RECAP4NDC Project

CAPACITY BUILDING FOR FOREST LANDSCAPE RESTORATION IN GUJARAT: A KEY STAKEHOLDER-BASED TRAINING NEEDS ASSESSMENT

INDIAN COUNCIL OF FORESTRY RESEARCH AND EDUCATION, DEHRADUN

Capacity Building for Forest Landscape Restoration in Gujarat: A Key Stakeholder-Based Training Needs Assessment

Output-V: Development of Capacities, Knowledge and Communication Mechanisms for Forest Landscape Restoration

Restore, Conserve and Protect Forest and Tree Cover for NDC Implementation in India (RECAP4NDC) Project

INDIAN COUNCIL OF FORESTRY RESEARCH AND EDUCATION

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

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FOREWORD

The threat of global climate change is both real and increasingly evident, impacting nature and humanity alike. Forests play a crucial role in maintaining ecological balance, environmental stability, sustainable development and essential ecosystem services. One of the greatest challenges facing humanity is managing natural resources in a way that meets growing human demands while preserving the health and resilience of ecosystems.

I have had the opportunity to witness first-hand the significant efforts invested in the Restore, Conserve and Protect Forest and Tree Cover for NDC Implementation in India (RECAP4NDC) Project. This report on training needs assessment is of critical importance, as it provides valuable insights into the capacity gaps identified within the State Forest Department, Other Line Departments and Local Communities of Gujarat in relation to forest landscape restoration. The findings from the Training Needs Assessment will play a key role in designing effective capacity-building modules and developing appropriate training manuals on forest landscape restoration and related topics for capacity development under Output V: Development of Capacities, Knowledge and Communication Mechanisms for Forest Landscape Restoration of the RECAP4NDC Project being implemented by ICFRE in collaboration with ICIMOD and GIZ.

Development of capacities, knowledge and communication mechanisms for Forest Landscape Restoration (FLR) is a key component of the RECAP4NDC Project, aimed at achieving the forest sector targets under the Nationally Determined Contributions, Land Degradation Neutrality targets, the Bonn Challenge and the Sustainable Development Goals. This report represents the culmination of several months of dedicated field research, including interviews with officers and staff of the State Forest Department, other line departments and members of local communities across Gujarat. It presents a comprehensive analysis of the data collected from the field and provides valuable insights into the training and capacity-building needs of these stakeholders. The findings highlight the critical areas where capacity building is needed to effectively implement FLR activities in the state. This report also offers practical recommendations to support future actions for building institutional and community-level capacities, ultimately contributing to the successful realization of FLR-related programmes and projects.

I am pleased to present this report on 'Capacity Building for Forest Landscape Restoration in Gujarat: A Key Stakeholder-based Training Needs Assessment'. I hope this report will inspire further discussion and concrete action to address the capacity-building needs essential for effective FLR, while also strengthening existing institutions to achieve the desired outcomes.

I commend Dr. R. S. Rawat, Principal Investigator and team of RECAP4NDC Project of ICFRE for bringing out this key stakeholder-based training needs assessment report for the state of Gujarat.

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(Kanchan Devi)

ACKNOWLEDGEMENT

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LIST OF ABBREVIATIONS

BMCs	Biodiversity Management Committees
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
CBD	Convention on Biological Diversity
COP	Conference of the Parties
CSO	Civil Society Organization
FCPF	Forest Carbon Partnership Facility
FLR	Forest Landscape Restoration
FSI	Forest Survey of India
GCF	Green Climate Fund
GCP	Green Credit Programme
GEF	Global Environment Facility
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GIM	Green India Mission
ha	Hectare
ICFRE	Indian Council of Forestry Research and Education
ICIMOD	International Centre for Integrated Mountain Development
IUCN	International Union for the Conservation of Nature
JFMC	Joint Forest Management Committee
LDN	Land Degradation Neutrality
mha	Million Hectares
MoEFCC	Ministry of Environment, Forest and Climate Change
NbS	Nature based Solution
NDC	Nationally Determined Contributions
NWFP	Non-Wood Forest Products
NGO	Non-Governmental Organization
RECAP4NDC	Restore, Conserve and Protect Forest and Tree Cover for NDC Implementation in India
REDD+	Reducing Emissions from Deforestation and Forest Degradation, Sustainable Management of Forests and the Conservation and Enhancement of Forest Carbon Stocks
SDG	Sustainable Development Goals
SFD	State Forest Department
SHG	Self Help Group
TERI	The Energy and Resources Institute
TNA	Training Need Assessment
TOF	Trees Outside Forest
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests

