overview of Conservation Approaches and Technologies, the Pastoral Systems Knowledge Hub and the Agroecology Knowledge Hub. This project will seek to participate in relevant knowledge management opportunities (e.g. open access webinars for restoration community). Further discussions with FAO will take place during the PPG phase (when the global project has been submitted for CEO</p> <p>Endorsement) to confirm these opportunities and the required activities/budget to be allocated in this project for participation and engagement.</p>
Global Landscapes Forum	GLF is the world's largest knowledge-led platform on sustainable landscapes, having connected 4,900 organizations and 190,000 participants at GLF events, and an overall reach of 770 million from 185 countries. GLF supports restoration initiatives such as AFR100, Initiative 20x20, Global Peatlands Initiative, Blue Carbon Partnership, Tropical Landscapes Finance Facility etc. Opportunities to align with GLF global knowledge platform for knowledge exchange, lessons learned and best practice replication will be explored further during the PPG phase.
<b>NGOs</b>	
Watershed Organisation Trust (WOTR)	WOTR supports participatory watershed development and ecosystem restoration, adaptive sustainable agriculture, integrated and efficient water management, and climate change mitigation, with a special emphasis on vulnerable communities, farmers and women.
Isha Foundation	Isha Foundation is a non-profit, spiritual organization founded in India in 1992, led by the founder Sadhguru, who is reported to be among the fifty most influential people in India. Efforts of Isha Foundation include training and extension with farmers, innovation through Isha model farm plots and empowering committed and passionate farmer leaders who form the core of the grassroots movement. In support of

	<p>Cauvery Calling, the Isha Foundation held many awareness campaigns covering 13 states, and has resulted in much groundswell support and engagement across Southern India for environmental issues. There is the opportunity for partnership for Isha Outreach to generate an India-wide social awareness dialogue on SLM and restoration to support the project and Gol Legacy Programme, particularly given Sadghuru's past engagement in fora such as Global Landscapes Forum and UNCCD. This partnership will be explored further during the PPG phase in consultation with executing partners.</p>
People's movements	<p>Such movements are usually guided by philosophies that perpetuate the larger good for society. Such organisations are plentiful in India and have a presence in most States across the country. Organisations such as the Art of Living, Brahma Kumaris are humanitarian and volunteer-based movements (along with Isha Foundation which is listed separately above). They have spearheaded work in Women Development, River Conservations, Health, and Forest &amp; River Rejuvenation. Utilising these movements as mechanisms to spread awareness about key issues hold immense potential. The movements that are anchored in the states identified in the project landscape can be vehicles of social and behavioural change. Engaging them as stakeholders hold immense potential for social outreach and awareness dissemination. There is good potential for partnerships with grassroots people's movement to generate India-wide social awareness dialogues on SLM and restoration, greatly benefiting the acceptance, implementation and success of the Gol Legacy Programme. Such partnerships will be explored further during the PPG phase.</p>
<b>Local communities</b>	
Local institutions (e.g. Gram Panchayats, Biodiversity Management Committees)	<p>Local institutions include Biodiversity Management Committees, Gram Panchayats, Eco-development Committees, SHGs and Farmers' cooperatives. The Panchayat (Extension to Scheduled Areas) Act, 1996 also known as PESA, was enacted to enable tribal self rule. PESA gives special powers to the Gram Sabhas in scheduled areas especially for the management of natural resources. Similarly, under the Biological Diversity Act, 2002, the panchayat can constitute a biodiversity management committee which will decide on matters related to access to bioresources and traditional knowledge. Local institutions in each district will be engaged in PPG consultations and also support consultations with communities.</p>
Communities	<p>Local communities have a heavy reliance on agriculture for livelihoods. Potential roles/relevance for local communities are:</p> <ul style="list-style-type: none"> <li>· Landless labour – new and additional sources of income from watershed activities, plantations, NTFP collection, processing of NTFPs, market linkages, green ski</li> </ul>

	<p>II development.</p> <ul style="list-style-type: none"> <li>· Marginal farmers – additional sources of income through solar pumps, rooftop solar, NTFP cultivation, timber and horticulture plantation on farm bunds, micro-irrigation and access to irrigation.</li> <li>· Large farmers – plantation of NTFP on farm bunds, solar pumps and roof-top solar, agri-tourism, water-shed activities.</li> <li>· Land barons – land-use planning, technical knowledge and capacity building on forest plantations, eco-tourism.</li> <li>· Gram Panchayats – grazing ground fodder cultivation, water-shed activities, converting sewage and kitchen waste to electricity and manure, roof top-solar, cooperative processing units for milk, agri-products and NTFPs.</li> <li>· Local communities will be engaged during PPG with consultations in each district at project sites.</li> </ul>
Indigenous groups / tribal communities	<p>There are indigenous groups / tribal communities within the demonstration landscape. For example, in Gujarat the population of Bhil tribe represents 46% of the total tribal population of the state. The population also includes members of sub tribes like Bhil Garasia and DholiBhil. Agriculture is the main occupation of Bhil community. Indigenous groups in the demonstration landscape will be engaged during the PPG phase to seek their inputs to project design. An engagement strategy is currently under development by a safeguards specialist to guide this consultation, including achievement of FPIC as required.</p>

### 3. Gender Equality and Women's Empowerment

**Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).**

Within the project landscapes, women make significant and increasing contributions towards agricultural production. For example in Gujarat, a 'feminisation of agriculture' is also observed with a rising share of farm work being completed by women, with some 65% of the female workforce employed in the agriculture sector compared to 44% of males (2011 census). Key involvement of women includes seed sowing, transplanting, weeding, harvesting, threshing, application of manure, storage of seeds and food grains and post-harvest home level processing, collecting fodder, chaff cutting, feeding and cleaning of cattle, maintaining cattle shed, and compost making. These contributions are on top of domestic work which often fall to women. Despite the above facts, land degradation tends to be most felt by poor and vulnerable populations, but it disproportionately is debilitating for women, even though women are very important stakeholders in the fight against land degradation. This is particularly true in that women have unequal access to land and natural resources in India. In rural India, women tend to be excluded from availing institutional credit, lack of access to information and resources, and face hurdles to actively participate in decision-making, planning and process of policy making, this is despite the fact that they contribute significantly in the rural agricultural sector.

As a consequence of the above, it is important that LDN transformative projects like this one, must be gender-responsive in order to strategically contribute to achievement of land degradation neutrality, which is also important to safeguard the vulnerable for climate mitigation. In this regard the project will ensure that specific needs and opportunities of rural women and men, particularly the poorest would be actively taken into consideration during the design of the project to reduce inequalities, stimulate growth and reverse environmental degradation. In particular, the project recognizes that maintenance and improvement of smallholder land productivity (reversing land degradation and climate vulnerabilities) is closely tied to women's traditional knowledge and skills in farming, as well as their access to soil enriching inputs and scientific developments, normally provided by means of agricultural and natural resources extension services.

The project will undertake a gender analysis during the PPG in order to assess opportunities to enhance the status of women in respect to LDN activities, to address the gender gap in the sector and to help design project activities and indicators that will ensure women's full participation as beneficiaries (and deliverers) of technical cooperation and knowledge building efforts. Consultation sessions will be held to obtain views and inputs of a wide range of local stakeholders, including women, to develop project activities and to inform a robust stakeholder involvement plan with full gender considerations. Specific activities (strengthening of women groups, involvement in producer groups, value addition and livelihood activities, governance and knowledge improvement) will be defined following the gender analysis to support women's engagement, involvement and benefit sharing. A corresponding gender mainstreaming plan for the project will be completed and submitted with the project document at time of CEO Endorsement. Gender-disaggregated targets and indicators will be included within the project results framework. Gender-responsive evaluation and adaptive learning will also be included. The project is aiming for at least 50% of direct beneficiaries to be female. The feasibility of this target is suggested by the experience of the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), described above, in which women have been important, and in some cases majority, participants.

UNDP has a team working on decentralized governance and integrated planning and social protection at the national and local level. The project will consult and work closely with the team to mainstream gender in the project design and implementation. Further, the Gender Focal Point of UNDP will be responsible for screening the project document to ensure gender mainstreaming for delivery of effective outcomes.

The following measures will be instituted in the project design:

- The gender specialist will work with local female community members to engage with, and collect data and information from community women to feed into the design of the project.
- Consultation meetings exclusively with women and/or women groups will be conducted, in addition to general village meetings, so as to obtain women-specific perceptions and priorities
- Specific investments will be identified in consultation with local women to be included in the project design.
- Gender aspect will be one of the key criteria for selecting and prioritising investments for implementation of action to reverse land degradation in the project sites.
- Community-based programs will consider the role of women in NRM programs and ways for women to engage and benefit (particularly economically) from these programs will be devised;
- Specific activities for strengthening women's organizations, including self-help groups will be assessed at PPG stage

Data collected for project monitoring and evaluation will be disaggregated by gender

**Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment? Yes**

**closing gender gaps in access to and control over natural resources; Yes**

**improving women's participation and decision-making; and/or Yes**

**generating socio-economic benefits or services for women. Yes**

**Will the project's results framework or logical framework include gender-sensitive indicators?**

Yes

#### 4. Private sector engagement

##### Will there be private sector engagement in the project?

Yes

##### Please briefly explain the rationale behind your answer.

The project will include corporate alliances, enabling policy and engaging with private sector actors. The project will work closely with private sector partners to promote climate-smart agriculture through capacity building for smallholders and SME; and potentially incremental financing/risk reduction for adoption of sustainable land management principles.

Private sector involvement for market and finance linkages is a top priority of the Government "Small Farmers' Agri-Business Consortium", mainly focusing on growth of Farmer Producer Organizations/Farmer Producer Companies. Engagement with private sector including SMEs, social enterprises and larger processors and buyers through innovation forums and impact investment funds will help raise participation of farmers and farmer collectives. It will facilitate investments in infrastructure for grading, sorting, food handling and hygiene; storage; value addition and processing; development of financial products and services for value chain and enterprise finance and digital payment systems.

Current value chains for key landscape products in the country lack aggregated production volumes which further limit outreach and bargaining power of poorly educated rural producers. Value chains for products such as nutri-cereals, livestock (including local breed for cow/goat), fodder for cattle and NTFPs and other medicinal plants are diverse, complex and highly fragmented. National government's food purchase programme (Public Distribution System), the school Midday Meal Programme and Minimum Price Guarantee Scheme only include some millets but very marginally compared to rice, wheat and maize. Recently, companies such as Kellogg's and Britannia have started millet-based products and are well received by consumers. Demand among industrial consumers (poultry feed, brewing and starch production) is also increasing. The project will look for opportunities and will have differentiated strategies tailored to the different value chains to strengthen public-private partnership. Following value chains will be supported in the targeted landscapes to ensure sustainable food systems that tackle negative externalities in the entire value chain and on promoting large scale restoration of degraded landscapes:

- Enhance collaboration between value chain actors to improve efficiencies and to link to favourable markets, especially public-private partnerships to build the organic market, both within India and globally;
- Participatory Guarantee Systems (PGS) implementation to improve quality to strengthen confidence amongst producers and consumers, to deliver social and environmental benefits;
- Development of backward and forward linkages with Farmer Producer Organizations (FPOs) to enhance smallholder access to public and private markets, and to pro-poor finance systems, link to technology-based market information platform such as E-NAM and 'Jaivik Kheti market portal' for organic produce; and
- Advocacy for including support to environmentally oriented FPOs in the "Start-up India Mission" which aims to nurture youth and women entrepreneurs.

Two potential private sector co-financers have already been identified during PIF consultation. The project will partner with United Phosphorus Limited (UPL), which is a well-known crop protection company across India. The company is developing new climate-smart technologies to improve the performance and efficiency of crops in unpredictable climate conditions. The project expects to partner with UPL for demonstrating innovative and improved technologies in water management in agriculture, fighting soil degradation and desertification, afforestation and agroforestry. In addition, PIF consultations have indicated the interest of Jain Irrigation Systems Ltd. (JISL) to partner in the project. JISL develops, manufactures, supports and sells diversified agriculture related products, such as micro-irrigation systems and its components, PVC and PE piping systems, greenhouses, bio-fertilizers, solar power, solar water-heating systems, solar water pumps, turnkey biogas plants, photovoltaic systems and tissue culture plants. JISL is expected to provide co-financing to support use of micro-irrigation systems and other agri-related activities.

Partnership arrangements and co-financing commitments will be finalized during the PPG stage, and UNDP due diligence processes conducted on potential private sector partnerships.

## 5. Risks to Achieving Project Objectives

Indicate risks, including climate change, potential social and environmental risks that might prevent the Project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the Project design (table format acceptable)

Note: Assessment and management responses to environmental and social safeguards risks are further detailed in the UNDP SESP pre-screening completed for this PIF. The overall SESP pre-screening categorization for the project is high.

**Table 4: Risks and Risk Management**

Risk	Level	Mitigation
Risk 1: Local governments and community associations might not have the capacity to implement project activities successfully	<b>Moderate</b>	<p>PPG assessment of capacity needs and priorities of local communities, community associations and government institutions at project landscapes.</p> <p>PCAT of Implementing Partner and assessment of executing support needs for implementing Partner and State-based executing partners that will be built into project design.</p> <p>Integration of Implementing Partner and executing partner support needs into management arrangements and project document.</p> <p>Development and implementation of capacity-building program for local duty-bearers and other stakeholders.</p> <p>Development and implementation of a comprehensive Stakeholder engagement Plan.</p>
Risk 2: Project will engage private sector as co-financers to support LDN activities. Due diligence has not yet been completed on these companies to confirm there are no enhanced safeguards risks through these private sector partnerships	<b>Moderate</b>	<p>Identification of potential private sector partnerships and related activities (including co-financed activities).</p> <p>Completion of due diligence of private sector partners including UNDP Private Sector Risk Assessment Tool.</p> <p>Development and implementation of comprehensive Stakeholder Engagement Plan.</p> <p>Clearly established partnership agreements with private sector partners in alignment with UNDP Private Sector Partnerships policy including any conditions in accordance with private sector risk assessment tool.</p>
Risk 3: Competing priorities at national and state levels may reduce political and financial support for SLM	<b>Moderate</b>	<p>There is a solid baseline; a key design focus of this project is that it seeks to reorient these investments to engender a paradigm shift to SLM. All current indications is that this baseline is secure - focused as it is on meeting basic development n</p>

<p>of SLM.</p>		<p>is secure - focused as it is on meeting basic development needs. To complement the achievements made by the pilot phase in generating awareness and ensuring greater political support and ownership for the SLM programme, the project will design and implement a common monitoring and evaluation system that will focus on generating evidence illustrating the economic and ecological success of landscape level SLM. This is critical to deepen the investment case for SLM and concretise SLM funding over the long-term.</p>
<p>Risk 4: Project outcomes will be vulnerable to potential impacts of climate change.</p> <p>Prevailing arid and semi-arid conditions along with the scarcity of water resources and livelihood dependency on agriculture makes the project States particularly vulnerable to climate change. Also refer Section below on Climate Risk Assessment</p>	<p><b>Moderate</b></p>	<p>Further assessment during PPG to identify current and projected climate vulnerabilities in the project landscape and potential climate change impacts on project interventions/results in short-term and longer-term. These vulnerabilities will be considered in project design to support climate-proofing and resilience of project activities and impacts as far as possible. This will include integration of climate change vulnerabilities into landscape monitoring systems, assessments and plans, and targeted M&amp;E to understand changing climatic conditions and potential impacts on project interventions. The selection of species for land restoration and rehabilitation will include climate change considerations to select species with the highest climate resilience potential.</p>
<p><b>Social and Environmental Risks</b></p>		
<p>Risk 5: Indigenous peoples including vulnerable groups in the project landscape might not be adequately involved in project design and therefore not engaged in, supportive of, or benefitting from project activities. Some project activities may require FPIC and this has not yet been obtained.</p>	<p><b>Substantial</b></p>	<p>Development during PPG of ESMF and IPPF. Implementation of ESMF during project implementation requiring the completion of scoped ESIA(s) and development and implementation of ESMP including an Indigenous Peoples Plan</p> <p>Development of comprehensive Stakeholder Engagement Plan during PPG, and implementation during project.</p> <p>FPIC and safeguard management actions will be integrated into ProDoc at activity level.</p> <p>Establishment of grievance response mechanism.</p> <p>Inclusion of community/IP specialists in PMU.</p>
<p>Risk 6: Project interventions could shift existing use of land or restrict access to land (e.g. propo</p>	<p><b>Substantial</b></p>	<p>PPG phase will hold consultation with the potentially affected individuals and communities to assess impacts on curr</p>

<p>strict access to land (e.g. proposed areas to be reforested) that could have adverse impacts on livelihoods/economic displacement, including of indigenous communities.</p>		<p>ent levels of access and use, including indigenous communities and potential need for FPIC. Based on this and other interacting risks, preparation of ESMF during PPG, and its implementation during project including the development of targeted ESIA and ESMP. Implementation of ESMP, including Livelihood Action Plan.</p>
<p>Risk 7: : Project districts (exact sites to be confirmed during PPG) sites contain globally and locally renowned sites with cultural, historical, religious, artistic and traditional values. Land restoration and rehabilitation activities may have structural adverse impacts on these site sites (including work in output 2.2), and other project activities, but may adversely impact traditional knowledge and practices that are part of the communities since in ancient India (e.g. PBR Output 2.4).</p>	<p><b>Moderate</b></p>	<p>During the PPG phase, the selection of sites will undertaken based on technical and SES considerations. Consultations with community/IP consultation and agreement, will serve as a means to avoid risks related to impact on potential cultural sites. This will entail conduct of an initial cultural heritage impacts screening and assess the potential impacts on cultural sites/heritage and on use of traditional heritage including need for FPIC and identification of priority cultural sites to be excluded from project investments. Completion of scoped ESIA(s) during implementation of the project to mitigate any impacts on other cultural aspects.</p> <p><b>Management:</b> Undertaking ESIA and development and implementation of ESMF and ESMP to design mitigation measures that will be integrated in the project.</p> <p>Development and implementation of comprehensive stakeholder engagement plan.</p> <p>Inclusion of safeguards expertise within PMU to oversee implementation and monitoring of ESMF/ESMP.</p>
<p>Risk 8: Although it is directly not linked to the project itself or co-financing, project landscapes could be impacted by any potential future Supreme Court rulings that claims of Scheduled Tribes and other Traditional Forest Dwellers are not valid (a 2019 order was stayed). This could result in conflict in demonstration landscapes and disrupt PPG consultations and/or project activities including</p>	<p><b>Moderate</b></p>	<p>Assessment of potential risk of future rulings; identification of potential overlap of project landscapes with claimants. Development and implementation of IP stakeholder engagement strategy starting from PIF submission.</p> <p>Based on the Supreme Court decision seek opportunities at PPG design to clarify or enhance tenure, to the extent that is feasible within the court decision to ensure SES compliance.</p>

ding local consultations and engagement of indigenous communities.		
Risk 9: Local governments and community associations might not have the capacity to implement project activities successfully or prevent gender based conflict.	<b>Moderate</b>	<p>At PPG an assessment would be undertaken of capacity needs and priorities of local communities, community associations and government institutions at project landscapes. PCAT of Implementing Partner and assessment of executing support needs for Implementing Partner and State-based executing partners that will be built into project design.</p> <p>Integration of Implementing Partner and executing partner support needs into management arrangements and ProDoc. Development and implementation of capacity-building program for local duty-bearers and other stakeholders. Development (during PPG) and implementation of a comprehensive Stakeholder Engagement Plan.</p>
Risk 10: Project activities and approaches to achieving LDN might not fully incorporate or reflect views of women and girls and ensure equitable opportunities for their involvement and benefit	<b>Moderate</b>	<p>A gender analysis will be conducted during the PPG. This will include specific consultations with women and girls in the demonstration districts.</p> <p>A gender mainstreaming plan will be prepared during the PPG. This will identify measures to include gender mainstreaming within both activities to ensure opportunities and benefits also flow to women and girls.</p>
Project 11: Project will engage private sector as co-financers to support LDN activities. Due diligence has not yet been completed on these companies to confirm there are no enhanced safeguards risks through these private sector partnerships.	<b>Moderate</b>	<p>At PPG, identification of potential private sector partnerships and related activities (including co-financed activities) and completion of due diligence of private sector partners including UNDP Private Sector Risk Assessment Tool would be undertaken</p> <p>Based on above, development and implementation of comprehensive Stakeholder Engagement Plan. Clearly established partnership agreements with private sector partners in alignment with UNDP Private Sector Partnerships policy including any conditions in accordance with private sector risk assessment tool.</p>
Risk 12: Potential negative impacts on biodiversity through (i)	<b>Moderate</b>	At PPG phase, the current guidelines and procedures for app

acts on biodiversity, through (i) utilization of plant genetic resources and (ii) reforestation, as opposed to natural regeneration, may have adverse impacts on biodiversity, including possible connecting areas adjacent to protected areas		<p>roval of plant genetic use and reforestation would be assessed to ascertain if they meet SES standards and what gaps exist.</p> <p>Project design (at PPG stage) will include ESMF that identifies screening, assessment and management measures and at project implementation phase an ESIA/ESMP will define safeguard measures (including FPIC procedures), including specific/ target management procedures/plans to ensure that mitigation/management measures are instituted in selection of sites, restoration/planting for agroforestry and natural forest regeneration. These management plans will also need to develop procedures to ensure appropriate sustainable harvest protocols for NTFPs including medicinal plants, IAS management for the restoration, etc.</p>
Risk 13: Extraction and diversion of water for agricultural and other uses, including irrigation, may raise certain environmental risks	<b>Moderate</b>	<p>PPG phase will assess the change in the water availability and usage to the local communities as a result of the project implementation.</p> <p>Based on this assessment, an ESIA(s) will be undertaken at PPG/project implementation to define safeguard management measures to be undertaken to address this issue</p>
Risk 14: Human health is negatively affected by the inappropriate use pesticides, herbicides and insecticides. Use of such chemicals could result in waste generation	<b>Moderate</b>	<p>National guidelines for chemical management and handling will be assessed for their compliance with UNDP SES requirements to identify if they are fully compliant or additional safeguard measures are needed.</p> <p>The SESP and ESIA/ESMF/ESMP will define measures to ensure safe chemical management, handling and use in relation to land restoration, including specific training needs to meet these standards.</p>
Covid Risk (refer Section below)		
Overall Risk	<b>Substantial</b>	

The key social and environmental assessment and management measures proposed at PIF stage that will be undertaken at the PPG state are:

- o preparation of local community and IP engagement strategy by a safeguards specialist, sensitization of strategy with IP and State-based executing partners, and commencement of consultations with local communities and IPs in accordance with this strategy (these will then continue throughout PPG phase).

- o a comprehensive Stakeholder Engagement Plan and implementation during project.
- o Conduct thorough stakeholder consultation to ensure feedback from all the stakeholders are obtained including consent where required.
  - o Following consultations at PPG stage and further assessments, the following safeguard management plans will be developed: SESP, ESMF, IPPF, SEP, Process Framework and GRM

To ensure full compliance with safeguards, CO commits additional resources (to recruit a safeguards specialist) to ensure this, as necessary, if the PPG resources is not enough to recruit a sfageuard specialist.

### **Climate Risk and Climate Risk Management**

The three landscapes under the project, namely agriculture, grassland and forest, including surface water bodies across these landscapes, are located across three states viz., Gujarat, Maharashtra and Karnataka which are located in different climatic zones of the country and as a consequence have different climate risk manifestations.