EXECUTIVE SUMMARY

Forests in India play a vital role in supporting the economy, livelihoods and ecological stability. Forests support the livelihoods of about 300 million people including tribal communities who rely on forest produce such as fuelwood, bamboo, medicinal plants, etc. Recognizing the importance of forests, India has set ambitious national target of increasing forest and tree cover to 33% of its geographical area and creating an additional carbon sink of 2.5 – 3 billion tonnes of CO_2 equivalent through additional forest and tree cover under its Nationally Determined Contributions. India is committed to the international conventions like the United Nations Framework Convention on Climate Change, United Nations Convention to Combat Desertification, Convention on Biological Diversity, Sustainable Development Goals and also the Bonn Challenge pledge. These commitments underscore the central role of forests in India's strategy for sustainable development and climate resilience. Competing uses of land for agriculture, infrastructure development, human settlement and industries exerts tremendous pressure on the forests. Rising atmospheric carbon dioxide concentration and climate change are additional stress on the forests and making them more vulnerable. Despite these challenges, India is pursuing to achieve its national targets and international commitments related to forests and environment. To fully realize the potential of forests in meeting the national targets and international commitments, it is essential to strengthen forest governance, invest in forest landscape restoration, and promote meaningful community participation for achieving national targets and international commitments related to forests and environment.

Several programmes and projects are being implemented in the country that integrate ecological restoration, biodiversity conservation, socio-economic development, robust policy frameworks and advanced monitoring technologies. An Indo-German Cooperation project titled 'Restore, Conserve and Protect Forest and Tree Cover for Nationally Determined Contributions Implementation in India (RECAP4NDC)' is being implemented in the selected landscapes of Delhi and National Capital Region, Uttarakhand, Maharashtra and Gujarat. RECAP4NDC Project empowering the stakeholders to effectively plan, finance, implement and monitor initiatives related to forest landscape restoration in project area. Development of capacities, knowledge and communication mechanisms for forest landscape restoration is one of the components of the RECAP4NDC Project. ICFRE is mainly responsible for execution of this component along with ICIMOD and GIZ.

A comprehensive training needs assessment (TNA) on forest landscape restoration was conducted for the State Forest Department, Other Line Departments and local communities of Gujarat. The objective of the TNA was to identify gaps in the knowledge and capacity of key stakeholders regarding forest landscape restoration (FLR), and to develop targeted training modules to address identified gaps for the successful implementation of FLR initiatives in the State of Gujarat.

The Training Needs Assessment (TNA) has highlighted the importance of focused, practical, and interactive training programs to address critical knowledge and capacity gaps across various stakeholders engaged in Forest Landscape Restoration (FLR) and associated thematic areas. These capacity-building efforts are essential for the successful implementation of FLR strategies in Gujarat and for aligning with national and global environmental goals.

Officers of the State Forest Department require comprehensive training across a broad spectrum of technical and policy-related subjects. Key areas include forest landscape restoration (FLR) concepts and approaches, measurement of forest carbon stocks, and the impacts of climate change on forest ecosystems, along with the REDD+ mechanism. Training should also cover international environmental conventions, India's climate commitments particularly its Nationally Determined Contributions (NDCs) under the Paris Agreement carbon markets, forest certification systems, and the Green Credit Programme. In addition, it is essential to build capacity in cross-cutting themes such as gender mainstreaming in FLR, valuation of ecosystem services, nature-based solutions, and value chains for non-wood forest products. Knowledge of financing mechanisms for FLR and familiarity with national initiatives like the LiFE (Lifestyle for Environment) Mission are also critical. These areas collectively support the effective implementation of sustainable forest management and climate-resilient development.

Frontline staff of the State Forest Department require hands-on, practical training focused on field-level implementation. Key training areas should include the principles and application of FLR, India's NDC targets, and techniques for assessing forest carbon stocks. Additional priority topics include spring-shed management, the use of nature-based solutions, ecosystem service valuation and sustainable harvesting of non-wood forest products for livelihood enhancement. Training also address the identification and control of invasive species, as well as the formulation and execution of FLR action plans tailored to forest landscape contexts.

Capacity building of officers and staff from Other Line Departments is essential to foster a collaborative and integrated approach to FLR. Training programs should encompass key areas such as international environmental agreements and conventions, India's legal and policy framework for environmental protection, management of invasive species, restoration of degraded landscapes and spring-shed management. In addition, it is important to include cross-cutting themes such as the Sustainable Development Goals and their relevance to FLR, gender mainstreaming, participatory natural resource management, eco-tourism, sustainable livelihood development, agroforestry, farm forestry and urban forestry. The integration of the Lifestyle for Environment (LiFE) Mission should also be emphasized to promote sustainable and climate-conscious behavior. Such comprehensive capacity-building efforts will help build synergy across departments, enhance inter-sectoral coordination and strengthen the effectiveness of FLR initiatives.

Local communities in Gujarat, particularly those reliant on forest resources, need targeted training and awareness programs. These initiatives should cover the fundamentals of FLR, soil and water conservation, sustainable land and farm management and strategies for climate change mitigation and adaptation. Training should also focus on sustainable harvesting and value addition of non-wood forest products, promotion of agroforestry and horticulture, management of invasive species and mitigation of human-wildlife conflicts. Empowering communities with the knowledge and skills to implement these practices is essential for fostering their active participation and long-term ownership of restoration efforts.

The development of comprehensive and targeted training modules on FLR is essential for effective capacity building of key stakeholders of Gujarat State. Enhanced capacity of the stakeholders will contribute to the restoration of degraded forest landscapes, promote ecosystem-based approaches and ensure the delivery of essential ecosystem services such as water regulation, carbon sequestration and biodiversity conservation. Moreover, strengthening the capacity of key stakeholders will support the development of climate-resilient forest landscapes. This will not only help in mitigating the impacts of climate change but also enhance the resilience of local communities and improve their access to sustainable livelihood opportunities. Therefore, need-based training modules on FLR are developed for capacity building of the State Forest Department, Other Line Departments and local communities of Gujarat State under the RECAP4NDC Project.

1 INTRODUCTION

As per the India State of Forest Report 2023, total forest cover of the country is 715342.61 sq km (21.76% of the total geographical area) and total tree cover of the country is 112014.34 sq km (3.41% of the geographical area). The total forest and tree cover of the country is 25.17% (827356.95 sq km) of its total geographical area. Forest and tree cover play a vital role in ecological and economic development of the country. While their direct contribution to gross domestic product is around 1.7% and this figure underrepresents the real value of the forests, as it excludes the contribution of ecosystem services like carbon sequestration, water regulation and soil conservation and non-wood forest products. Forests support the livelihoods of about 300 million people including tribal communities who rely on forest products such as fuelwood, bamboo, medicinal plants, etc. Recognizing the importance of forests, India has set ambitious national target of increasing forest and tree cover to 33% of its geographical area under the National Forest Policy 1988, and creating an additional carbon sink of $2.5 - 3$ billion tonnes of CO_2 equivalent through additional forest and tree cover by 2030 under its Nationally Determined Contributions. India is committed to the international conventions like the United Nations Framework Convention on Climate Change (UNFCCC), United Nations Convention to Combat Desertification (UNCCD), Convention on Biological Diversity (CBD), Sustainable Development Goals (SDGs) and also the Bonn Challenge pledge. These commitments underscore the central role of forests in India's strategy for sustainable and climate resilience development.

Competing demands of land for agriculture, infrastructure development, human settlement and industrial expansion exert immense pressure on the forests. Rising atmospheric carbon dioxide concentration and climate change are additional stress on the forests and making them more vulnerable to climate change. Despite these challenges, India remains committed to achieving its national targets and international commitments related to forests and environment. The Government of India is implementing a range of programmes and projects that focus on restoration of degraded forests, biodiversity conservation, socio-economic development, robust policy frameworks and use of advanced monitoring technologies.

To fully realize the potential of forests in achieving national targets and fulfilling international commitments, it is essential to strengthen forest governance, invest in forest landscape restoration and promote meaningful participation of the local communities. These measures are crucial for ensuring the climate resilience and long-term sustainability of India's forest ecosystems.

2 OVERVIEW OF GUJARAT STATE

Gujarat, located on the western coast of India, spans an area of 196,024 sq km between latitudes 20°01' to 24°07' N and longitudes 68°04' to 74°04' E. It shares borders with Rajasthan to the north and east, Madhya Pradesh to the southeast, and Maharashtra to the south. To the northwest, it touches the international border with Pakistan. The Arabian Sea lies to its west and southwest, encompassing the Gulf of Kachchh and the Gulf of Khambhat. Gujarat has the longest coastline among Indian states, stretching approximately 1,663 kilometers. The state exhibits a highly diversified topography, encompassing a wide range of landscapes such as forested hill ranges, estuarine zones, fertile alluvial basins with high agricultural productivity and arid desert flatlands in the northwest.