**In the State of Gujarat**, the complexity of the climate-economy relationship has been made apparent by various studies and the Government of Gujarat recognizes that Climate Change is not only an environmental concern; it has profound implications for economic growth, social advancement, and almost all other aspects of human wellbeing. With only five per cent of the country's population and six per cent of the country's geographical area, Gujarat contributes to about 16 per cent of industrial and 12 per cent of agricultural production in India, and is dominant in the manufacturing and infrastructure sectors. Climate sensitivity in the state comes from the fragile-ecosystem of the region and the varied physiological features of the state, which gives rise to varied types of climate ranging from sub-humid climate in southern Gujarat, moderately humid climate in central Gujarat, humid and sultry climate in the coastal region, dry climate in regions of central Gujarat and arid and semi-arid climate in north Gujarat and Kutch. Accordingly, the summer temperature varies between 25<sup>0</sup>C and 45<sup>0</sup>C, while the winter temperature ranges between 15<sup>0</sup>C and 35<sup>0</sup>C degrees. The average annual rainfall over the State varies widely from 300 mm in the Western half of Kutch to 2,100 mm in the Southern part of Valsad district and the Dangs. In addition, with vast coastline of approximately 1663 km, which is highly vivid and distinct from others in terms of geomorphology, natural resources and human activities, makes Gujarat even more sensitive to impacts due to climate changes, including changes in temperatures, rainfall variability, sea surface temperatures, rainfall extremes, variation in sea levels, storm surge occurrences and cyclonic activity in the Arabian Sea.

Climate change as projected in the state and the gridded 30 years moving averages of mean maximum and minimum temperature over Gujarat indicate an increase by 0.11<sup>0</sup>C and 0.107<sup>0</sup>C, respectively, for the past 40 years (1969-2005) and this impact is more over Saurashtra region as compared to other regions of the State, as well as variability of rainfall pattern, with increase in some parts and decrease in other parts of the state, which is likely to result into destructive effect on the agriculture. Forests and grassland are also important natural resource in Gujarat on which a large extent of the tribal population that dependent on it. It is projected that climate change might enhance forest vulnerability, including coastal ecosystems, that might result in extensive human

induced forest disturbance and fragmentation. Climate change can also have an impact on agricultural yields and water resources availability. Some of the key problems associated with climate change would be the loss of biodiversity and some endemic species that would require better dialogue and diversification of agro-forestry and agri-sylvicultural practices.

The Government of Gujarat initiated a number of processes, involving multiple stakeholders at multiple levels, representative of all sections of society, to cooperate and create a roadmap that leads to the realization of a growing, low-emitting and sustainable economy with a more climate resilient population in Gujarat. The State Action Plan on Climate Change (SAPCC) has been prepared following a consultative process and aims to ensuring success of these measures and realization of the 'ambitious and progressive' vision for development. On the world Environment Day (6 June 2021), the Gujarat government unveiled its "State Action Plan on Climate Change" with the aim to built a sustainable and climate-resilient future by 2030. The state action plan aims to build a sustainable and climate-resilient future for its people in line with the UN's Sustainable Development Goals (SDGs). The plan has thematic groups representing the key priorities for Gujarat such as agriculture, water, health, forests and biodiversity, sea-level rise and coastal infrastructure, energy efficiency, and renewable energy, urban development, and green jobs. It will have strategies such as people's participation, mobilizing private investment as well as policy measures and public investment.

*Reference: Gujarat State Action Plan on Climate Change, 2014.*

**The State of Maharashtra** is reeling from the impacts of climate change, and particularly from frequent droughts in rural areas and floods in urban areas. The frequency of droughts in semi-arid regions of Marathwada and Vidharbha is now once in every five and six years, respectively. A wide variation in the distribution of rainfall is seen across the State, with the coastal belt, the Konkan region, receiving more than 2,000 mm annually, and the second highest rainfall being recorded in the Vidarbha region. Rainfall in Maharashtra increases steadily towards the east and average rainfall in the easternmost districts is about 1,400 mm. The rain shadow and Marathwada regions are the drought-prone areas of the State, with an annual average rainfall of less than 600 mm. These regions are generally characterized by extreme aridity, hot climate, and acute deficiency in water availability. More recently, areas in Vidarbha, which usually have reliable rainfall, have experienced variable and reduced. Warming trend has been established over Maharashtra for both maximum and minimum temperatures over the past 100 years. Rainfall patterns have undergone drastic change (decreasing rainfall witnessed in July and increasing rainfall seen in August) due to climate change. There is an increase in projected rainfall in the 2030s, with a projected decrease by the 2050s. This fluctuation can result in water scarcities of varying intensities for rivers Tapi, Narmada, Godavari and Krishna.

About a quarter of India's drought-prone districts are in Maharashtra, with 73% of its geographic area classified as semiarid and drought-affected districts account for 60% of the net sown area and lie in the rain shadow region east of the Sahayadri mountain ranges in Maharashtra and the adjacent Marathwada region. Maharashtra experienced severe and successive years of drought in 1970-1974 and 2000- 2004. Climate change effects are seen to escalate the vulnerabilities of the farmers who already suffer from a low-risk coping capacity and have to navigate through unorganised agricultural markets and food supply, unavailability of sufficient cold storage, and post-harvest losses regularly. Due to weather changes, the arrival patterns of the crop in the market is affected creating demand-supply discrepancies. Deforestation and forest degradation are major threats to the forests and biodiversity in Maharashtra. There has been a decrease in dense forest cover in Western Ghats by more than 10% and an increase in the area under water bodies (including dams). Land cover

changes owing to expansion of human settlement and agriculture has worsened the problem. Increased fire risks in savannah woodlands, increased aridity, reduced fodder availability, fragmentation of habitats and extinction of specific species from evergreen forests, severe threat to the flora and fauna already under threat currently, and increased salinity in coastal zones affecting local fish species sums up the impact of climate change on ecosystems.

The state government is gradually recognising that in order to meet citizens' basic development needs, it must integrate climate change concerns into its development planning and implementation processes and the Maharashtra State Action Plan on Climate Change (MSAPCC) aims to increase the resilience of the people and the economy of Maharashtra to future climate change.

***Reference: Maharashtra State Adaptation Action Plan on Climate Change (MSAAPC), 2014***

**The State of Karnataka**, is located in southern part of India with 1,91,791 sq. km area. The state has ten agro-climatic zones and observes three growing seasons. Farmers and agricultural labourers account for nearly 57% of the Karnataka's work force. The state experiences semi-arid tropical climate with average annual rainfall of 1,151 mm. Agriculture is highly vulnerable to climate change because of its wide exposure to temperature, precipitation, pests and diseases. Studies predict that a number of districts may become vulnerable in respect of crops presently grown. Likewise, opportunities emerge in terms of improving cultivation conditions for certain crops in certain areas. All in all, a net decline of -2.5% in agricultural production has been projected by a recent study over the next two to five decades with a major reduction in coastal regions. Frequent droughts in the state affect agricultural production in the state to a great extent, so do floods, to which especially *kharif* crops are prone. Karnataka experienced a decline in net annual groundwater availability by 3.2% between 2004 and 2009, attributed to groundwater extraction beyond replenishment.

About 20% of Karnataka's geographical area is under forest cover. Forests declined by about 2% between 2001 and 2007, especially dense forests were affected (-16%). The Western Ghats are among the 25 global biodiversity hotspots. Likewise, the coastal area has a rich and diverse biodiversity. A large number of species are identified as rare, endemic or threatened in both biota due to climate change and loss of agricultural biodiversity is a serious concern.

A recent study observed a declining trend in rainfall during the southwest monsoon: -1 mm per day per 100 years or 6% in 50 years. Projections made for the period 2021 to 2050 under a SRES A1B scenario predict a decline in annual rainfall for the south-western and north-eastern regions of the state. A wide region from the north-western part of the state including the coastal districts to the south-east is projected to see significant increase. Overall, a warming trend in Karnataka has been observed for the period June to September in northern interior Karnataka. Both minimum and maximum temperature were found to have risen by up to 0.6°C over the last 100 years. According to projections made (SRES A1B scenario), average temperatures may rise further by 1.7°C to 2.2°C by the 2030s. Projected increases are more pronounced in the northern districts. It is predicted that regions that already witness less rainfall and higher temperatures, such as northern Karnataka, will further experience lesser rainfall and increases in average temperatures.

***Reference: Karnataka State Action Plan on Climate Change, 2013***

Table 5: Climate Risk Analysis

Risk	Risk Management Objective	Project Climate Mitigation and Management Strategy
Climate change impact leading to high temperatures, variability in rainfall pattern, and unsustainable agricultural practices causing loss of soil properties, may affect opportunities for 'greening' village plans	Improving sustainable biodiversity-friendly practices for agriculture, grassland and forest landscape resource management productivity, viability and quality	The project will attempt to mitigate this impact by supporting biodiversity-friendly and sustainable resource use practices through demonstrating best practices for erosion control, soil fertility improvement and other techniques for soil moisture conservation and sustainable production; sustainable harvesting, capacity building and public awareness campaigns; and participatory implementation frameworks.
Climate risks could exacerbate risks posed by clearing of forests and unsustainable forest and land use practices could result in increased vulnerability and reduced coping capacity	Improve design of landscape conservation and forest connectivity outcomes to enhance protection and maintenance of forests and natural habitats that can act as an effective means to reduce impacts of climate change	The project will support improved management of existing forests through promotion of conservation practices to protect and maintain critical ecosystems services and help increase the overall resilience of the natural systems to climate risks in the areas compared to business as usual. Also support for learning and communications to improve awareness of climate and ensure adoption of measures to improve climate resilience
Climate sensitivity for local communities recognizing the profound relationship between climate change and local community vulnerabilities	Enhancing community resilience and capacity to cope with climate impacts	The project recognizes the need to assist the vulnerable local population to cope with climate impacts through integration of climate adaptation in farming practices, ensure forest conservation practice, protect riparian corridors, that could have a positive impact on improving resilience to climate impacts, etc.
Forest degradation can enhance climate risks and impacts	Enhancing conservation of degraded forests	The objective of this project is to improve management of existing forests, reduce conversion of forests to other use and promote forest conservation that will be likely be much less vulnerable to the effects of climate than fragmented landscapes as well as attempt to reduce the effect

		s of non-climate stressors, such as pollution, overexploitation of natural resources and land use change.
Social inequalities can exacerbate impacts of climate change on women and disadvantaged groups	Reduce vulnerabilities of women and disadvantaged groups to climate impacts	As part of the PPG process, the project will identify populations most at risk and target adaptation measures toward them, actions to enhance women and vulnerable community capacity to adapt to climate impacts. The gender strategy will seek to identify actions that can empower women and marginalized populations and ensure that they are part of the decision-making process through their participation in local decision-making processes with regard to adaptation efforts, training and awareness to women and marginalized groups regarding the risks associated with climate change and measures to reduce such risks; etc.
Limited technical and institutional capacity and information for climate risk management can exacerbate impacts	Information management	This will be addressed at PPG stage through identification of technical and extension support to address climate effects, adaptation and mitigation actions as part of the village planning process
Monitoring of climate risks will be critical to ensure that the project benefits are effective.	Monitoring of climate risks	This will be addressed at PPG stage to identify appropriate ways in which to monitor and ensure that climate risk management measures are integrated into local planning systems
Lack of financial support for local communities can constrain their ability to sustain and respond effectively to climate risks in the long-term, in particular on biodiversity mainstreaming in village development plans	Financial support for climate risk management	The project will look at potential financial instruments that can support complementary activities aimed at climate response in village development planning, including in the longer-term, the project will seek to identify promising financial instruments, including more effective use of viable BIOFIN options.

### Management of implications of COVID-19

The COVID-19 pandemic is a global health crisis that is already having devastating impacts on the world economy – both directly and through necessary measures to contain the spread of the disease. These impacts are also being felt by the food and agriculture sector. While the supply of food has held up well to date in many countries, including India, the measures put in place to contain the spread of the virus are starting to disrupt the supply of agro-food products to markets and consumers, both within and across borders. The sector is also experiencing a substantial shift in the composition and – for some commodities – the level of demand (OECD).

Covid-19 implications will be built into the project stage to address implications of the disease. Risks associated with Covid-19 and other zoonotic diseases will be developed in terms of management of risks, enhancing opportunities and seeking implications on ecology. From an ecological perspective, the intention of the project is to support a well-managed production landscape and reduce conversion and degradation of forests with the goal of supporting a more intact landscape that develops over time, so that the possibility of zoonoses is substantially reduced. In terms of impacts, the Covid19 (unless contained) can pose severe limitations on project design and implementation and also impact effective integration of biodiversity into local level planning systems.

**Table 6: Covid Management and Mitigation**

Risk category	Potential Risk	Mitigations and Management
Delay in project design start up and implementation	Continued or renewed efforts in COVID-19 containment are likely over the course of project development and possibly into implementation.	If the COVID19 pandemic continues or is not effectively contained, project start-up and implementation could be delayed. The availability of co-financing could be affected by shifts in government fiscal priorities and exchange rates. Methods for bio-secure implementation will be needed, such as increased use of remote communication, use of PPE, etc.
	Only some minimal consultation on the project design was undertaken during PIF development, due to COVID-19 related restrictions. If the Covid-19 situation continues there might be difficulty to undertake community level consultations at PPG stage	Local level consultation will only be undertaken if it complies to national and local government guidelines and UNDP-CO guidelines. For example, it is likely that the consultations will have to take place in small groups (10-20 people) and following national/state protocols relating to social distancing and use of PPE and outdoor settings.  In all cases, continued attention will be given to ensuring the voices of IP, women, youth, and any underrepresented community members.

		Development of the Stakeholder Engagement Plan for implementation will also address such restrictions and mitigations.
Changes to baseline	The COVID19 outbreak could accelerate resource exploitation due to economic disruptions	At PPG stage and initial assessment will be undertaken of the social and economic impacts of ongoing Covid-19 on vulnerable populations as part of the ESMF preparation, mapping of hotspots and developing potential investment plans for responding to and ensuring income recovery for affected vulnerable populations.
Stakeholder engagement process	Government is too occupied with COVID issues that might have impacts on co-financing	The availability of co-financing could be affected by changes in government, state and private fiscal priorities and exchange rates. Government, at this juncture seems to be very supportive of the project and likely that funding would not be seriously affected as the national and state schemes for local development seem not to be overly affected by the Covid-19 situation
Future zoonoses	Potential for adverse impacts that might contribute to future pandemics, for example, there will be no focus on increasing the human-wildlife interface or any actions that cause degradation.	Ensure a well-managed production landscape and reduce conversion and degradation of forests with the goal of achieving a more intact landscape that develops over time, so that the possibility of zoonoses is substantially reduced.

## 6. Coordination

**Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.**

The proposed project will be implemented under a National Implementation Modality (NIM) of UNDP, with Ministry of Environment, Forest and Climate Change as the Executing Agency (EA). The EA will be responsible for project execution working closely with other government agencies and Ministries, and with State and local stakeholders. A Project Management Unit (PMU) will be embedded within MoEFCC. This PMU will be responsible for overseeing project monitoring and evaluation and ensuring a coordinated approach is taken with the delivery of project activities, including integration between activities at national and landscape level, and broader collaboration with associated projects and initiatives, including relevant GEF-financed projects.

**Table 7: Coordination with on-going Initiatives**

Title	Focal Areas	Implementing Agency	GEF Agency
Transforming agricultural systems and strengthening local economies in high biodiversity areas of India through sustainable landscape management and public-private finance	Land Degradation, Biodiversity	MoEFCC; MoAFW	UN Environment
Transforming Rice-Wheat Food Systems in India (FOLUR)	Climate Change, Biodiversity, Land Degradation	MoAFW	FAO
Transforming Indian Agriculture for Global Environmental Benefits and the Conservation of Critical Biodiversity and Forest Landscapes	Climate Change, Biodiversity, Land Degradation	MoAFW; MoEFCC	FAO
Integrated SLEM Approaches for Reducing Land Degradation and Desertification	Land Degradation	MoEFCC	The World Bank

AVACLIM: Agro-ecology, Ensuring Food Security and Sustainable Livelihoods while Mitigating Climate Change and Restoring Land in Dryland Regions	Climate Change, Land Degradation	CARI	FAO
Building the Foundation for Forest Landscape Restoration at Scale	Land Degradation	MoEFCC; MoAFW	UN Environment
Mainstreaming Agrobiodiversity Conservation and Utilization in Agricultural Sector to Ensure Ecosystem Services and Reduce Vulnerability	Biodiversity	Indian Council of Agricultural Research (ICAR); Bioversity International	UN Environment

GEF-financed projects working on land degradation, agricultural system transformation and sustainable land management would have a bearing upon the proposed project, offering lessons learned, best practices for replication and for knowledge transfer during implementation. Key lessons and mechanisms to coordinate will be defined during the PPG phase.

A Project Steering Committee (PSC) will be established to provide overall guidance and decision-making for the project. The PSC is proposed to be Chaired by the Additional Secretary, MoEFCC, with indicative membership including representatives of Ministry of Jal Shakti, Ministry of Rural Development, Ministry of Agriculture and Farmers Welfare, Ministry of Fisheries, Animal Husbandry and Dairying, Ministry of AYUSH, Ministry of Statistics and Programme Implementation, Ministry of Tribal Affairs, Ministry of Panchayati Raj, NITI Aayog, State Governments, Private sector, and NABARD. Membership will be finalized during the PPG phase.

The project results would be monitored annually and evaluated periodically during project implementation to ensure achievement of desired outcomes. A monitoring and evaluation plan will also facilitate learning and ensure knowledge is shared widely and disseminated to support the scaling up and replication of project results. Project level monitoring and evaluation will be undertaken in compliance with UNDP requirements as outlined in UNDP POPP and UNDP Evaluation Policy. The UNDP CO will work with the relevant stakeholders to ensure that M&E requirements are met in a timely manner. Additional mandatory GEF- specific M&E requirements will be undertaken in accordance with the GEF M&E policy and other relevant GEF policies.

The Government of India may identify a need for executing support services for project implementation (e.g. for procurement, recruitment and operational transactions). Options for Third-party providers will be identified to provide any execution support services. The need for such services will be assessed during the PPG stage, including through assessments of the implementing partner's capacity to execute the project. Procedural

efficiency and cost effectiveness will be the primary factors in selecting third-party entities to provide any support services.

## 7. Consistency with National Priorities

**Is the Project consistent with the National Strategies and plans or reports and assessments under relevant conventions?**

Yes

**If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc**

The project has been designed to closely follow guidance and national strategy under the UNCCD, as detailed in the UNCCD Scientific-Conceptual Framework for Land Degradation Neutrality and as summarized in the Checklist for Land Degradation Neutrality Transformative Projects and Programmes (LDN TPP). Elements of alignment with the framework and guidelines include the following:

- Fundamental features: (1) use of a landscape approach involving multiple land units involving various land use types (grazing lands, agricultural lands and forest), jurisdictions (six demonstration districts supported by GEF, and governance (communal, private and public lands); (2) promoting / targeting land degradation neutrality (LDN), using the response hierarchy (avoid > reduce > reverse) and presentation / monitoring by land type (Note: these will be assessed during PPG); (3) contributing to national LDN targets; (4) location based on country priorities (5) monitoring system to be embedded within national LDN and SDG targets; (6) inclusion of mitigating measures for leakage (Note: to be developed during PPG); (7) commitment to gender equality, including gender-specific indicators; (8) measures for gender-responsive evaluation and adaptive learning; (9) inclusion of relevant stakeholders in monitoring and evaluation of LDN status.

- Promoting responsible and inclusive governance: (1) safeguarding land rights of local land users (to be identified / assessed under Component 2 strategy development); (2) ensuring free, prior and informed consent (FPIC) (to be conducted during PPG and/or full project, as appropriate depending on timing of detailing of locations and activities); (3) mechanisms for gender-responsive stakeholder engagement (to be developed during PPG as part of Stakeholder Engagement and Gender Plans); (4) gender equality, inclusiveness, accountability and transparency in land use decisions (to be ensured in multiple project components, including policy (C-1), planning (C-2), implementation (C-3) and M&E and knowledge sharing (C-4); (5) Strengthening institutional through collaboration (inherent in the platform approach under C-2); (6) strengthen / develop a grievance mechanism (to be elaborated during PPG).

- Enhancing-sub-national ownership and capacities: (1) encourage capacity development; (2) use of public and private financing vehicles (see Table C above for the wide range of co-financing partners); (3) ensuring positive impacts beyond the project lifetime (to be ensured through emphasis on local knowledge and learning, including institutionalization of South-South cooperation).

- Leveraging innovative financing: (1) leveraging private sector participation; (2) income generation and job creation for communities; (3) innovative and sustainable incentive-based financing mechanisms (to be identified / leveraged as part of Strategy development); (4) promoting innovative financing (options to be developed under Component 1, policy).

With respect to plans, reports and assessments under relevant conventions, the project is consistent in broad terms including:

- o The project will support national contributions to the UNCCD, through India's National Action Plan to Combat Desertification (NAP-CD), which is currently under revision and in line with the Modi Government's commitment to achieve LDN by the year 2030.
- o The Convention on Biological Diversity (CBD), including National Biodiversity Strategy and Action Plan (NBSAP), as well as the CBD national report, the Cartagena protocol national report and Nagoya protocol national report: The Government of India has set twelve National Biodiversity Targets (NBT) against the twenty Aichi Targets set under the Strategic Plan for Biodiversity 2011-2020. The NBT related to LDD and LDN are as follows upto 2020, but these targets are currently under revision to 2030:
  - o A significant proportion of the country's population, especially the youth, is aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
  - o Values of biodiversity are integrated into national and state planning processes, development programmes and poverty alleviation strategies.
  - o Strategies for reducing the rate of degradation, fragmentation and loss of all natural habitats are finalized and actions put in place for environmental amelioration and human well-being.
  - o Measures are adopted for sustainable management of agriculture, forestry and fisheries.
  - o Genetic diversity of cultivated plants, farm livestock, and their wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.
  - o Ecosystem services, especially those relating to water, human health, livelihoods and well-being, are enumerated and measures to safeguard them are identified, taking into account the needs of women and local communities, particularly the poor and vulnerable sections.
- o The United Nations Framework Convention on Climate Change (UNFCCC), including UNFCCC reporting and priorities, National Determined Contributions (NDCs), National Communications and Biennial Update Reports (BURs) and UNFCCC technology needs assessment. The relevant NDC targets are as follows:
  - o To put forward and further propagate a healthy and sustainable way of living based on traditions and values of conservation and moderation.
  - o To adopt a climate friendly and a cleaner path than the one followed hitherto by others at corresponding level of economic development.
  - o To reduce the emissions intensity of its GDP by 33 to 35 percent by 2030 from 2005 level.
  - o To create an additional carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent through additional forest and tree cover by 2030.
  - o To better adapt to climate change by enhancing investments in development programmes in sectors vulnerable to climate change, particularly agriculture, water resources, Himalayan region, coastal regions, health and disaster management.
  - o To mobilize domestic and new & additional funds from developed countries to implement the above mitigation and adaptation actions in view of the resource required and the resource gap.

The proposed project will help strengthen India's contributions to global initiatives on land restoration. At CoP 14 to UNCCD, India increased its Bonn Challenge commitment from restoring 21 million ha to 26 million ha – a target that the project will directly support through its restoration efforts. Project interventions will also contribute towards the implementation of the strategy on the UN Decade for Restoration, with activities that are relevant to the strategy's pathways of building a global movement (e.g. support for scaling up and south-south cooperation via the Centre of Excellence, outreach partnerships and knowledge management under Component 3), generating political support (e.g. through establishment of cross-sectoral platforms to define

restoration priorities and plans under Component 1) and building technical capacity (e.g. through integrated technical support and extension packages across pastoral, agricultural and forested lands under Component 1).