Geomorphologically, the state can be broadly divided into two primary regions: Kachchh in the northwest and the Saurashtra-Kathiawar peninsula. The Kachchh region is notable for its extensive saline deserts the Great Rann and Little Rann of Kachchh as well as the flat, low-lying areas of Bhal and Banni, each with distinct soil characteristics and hydrological systems. The mainland region, covering over half of the state's area, stretches from the northeast to the southern parts, with an approximate width of 121 km and a length of 400 km. This area is dominated by expansive alluvial plains formed by the Indus, Sabarmati, Banas and Luni river systems which contribute significantly to the state's agricultural output. Along

the eastern boundary, a narrow strip of forested, hilly terrain marks the transition to elevated landforms. This zone comprises four major hill ranges of Vindhyas, Satpuras, Aravallis and Sahyadris, which contribute to the ecological diversity and serve as important watersheds.

The majority of the state consists of flat plains interspersed with low hills and small hill ranges that extend from neighboring states of Rajasthan, Madhya Pradesh and Maharashtra. While the state has a long coastline along the Arabian Sea. The Aravalli ranges from Rajasthan extend into the state, while the Satpura hills lie to the east. The Aravalli ranges also merge with the Vindhya range to form the Pavagadh hills located near Vadodara.

3 FORESTS AND TREE COVER

According to the India State of Forest Report 2023, Gujarat has a total forest cover of 15,016.64 sq km, which constitutes 7.65% of the state's geographical area (FSI, 2024). The forest cover is classified into three density categories viz. very dense forests (419.71 sq km), moderately dense forests (4,902.20 sq km) and open forests (9,694.73 sq km) (Table 1).

Table 1: Forest Cover of Gujarat

Class	Area (sq km)	% of Geographical Area
Very Dense Forest	419.71	0.21
Moderately Dense Forest	4,902.20	2.50
Open Forest	9,694.73	4.94
Total	**15,016.64**	**7.65**
Scrub	2,029.95	1.03

Source : FSI, 2024

Forest types reported in the state of Gujarat are presented in Table 2.

Table 2: Forest Types found in Gujarat

S. No.	Forest Type	Area (sq km)	% of Mapped Area
1	3B/C1b Moist teak forest	793.43	4.65
2	3B/C1c Slightly moist teak forest	661.71	3.88
3	3B/C2 Southern moist mixed deciduous forest	998.09	5.86
4	4B/TS1 Mangrove scrub	646.55	3.79
5	4B/TS2 Mangrove forest	630.76	3.70
6	5A/C1a Very dry teak forest	3.06	0.02
7	5A/C1b Dry teak forest	26.38	0.15
8	5A/C3 Southern dry mixed deciduous forest	718.60	4.22
9	5B/C2 Northern dry mixed deciduous forest	351.17	2.06
10	5/DS1 Dry deciduous scrub	72.99	0.43
11	5/DS4 Dry grassland	2.73	0.02
12	5/E1 *Anogeissus pendula* forest	58.02	0.34
13	5/E2 *Boswellia* forest	91.11	0.53
14	5/E3 Babul forest	142.84	0.84
15	5/E5 Butea forest	120.85	0.71
16	5/E8c *Salvadora-Tamarix* scrub	740.20	4.34
17	5/E9 Dry bamboo brakes	1,618.39	9.49
18	5/1S1 Dry tropical riverain forest	1,997.42	11.72

19	5/2S1 Secondary dry deciduous forest	911.13	5.34
20	6A/C1 Southern thorn forest	915.92	5.37
21	6B/C1 Desert thorn forest	510.52	2.99
22	6B/DS2 Tropical Euphorbia scrub	23.74	0.14
23	6/E2 *Acacia senegal* forest	42.06	0.25
24	6/E3 Rann saline thorn forest	1,277.59	7.49
25	6/E4 Salvadora scrub	831.81	4.90
	Sub Total	**14,187.07**	**83.23**
26	TOF/Plantation	2,859.52	16.77
	Total (Forest Cover & Scrub)	**17,046.59**	**100.00**

Source : FSI, 2024

4   LAND USE PATTERN

The land use pattern of Gujarat reflects a strategic allocation of its land resources, shaped by both natural features and socio-economic needs. The state spans a total geographical area of 19.6 mha, of which 18.81 mha is officially reported under land utilization. This vast expanse of land is categorized based on its usage, revealing the significance of agriculture, forestry, and pastoral activities in the state.

Forests occupy approximately 10.91% of the reporting area. These include natural forested regions that play a crucial role in maintaining ecological balance, conserving biodiversity, and acting as natural carbon sinks. Their environmental value extends beyond ecological preservation to influencing the state's climate and supporting wildlife habitats.

Around 18.83% of Gujarat's land is classified as not available for cultivation. This includes land used for non-agricultural purposes such as infrastructure, settlements, and barren or unculturable areas. The growing share of this category reflects the impact of urbanization and industrial development on land availability. Permanent pastures and grazing lands account for about 4.19% of the land. These lands are vital for sustaining livestock farming, which is an important livelihood, especially in rural and semi-arid regions of the state. The availability of such lands supports animal husbandry and contributes to the rural economy.

Another significant category is culturable wasteland, comprising 10.19% of Gujarat's land. This refers to land that is potentially fit for cultivation but remains underutilized due to factors such as poor soil quality, salinity or lack of irrigation. With appropriate interventions, these lands could be brought under productive agricultural use, thereby enhancing overall land productivity. Fallow lands, or lands left uncultivated for short periods, make up a relatively small portion of the total land area. Fallow land other than current fallows accounts for just 0.65%, while current fallows comprise 3.51%.

The most dominant land use category in Gujarat is the net area sown, which makes up about 51.67% of the reporting area. This indicates that over half of the state's land is actively used for crop production, underscoring the central role of agriculture in Gujarat's economy and land management practices (Table 3).

Table 3: Land Use Pattern of Gujarat State

Land Use Types	Area (in '000 ha)	Percentage
Geographical Area	19,624	
Reporting area for land utilization	18,810.21	100.00
Forests	2,051.60	10.91
Not available for land cultivation	3,542.16	18.83
Permanent pastures and other grazing lands	788.22	4.19
Land under misc. tree crops and groves	10.02	0.05
Culturable wasteland	1,917.35	10.19
Fallow land other than current fallows	119.82	0.65
Current fallows	660.91	3.51
Net area sown	9,720.13	51.67

Source: FSI, 2024

5 FLORAL AND FAUNAL DIVERSITY

Gujarat is home to an impressive array of biodiversity, with over 7,360 documented species of flora and fauna. Among India's well-documented animal groups, the state supports a significant share of fish species (24%), reptiles (24%), birds (37%), and mammals (27%). Estimates suggest that Gujarat could potentially harbor more than 15,000 species of Indian fauna, underscoring its ecological importance. This rich diversity is largely attributed to Gujarat's wide range of ecosystems, which include the arid deserts of the Rann of Kutch, lush wetlands, coastal zones and forested areas. The state is also home to several key protected areas, such as Gir National Park and the Marine National Park in the Gulf of Kutch.

Gujarat state also boasts a remarkable floral diversity with 4,228 recorded plant species. This includes 1,933 species of algae, which represent a significant component of the state's aquatic biodiversity. The state also records 2,106 species of angiosperms, highlighting its contribution to India's plant wealth. Other plant groups present in Gujarat include 164 species of fungi, 8 species of bryophytes, and 16 species of pteridophytes (Table 4). Gujarat accounts for approximately 9% of India's total recorded plant species. While this figure may represent a smaller percentage on a global scale, the state's high concentration of angiosperms and algae reflects its ecological significance. This diverse plant life supports the state's varied ecosystems, ranging from coastal and desert regions to forests and wetlands, making Gujarat an important region for plant conservation in India (Sharma *et al.*, 2002).

Table 4: Floral Diversity of Gujarat State

Floral Diversity	No. of Recorded Species
Algae	1933
Fungi	164
Bryophyta	8
Pteridophyta	16
Gymnosperms	1
Angiosperms	2106
Total	**4228**

Source: Sharma *et al.*, 2002

6 FOREST CARBON STOCKS

The total forest carbon stock in the State is 108.322 million tonnes with carbon stock density of 72.13 tonne/hectare. Pool wise forest carbon in Gujarat is given in the Table (5).

Table 5: Forest Carbon Stocks in Gujarat

S. No.	Carbon Pools	Forest Carbon (000 tonnes)
1	Aboveground Biomass	28,497
2	Belowground Biomass	9,653
3	Deadwood	1,476
4	Litter	1,282
5	Soil Organic Carbon	67,414
	Total	**1,08,322**

Source: FSI, 2024

7 LAND DEGRADATION, DESERTIFICATION AND DROUGHT

The statistical analysis of land degradation in Gujarat reveals that 52.22% (10.24 mha) of the state's total geographical area experienced desertification/land degradation in the 2018-19 period. This is slightly lower than the 52.29% (10.26 mha) recorded in 2011-13, and higher than 51.39% (10.07 mha) observed in 2003-05. From 2011-13 to 2018-19, there was a minor decrease of 0.07% (13,584 ha) in the area affected by desertification and land degradation, while from 2003-05 to 2011-13, the area under desertification and land degradation increased by 0.94% (184,186 hectares) (SAC, 2021).