## 8. Knowledge Management

**Outline the knowledge management approach for the Project, including, if any, plans for the Project to learn from other relevant Projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.**

The project will support knowledge management at different levels, including:

- Between project villages/districts (e.g. cross-site knowledge exchanges, joint capacity development efforts, use of multi-stakeholder platforms in order to facilitate information dissemination and knowledge transfer);
- Across India (e.g. development of outreach partnerships with prominent individuals and people's movements to share lessons across farmer groups/networks, development of project website as a knowledge base for government agencies/organizations across India; through the Dehradun-based Centre of Excellence and associated training program and virtual community of practice; and through project steering committee and technical partnerships);
- With other countries facing similar land degradation and desertification challenges in dryland systems(e.g. through the Centre of Excellence and through the project's active engagement in virtual/physical knowledge and learning events of global restoration platforms and contribution of project best practices and lessons to these fora).
- For monitoring and knowledge management of the project components, a web portal will be created using realtime and localized data detailing progress, impact and interventions on water, soil and land restored. The portal would feature mapping assessment of existing government schemes on land degradation and financial gap assessment outlined to elucidate available resources and information on land degradation in a collated and cohesive manner to determine solutions for government partners, research institutions, etc.

Knowledge management will follow an iterative sequence of:

- o Socialize knowledge management across the project, including through engagement of project staff in existing virtual knowledge platforms (e.g. GLF) from the time of project inception, along with the use of existing lessons to inform detailed project development in PPG phase.
- o Establish stakeholder partnerships (e.g. multi-stakeholder platforms, steering committee) and mechanisms (e.g. website, community of practice) that will facilitate project knowledge exchange and learning.
- o Identify project lessons and best practices, codify and document in a range of formats and for a range of audiences.
- o Disseminate project lessons and best practices via a range of platforms and methods (including those established by the project or in place under other initiatives/partnerships).
- o Use knowledge generated from the project and elsewhere to inform adaptive management.

Knowledge management is a focus of Component 3. The project will help set up the proposed Centre of Excellence on Sustainable Land Management under component 3 for promoting south-south cooperation (Output 3.4). This will include targeted support for the development of course material, modules, syllabus and also capacity building of master trainers. National and international good practices will be documented through an electronic community

of practice. This will contribute to a growing body of international best landscape restoration practices, including business opportunities, and feed experiences into national and global communities of practice (including via the project's engagement with knowledge platforms of the Global Landscapes Forum and the GEF Sustainable Forest Management Drylands Impact Program). This will help share knowledge and learning with stakeholders within the country as well as in neighboring countries in Asia and in Africa. The project will identify, document and disseminate project based best practices, including on gender mainstreaming and documentation and use of traditional knowledge.

## 9. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

### Overall Project/Program Risk Classification\*

PIF	CEO Endorsement/Approval	MTR	TE
High or Substantial			

### Measures to address identified risks and impacts

Provide preliminary information on the types and levels of risk classifications/ratings of any identified environmental and social risks and potential impacts associated with the project (considering the GEF ESS Minimum Standards) and describe measures to address these risks during the project design.

### Project Information

<b><i>Project Information</i></b>	
1. Project Title	<b>Sustainable management and restoration of degraded landscapes for achieving Land Degradation Neutrality (LDN) in India</b>
2. Project Number (i.e. Atlas project ID, PIM S+)	PIMS 6670
3. Location (Global/Region/Country)	India
4. Project stage (Design or Implementation)	PIF
5. Date	August 2021

### Part A. Integrating Programming Principles to Strengthen Social and Environmental Sustainability

QUESTION 1: How Does the Project Integrate the Programming Principles in Order to Strengthen Social and Environmental Sustainability?
<b><i>Briefly describe in the space below how the project mainstreams the human rights-based approach</i></b>
The project fully considers the human rights-based approach and does not lead to any adverse impacts on enjoyment of the human rights (civil, political, economic, environmental, social or cultural) of any key or potential stakeholders, communities involved or wide population. The project provides a governance structure, district specific action strategies, investment and public private partnership with a human rights-based approach towards achieving land degradation neutrality (LDN) by 2030, free of any prejudice or discrimination. The project will engage with all stakeholders, including marginalized individuals and groups, during all phases of projects. Specifically, the project will support meaningful participation and inclusion of all stakeholders in processes that may impact them, including design, implementation and monitoring of the project through capacity building, creating an enabling environment for participation by public and private sector. Considering the fact that there are nearly 700 million people living in rural India who are dependent on forest and agriculture for their livelihoods, including tribal communities, women and smallholder farmers, multi-stakeholder platforms for LDN with participation of responsible governmental authorities, along with private sector, academia, civil society and community-based organizations in policy formulation will be an important tool for mainstreaming the human-rights based approach. However, there is a possibility from the project to potentially restrict availability, quality of and access to resources or basic services, in particular to marginalized or indigenous individuals or groups.
<b><i>Briefly describe in the space below how the project is likely to improve gender equality and women's empowerment</i></b>
The project will build upon the various initiatives undertaken over the years by the Government of India including policy reforms, programmes and action plans at various levels for empowering women and facilitating their active participation in the social, economic and political life of the country. Some of major policy measures of Government of India include reservation of one third to half of the seats for women in the local Governments for ensuring equal representation of women and to bring gender parity. National Policy on Education (1986) provides for universal access and enrolment. National Mission for Empowerment of Women (2010) aims to strengthen and promote all round development of women. The Draft National Policy for Women (2016) is focused on encouraging women to shift 'from being recipients of welfare benefits' towards actively 'participating in the development process'. The mission of the policy is to create an effective framework to enable the process of developing policies, programmes and practices, which will ensure equal rights and opportunity for women in the family, community, workplace and in governance. From aforesaid, it can be concluded that the present legal and policy f

framework will be conducive and supportive of women's participation in the project.

A gender analysis will be conducted during the PPG phase, in accordance with standard UNDP procedure, to identify the differences, needs, roles and priorities of women and men as they relate to engagement in activities such as sowing, transplanting and post-harvest operations, homestead gardening, live stock and poultry rearing, selling labour, etc. Specific project activities will be developed to support the engagement of women in project activities during the PPG phase. The results of the gender analysis conducted during the PPG will be integrated into the project design to ensure that gender-based differences are built into project activities as appropriate, and gender-disaggregated targets will be developed as indicators of project's success. A gender responsive evaluation and adaptive learning measures will be undertaken during the PPG in order to assess opportunities to enhance the status of women in respect to LDN activities, to address the gender gap in the sector and to help design project activities and indicators that will ensure women's full participation as beneficiaries (and deliverers) of technical cooperation and knowledge building efforts. Consultation sessions will be held to obtain views and inputs of a wide range of local stakeholders, including women, to develop project activities and to inform a robust stakeholder involvement plan with full gender considerations. A corresponding gender mainstreaming plan for the project will be completed and submitted with the project document at time of CEO Endorsement. Gender-disaggregated targets and indicators will be included within the project results framework.

***Briefly describe in the space below how the project mainstreams sustainability and resilience***

The project supports implementation of national environmental sustainability priorities identified in the UNDAF, Government of India policies, and international agreements such as UNCCD, UNCBD and UNFCCC, through strengthening environmental management capacity of all partners in forest, pasture and agriculture landscapes. The project is seeking to avoid, reduce and reverse land degradation / desertification in degraded transitional zone of Northwest India. The project will work across the landscape, both strengthening the national and state-level policy frameworks, improving inclusive decision making through multi-stakeholder platforms in three districts, providing technical support packages and supporting national and international collaboration to avoid, reduce and reverse land degradation and desertification.

***Briefly describe in the space below how the project strengthens accountability to stakeholders***

At PPG stage consultation will be undertaken with communities, IPs and other stakeholders to better understand their interaction and dependencies with the landscape (natural resources such as land, forests and wetland resources), their rights and interests, territories, traditional livelihoods and determine when FPIC applies in accordance with national contexts and preferences. This will lead to the development of a comprehensive Stakeholder Engagement Plan at PPG stage that will identify culturally appropriate means of participation of stakeholders, management and monitoring and ensure that such measures are inclusive, participatory and transparent. The project design will include identification of capacity needs of stakeholders to enhance their participation, decision-making and understanding of their rights and responsibilities. At PPG stage, a participatory framework will be developed to ensure that stakeholders (mainly local communities, IPs, women, and other marginalized groups) have free and fair access to information in a timely manner, can actively participate as equal partners in the design and implementation of activities, ensure transparency, provide feedbacks on the project impacts, promote inclusiveness and equity in resource and benefit sharing. The project will also develop a grievance redressal system to mitigate and manage potential conflicts.

**Part B. Identifying and Managing Social and Environmental Risks**

**QUESTION 2: What are the Potential Social and Environmental Risks?**

*Note: Complete SESP Attachm*

**QUESTION 3: What is the level of significance of the potential social and environmental risks?**

*Note: Respond to Questions 4 and 5 below before proce*

**QUESTION 6: Describe the assessment and management measures for each risk rated Moderate, Substantial or High**

ent 1 before responding to Question 2.	eding to Question 5			
<b>Risk Description</b> <i>(broken down by event, cause, impact)</i>	<b>Impact and Likelihood (1-5)</b>	<b>Significance (Low, Moderate, Substantial, High)</b>	<b>Comments (optional)</b>	<b>Description of assessment and management measures for risks rated as Moderate, Substantial or High</b>
<p><i>Risk 1: Indigenous peoples including vulnerable groups in the project landscape might not be adequately involved in project design and therefore not engaged in, supportive of, or benefitting from project activities, or have equal opportunities in access to project-related work. Some project activities may require FPIC and this has not yet been obtained.</i></p> <p><b>Overarching Principle: Leave No one Behind</b></p> <p>Principle: Human Rights (P.3; P.4; P.5, P.6, P.7)</p> <p>Principle: Accountability (P.13, P.14)</p> <p>Standard 6: Indigenous Peoples (6.1, 6.2, 6.3, 6.4, 6.6, 6.8)</p> <p>Standard 7: Labor and Working Conditions (7.5)</p>	<p>I = 4 L = 3</p>	<p>Substantial</p>	<p>Project demonstrations will take place in Gujarat, Karnataka and Maharashtra. Project landscapes are inhabited by indigenous communities some of who might not have stable land rights arrangements (see Risk 4, outside the control of the project).</p> <p>Agriculture is the main occupation of these communities. There has not been any consultation so far with these communities. These communities might not be fully capacitated to give FPIC or understand their rights.</p> <p>The Panchayat (Extension to Scheduled Areas) Act, 1996 also known as PESA, was enacted to enable tribal self-rule in these areas. PESA gives special powers to the Gram Sabhas in scheduled areas especially for the management of natural resources. Similarly, under the Biological Diversity Act, 2002, the Panchayat can constitute a biodiversity management committee which will decide on matters related to access to bio-resources and traditional knowledge.</p> <p>PIF consultations to date have f</p>	<p><b>Assessment:</b> To ensure the full, effective and meaningful participation of indigenous peoples in the project landscape, the CO will engage a safeguards specialist with IP expertise at the PPG stage to design a comprehensive local community and IP engagement strategy including processes for FPIC, in line with SES guidance note on Standard 6. This will include detailed consultation (with application of FPIC procedures) with communities and community-linked local institutions such as Biodiversity Management Committees, Gram Panchayats, Eco-development Committees, SHGs and Farmers' cooperatives. Implementation of the engagement strategy will be commenced by State partners, with support from UNDP CO. Initial discussions will include identification of community preferences for giving FPIC (which may apply to some project activities). This will then be continued throughout the PPG phase, with detailed consultations with local indigenous communities. During PPG the selection of target project intervention sites will be based on ecological and technical criteria as well as community/IP agreements following consultation and consent. Thereafter a targeted assessment of project activities and potential impacts for indigenous communities, including FPIC application to any project activities. Further assessment as part of scoped ESIA(s) during year 1 of the project implementation.</p> <p>Specialist safeguards expertise will be recruited to support the PPG phase that would be complemented by additional CO resources to ensure that safeguards, including IP issues are adequately address</p>

			<p>... consultations to date have focused on government representatives at national and State levels, who have confirmed that the project activities are in alignment with community priorities expressed in their regular dialogues with communities. Based on a review of outputs and proposed project approaches at PIF stage, a conservative assessment is that FPIC could be required for most activities.</p>	<p>... audits, including IP issues are adequately addressed at PPG stage (through preparation of an IPPF) and beyond into implementation phase (IPP).</p> <p><b>Management:</b></p> <p>Development during PPG of ESMF and IPPF. Implementation of ESMF during project implementation requiring the completion of scoped ESIA(s) and development and implementation of scoped ESMP(s) including an Indigenous Peoples Plan.</p> <p>Development of comprehensive Stakeholder Engagement Plan during PPG, and implementation during project.</p> <p>FPIC and safeguard management actions will be integrated into ProDoc at activity level.</p> <p>Establishment of grievance response mechanism. Inclusion of community/IP specialists in PMU.</p>
<p><i>Risk 2: Project interventions could shift existing use of land or restrict access to land (e.g. proposed areas to be reforested) that could have adverse impacts on livelihoods/economic displacement, including of indigenous communities.</i></p> <p>Standard 5: Displacement and Resettlement (5.2, 5.4) Standard 6: Indigenous Peoples (6.3, 6.6)</p>	<p>I = 4 L = 3</p>	<p>Substantial</p>	<p>If not carefully designed, site-level interventions could shift existing use/access of land (e.g. areas to be reforested) that could have adverse impacts on livelihoods/economic displacement. Given the presence of indigenous peoples in the landscape, this could also impact on lands, natural resources and traditional livelihoods of indigenous peoples and require FPIC.</p>	<p><b>Assessment:</b> PPG phase will hold consultation with the potentially affected individuals and communities to assess impacts on current levels of access and use, including indigenous communities and potential need for FPIC. Based on this and other interacting risks, targeted ESIA may be required (see below).</p> <p><b>Management:</b> Preparation of ESMF during PPG, and its implementation during project including the development of targeted ESIA and ESMP. Implementation of ESMP, including Livelihood Action Plan.</p>
<p><i>Risk 3: Project districts (exact sites to be confirmed during PPG) sites contain globally and locally renowned sites with cultural, historical, religious, artistic and traditional values. Land restoration and rehabilitation activities may have structural adverse impacts on these site sites (including work in output 2.2), and other pr</i></p>	<p>I = 3 L = 2</p>	<p>Moderate</p>	<p>Ethnic minorities and indigenous population at the project sites (Gujarat, Karnataka and Maharashtra) have cultures deep-rooted in ancient India life and cultural sites that centuries old. The way life and local communities' culture ancestral link to the land</p>	<p><b>Assessment:</b> During the PPG phase, the selection of sites will undertaken based on technical and SES considerations. Consultations with community/IP consultation and agreement, will serve as a means to avoid risks related to impact on potential cultural sites. This will entail conduct of an initial cultural heritage impacts screening and assess the potential impacts on cultural sites/heritage and on use of tra</p>

<p><i>object activities, but may adversely impact traditional knowledge and practices that are part of the communities since in ancient India (e.g. PBR Output 2.4).</i></p> <p>Standard 4: Cultural Heritage (4.1, 4.3, 4.4, 4.5)</p> <p>Standard 6: Indigenous Peoples (6.9)</p>			<p>and forest within the project sites. The communities' have vital connection with natural resources both culturally and economically, and therefore have been managing and protecting these resources. Due to the close dependency on land and forest, the communities have garnered traditional knowledge and their cultural have co-evolved. The project is proposing to use/reproduce traditional indigenous approaches to address land degradation. This could require FPIC and these consultations have not yet happened.</p>	<p>ditional heritage including need for FPIC and identification of priority cultural sites to be excluded from project investments. Completion of scoped ESIA(s) during implementation of the project to mitigate any impacts on other cultural aspects.</p> <p><b>Management:</b> Undertaking ESIA and development and implementation of ESMF and ESMP to design mitigation measures that will be integrated in the project.</p> <p>Development and implementation of comprehensive stakeholder engagement plan.</p> <p>Inclusion of safeguards expertise within PMU to oversee implementation and monitoring of ESMF/ESMP.</p>
<p><i>Risk 4: Although it is directly not linked to the project itself or co-financing, project landscapes could be impacted by any potential future Supreme Court rulings that claims of Scheduled Tribes and other Traditional Forest Dwellers are not valid (a 2019 order was stayed). This could result in conflict in demonstration landscapes and disrupt PPG consultations and/or project activities including local consultations and engagement of indigenous communities.</i></p> <p>Standard 5: Displacement and Resettlement (5.4)</p> <p>Standard 6: Indigenous Peoples (6.1, 6.2, 6.3)</p>	<p>I = 3 L = 2</p>	<p>Moderate</p>	<p>There is the risk of local conflict in project landscapes if there are any future rulings on the claims of traditional forest dwellers. The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 recognizes and vest the forest rights and occupations in forest land in forest dwelling scheduled tribes and other traditional forest dwellers who have been residing in such forests for generations but whose rights could not be recorded and provide a framework for recording the forest rights so vested and the nature of evidence required for such recognition and vesting in respect of forest land. In February 2019, the Supreme Court of India</p>	<p><b>Assessment:</b> Assessment of potential risk of future rulings; identification of potential overlap of project landscapes with claimants.</p> <p><b>Management:</b> Based on the Supreme Court decision seek opportunities at PPG design to clarify or enhance tenure, to the extent this is feasible within the court decision to ensure SES compliance.</p>

			<p>ordered State governments to start to evict families linked to 1.1 million rejected claims from Scheduled Tribes and other Traditional Forest Dwellers under this Act. A stay on this was issued on 28 Feb 2019, and eviction did not proceed. It is not known whether any of the claimants are living within project landscapes (one media source indicated 37,000 rejected claims in Rajasthan), or if future rulings could be made by the Supreme Court.</p>	
<p><i>Risk 5: Local governments and community associations might not have the capacity to implement project activities successfully or prevent gender-based conflict.</i></p> <p>Principle: Human Rights (P.2)</p>	<p>I = 3 L = 2</p>	<p><b>MODERATE</b></p>	<p>The project will support activities with local communities, community associations and local institutions at project sites. These might not be fully capacitated to discharge project activities. Lack of capacity to implement these activities could limit success of project activities or result in unintended negative consequences.</p>	<p><b>Assessment:</b> PPG assessment of capacity needs and priorities of local communities, community associations and government institutions at project landscapes. PCAT of Implementing Partner and assessment of executing support needs for Implementing Partner and State-based executing partners that will be built into project design.</p> <p><b>Management:</b> Integration of Implementing Partner and executing partner support needs into management arrangements and ProDoc. Development and implementation of capacity-building program for local duty-bearers and other stakeholders. Development (during PPG) and implementation of a comprehensive Stakeholder Engagement Plan.</p>
<p><i>Risk 6: Project activities and approaches to achieving LDN might not fully incorporate or reflect views of women and girls and ensure equitable opportunities for their involvement and benefit, including equal opportunities in accessing employment opportunities</i></p> <p>Principle: Gender Equality and Women's Empowerment (P.9, P.10, P.11)</p>	<p>I = 3 L = 2</p>	<p><b>MODERATE</b></p>	<p>There are gender disparities in the target districts that need to be identified and considered in project design. There is a risk that these consultations might not fully capture or reflect views of women and girls including indigenous groups.</p>	<p><b>Assessment:</b> A gender analysis will be conducted during the PPG. This will include specific consultations with women and girls in the demonstration districts. The gender analysis and action plan to be developed at PPG stage will engage local institutions and involve consultations with women (including IPs) to assess special measures needed to involve women in decision-making process related to land and livelihoods.</p> <p><b>Management:</b> A gender mainstreaming plan will be</p>

Standard 7: Labor and Working Conditions (7.5)				prepared during the PPG. This will identify measures to include gender mainstreaming within both activities to ensure opportunities and benefits also flow to women and girls. Implementation of gender mainstreaming plan during project. Development and implementation of comprehensive Stakeholder Engagement Plan.
<p><i>Risk 7: Project will engage private sector as co-financers to support LDN activities. Due diligence has not yet been completed on these companies to confirm there are no enhanced safeguards risks through these private sector partnerships.</i></p> <p>Principle: Human Rights (P.3)</p> <p>Standard 1: Biodiversity Conservation and sustainable NRM (1.2, 1.8)</p>	I = 3 L = 2	<b>MODERATE</b>	The project will explore opportunities for private sector engagement, in line with GEF expectations. At PIF stage, potential partnerships are identified with Jain Irrigation and UPL, and more opportunities will be explored during PPG. Due diligence has not yet been completed with these private sector partners to confirm they adhere to UNDP expectations on exclusionary criteria, potential controversies and commitment to ESG, and that any potential risks can be managed through conditions etc.	<p><b>Assessment:</b> Identification of potential private sector partnerships and related activities (including co-financed activities) during PPG stage and completion of due diligence of private sector partners including UNDP Private Sector Risk Assessment Tool.</p> <p><b>Management:</b> Development and implementation of comprehensive Stakeholder Engagement Plan. Clearly established partnership agreements with private sector partners in alignment with UNDP Private Sector Partnerships policy including any conditions in accordance with private sector risk assessment tool.</p>
<p><i>Risk 8: Project outcomes will be vulnerable to potential impacts of climate change</i></p> <p>Standard 2: Climate Change and Disaster Risks (2.2)</p>	I = 3 L = 2	<b>MODERATE</b>	Climate change could result in increased frequency and/or severity of extreme climatic events or natural hazards that could impede project impact in medium and long term	<p><b>Assessment:</b> Further assessment is required during PPG to consider potential climate change impacts on project activities in short-term and longer-term and to ensure that these are reflected in project design to support climate-proofing and resilience of project activities and impacts as much as possible.</p> <p><b>Management:</b> Project design (based on PPG assessment) will include design of specific measures (as part of SES) to ensure climate resilience (including selection of species in land restoration and rehabilitation with the highest climate resilience potential, climate resilient livelihood and land productivity act</p>

				ivities)
<p><i>Risk 9: Potential negative impacts on biodiversity, through (i) utilization of plant genetic resources and (ii) reforestation, as opposed to natural regeneration, may have adverse impacts on biodiversity, including possible connecting areas adjacent to protected areas</i></p> <p>Standard 1: Biodiversity Conservation and sustainable NRM (1.2, 1.6, 1.7, 1.8, 1.9, 1.13)</p>	I = 3 L = 2	<b>MODERATE</b>	Risks from rehabilitation efforts could include monoculture planting, poor species selection, accidental introduction of invasive alien species (IAS) etc.	<p><b>Assessment:</b> At PPG phase, the current guidelines and procedures for approval of plant genetic use and reforestation would be assessed to ascertain if they meet SES standards and what gaps exists.</p> <p><b>Management:</b> At the PPG stage, project design will prepare ESMF that identifies screening, assessment and management measures, and at project implementation phase an ESIA/ESMP will define safeguard measures (including FPIC procedures), including specific/ target management procedures/plans to ensure that mitigation/management measures are instituted in selection of sites, restoration/planting for agroforestry and natural forest regeneration. These management plans will also need to develop procedures to ensure appropriate sustainable harvest protocols for NTFPs including medicinal plants, IAS management for the restoration, etc.</p>
<p><i>Risk 10: Extraction and diversion of water for agricultural and other uses, including irrigation, may raise certain environmental risks</i></p> <p>Standard 1: Biodiversity Conservation and sustainable NRM (1.7, 1.9)</p>	I = 3 L = 2	<b>MODERATE</b>	The project may support activities such as construction of check dams (earthen or concrete dams), stream bunds and contour trenching.	<p><b>Assessment:</b> At PPG phase, an assessment will be made of potential impacts of project activities on change in the water availability to the local communities</p> <p><b>Management:</b> Based on this assessment, the risk will be included in the scope of the ESMF prepared during the PPG. Per the ESMF, an appropriately scoped ESIA(s) will be undertaken at project implementation to define safeguard management measures to be undertaken to address this issue.</p>
<p><i>Risk 11: Human health is negatively affected by the inappropriate use of pesticides, herbicides and insecticides. Use of such chemical could result in waste generation.</i></p>	I = 3 L = 2	<b>MODERATE</b>	As pesticides, herbicides and insecticides are likely to be used during the demonstration work. there will be a concern as to whether this usage will have any h	<p><b>Assessment:</b> National guidelines for chemical management and handling will be assessed for their compliance with UNDP SES requirements to identify if they are fully compliant or additional safeguard measures are needed.</p>

<p>Standard 3: Community health, safety and security (3.5)</p> <p>Standard 8: Pollution prevention and resource efficiency (8.5)</p>		<p>health effects. During the implementation of restoration activities involving the use of pesticides, herbicides and insecticides, the project will ensure that 1) no internationally or nationally banned pesticides, herbicides and insecticides are used 2) workers working with said chemical products are trained and equipped with protective.</p>	<p><b>Management:</b> The ESMF prepared during the PPG will cover this risk, and the subsequent scoped ESI A/ESMP(s) (prepared during implementation) will define measures to ensure safe chemical management, handling and use in relation to land restoration, including specific training needs to meet these standards.</p>
<p>QUESTION 4: What is the overall project risk categorization?</p>			
<p><i>Low Risk</i></p>		<input type="checkbox"/>	
<p><i>Moderate Risk</i></p>		<input type="checkbox"/>	
<p><i>Substantial Risk</i></p>		<input checked="" type="checkbox"/>	<p>At PIF stage the project is categorized as SUBSTANTIAL risk. There are 11 risks identified, with two of these categorized as SUBSTANTIAL:</p> <ul style="list-style-type: none"> <li>-Risk 1: Some project activities might require FPIC and indigenous communities in project landscape have not yet been consulted or engaged in project discussions.</li> <li>-Risk 2: Potential restrictions on access/use of land (e.g. in identified for restoration) by local communities, including indigenous peoples.</li> </ul> <p>All safeguards principles and standards are triggered by the 11 risks (see question 5).</p> <p>The key assessment and management measures proposed at PIF stage that will be undertaken at PPG include (full list in Question 5 below):</p> <ul style="list-style-type: none"> <li>o preparation of local community and IP engage</li> </ul>

ment strategy by a safeguards specialist, sensitization of strategy with IP and State-based executing partners, and commencement of extensive consultations with local communities and IPs in accordance with this strategy (these will then continue throughout PPG phase). and UNDP SES guidance. This is particularly would be to compensate for the lack of local level consultations during the PIF stage due to the high level of Covid-19 infections in the country. The first and second waves of infection and strict lockdown enforced by the Government prevented the organization of consultations with local communities.