The primary drivers of land degradation in Gujarat are water erosion, salinity, vegetation degradation, and wind erosion. Water erosion remains the most significant process, affecting 19.53% of the area in 2018-19, compared to 19.67% in 2011-13 and 19.30% in 2003-05. Salinity impacts 13.24% of the land in 2018-19, slightly lower than 13.48% in 2011-13 and 13.47% in 2003-05. Vegetation degradation affects 11.84% of the land in 2018-19, a slight increase from 11.82% in 2011-13 and 11.49% in 2003-05. Wind erosion affects 5.99% of the land in 2018-19, similar to the 6.00% and 6.01% recorded in the earlier periods. Between 2011-13 and 2018-19, there was a slight increase in the area of forest land undergoing vegetation degradation, alongside a decrease in areas affected by salinity and water erosion. Conversely, from 2003-05 to 2011-13, both vegetation degradation and water erosion expanded (Fig. 1).
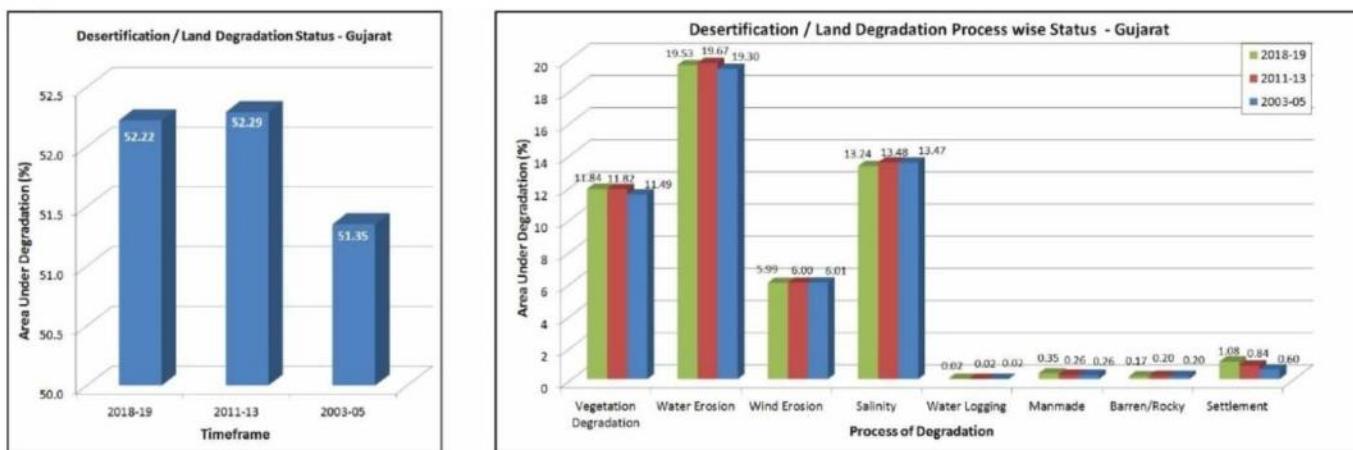
Source: SAC, 2021

Fig. 1: Status of Desertification/Land Degradation of Gujarat

8 PROGRAMMES/ PROJECTS ADDRESSING THE FOREST DEGRADATION

Social Forestry: The Gujarat Forest Department introduced the Social Forestry Program to promote tree planting on various types of unused lands. This initiative focuses on planting trees across the government land, Gauchar land, private land of individuals. During the year 2022-23 the following achievements have been made under this programme of social forestry.

Strip Plantations: Under this model, available land along both sides of the State Expressway, National Highways, State Highways, railway tracks and canals is systematically planted by the department. At a planting density of 800 saplings per hectare, the focus is on cultivating dense, productive and upright trees. In the year 2022-23, a total of 375.00 hectares of land were planted under this programme.

Gram Van (Irrigated): In villages across the state with Gauchars, government dams, and irrigation facilities in flat areas, 1,600 saplings per hectare were planted. Along with the saplings, intercrops and grass are also sown using irrigation. Trees such as Nilgiri, Ardusa, Acacia and fruit-bearing varieties like tamarind, mango, rayan, kothi, jambu and amla are chosen for their high-income potential. In the year 2022-23, a total of 720 hectares were planted under this programme.

Gram Van (Rainfed): Gram Van (Rainfed) planting is carried out in areas surrounding villages, including Gauchar and government land. A total of 400 saplings per hectare are planted, selected based on their suitability to the local soil. The trees planted include a mix of fruit-bearing, ornamental, fuel and fodder species. In the year 2022-23, a total of 1,090.00 hectares were planted under this programme.