- o Development during PPG of a comprehensive Stakeholder Engagement Plan. Implementation during project.
- o At PPG stage, conduct thorough stakeholder consultation to ensure feedback from all the stakeholders are obtained including consent where required. To ensure full compliance with safeguards, CO commits to putting in additional resources (to recruit a safeguards specialist) to ensure this, as necessary, if PPG does not provide enough resources. Currently with the ongoing VF projects, CO coordinates regular meetings with Gol and in the PB to discuss on the safeguards.

*High Risk*

**QUESTION 5: Based on the identified risks and risk categorization, what requirements of the SES are triggered? (check all that apply)**

Question only required for Moderate, Substantial and High Risk projects

	<input checked="" type="checkbox"/>		<i>Status? (completed, planned)</i>
<i>Is assessment required? (check if "yes")</i>	<input checked="" type="checkbox"/>		
<i>if yes, indicate overall type and status</i>		<input checked="" type="checkbox"/> Targeted assessment(s)	Planned for PPG: gender analysis, stakeholder analysis

		<input checked="" type="checkbox"/>	ESIA (Environmental and Social Impact Assessment)	Planned for implementation
		<input checked="" type="checkbox"/>	SESA (Strategic Environmental and Social Assessment)	To be confirmed during the PPG
	<b>Are management plans required? (check if "yes")</b>	<input checked="" type="checkbox"/>		
	<i>If yes, indicate overall type</i>	<input checked="" type="checkbox"/>	Targeted management plans (e.g. Gender Action Plan)	Planned for PPG: Gender Action Plan, Stakeholder Engagement Plan

		<input checked="" type="checkbox"/>	ESMP (Environmental and Social Management Plan which may include range of targeted plans)	Planned for implementation
		<input checked="" type="checkbox"/>	ESMF (Environmental and Social Management Framework)	Planned for PP G (with IPPF)
	<b>Based on identified risks, which Principles/Project-level Standards triggered?</b>		<b>Comments (not required)</b>	
	<b>Overarching Principle: Leave No One Behind</b>			
	<b>Human Rights</b>	<input checked="" type="checkbox"/>		
	<b>Gender Equality and Women's Empowerment</b>	<input checked="" type="checkbox"/>		
	<b>Accountability</b>	<input checked="" type="checkbox"/>		
	<b>1. Biodiversity Conservation and Sustainable Natural Resource Management</b>	<input checked="" type="checkbox"/>		
	<b>2. Climate Change and Disaster Risks</b>	<input checked="" type="checkbox"/>		
	<b>3. Community Health, Safety and Security</b>	<input checked="" type="checkbox"/>		
	<b>4. Cultural Heritage</b>	<input checked="" type="checkbox"/>		
	<b>5. Displacement and Resettlement</b>	<input checked="" type="checkbox"/>		
	<b>6. Indigenous Peoples</b>	<input checked="" type="checkbox"/>		
	<b>7. Labour and Working Conditions</b>	<input checked="" type="checkbox"/>		
	<b>8. Pollution Prevention and Resource Efficiency</b>	<input checked="" type="checkbox"/>		

**Supporting Documents**

Upload available ESS supporting documents.

**Title****Submitted**

PIMS 6670\_Pre-SESP India PIF\_27 Aug 2021

**Part III: Approval/Endorsement By GEF Operational Focal Point(S) And GEF Agency(ies)**

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter with this template).

<b>Name</b>	<b>Position</b>	<b>Ministry</b>	<b>Date</b>
Neelesh Kumar Sah	Joint Secretary	Ministry of Environment, Forest and Climate Change	9/14/2021

**ANNEX A: Project Map and Geographic Coordinates**

Please provide geo-referenced information and map where the project intervention takes place

**Project sites selection criteria and current status of Land Degradation and Land Use (LDLU) Planning**

The project sites are selected based on the published literature as well as information provided in national and state government governments reports, relating to status of land degradation and land use planning across target project landscapes viz., agriculture landscape, forest landscapes, grasslands and surface water bodies. Ground trothing will be done during the PPG phase of the project and village level baseline will be documented during first year of the full project implementation, including documentation of factors leading to land degradation and land use planning across different landscapes.

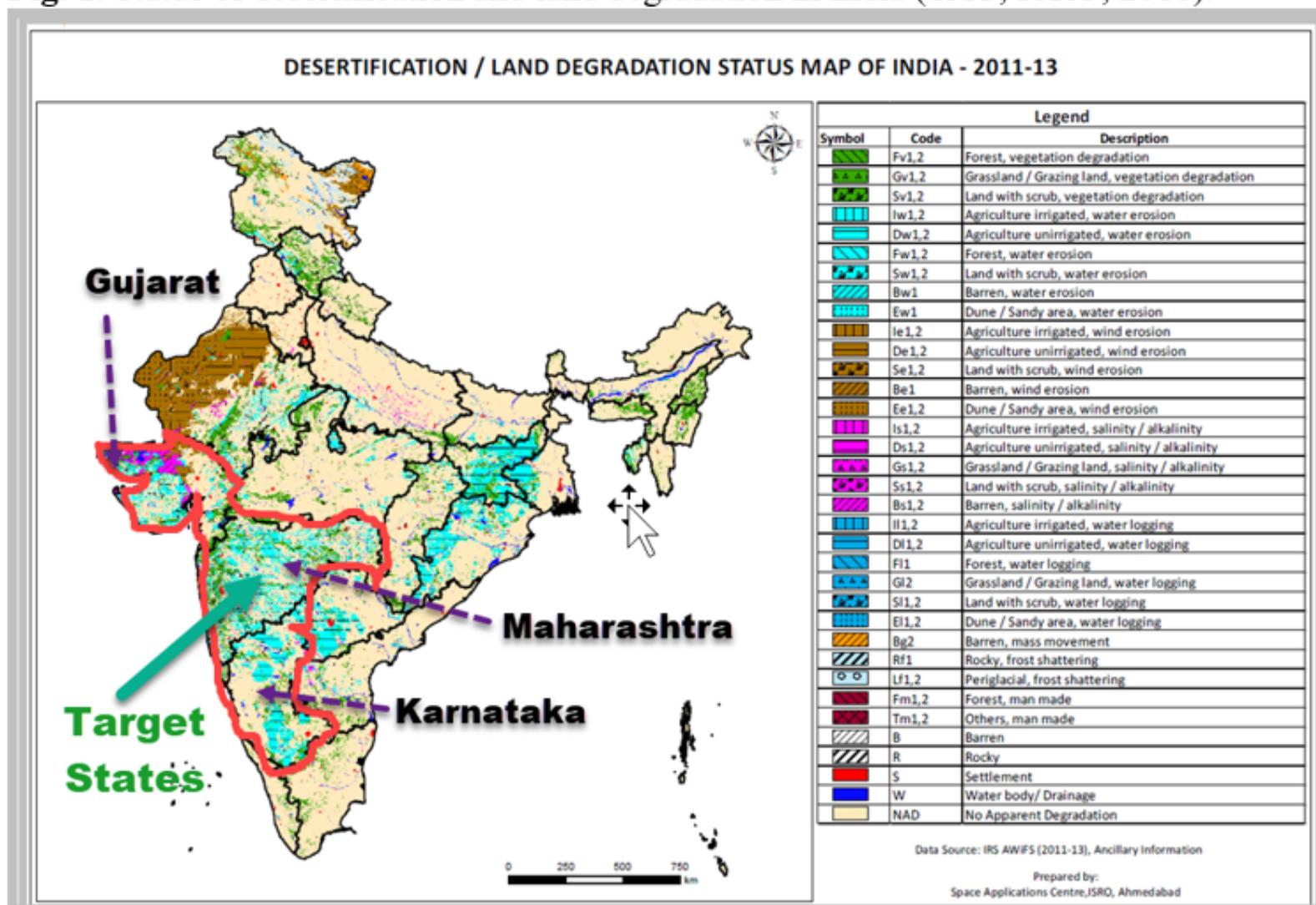
Target project states are selected based on the information provided under Desertification/land degradation analysis of India (SAC, ISRO, 2016), which reveal that 96.4 million ha of the country is affected by land degradation, representing 29.32% of the Total Geographic Area (TGA) of the country, of which 73.42% is contributed by Rajasthan, Maharashtra, Gujarat, Jammu & Kashmir, Ladakh, Karnataka, Jharkhand, Odisha, Madhya Pradesh and Telangana, affecting livelihood of people living in rural India who mainly dependent on forest and agriculture based farming systems, including tribal communities, women and small holder famers. The desertification and land degradation in Jammu & Kashmir and Ladakh (now two separate Union territory as Jammu and Kashmir and Ladakh) is due to land degradation in the cold arid track of Ladakh and was not considered as target project site as the project focus in in the arid and semi-arid landscape of the country.

About 228 mha (69%) of its geographical area fall within the dryland (arid, semi-arid and dry sub-humid) as per Thornthwaite classification. The Thar Desert lies in the hot arid region of Western Rajasthan and Northern part of Gujarat and is one of the most densely populated deserts of the world. Agriculture is the major sector of growth of the Indian economy and a large percent of the population is still dependent on agriculture for its sustenance. Of the total cultivated area of 142 mha, major part of agriculture in the country is rainfed, extending to over 97 mha and constituting nearly 68% of the net cultivated area. About a third of the total feed intake of the ruminants in India is by grazing on common property resources (CPRs). Overgrazing by herds far larger than what the land can sustain, year after year, has progressively rendered them marginal or waste lands, due to erosion of top soil and changing plant association, making them unsuitable for bovines and fit only for sheep and goats. Forestry is an important part of land use in the country and more than half of the forest area in India is tropical-moist and dry-deciduous types. The tropical deciduous form the major forest type of India with 38.2% of the total forest area. Other predominant forest type is the moist deciduous covering 30.3 % of the forest area of the country.

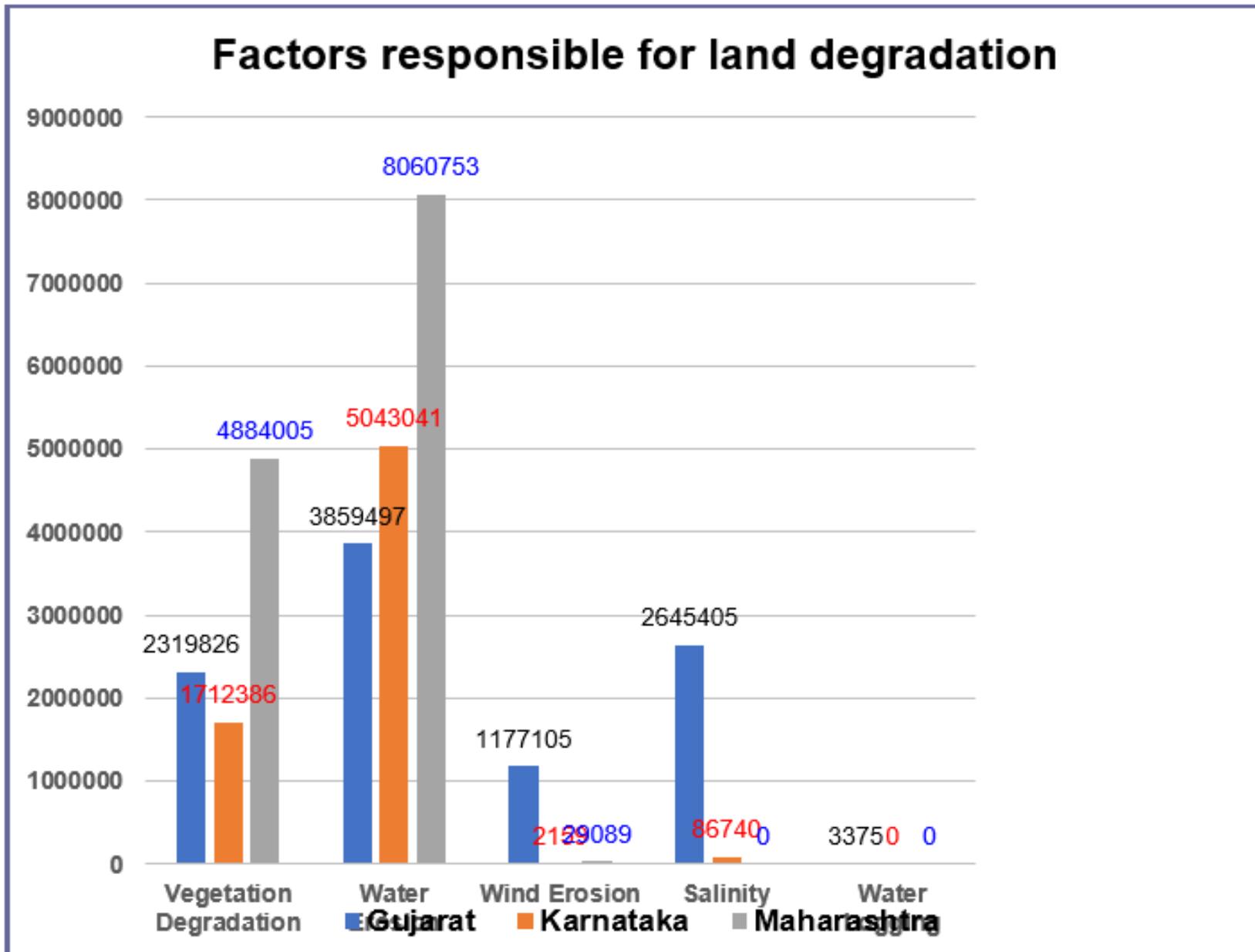
Accordingly, it was decided in consultation with the Desertification Cell of the Ministry of Environment, Forest and Climate Change (MoEF&CC) to target the project intervention across three States (Maharashtra, Gujarat and Karnataka) targeting agriculture, forest and grassland landscapes, including surface water bodies. Part of South-West Rajasthan landscape, bordering Northern Gujarat, under desertification will be targeted during the out scaling of the project outcomes, with support from co-financing from State Government.

Current status of desertification/land degradation is shown in Fig. 1 (SAC, ISRO, 2016), indicating that the most significant processes of desertification/land degradation are water erosion (10.98%), vegetation degradation (8.91%) and wind erosion (5.55%), Fig. 2. Description for each of the three states (Gujarat, Karnataka and Maharashtra), together with target states and project sites across each state are presented below:

**Fig. 1. Status of desertification and land degradation in India (SAC, ISRO, 2016).**



*(Map disclaimer: The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations or UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries)*



**Fig 2.** Major causes of land degradation across target states (SAC, ISRO, 2016).

Gujarat:

The State of Gujarat lies on the western coast of India between 20<sup>06</sup>' N and 24<sup>042</sup>' N and 68<sup>010</sup>' E to 74<sup>028</sup>'E. The length of Gujarat from north to south is approximately 590 km and width from east to west is approximately 500 km. The State is spread across an area of 196,024 sq. km, which is just six per cent of the total geographical area of India, and it has a longest coastline (1,663 km) among Indian states. The State is bound by Arabian Sea on the west and south-west, Rajasthan in the north and northeast, Maharashtra in the south and southeast and Madhya Pradesh in the east. The State has an international boundary with Pakistan in north-west. The Gulf of Kutch and Gulf of Khambhat are situated on the Arabian Sea. Three perennial rivers - Narmada, Tapi and Mahi are located in South Gujarat. The major non-perennial river, Sabarmati flows through the districts of Sabarkantha, Mehsana and Ahmedabad. The state has population of 6,04,39,692; with 308 population density, 919 sex ratio and 78.03% literacy (Census 2011). Gandhinagar is the capital of Gujarat.

Five types of landforms are found in Gujarat, namely alluvial plains, hilly areas, highlands, desert areas and coastline areas. The alluvial plains extend from Banaskantha in north Gujarat to Valsad in the south and westward to the little Rann and Banni area of Kutch. Hilly tracts form a major divide in the State and most of the rivers originate from the hills in the east and flow towards the south and southwest except the Narmada and Tapi (interstate rivers). The Highland of Kutch (Saurashtra) with an elevation of about 150 to 500 m. comprises of sedimentary and volcanic rocks. Marshy and saline deserts of Rann of Kutch and little Rann of Kutch extend into the saline tracts around the Gulf of Kutch. The coastal areas extend from Rann of Kutch through the little Rann of Kutch and low-lying delta region of Bhadar, Bhogavo, Sabarmati, Mahi Dhadar, Narmada and Tapi rivers.

The State has 33 districts and Gandhinagar is the capital city. Ahmedabad, Vadodara, Surat, Rajkot, Bhavnagar and Jamnagar are other key cities. The State falls in the subtropical climate zone and experiences sub-humid climate in southern Gujarat (South of River Narmada), moderately humid climate in central Gujarat (between Narmada and Sabarmati rivers), humid and sultry climate in the coastal region (south facing coastal region of Saurashtra), dry climate in regions of central Gujarat (north of Ahmedabad and part of central Saurashtra) and arid and semi-arid climate in north Gujarat and Kutch.

The complexity of the climate-economy relationship has been made apparent by various studies and the Government of Gujarat recognizes that Climate Change is not only an environmental concern; it has profound implications for economic growth, social advancement, and almost all other aspects of human wellbeing. With only five per cent of the country's population and six per cent of the country's geographical area, Gujarat contributes to about 16 per cent of industrial and 12 per cent of agricultural production in India, and is dominant in the manufacturing and infrastructure sectors. However, in the backdrop of mounting global concern regarding potential risks of future climate change, there is a need to ensure that Gujarat's economic performance and social progress stays resilient and capable of withstanding climatic stress and shocks. Accordingly, the Government of Gujarat initiated a number of processes, involving multiple stakeholders at multiple levels, representative of all sections of society, to cooperate and create a roadmap that leads to the realization of a growing, low-emitting and sustainable economy with a more climate resilient population in Gujarat. The State Action Plan on Climate Change (SAPCC) has been prepared following a consultative process and aims to ensuring success of these measures and realization of the 'ambitious and progressive' vision for development.

On the world Environment Day (6 June 2021), the Gujarat government unveiled its "State Action Plan on Climate Change" with the aim to build a sustainable and climate-resilient future by 2030. The state action plan aims to build a sustainable and climate-resilient future for its people in line with the UN's Sustainable Development Goals (SDGs). The plan has thematic groups representing the key priorities for Gujarat such as agriculture, water, health, forests and

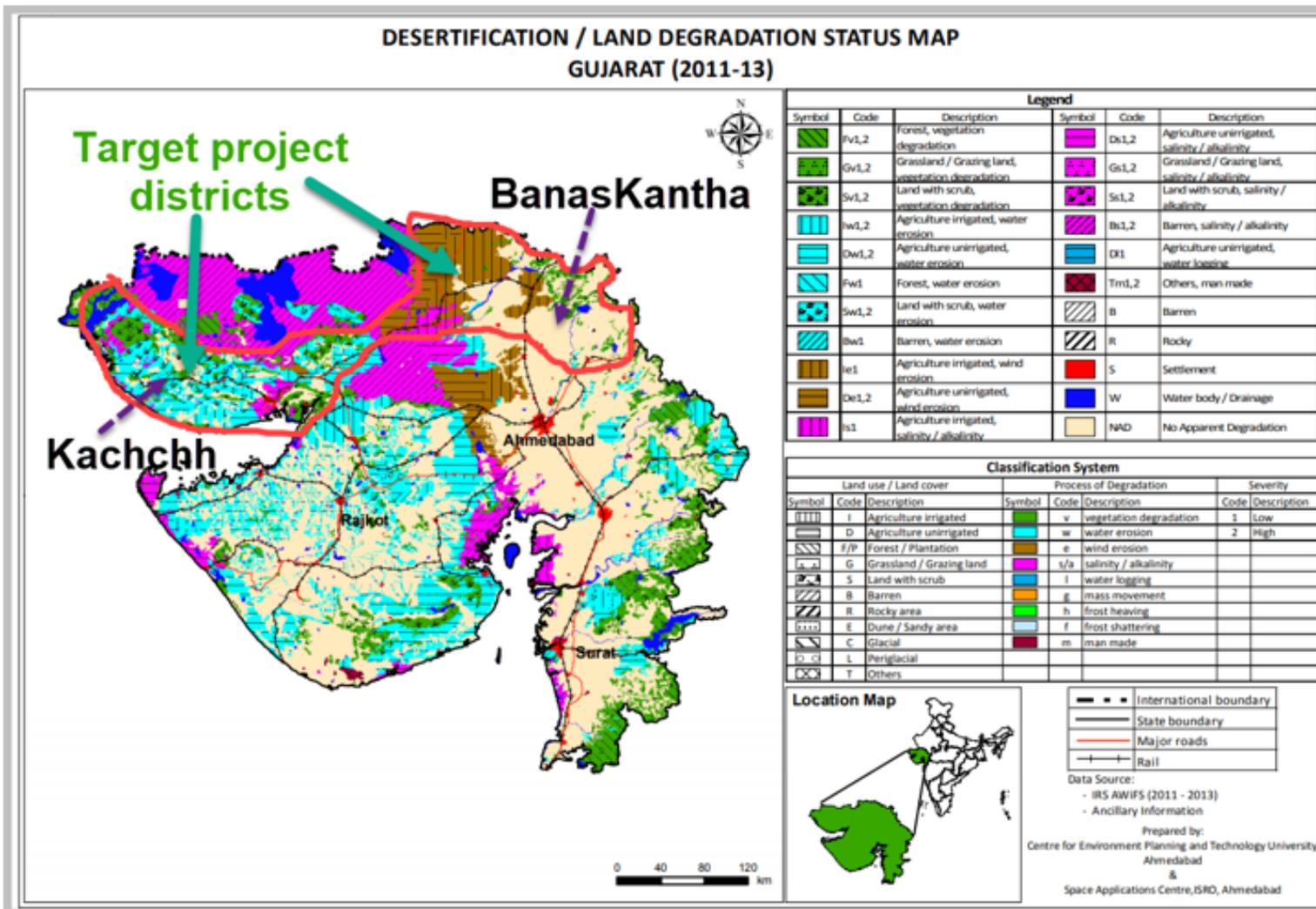
biodiversity, sea-level rise and coastal infrastructure, energy efficiency, and renewable energy, urban development, and green jobs. It will have strategies such as people's participation, mobilizing private investment as well as policy measures and public investment.