Farm Forestry: This scheme is designed for small and marginal farmers, focusing on planting trees on non-cultivable (eroded) land. Planting is carried out in blocks, with all operations managed by the Forest Department. However, post-planting care is the farmer's responsibility. In the year 2022-23, a total of 7,000 hectares were planted under this programme.

Hariyalu Gram Yojana: Hariyalu Gram Yojana has been implemented to ensure proper planting and maintenance in cities and villages. Under this scheme, the State Forest Department provides free saplings, which are planted at the government's expense on the landholder's property, with transportation included. The responsibility for post-planting care lies with the landholder or institution. The focus is on planting fruiting, ornamental and shade trees. The scheme raises 400 saplings per hectare, and it is available to government, non-government, educational, industrial and Swaraj organizations. In the year 2022-23, a total of 300 hectares were planted under this programme.

Vrux Kheti Yojana: Farmers with access to irrigation facilities plant 1,000 saplings per hectare in their fields, including species like Saru plant and clonal Nilgiri. The planting is carried out by leveling and plowing the land, with the timing dependent on water availability. This scheme includes three types of plantations: General (Non-Tribal) Vrux Kheti, Tribal Vrux Kheti and Special Component Plan Vrux Kheti. In the year 2022-23, a total of 5025 hectares were planted under this programme.

National Bamboo Mission: Under this Scheme, the State Forest Department carries out planting on both farmer-owned and Panchayat lands, with maintenance provided by the department for three years. The National Bamboo Mission, a joint initiative between the State and Central Governments, involves planting bamboo through four components across two main models. The first model is High-Density Plantation on Panchayat land, while the second involves high-density planting on farmer-owned land, with 625 saplings per hectare and a compensation of Rs. 12,000 per hectare for three years. Additionally, under the Block Plantation model, bamboo is planted on farmer's land with 416 saplings per hectare, and farmers receive the same compensation of Rs. 12,000 per hectare for three years. The grant ratio for this scheme is 60% from the Central Government and 40% from the State Government. In the year 2022-23, a total of 1,140.93 hectares were planted under this programme.

Van Mahotsav Scheme: Under this model, the department raises saplings of various varieties each year through its Farm Forestry and Special Component Plan Nursery, in line with set targets. These saplings are distributed annually during the monsoon season to various institutions, including government and non-government organizations, schools, religious and government societies, women and youth groups, private individuals and farmers. In the year 2022-23, a total of 1,035 lakh seedlings were distributed under this programme.

9 DEMOGRAPHIC PROFILE

Gujarat has a population of 60.4 million, with 31.5 million males and 28.9 million females. Between 2001 and 2011, the state's decadal growth rate was 19.3%. Of this, 34.7 million live in rural areas and 25.7 million live in urban areas (Census, 2011). With 4.99% of India's total population, the state ranks 10th in terms of total population and 14th in terms of population density among all states. Nonetheless, there was a significant skewness in the distribution of the population, with three districts of Ahmedabad, Surat and Vadodara and contributing 29% of Gujarat's total population. In the seven districts, there are about 50% of the State's residents. viz. Ahmedabad, Surat, Vadodara, Rajkot, Banaskantha, Bhavnagar and Junagadh. 57.4% is the rural population and 42.6% is urban population of the total population (Table 6).

Table 6: Demographic Profile of the Gujarat

District	Total Households	Total Population	Male Population	Female Population	Total Literacy (%)	Male Literacy (%)	Female Literacy (%)
Ahmadabad	1510134	7214225	3788051	3426174	75.30	79.90	70.30
Amreli	294837	1514190	771049	743141	65.70	72.40	58.80
Anand	427605	2092745	1087224	1005521	74.10	80.40	67.30
Banaskantha	560411	3120506	1610379	1510127	54.60	65.10	43.50
Bharuch	333483	1551019	805707	745312	72.10	77.30	66.40
Bhavnagar	538605	2880365	1490201	1390164	65.50	73.00	57.50
Dang	44699	228291	113821	114470	61.70	67.90	55.60
Dohad	334272	2127086	1068651	1058435	47.30	56.10	38.60
Gandhinagar	289990	1391753	723864	667889	74.00	80.50	67.00
Jamnagar	430941	2160119	1114192	1045927	64.70	71.40	57.50
Junagadh	527326	2743082	1404356	1338726	67.20	74.60	59.40
Kheda	466856	2299885	1185727	1114158	72.20	79.50	64.40
Kuchchh	445672	2092371	1096737	995634	59.90	67.40	51.50
Mahesana	424479	2035064	1056520	978544	73.80	80.20	67.00
Narmada	122174	590297	301086	289211	62.70	70.30	54.80
Navsari	295131	1329672	678165	651507	75.40	79.50	71.00
Panchmahal	446611	2390776	1226961	1163815	60.30	69.90	50.10
Patan	267633	1343734	694397	649337	62.40	71.20	52.90
Porbandar	124556	585449	300209	285240	67.20	73.80	60.30
Rajkot	786586	3804558	1974445	1830113	71.60	76.70	66.20
Sabarkantha	481414	2428589	1244231	1184358	65.00	73.80	55.70
Surat	1333200	6081322	3402224	2679098	75.20	79.00	70.30
Surendranagar	343213	1756268	909917	846351	62.30	70.70	53.20
Tapi	177091	807022	402188	404834	60.70	66.90	54.60
Vadodara	877106	4165626	2153736	2011890	69.50	74.90	63.60
Valsad	364403	1705678	887222	818456	68.60	73.90	62.90