The average annual rainfall over the State varies widely from 300 mm in the Western half of Kutch to 2,100 mm in the Southern part of Valsad district and the Dangs. The monsoon usually commences by the middle of June and withdraws by the end of September, with about 95 per cent of the total annual rainfall being received during these months. The total number of rainy days varies from one part of the State to another, ranging from a minimum of 16 days in Kutch to a maximum of 48 days in Surat and the Dangs. Generally, the number increases towards the eastern and the southern parts of the State, and is higher in the months of July and August, as compared to June and September. The average temperature varies across the State. The summer temperature varies between 25<sup>0</sup>C and 45<sup>0</sup>C while the winter temperature ranges between 15<sup>0</sup>C and 35<sup>0</sup>C degrees.

With vast coastline of approximately 1663 km, which is highly vivid and distinct from others in terms of geomorphology, natural resources and human activities, makes Gujarat even more sensitive to impacts due to climate changes, including changes in temperatures, rainfall variability, sea surface temperatures, rainfall extremes, variation in sea levels, storm surge occurrences and cyclonic activity in the Arabian Sea. The gridded 30 years moving averages of mean maximum and minimum temperature over Gujarat indicate an increase by 0.11<sup>0</sup>C and 0.107<sup>0</sup>C, respectively, for the past 40 years (1969-2005) and the impact is more over Saurashtra region as compared to other regions of the State.

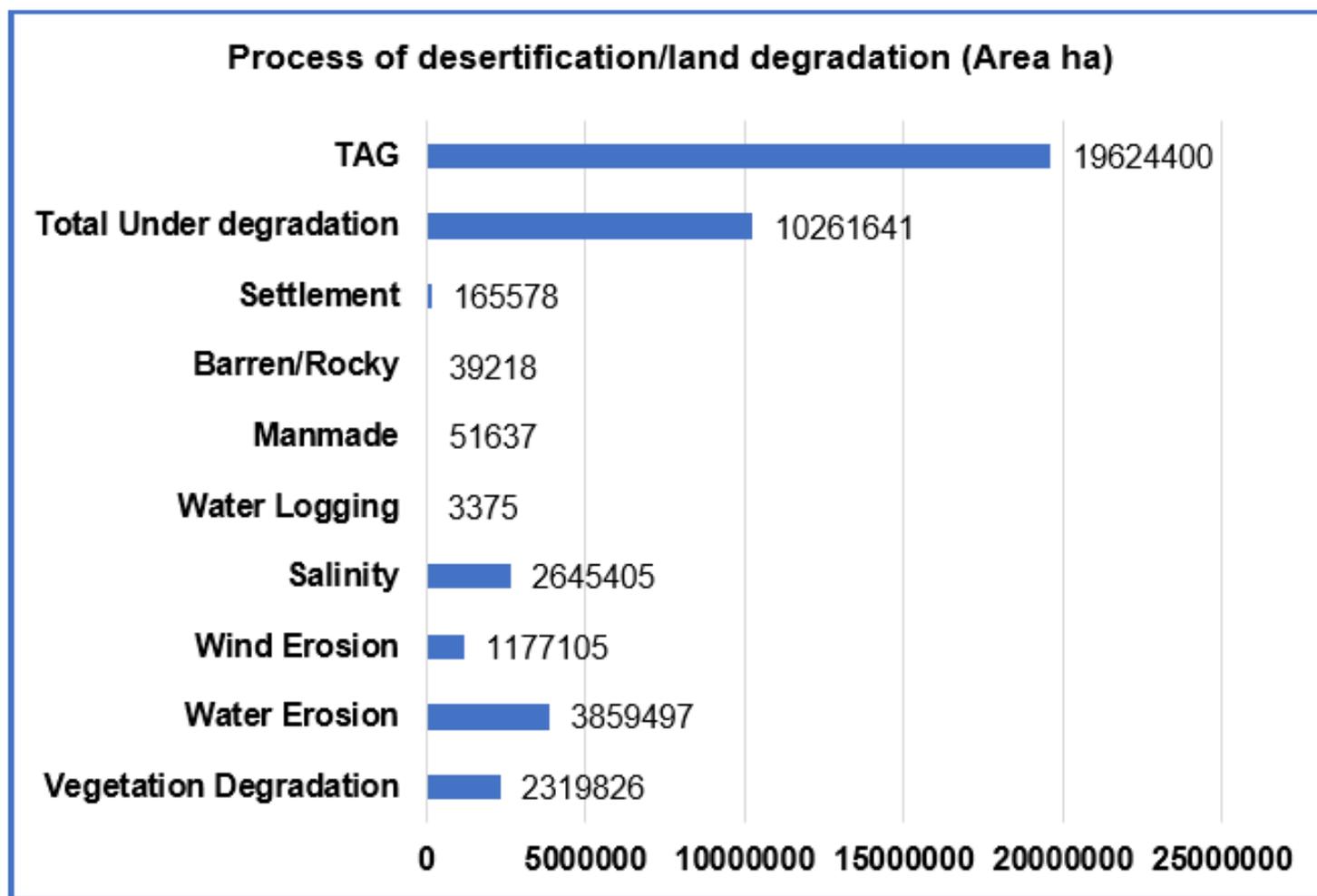
Gujarat is the state with third highest area under desertification/ land degradation with respect to country TGA and fourth highest with respect to state TGA. The state is observed with 52.29% of the total geographical area under desertification/land degradation for the period of 2011-13 (**Fig. 3**). The desertification/land degradation area in Gujarat has increased about 0.94% since 2003-05. The most significant process of desertification/land degradation in the state is Water Erosion (19.67%), followed by Salinity (13.48%), Vegetation Degradation (11.82%) and Wind Erosion (6.00%), as per **Fig. 4**. Gujarat accounted for as much as 56.8% of the country-wide area affected by exclusively saline soils and 20.9% affected by sodic soils (ICAR, 2010).

Two districts have been identified for project interventions viz., Kachchh and Banaskantha (**Fig. 3**). The major focus in Kachchh will be restoration of degraded grassland and in Banaskantha the focus will be on degraded agricultural and forest landscapes as per the details provided below:



**Fig. 3.** Status of land degradation in Gujarat and target project sites (SAC, ISRO, 2016).

*(Map disclaimer: The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations or UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries)*



**Fig. 4.** Process of desertification/land degradation in Gujarat (Area showing in ha.)

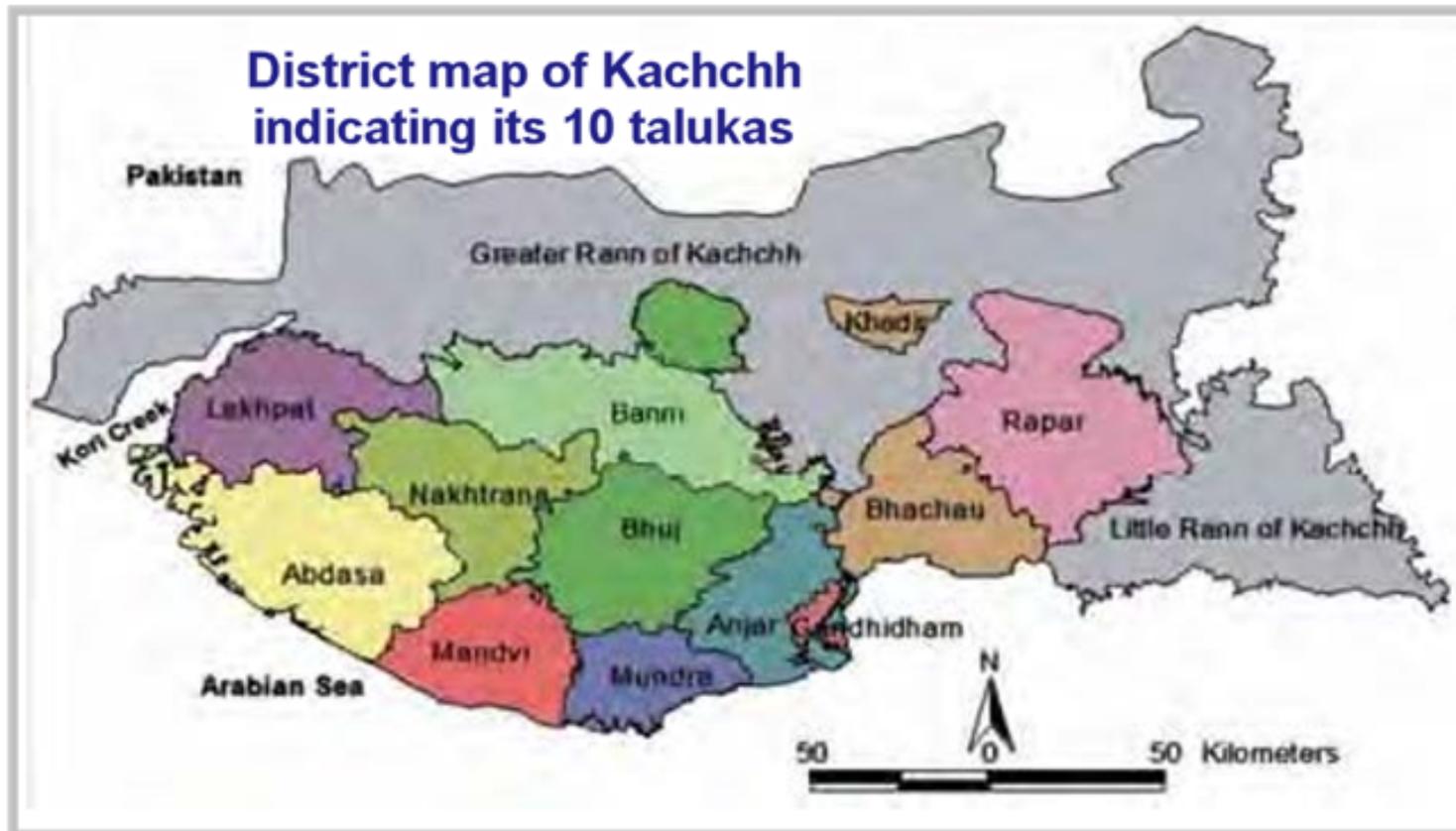
#### Kachchh:

Total area of the district is 45,674 sq. km across 924 villages, 10 Talukas and 6 Municipality, with a total population 20,92,371; Literacy Rate: 70.59%. Kachchh contributed 34.72% to the state-wise area affected by salinity. Inherent salinity in Kachchh grasslands is a major problem which is further aggravated due to climatic conditions. On top of this, Kachchh region has the maximum livestock population in Gujarat state. Kachchh harbors two large grasslands viz., the Banni and the Nailya, located along the northern border of Kachchh district and are among the largest 2 stretches of contiguous grassland in India (Fig. 5 and 6). These grasslands are spread over an area of ca. 2618 km, and account for approximately 45% of the pastures in the Gujarat state. The Banni grassland is divided into three areas: (i) Ugamani Banni - East Banni, (ii) Vachali Banni - Central Banni, and (iii) Aathamani Banni or Jat Patti - West Banni (Bharwada and

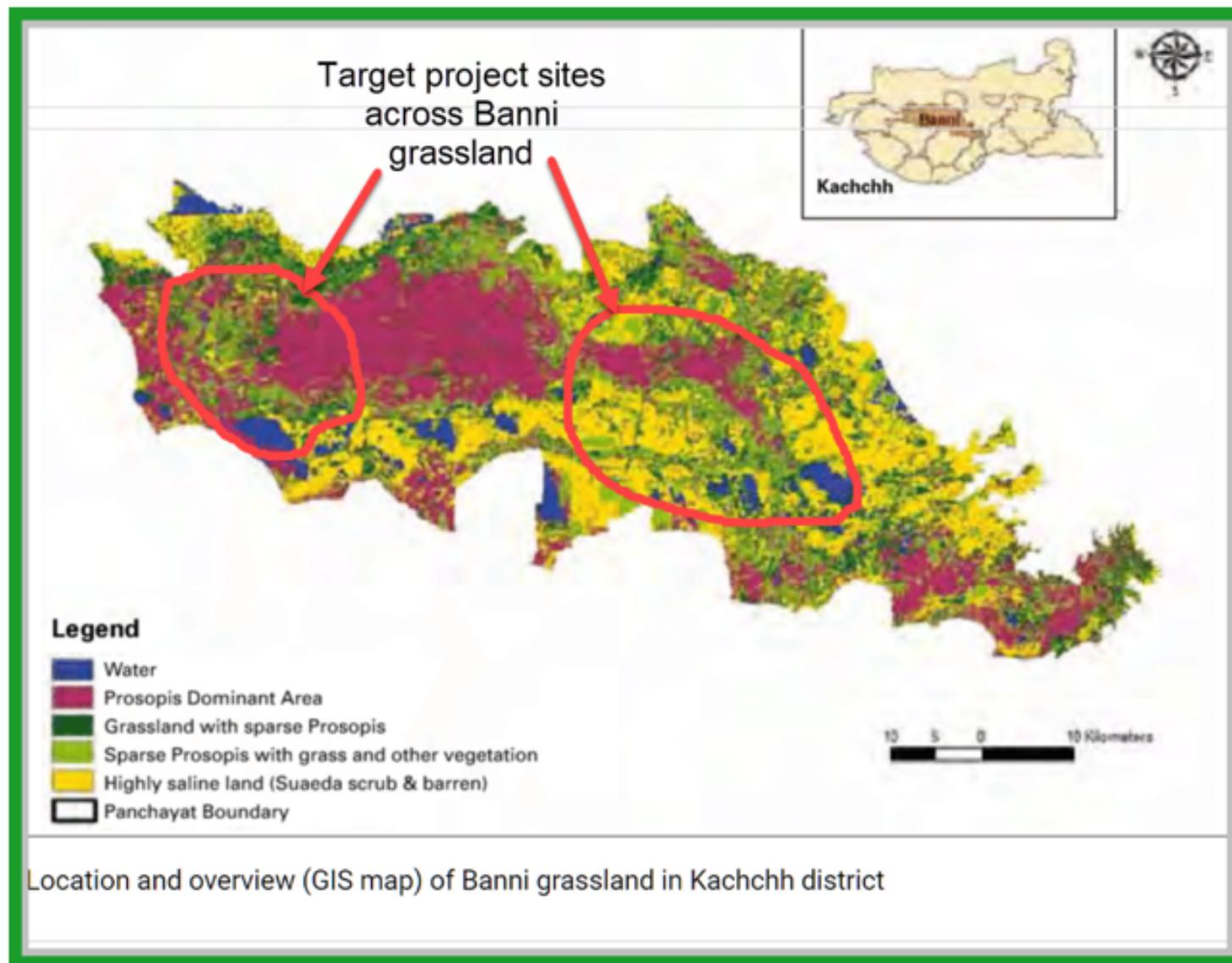
Mahajan, 2012). There are many pastoral communities in Banni who have migrated several generations ago from Sindh, Marwar and Baluchistan. The livestock breeders of Banni are called Maldharis. The other community in Banni is the Meghwals. Their main occupation has been leather tanning and shoe making including making artifacts from leather. The Banni grassland was once known as Asia's finest tropical grassland.

Livestock breeding is a very important agriculture allied activity in Kachchh. Traditionally Kachchh is famous for livestock related activities and rural folk is highly dependent on it. Animal husbandry is the second largest employment providing activities in Kachchh after agriculture. Animal husbandry development will have direct impact on the development of rural economy of the district. Animal husbandry is the main source of livelihood for shepherds and many nomadic tribes in Kachchh. Cows and buffaloes are reared as milk cattle in all talukas of Kachchh, mainly by farming communities as a supplementary income source from milk. Sheep, goat, camel, horse and donkey are reared mainly by nomadic tribes in Kachchh. Sheep and goat are reared for wool and meat purpose. Camel, horse and donkey are reared for breeding purpose and selling the mas load carrying animals. 'Banni' buffalo, 'Kankrej' cow and ox, 'Patanwadi' sheep and 'Kachchh' goat are proven important breeds of Kachchh. The expanding market with rise in demand for diverse animal products and easy access to marketing are added opportunities for further strengthening of this allied sector in the district with wide network of infrastructural and support services.

Banni was not traditionally a dairy-farming economy. It is only recently after the introduction of dairy, in 2009-2010 for milk collection that the pastoralists of Banni started selling milk. Since the Banni Grassland is classified as a Protected Reserve Forest, it has been illegal to cut Prosopis and there has been a ban in place. In 2004 this ban was lifted, leading to a huge increase in charcoal production (Bharwada and Mahajan, 2012).



**Fig. 5.** District map of Kachchh indicating its 10 talukas.



**Fig 6.** Target project sites across Banni grassland of Kachchh, Gujarat

About 13 different communities inhabit Banni and the vast majority belong to the Maldharis who live in 48 villages. The herders of the area keep animals of superior breeds, supplying them to various parts of the state and even to other neighbouring states. However, due to establishment of milk co-operative societies, the locals are now inclined towards selling the milk and milk products. Over the years of survival in the harsh climatic regime, the traditional

livestock breed of the area emerged as one of the most productive buffalo in India and Banni buffalo is recently recognized as 11<sup>th</sup> distinct buffalo breed of the country by National Bureau of Animal Genetic Resources, Karnal.

Currently, Kachchh rangelands experience extreme grazing pressure beyond the carrying capacity as the fodder requirement cannot be met from the existing grassland resources. Over few decades' invasion by *Prosopis juliflora* in Banni grassland and high salinity have put the entire ecosystem's health at risk as they remain threat to the integrity and function of ecosystems. The Gujarat State Forest Department, as a measure to check the advancement of the Rann, has planted initially about 31,550 ha exclusively of *Prosopis juliflora*. The successive droughts and increasing salinity of Banni provides more suitable conditions for the growth and extension of this species, which has today become the most dominant species and is spreading at the rate of about 25 km<sup>2</sup> per year. As a consequence of high salinity, enormous grazing pressures and *P. juliflora* infestation, these grasslands have reduced fodder availability for the livestock. The grassland of Naliya is a breeding ground for the **endangered Great Indian Bustard (GIB)**. Thus, loss of grassland habitat has impounding grazing pressures and is foreseen as a threat to this species. In view of these restoration of the grasslands of Banni and Naliya to their normalcy, and maintain their ecological integrity is necessary to protect the local crop and animal diversity and improve the livelihood of the local tribes.

In addition, Kachchhi camels have its native breeding tract in Kachchh and found across different talukas of the district. They are physically strong, and well adapted for the arid climate and the uneven terrain of the region. According to Livestock census 2003 and 2007 (provisional) the population of Kachchhi camel in Kachchh district was 10477 and 8575 respectively. So, approximately 20 percent decline in camel population was recorded in 4 years. Currently there are about 8000 Kachchhi camels in the district today. Therefore, it was realized to consider Kachchhi Camel as a threatened breed, hence, with the participation of Breeders, NGOs and Department of Animal Husbandry, Government of Gujarat would function collectively to check the further decline in camel population. Camel milk with 7% milk solids not fat (SNF) costs Rs 100 per litre for the pasteurised variant and Rs 125 litres for the UHT pack. It is considered suitable for lactose-intolerant consumers, who can't take regular animal milk. Considered as a rich source of natural insulin-like protein that helps in managing Type-1 Diabetes, besides nutrients including iron and Vitamin C, camel milk is currently sold in Gujarat under the Amul brand. But looking at the growing traction from the urban consumers, Kutch District Cooperative Milk Producers' Union Ltd (Sarhad Dairy) which is a member dairy of Gujarat Cooperative Milk Marketing Federation Ltd (GCMMF) is now getting into bigger markets with its one litre ultra-high temperature treated (UHT) packs as well as 25-gram powder sachets.

The grassland productivity has come down from 4000 kg/ hectare in the 1960s to 620 kg/ hectare in 1999 (Bharwada and Mahajan, 2012). While, many reasons are attributed to the degradation of the Banni grassland, the evidence is still inconclusive on whether the dominant cause is increasing salinity or spread of *Prosopis juliflora*. However, the most cited reason by the Maldharis (pastoralists of Banni) is the spread of *Prosopis juliflora*, which do not allow other species to grown. Also, the area under grassland has reduced from 1,42,000 hectares in 1989 to 63,000 hectares in 2009 while the area invaded by *Prosopis juliflora* has increased to 82,000 hectares (Koladiya, 2016). With livestock rearing being the primary occupation of the people of Banni, grassland degradation poses a serious problem for sustaining their pastoral economy. Livestock rearing is an important occupation for arid district, Kachchh. The total livestock population in Kachchh increased from 94,097 in 1962 to 1,707,279 in 2007, 18 times increase in a span of 45 years (Gavali, 2011). The increase in the population of sheep and goat is an indicator of desertification. Other factors that have contributed to the changing livestock composition is the susceptibility of Kankrej cattle (a local cattle breed) to *Prosopis juliflora*, decline in grazing land, less inclination towards pastoralism by the young generation and promotion of dairy industry in Kachchh (Gavali, 2011). Further, during the normal rainfall years, livestock from neighbouring talukas and districts of

Kachchh, and even from other states, totaling over 2 lakhs immigrates into Banni for grazing. On average, the grazing pressure in these arid rangelands ranges from 1 to 4 ACU (Adult Cattle Unit) per ha per year against the carrying capacity of 0.2 to 0.5 ACU per ha per year. In spite of the fact that one ACU in arid areas requires between 2 and 5 ha of pastureland, the available grazing land, which includes all categories i.e., good, fair, medium and poor condition grasslands, is less than 2 ha per ACU in the Kachchh district. Therefore, the grazing requirement of the entire livestock in the district cannot be met from the existing grassland resources.

These issues have resulted in a severe unsustainability in Banni grassland, which decreased the human population from 14,389 in 1981 to 10,949 in 1991 (24 per cent), and livestock population from 49,240 in 1982 to 26,084 in 1992 (47 per cent). Among the three regions (east, west and central) of Banni, the eastern Banni has already lost its capacity to sustain both human and livestock populations, and the western Banni is slowly losing its capacity. As a result, a maximum concentration of 55 per cent of the human (4149) and 65 per cent of the livestock population (7333) is located at central Banni region (GUIDE, 1998), exerting excessive pressures in this area which may lead to massive degradation due to over-exploitation of resources.

Some initiative has been undertaken for the restoration of these grassland; however, the success rate was low. The Gujarat Ecology Commission (GEC), a body created by the Forest and Environment Department of the Government of Gujarat, initiated a restoration programme for Banni grassland in 1995 with the aims to improve ecosystem productivity, and thereby ensure the socio-economic resilience of local inhabitants in a region entirely dependent upon livestock and the rangelands that sustain them. More recently, the Government of Gujarat has taken special interest in the project of rejuvenation of Banni grassland. The successful replantation of grass and creation of seed bank will be a major step towards tackling climate change effects too. This is also a successful attempt at mankind Kutch self-reliant in grass production (*Times of India news of 5 April 2021, by Mr. Rajiv Gupta, Additional Chief Secretary, Forest and Environment, Government of Gujarat*).

The project will be thus supporting the on-going planned initiatives with innovative models and designs and the following intervention are suggested:

- Providing alternative source of animal feeding to protect Banni grassland from frequent grazing to facilitate the replacement of undesirable annual grasses with productive perennial species. This will through be promoting high yielding fodder varieties of cultivated fodder species such as sorghum, pearl millet, maize, cowpea, Lucerne, Berseem, Oats, Horsegram, etc.
- Introduction of improved varieties of indigenous rangeland grass species such as *Cenchrus setigerus*, *Sporobolus* sp., *Eurochondra* sp., *Dichanthium annulatum*, *Chloris barbata* and *Cenchrus ciliaris*. Other species, which are not reported from this region such as *Chrysopogan fulvus* and *Pennisetum pedicellatum* to be tried in small quantities. The source of improved varieties of these species will be obtained from IGFRI and CAZRI.
- Introduction of controlled grazing system that will increase reseeding activity (increase the seed bank of the area) and thereby enrich the grass density and diversity of the restoration site.
- For improved germination of grasses, seed scarification techniques to be introduced for better establishment of rangelands.

- A three-tier system of Banni grassland will be introduced, including multi-purpose trees, shrubs and range grasses and legumes. This will allow round the year animal feed.
- Suitable varieties of fruit tree species will be introduced such as Ber, Aonla (Indian gooseberry), Guava, Jamun, etc. which will provide additional income for the local communities and increase availability of fruits.
- Establishment of Farmers Field School for climate smart fodder production with ICAR-KVKs
- Capacity building programmes for small food and fodder processing industries, with increase participation of women.

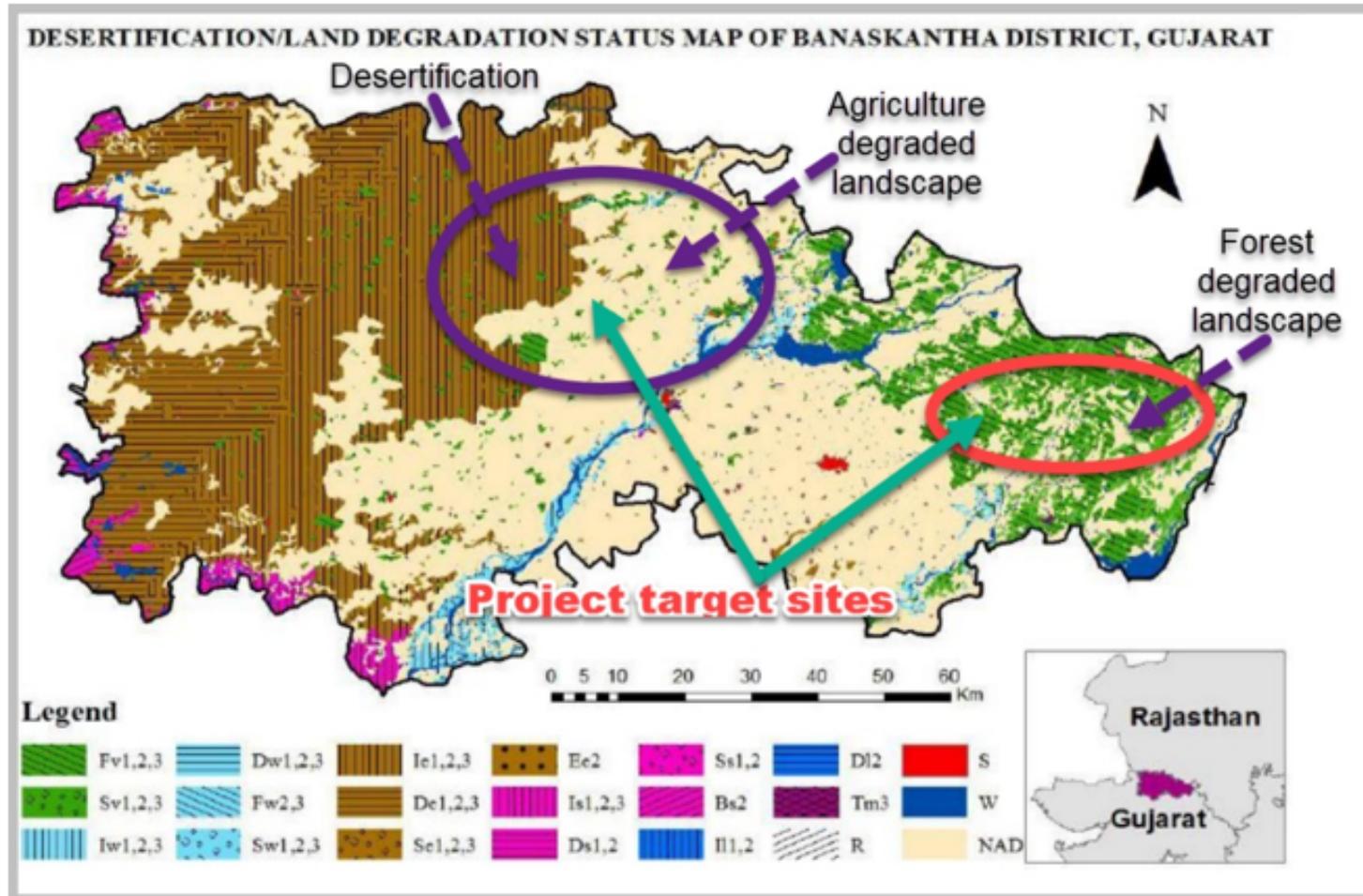
### **Banaskantha:**

Banaskantha, located in semi-arid regions of Gujarat, falls in the north-western part of the Gujarat state (India) and lies between 23° 55' and 24° 43' North latitudes and 71° 16' and 73° 0' East longitudes. It is the fourth largest district in terms of area accounting for 5.47 % of the total geographical area of Gujarat i.e., 10,743 sq. km. Banaskantha receives merger amount of rainfall. The average annual rainfall is about 696 mm. Topographically the district can be divided into three main parts – the hilly or mountainous sub-region in the east, the piedmont zone in the central part and the plain area in the west. About 49% of the district is drought prone affecting about 34% of the total population of the district. All the drought prone talukas of Banaskantha are confined on the western part of the district, on fringes of Rann of Kachchh, making them vulnerable to desertification. Furthermore, non-availability of forest cover i.e., 10.3% of TGA (Forest Department,2010-11) along with increasing population and livestock also enforce the process of desertification in the district.

The barren lands and agricultural areas on the western part of the district, adjacent to Rann of Kachchh, are subject to salinization. Scarce vegetation along with high wind velocity from the western to the eastern direction is the causes of intrusion of sands from Rann of Kachchh in this area. Some portion of this agricultural land gets water-logged in monsoon. The agricultural areas in the western part of the district receive less rainfall as compared to eastern part of the district and are comparatively quite dry. It falls under areas classified as drought prone. It shows that the whole agricultural economy of the area depends on the kharif crop and a single drought year can give a fall to the economy of the area. During rest of the year, the areas remain bare and are subject to wind erosion of moderate to high severity. The central part of the district and all the agricultural areas surrounding the Banas River get adequate amount of water for irrigation and no apparent degradation is observed here. Water erosion on the banks of Banas River is observed to be affecting surrounding agricultural areas, scrublands and forest area. About 8.49% of district area covered by forest in the hilly mountainous regions in the eastern part of the district is subject to vegetation degradation of moderate to high levels of severity. The man-made processes such as mining and quarrying were also found to be operative locally but severely. The most significant classes of desertification in the district are wind erosion in agricultural lands and vegetation degradation in forest lands with medium to high severity. The study clearly indicated that satellite data could be effectively used to provide quick and timely information on the process of the desertification, land use and land cover classes affected by the processes and severity of degradation.

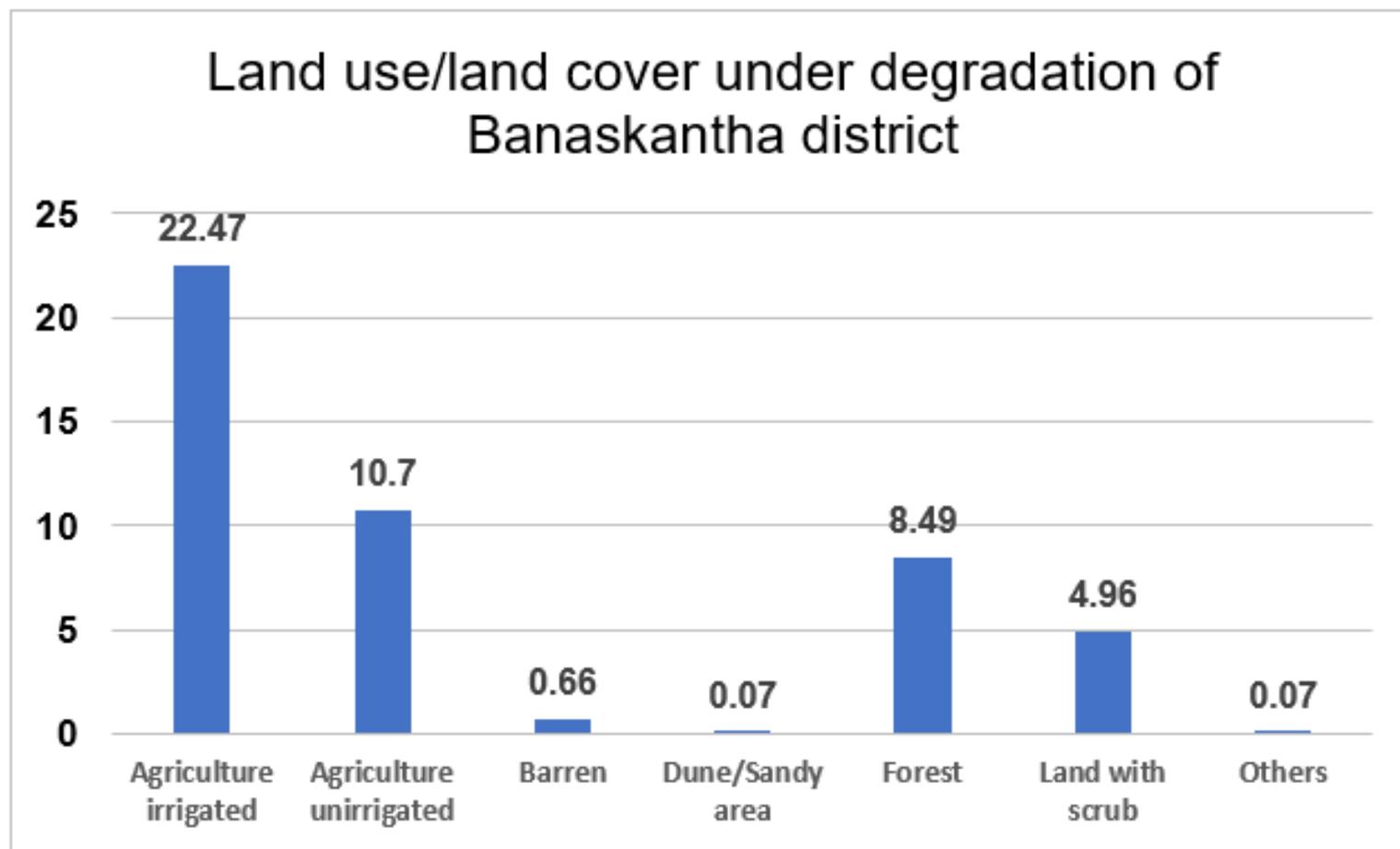
About 79% of the district in under agriculture (irrigated as well as unirrigated). Other classes include forest (10.22%), scrublands (6.27%), sandy area (0.09%), barren land (0.66%), rocky area (0.04%), and other mining activities (0.08%). About 3.5% of the total district is covered by water bodies, drainage and settlements, having no scope for desertification. Major crops of the district are bajra, castor, cluster bean, mung bean, moth bean, groundnut, cotton, Fruits: Citrus, pomegranate, Aonla, Mango, Sapota. Vegetables: Brinjal, cluster bean, tomato, and cowpea.

Drought is a common feature causing soil moisture deficiency leading to desertification. The study revealed that Banaskantha district is classified into 37 desertification classes and about 47% of its area is undergoing degradation (Davda Kruti *et al.*) The major degradation processes observed in the district are wind erosion (~32%) and vegetation degradation (~10%). Rest of the areas shows water erosion (~3%), salinization (~2%) and water logging (~0.1%). The most significant classes of desertification in the district are wind erosion in agricultural lands and vegetation degradation in forest lands with medium to high level of severity (Fig. 7).



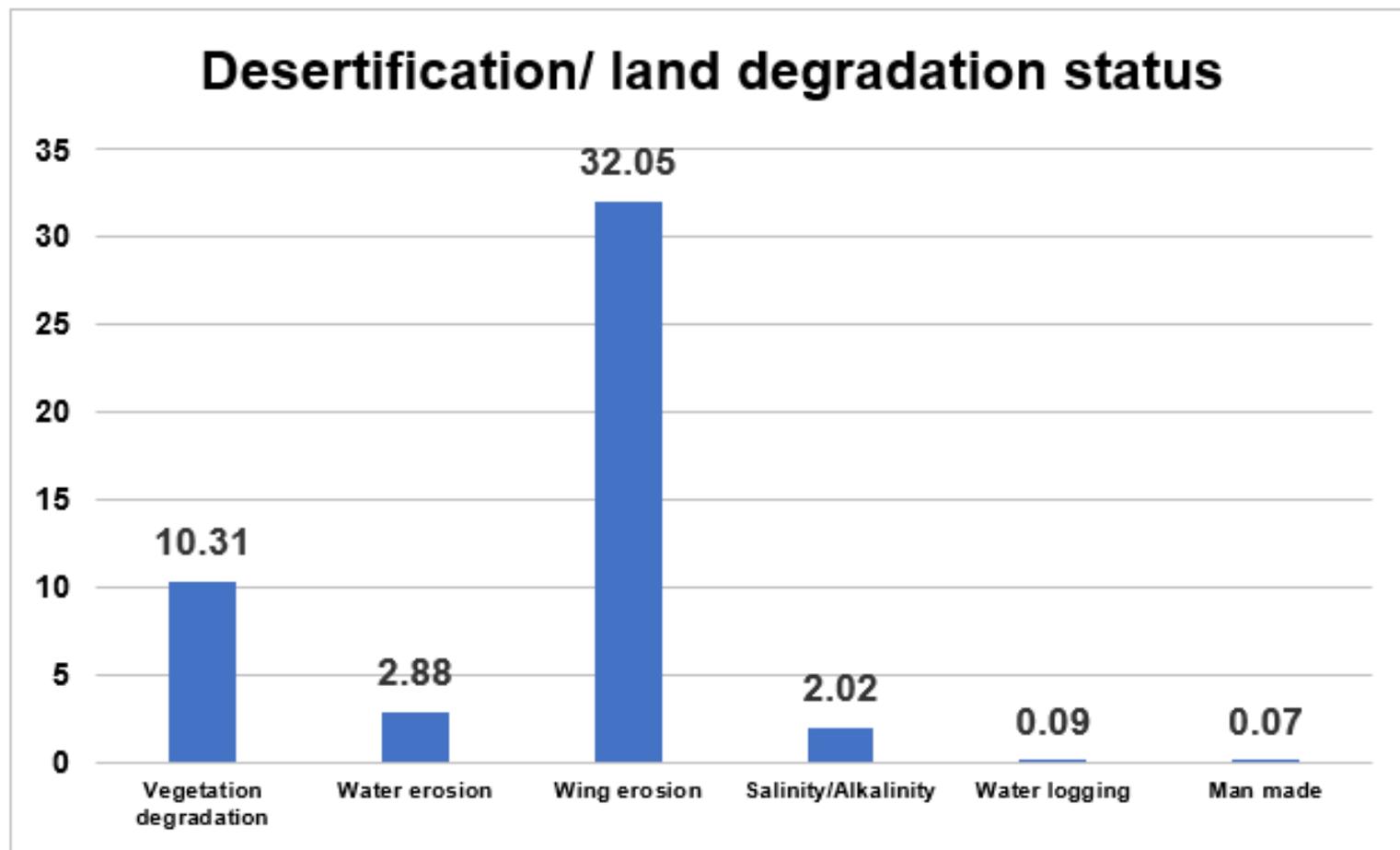
**Fig. 7.** Desertification status map of Banskantha districts, Gujarat.

The major land use/land cover classes affected by desertification process are irrigated agriculture (22.47% of TGA), unirrigated agriculture (10.70%), forest (8.49%) and scrublands (4.96%), as shown in Fig. 8 below.



**Fig. 8.** Land use/land cover under desertification in Banaskantha district, Gujarat.

Fig. 9 shows distribution of various degradation process identified in the district. The observed processes in the district are vegetation degradation (10.31%), water erosion (2.88%), wind erosion (32.05%), salinization (2.02), water-logging (0.09%) and man-made activities (0.07%).



**Fig. 9. Desertification/land degradation status of Banaskantha district, Gujarat.**

#### Maharashtra:

Maharashtra is located in south-western part of India and is the third largest State in India accounting for 9.4% of the total geographical area (3,07,713 sq. km) of the country and the second most populous State with a population of 11,23,74,333; with 365 population density, 929 sex ratio and 82.34% literacy (2011 Census). Maharashtra occupies the western and central part of the country and has a long coastline stretching nearly 720 km along the Arabian Sea. The Western Ghats is not only the prominent biodiversity resource for the region and an important climatic divide (average elevation of 1200 metres), but also forms one of the three watersheds of the State from which originate several important rivers, including Godavari and Krishna. Mumbai is the capital of Maharashtra and also the financial capital of the country.

The major geographic features of Maharashtra are Sahyadri Range, Western Ghats, Deccan Plateau, Konkan coastal belt and the river valleys. The main rivers of the state include Krishna, Bhima, Godavari, Tapi-Purna and Wardha-Wainganga. The soil which dominates the state is the black soil, also known as the black cotton soil. The climate is of a tropical monsoon type with a searing heat in the summer months, and cold winter. The monsoons have varied influence over different regions, causing heavy rain at some places and mild rainfall in others.

A wide variation in the distribution of rainfall is seen across the State, with the coastal belt, the Konkan region, receiving more than 2,000 mm annually, and the second highest rainfall being recorded in the Vidarbha region. Rainfall in Maharashtra increases steadily towards the east and average rainfall in the easternmost districts is about 1,400 mm. The rain shadow and Marathwada regions are the drought-prone areas of the State, with an annual average rainfall of less than 600 mm. These regions are generally characterized by extreme aridity, hot climate, and acute deficiency in water availability. More recently, areas in Vidarbha, which usually have reliable rainfall, have experienced variable and reduced.

A warming trend has been established over Maharashtra for both maximum and minimum temperatures over the past 100 years. Although uniform maximum temperatures between 34<sup>0</sup>C to 40<sup>0</sup>C are seen over large parts of India, steep temperature gradient during pre-monsoon season is found over the west coast including parts of Maharashtra. The seasonal temperature variation is considerably modified by the southwest monsoon. The spatial changes in minimum temperatures are observed to be decreasing in most parts of Western Ghats. Pre-monsoon maximum temperatures have increased significantly over the west coast.

About 40% of the area in Maharashtra is drought prone and 7% is flood prone. About 90% of the land in the State has basaltic rock, which is nonporous and prevents rainwater percolation into the ground, thus making the area prone to droughts. Floods are a result of damage to the dam embankments, excessive water release from dams, improper storm-water drainage systems and unplanned urbanisation. About a quarter of India's drought-prone districts are in Maharashtra, with 73% of its geographic area classified as semi-arid. The drought-affected districts of Maharashtra are mainly Ahmednagar, Solapur, Nashik, Pune, Sangli, Satara, Aurangabad, Beed, Osmanabad, Dhule, Jalgaon, and Buldhana which account for 60% of the net sown area and lie in the rain shadow region east of the Sahyadri mountain ranges in Maharashtra and the adjacent Marathwada region. Maharashtra experienced severe and successive years of drought in 1970-1974 and 2000- 2004.

The four river basins namely Krishna, Godavari, Tapi and Narmada are monsoon-dependent and together, they support 92% of the agricultural cultivation and more than 60% of the rural population. Groundwater is an important water source due to the integral role it plays in agriculture, industries and domestic purposes. Sadly, it is depleting in central and western Maharashtra due to excessive sugarcane cultivation. Rainfall patterns have undergone drastic change (decreasing rainfall witnessed in July and increasing rainfall seen in August) due to climate change. There is an increase in projected rainfall in the 2030s, with a projected decrease by the 2050s. This fluctuation can result in water scarcities of varying intensities for rivers Tapi, Narmada, Godavari and Krishna. With respect to droughts, the frequency is predicted to increase in the future through changes in the hydrological cycle viz. precipitation, evapo-transpiration (ET), soil moisture etc. and additionally, land cover changes may decrease recharge. Rising sea levels will allow saltwater to penetrate further inland and upstream in low lying river deltas. An overall increase in surface runoff is projected in specific catchment areas as well.

Maharashtra is predominantly still an agrarian state with 56.5% of the land being cultivated. However, only 19.64% of the cultivated land is irrigated, while the remaining land is directly dependent on rainfall. A shift from cultivation of food grains and forage crops to cash crops has been observed with the area under cultivation of pulse crops and horticulture still being high. There has been a growth in the use of crucial inputs such as irrigation, chemical fertilizers and high-yielding variety seeds, but productivity of crops in the state has not improved much, rather, it has decreased in some cases. Lack of irrigation facilities along with issues of soil erosion, salination of irrigated lands, degradation of pastures, water pollution and overexploitation of forest stocks remain a challenge for the State. Changing temperatures, pests and pathogens, moisture changes, water availability and CO2 concentrations have led to changes in crop growth cycle and stunted growth of crops.

Climate change effects are seen to escalate the vulnerabilities of the farmers who already suffer from a low-risk coping capacity and have to navigate through unorganized agricultural markets and food supply, unavailability of sufficient cold storage, and post-harvest losses regularly. In case of perishables, horticulture crops that fetch high commercial returns, lower quality produce results in losses. Due to weather changes, the arrival patterns of the crop in the market are affected creating demand-supply discrepancies. In the case of livestock, increased temperatures lead to high body temperatures of animals, resulting in decline in feed intake, disturbed reproductive functions and low milk yields. This increases their susceptibility to a number of diseases and makes them more prone to vector-borne diseases and severe weather events. Fishing as a livelihood option is also impacted due to temperature rise, sea level rise, salinity and acidification. The abundance of certain species as well as overall harvests and resultant incomes are facing a threat with fishing stock and distribution, infrastructure and operations taking a severe hit due to extreme weather events like floods and storms. A macro-effect here would be the impact on food security and culture that could push the fishing communities to migrate and force them to change their livelihood option.

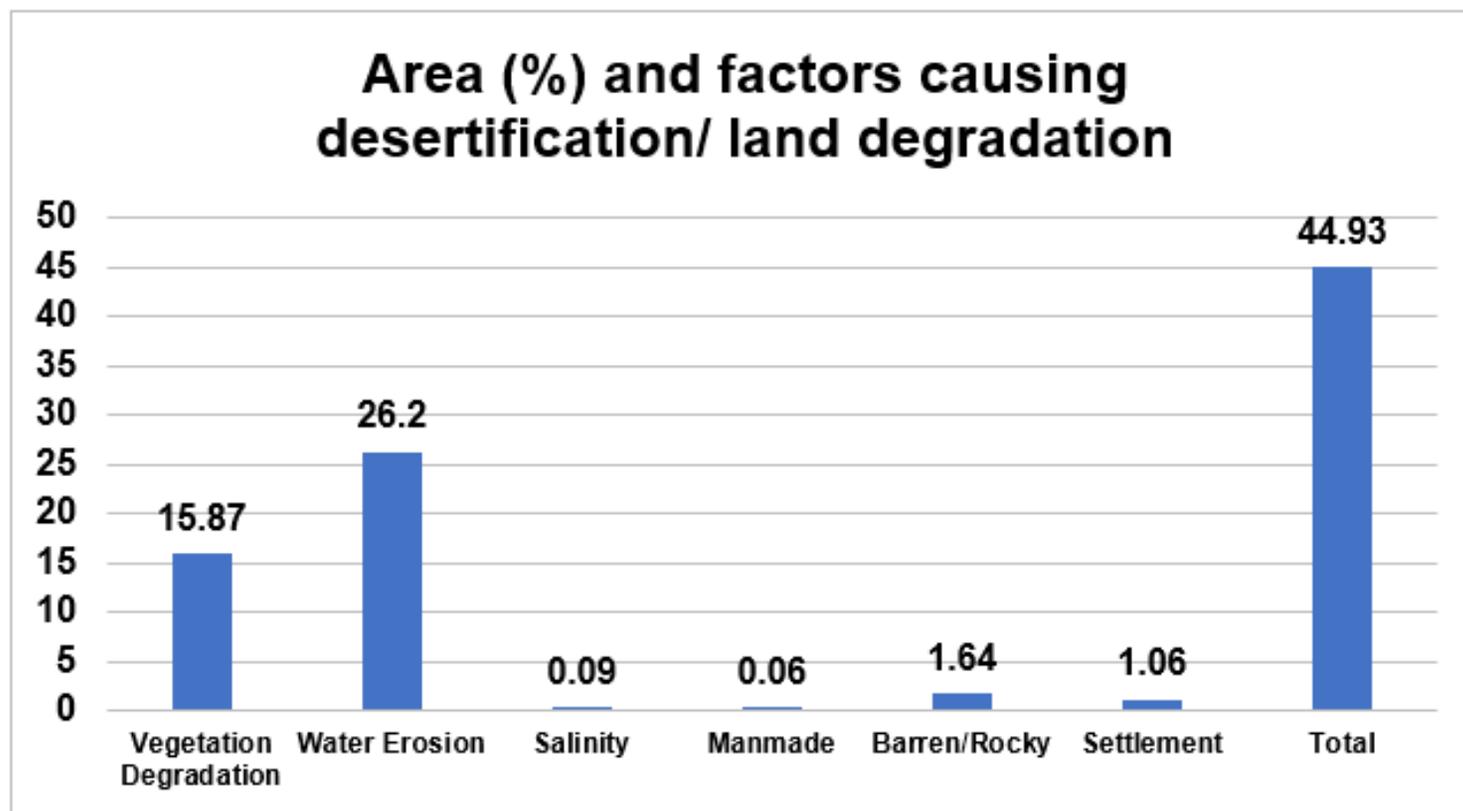
Deforestation and forest degradation are major threats to the forests and biodiversity in Maharashtra. There has been a decrease in dense forest cover in Western Ghats by more than 10% and an increase in the area under water bodies (including dams). Land cover changes owing to expansion of human settlement and agriculture has worsened the problem. The northern and central parts of Western Ghats are vulnerable to climate change, while the southern part appears more resilient. Increased fire risks in savannah woodlands, increased aridity, reduced fodder availability, fragmentation of habitats and extinction of specific species from evergreen forests, severe threat to the flora and fauna already under threat currently, and increased salinity in coastal zones affecting local fish species sums up the impact of climate change on ecosystems.

Likewise, sea-level rise, developmental activities, changes in frequency and levels of high-water events and storm events, along with rise in temperature, altered ocean circulation patterns and changes in precipitation would have an impact on mangroves and will continue to do so unless we take remedial steps.

The Maharashtra State Adaptation Action Plan on Climate Change (MSAAPCC) adopted by the state government in 2014 explains climate change and its effect on eight sectors, namely water, agriculture, forests, biodiversity, livelihoods, health, energy and infrastructure, and focused on one highly vulnerable region. The state action plan puts forth points of action for developing sustainable groundwater management mechanisms, retaining and conserving the riparian buffer around the wetlands for improved surface runoff management, conserving and re-naturalizing rivers and water bodies, and enhancing water storage and groundwater recharge. The state action plan points for enhancing quality of forest cover and improving ecosystem services, diversifying livelihood options, and promoting scientific monitoring and research for improved decision-making. It also includes launching a Green Maharashtra Mission 2020 for

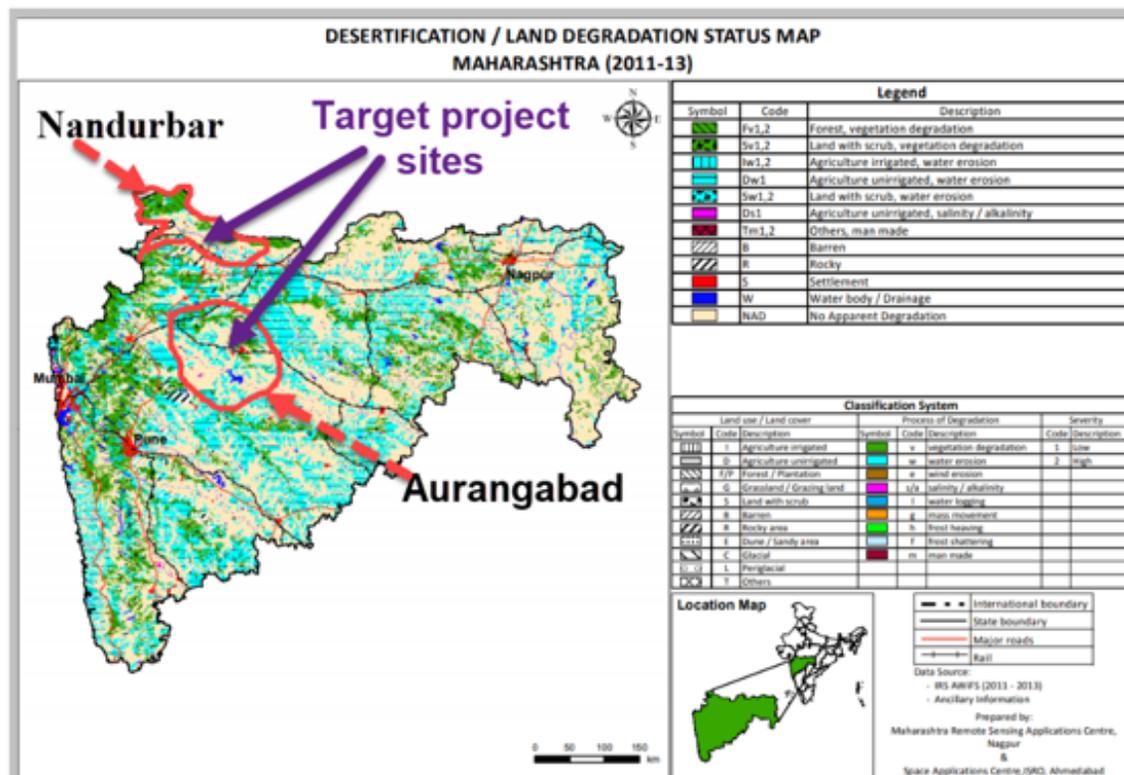
biodiversity, developing buffers, conserving biodiversity, promoting ecosystem research on climate variability and reducing the non-climatic stressors on the mangrove ecosystem by formulation of Regional Monitoring Networks. However, the plan does not address land acquisition and deforestation caused by government development projects or industrialists. The violation of rights and existing climate vulnerabilities of tribal communities have not been acknowledged. Their activities are seen as “threats” to forests, completely nullifying their role in conservation efforts.

Maharashtra is the state with second highest area under desertification/ land degradation with respect to country TGA, i.e., 44.93% for period 2011-13. The desertification/ land degradation area in Maharashtra has increased about 1.55% since 2003-05. The most significant process of desertification/ land degradation in the state is Water Erosion (26.20% in 2011-13 and 24.77% in 2003-05) followed by Vegetation Degradation (15.87% in 2011-13 and 15.89% in 2003-05), as shown in Fig. 10.



**Fig. 10.** Desertification and land degradation status of Maharashtra.

Target project sites in Maharashtra include forest and agricultural (irrigated and unirrigated) landscapes and to some extent grasslands, as shown in Fig. 11, covering the states of Nandurbar and Aurangabad.



**Fig. 11. Status of Desertification/ Land degradation and proposed target project sites in Maharashtra.**

*(Map disclaimer: The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations or UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.)*

### Nandurbar:

Nandurbar district belongs to Nashik Division of Maharashtra State and is situated between 73.31 and 74.32 East longitude and 21.03 and 22.00 North latitude. The natural boundaries of satpuda hills along with Narmada River form its boundaries. It is spread over a geographical area of 5,955 Sq. Kms, which is 1.62% of the total Geographical area of Maharashtra. District has 6 tehsils with 4 Municipal council, one Nagar Panchayat and 595 Gram panchayats. The district headquarters are located at Nandurbar city. The district occupies an area of 5955 km<sup>2</sup> and has a population of 16,48,295 of which 15.45% were urban. Total drainage network of the district contains about 29 watersheds out of which 21 are in Tapi river basin and eight are in Narmada basin. There are 943 villages across 3 sub-division and 6 Taluks.

The climate of the district is characterized by a hot summer and general dryness throughout the year except during the south-west monsoon season, i.e., June to September. The daily mean minimum temperature is 15.8°C and mean maximum temperature is 40.7°C. The average annual rainfall over the district is about 801 mm. It is the minimum in the eastern part of the district and increases westwards towards Nawapur and Akkalkuwa.

The total area under the forest is 104 thousand hectares which is 20.78% of the total geographical area of the district. The forest in the district covers an area of 3465.79 sq. km., mostly in Dhadgaon, Akkalkuwa, Taloda and Navapur talukas. The maximum forest area is in Akkalkuwa taluka alone (42.34%).

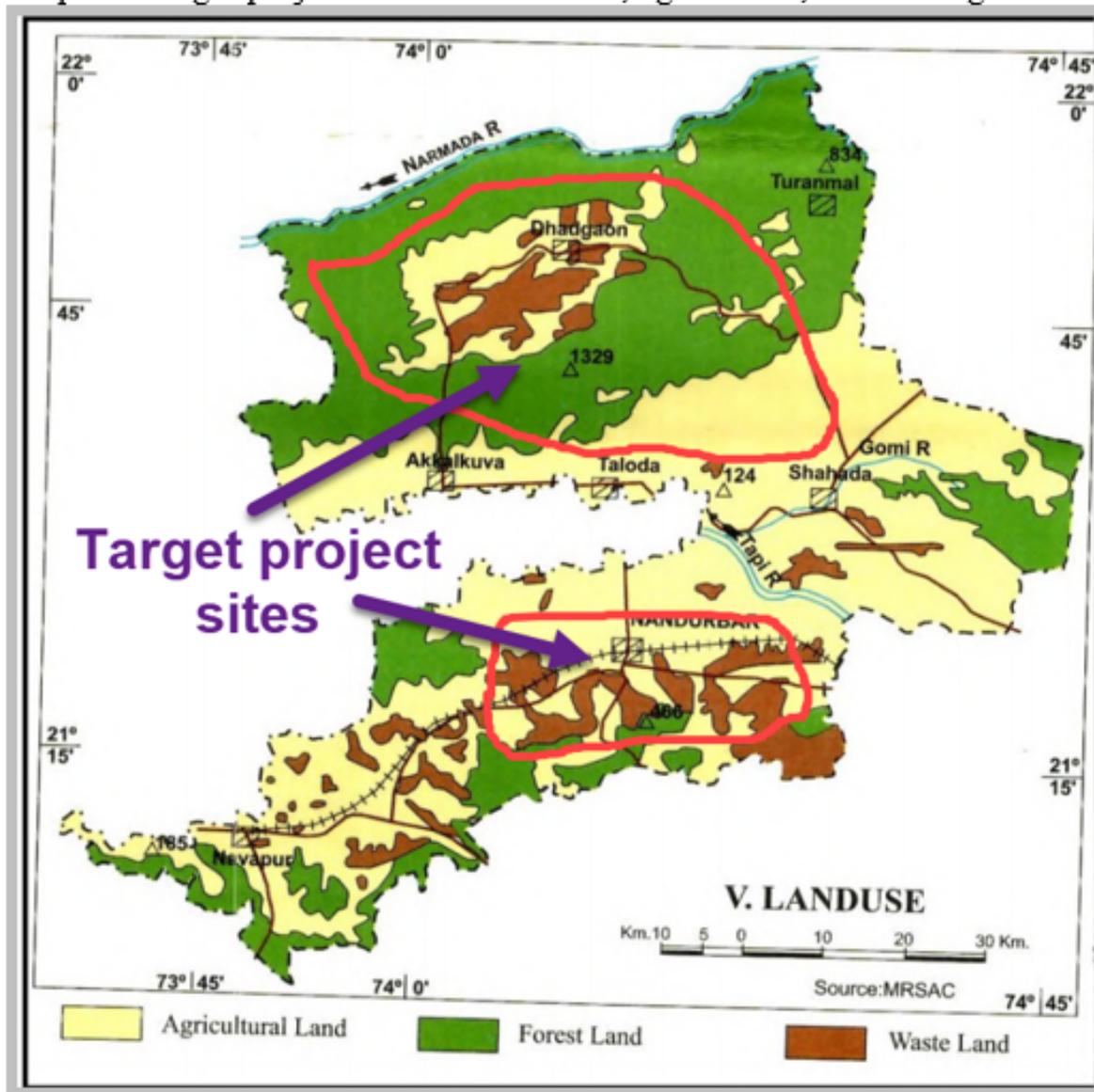
Mining activity is one of the main revenue sources for the district. District has 24 stone quarry leases (3 with valid environmental clearance but under stage of lease order) till March 2020 covering area 49.3ha. There are 31 locations of sand ghats over Tapi, Rangvali, Sarpani rivers where sand deposition are allowed from replenishment and other safety point of view in the district. (Source info. District Mining Office, Nandurbar). The major part of the district is covered by basaltic flows commonly known as Deccan Traps and dykes of Upper 6 Cretaceous-Lower Eocene age. Tapi Alluvial deposits are observed in Tapi River valley occupying parts of Taloda, Shahada and Nandurbar talukas. Along the north-western corner of the district, pre-trappean Bagh Beds of Middle to Upper Cretaceous age are exposed over a small area along the valley of the Devganga River. Trap rocks are hard, dense and durable and are suitable for building /construction purposes. Economically important mineral required for industrialization not found in the district. Hence district has basalt mining for infrastructural requirements with natural river sand up to some extent. At some places some patches of agate are found but with inferior quality.

Soil and Cropping pattern on the basis of depth, texture and colour, the soil of the district is grouped into three categories viz., light soil, medium soil and deep black soils. Along the banks of Tapi River and its tributaries soil type is black cotton soil. It is enriched by lime, iron, magnesia and alkalis. In the northern part of the district the soil varies from dark brown to yellowish brown of lighter type on the hill slopes, with clayey deep soil of the Tapi River valley to its south. Medium soils are mostly located in the southern and central zones of the district below the Tapi River valley in Nawapur. The soil varies from dark brown to dark reddish brown in colour. Owing to the peculiarity of the soil, both Kharif and Rabi crops are cultivated in this zone.

Malnutrition is a severe problem in this district indicating ecological poverty, lack of access to the natural resource base, etc. With the speedy depletion of forest and lands, food scarcity has badly hit tribal districts solely dependent on these for its food needs. Long spells of scarcity leave women and children – the first victims of environmental degradation – malnourished. This makes them vulnerable to various diseases. Nandurbar, just a few decades ago densely forested and with fertile agriculture lands, was a food-sufficient district in Maharashtra. A survey carried out this year by the Maharashtra State Tribal Research Institute found that three out of four infants in the predominantly tribal district of Nandurbar were malnourished.

Most of the people of this District are engaged in agricultural activities. According to Census 2011, percentage of the total workers engaged as cultivators is 24.29% and as agricultural labourers is 44.26% in the district. Together they constitute 68.55 % of the total workers of the district. District is producing *Kharif* Jowar, Paddy, Bajra, Maize, Toor, Mung, Soyabean, Groundnut seed and wheat as rabbi crop as most common agricultural crops.

Proposed target project sites across forest, agriculture, and mining land utilization are shown in **Fig. 10**.



**Fig. 10.** Target project sites in Nandurbar District, Maharashtra

Aurangabad:

Aurangabad District is located mainly in Godavari Basin and its some part towards North West of Tapi River Basin and is situated between 19°15'and 20°40' North Latitude and 74° 37'and 75° 52' East Longitude. Aurangabad district is situated in the north central part of Maharashtra between North Latitude 19° 15'and 20° 40, and East Longitude 74° 37'and 75° 52'. The total geographical area as per Census 2011 of the district is 10107 sq. km which constitute 3.28 % of the total area of State. Based on area classification, Vijapur Tahsil is the largest covering 1510.5 sq.km while Khultabad Tahsil is the smallest Tahsil with an area of 484.90 sq.km. The total population of the district is 36.95 lakh which is 3.28% of the total population of the State, of which 20.79 Lakhs population lives in rural area whereas 16.16 Lakhs population lives in urban areas. The total No. of households is around 4.25 lakhs of which 2.81 lakhs live in rural area while 1.44 lakhs live in urban area. The literacy rate in the district is 80.4 %. There is one municipal corporation (Aurangabad) and 6 municipalities in the district. Aurangabad district has 9 Tehsils viz. Aurangabad, Sillod, Vijapur, Paithan, Soigaon, Fulambri, Gangapur, Kannad, Khultabad. Municipal Corporation for Aurangabad and Municipal Council for other Tehsils is responsible for urban development of all the Tehsils. There are 9 Panchayat Samities and 6 Nagar Parishads.

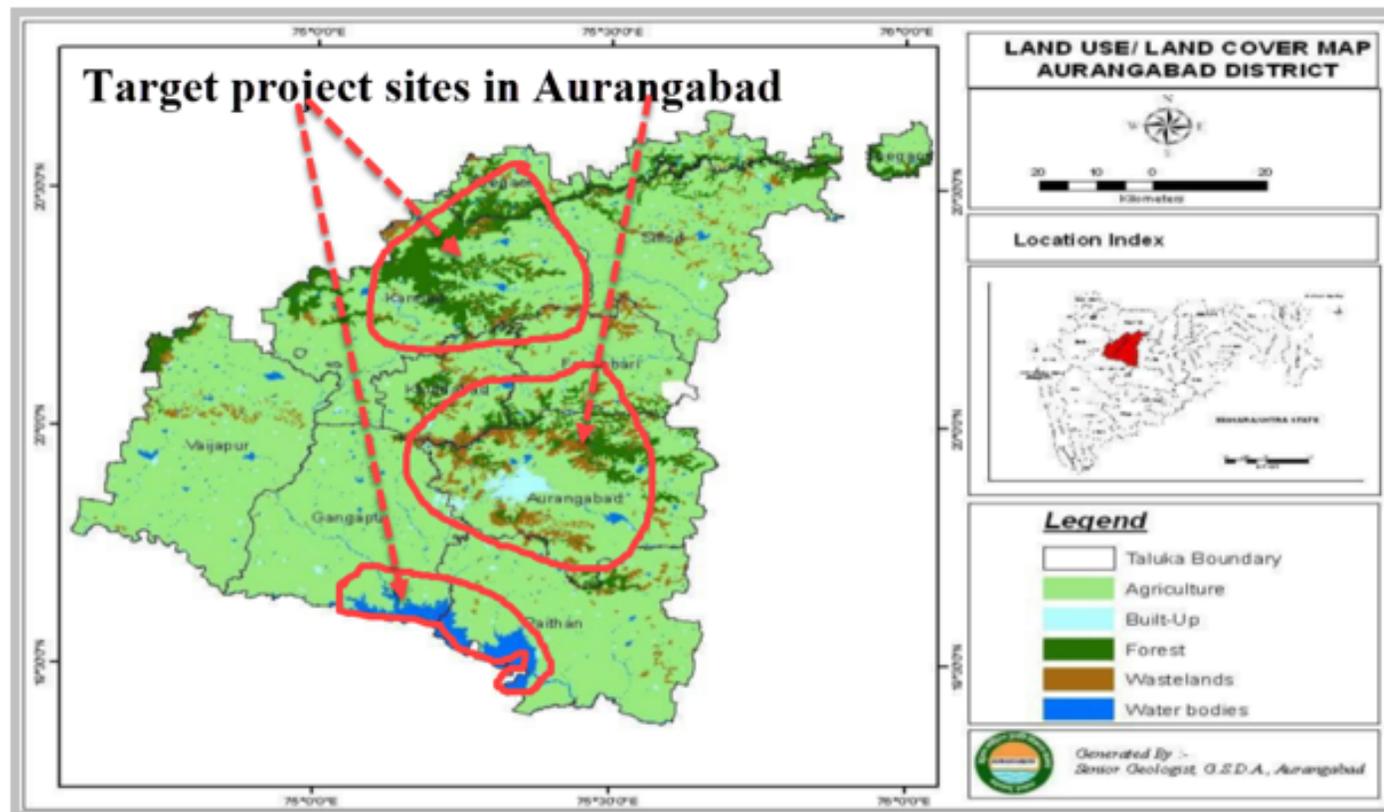
In the rural areas, the agriculture is the core sector of the economy and the major crops (irrigated) are wheat, jowar and gram, cotton, sugarcane and banana. Crops cultivated across un-irrigated areas included Rabi jowar, bajra, arhar and sunflower.

The climate of the district is characterized by a hot summer and a general dryness throughout the year except during the south west monsoon season, which is from June to September, while October and November constitute the post-monsoon season. The winter season commences towards the end of November when temperatures begin to fall rapidly. December is the coldest month with the mean maximum temperature of 28.9° C, while the mean minimum temperature is 10.3°C. From the beginning of March, the daily temperature increases continuously. May is the hottest month with the mean maximum temperature of 39.8°C and the mean minimum temperature of 24.6° C.

The district comprises of varied topographic features and landscapes consisting of high hills and plains and low-lying hills. Most of the hill ranges are located in the northern part of the district. The Satmala hills and Ajanta hills extend from east to west. The rivers in Aurangabad district may be grouped into three major classes, one is Godavari and Dudhna and the tributaries, second is Purna and Dudhana and their tributaries and the third is the tributaries of Tapi Basin.

The district is speedily growing to be a potential industrial place after Bombay, Pune, Sholapur, and Nashik. During the past decade it has gained prime place in starting major Industries in & around Aurangabad city. All other towns in the district are also growing fast towards industrialization.

Project will target mainly agricultural landscape, both irrigated and unirrigated, forest landscape and to some extent surface water bodies as shown in **Fig. 11**.



**Fig. 11.** Land use/ Land cover map of Aurangabad district and proposed project target sites.

#### Karnataka:

Karnataka is located in southern part of India with 1,91,791 sq. km area. The state has population of 6,10,95,297; with 319 population density, 973 sex ratio and 75.36% literacy (Census 2011). Karnataka has three natural regions like the Coastal strip (Paschima Karavali), the Western Ghats (Malenadu or Sahyadris) and the Deccan plateau (Bayaluseema). The Sahyadris are covered with evergreen forests. Karnataka has Arabian Sea in the west, [Goa](#) in the northwest, [Maharashtra](#) in the north, [Andhra Pradesh](#) in the east, [Kerala](#) in the southwest and Tamil Nadu in the southeast. The rivers Krishna, Bhima, Ghataprabha, Vedavati, Malaprabha, Tungabhadra, Cauvery, Hemavati, Shimsha, Arkavathi, Lakshmana Thirtha and Kabini flow through the state. Krishna and the Cauvery are the main rivers of the state, which drain the plateau regions of the state. Karnataka has a forest area of 38,720 sq. kilometres. There are five national parks located in the state namely Anshi, Bandipur, Bannerghatta, Kudrmukh and Nagarhole. There are also 18 wildlife sanctuaries and 7 bird sanctuaries.

Farmers and agricultural labourers account for nearly 57% of the Karnataka's work force. The state has ten agro-climatic zones and observes three growing seasons. Among these *khari*, the monsoon season lasting from July to October, accounts for 70% of the annual food grain and oilseed production. An overall increase in production and yield of major crops has been observed over the last decade. Yet the introduction of high yielding varieties has progressively reduced the cultivation of traditional varieties in the state. The loss of agricultural biodiversity is a serious concern. Droughts affect agricultural production in the state to a great extent, so do floods, to which especially *khari* crops are prone. Agriculture is highly vulnerable to climate change because of its wide exposure to temperature, precipitation, pests and diseases. Studies predict that a number of districts may become vulnerable in respect of crops presently grown. Likewise, opportunities emerge in terms of improving cultivation conditions for certain crops in certain areas. All in all, a net decline of -2.5% in agricultural production has been projected by a recent study over the next two to five decades with a major reduction in coastal regions.

About 20% of Karnataka's geographical area is under forest cover. Forests declined by about 2% between 2001 and 2007, especially dense forests were affected (-16%). The Western Ghats are among the 25 global biodiversity hotspots. Likewise, the coastal area has a rich and diverse biodiversity. A large number of species are identified as rare, endemic or threatened in both biota.

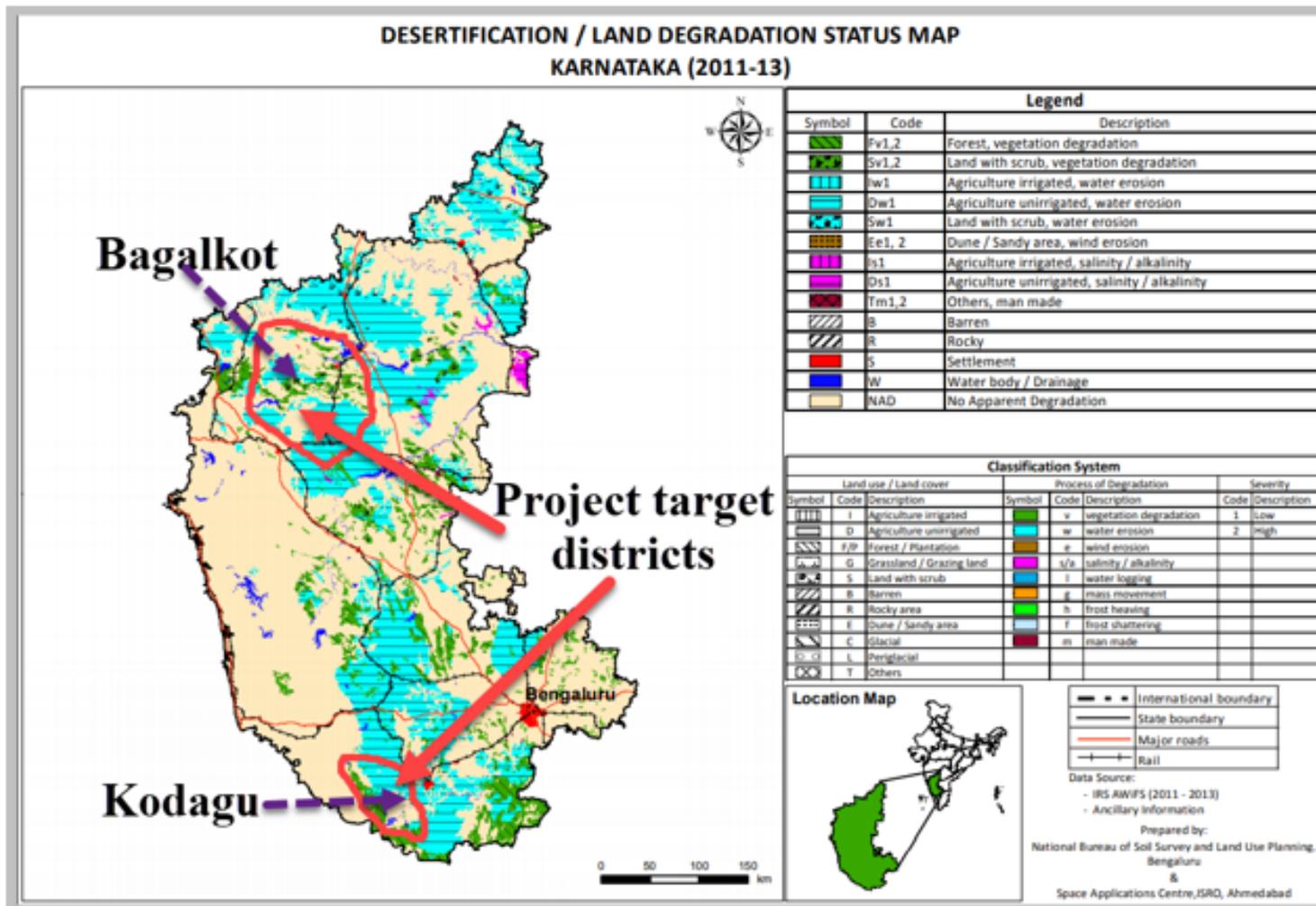
The state experiences semi-arid tropical climate with average annual rainfall of 1,151 mm. Around 80% of it is received during the southwest monsoon, 12% in the post monsoon period, 7% during summer and 1% in winter. Within the state there are considerable variations. During the southwest monsoon, rainfall is much higher in coastal locations on the windward side of the Western Ghats (3,350 mm) which drops sharply on the leeward side (600-700 mm). Northern interior regions by contrast have markedly semi-arid climates with low annual precipitation (500–600 mm). A recent study observed a declining trend in rainfall during the southwest monsoon: -1 mm per day per 100 years or 6% in 50 years. Projections made for the period 2021 to 2050 under a SRES A1B scenario predict a decline in annual rainfall for the south-western and north-eastern regions of the state. A wide region from the north-western part of the state including the coastal districts to the south-east is projected to see significant increase.

Karnataka has seven river basins and receives a total of 236 billion m<sup>3</sup> of water every year, 92% of it through rainfall. Around 47% are 'lost' through evapo-transpiration and another 46% flow into the Arabian Sea, into Andhra Pradesh and Tamil Nadu. The state meets its requirement from the remainder of about 7.5% paired with groundwater. There are nearly 37,000 tanks and lakes with a water spread area of 6.9 lakh hectare and more than 20,000 irrigation tanks. Groundwater provides for 45% of irrigation in the state. Karnataka experienced a decline in net annual groundwater availability by 3.2% between 2004 and 2009, attributed to groundwater extraction beyond replenishment. There are 8.6 lakh irrigation wells, 94% of which are equipped with electric pumps. Groundwater development stands at 68%. As much as 64 watersheds covering 35 of the 176 taluks of the state are over-exploited. It is projected that the Krishna basin may see a decline in rainfall while the Cauvery basin may experience an increase. Yet contrary to expectation, this may not lead to an increase in surface run-off. A net decline of 2% is projected because of the enhanced rate of evapo-transpiration.

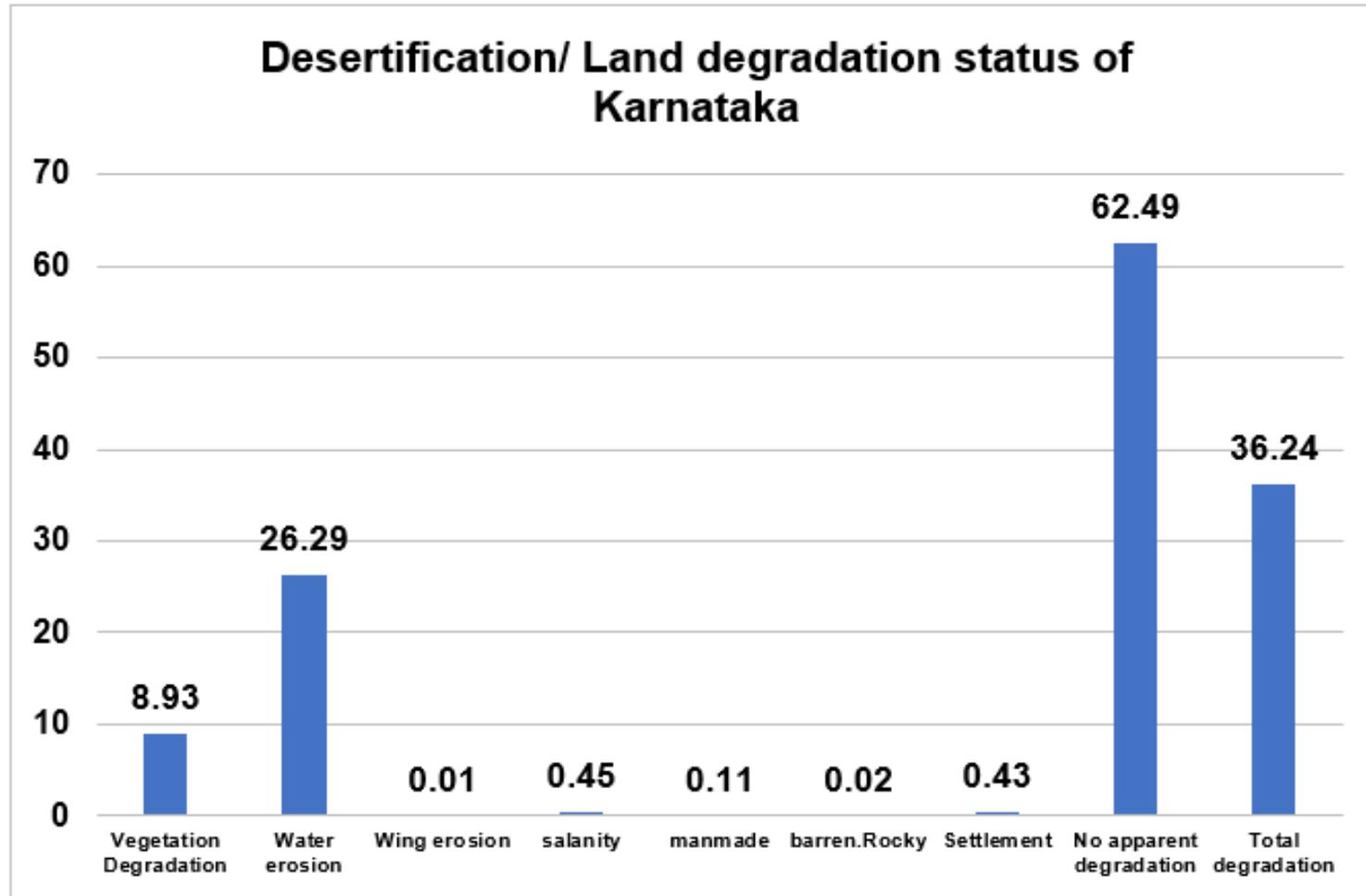
Karnataka's has 320 kilometres of coastline lined with coastal plains and undulating hills of 50 to 80 km and high hills further east. Fishing is a major source of livelihood with about three lakh people directly or indirectly engaged. Within the agriculture sector, the share of fisheries is increasing albeit marine fish production has witnessed considerable variation. The per-unit effort and return on investment in marine fishery is declining. A study cited estimates that over the last 20 years the peak catch in the state was 0.22 million tons against a projected maximum sustainable yield of 0.15 million tons.

Overall, a warming trend in Karnataka has been observed for the period June to September in northern interior Karnataka. Both minimum and maximum temperature were found to have risen by up to 0.6°C over the last 100 years. According to projections made (SRES A1B scenario), average temperatures may rise further by 1.7°C to 2.2°C by the 2030s. Projected increases are more pronounced in the northern districts. It is predicted that regions that already witness less rainfall and higher temperatures, such as northern Karnataka, will further experience lesser rainfall and increases in average temperatures.

Karnataka is observed with 36.24% of the total geographical area under desertification/ land degradation for the period of 2011-13. The desertification/ land degradation area in Karnataka has increased about 0.05% since 2003-05. The most significant process of desertification/ land degradation in the state is Water Erosion (26.29%) followed by Vegetation Degradation (8.93%), as shown in **Fig. 13**.



**Fig. 13.** Status of Desertification/ Land degradation and proposed target project sites in Karnataka.



**Fig. 14. Causes of Desertification/ Land degradation in Karnataka.**

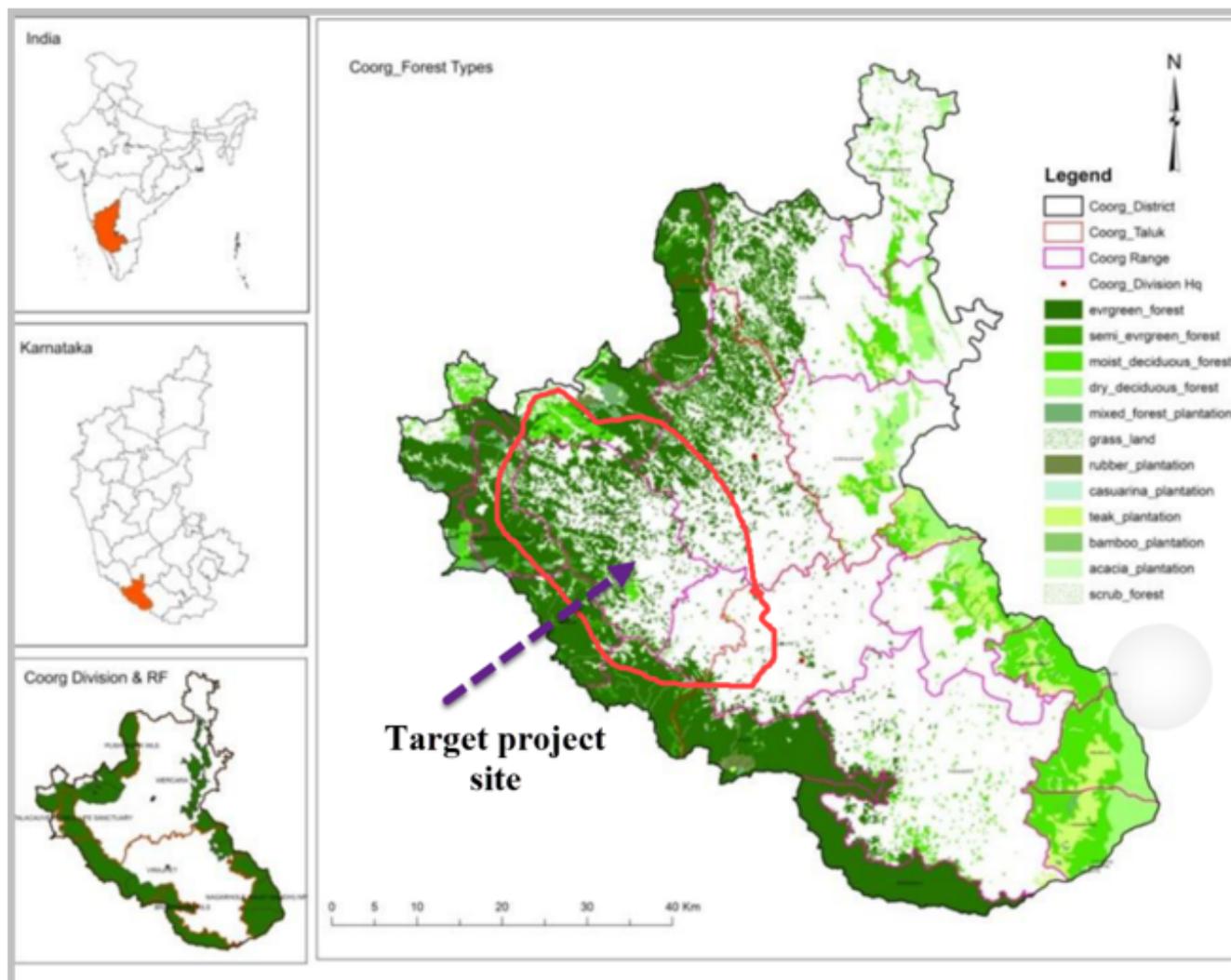
#### Kodagu district:

Kodagu District (Coorg) also known as “Kashmir of South” and “Switzerland of India”, is located in a nerve point of central and southern Western Ghats, which forms an important ecological section with abundant natural resources, native forests, mountains, lush green valleys, misty woods, paddy fields, numerous lakes, racing rivers and enchanting waterfalls, wildlife, tribal life, archaeological remains, historical monuments, great religious and cultural heritage. The district encompasses an area of 4102 km<sup>2</sup> with a population of 5,54,762 as per 2011 census. The elevation ranges from 900 to 1750 m above mean sea level and mean temperature range from 20°-24°C with an average rainfall of 4000 mm. The district is divided into the two forest divisions, namely Madikeri and Virajpet, which include three wildlife sanctuaries (WLS-Bramhagiri, Talacauvery, and Pushpagiri) and one national park (NP-Nagaraholé). The region is a home to endangered *Myristica* swamps having Critically Endangered *Syzigium travancoricum* and *Gymnacranthera canarica* (Vulnerable) are amongst many other species (Ramachandra et al., 2019).

The area has a large number of medicinal plants and non-timber forest product (NTFP) yielding plants. Kodagu covers 25% faunal species found in India and also a part of the Nilgiris biosphere reserve, home to two of the most prestigious and important wildlife Schemes - Project Elephant and Project Tiger. Kodagu forms (approximately 1600 to 1700 elephants present) a primary elephant movement path connecting the northern and southern portions of Mysore elephant reserve boundary (Karnataka Forest Department, Government of Karnataka). The economy of the district is driven by a thriving rural agrarian economy (agriculture, horticulture, livestock), which is supplemented by cash crops and incomes from tourism. The Kodagu produces more than one third of India's coffee with a share of 56% in Karnataka. The district alone produces 2% of the world's coffee. Coffee revenue has helped Kodagu to become one of the richest districts in India. The region has rivers such as Cauvery (Harangi, Lakshmanathirtha, Taraka, Cauvery, Hemavathi, and Kabini), Aralampuzha, Kuppanam, Payaswini, Valapattanam, Netravathi (Kumaradhara), etc., acting as a lifeline for Karnataka, Tamil Nadu, Kerala states. Sacred groves or devarakadu or *kan* forests are culturally protected patches of forests continue to thrive as a living tradition in Kodagu district. The district has highest density of groves in the world with at least a grove for every 300 ha, aid as islands for protecting the diversity of rare species in high human dominated landscape. However, the recent changes in sociocultural and religious belief of the communities also have contributed to the degradation of groves. The district is well connected with national and state high ways. The Government has now proposed to increase the road width of existing seven major highways in Kodagu and a new railway line connecting Talassery and Mysore. All the proposed expansions are either passing through sensitive habitats of wildlife and through buffer regions or running parallel to the protected area boundary.

Several temporal LU analyses highlight the loss of evergreen forest cover from 40 (1973) to 24% (2018) with the increase in other LU. The reduction of contiguous or intact/interior forest cover from 31 to 19% (2018) highlight the seriousness of the prevailing LU transitions (Ramachandra et al., 2019). The native forests are being replaced with the monoculture plantations (of exotic species) are responsible for microclimate alterations threatening the sustenance of horticulture crops. The emissions due to deforestation and loss of carbon sequestration potential of the landscape will enhance global warming with the consequences of changes in the climate.

Project will target degraded landscape across forest, horticultural and grassland landscapes, as shown in **Fig. 14**.



**Fig. 14.** Location map of Kodagu district showing Taluk, Division, Range and reserve forests boundaries along with Land Use / Land cover classification.

#### Bagalkot District:

Bagalkot a district carved out of Bijapur in 1997 as a separate district. Bagalkot is in the Northern part of Karnataka and surrounded by Bijapur, Belgaum, Raichur, Koppal and Gadag districts. Districts comprises 6 Taluks, 15 Towns and cities, 18 Hoblies, 623 Villages and 163 Gram panchayats. It is having 6,58,877 ha of geographical area. Net area sown is 4,59,387 hectares. Bagalkot is blessed with the flow of 3 rivers, Krishna, Ghataprabha and Malaprabha.

Black Cotton soil is the predominant soil type of the district. Important crops are jowar, Sugarcane, Maize, Groundnut, Sunflower, Grams, etc., along with Horticultural crops. As per 2011 census, district is having 18, 90,826 population (Rural population = 13, 34, 714, and Urban population = 5, 56,112), that amount to 29%, which is 3% less than the state average. Density per Sq. Km. is 288, which is lower than both state and country's average.

Bagalkot District is predominantly agriculture district as more than seventy percent of the population is dependent on agriculture. Bagalkot was chosen as the district is known for its rich horticultural production base of grapes, pomegranate, banana, guava, fig, lime, sapota, ber, vegetables, beetle vine, coconut, spices, and medicinal plants. The district is surrounded by Belgaum in the west, Dharwad and Koppal in the south, Bijapur in the north, and Raichur in the east, which are hubs for the production of grape, mango, pomegranate, flowers and vegetables. The area has a congenial climate for all kinds of crops besides its rich historical and cultural heritage making it an project site.

As water is one of the most important inputs essential for the production of crops, now a day's water is becoming increasingly a scarce source and is limiting the overall agriculture development. The gross crop coverage in the district is 2.4 lakh ha, 3.0 lakh ha. and 0.36 lakh ha. during *Kharif*, *Rabi* and summer season respectively. Major area of the district is dependent on rainfall and monsoon being the erratic many times, the total crop production and productivity are variable. Though there few irrigation projects in the district, the tail end areas of the canal are suffering from water availability. By drafting the water from the ground, the water table is decreasing day by day. On the other hand, by injudicious use of water the fertile soil of the district is becoming saline and alkaline in nature, which in turn affects the total crop production.

The project will target agricultural landscape, mainly focusing on rainfed agriculture and degraded forest land, as shown in **Fig. 15**.



Fig. 15. Location map of Bagalkot district showing district headquarter and other major cities and the proposed target project site.