Source: Census, 2011

10 OVERVIEW OF THE STAKEHOLDERS FOR FOREST LANDSCAPE RESTORATION

Forest landscape restoration in Gujarat involves multiple stakeholders working together to restore degraded forest landscape. The Gujarat State Forest Department leads implementation of restoration programmes/ projects and responsible for overall management and conservation of forests. Other State Government Departments of Gujarat such as Rural Development, Agriculture, Horticulture, Animal Husbandry, Soil and Water Conservation and Watershed. Local communities, particularly tribal and rural groups, play a crucial role through participatory management structures such as Village Forest Committees and Joint Forest Management Committees, ensuring sustainable use and protection of restored areas. NGOs and civil society organizations support these efforts by mobilizing communities and providing technical expertise, while research institutions contribute scientific knowledge to enhance restoration practices.

10.1 Forest Department: The Gujarat State Forest Department is responsible for the management, conservation and protection of forests and wildlife. The department oversees a vast network of protected areas, including national parks,

wildlife sanctuaries and marine parks. It plays a crucial role in safeguarding the state's natural heritage by implementing sustainable forest management, afforestation programs and wildlife conservation efforts. One of its most notable responsibilities is protecting the Asiatic lion, which is found only in the Gir Forest National Park. The department also focuses on promoting eco-tourism in a way that balances environmental conservation with visitor engagement, while actively involving local communities in forest and wildlife preservation initiatives. Through its various initiatives, the Gujarat State Forest Department strives to maintain ecological balance, enhance biodiversity, and reduce human-wildlife conflict. It also contributes to the state's green cover by promoting tree plantations and reforestation efforts.

10.2 Other Line Department

Agriculture Directorate: The Agriculture Department's primary goal is to meet the needs of the State and raise farmers' incomes by increasing agricultural productivity and production, educating farmers about scientific agricultural methods.

Horticulture Directorate: In order to provide a more targeted approach to crop diversification and sustainable horticulture, the Directorate of Horticulture was founded in 1991. The goal of the Directorate is to expand the horticultural crops' area, production, and productivity. The thirty-three subordinate offices and four divisions that make up the Directorate of Horticulture are dispersed throughout the state. In addition, the Department has administrative supervision for 33 canning centres, 23 nurseries and 17 Centres of Excellence. The Directorate carries out the State Government's Integrated Horticulture Development Program (State Plan), which includes the National Mission on Edible Oil-Oil Palm and the Mission for Integrated Development of Horticulture.

Animal Husbandry Directorate: The Animal Husbandry Directorate was established on May 1st, 1960. It is currently governed by the Gujarat government's Agriculture, Farmers Welfare, and Cooperation Department. The department carries out a number of tasks pertaining to the scientific rearing of domestic animals, the prevention and management of infectious illnesses in animals and poultry, the preservation of native breeds, etc. The department's main initiatives include developing programs for different species, including cattle, buffalo, sheep, goats, horses, and poultry, as well as preventing infectious diseases in animals.

Gujarat State Watershed Management Agency: Gujarat State Watershed Management Agency is the nodal Agency for implementation of Integrated Watershed Management Programme in the state and its mandate includes planning for and development of all the watersheds of the state either directly or indirectly.

Role of Local Communities in Forest Landscape Restoration: Communities living near forests are key stakeholders in forest landscape restoration initiatives. The landscape is deeply intertwined with their culture and identity, providing essential goods and services such as food, water and livelihoods that support community development. Local communities play a central role in the success of forest landscape restoration initiatives. However, they often lack access to the knowledge, skills, and resources needed to effectively participate in the restoration efforts.

11 BACKGROUND OF THE RECAP4NDC PROJECT

'Restore, Conserve and Protect Forest and Tree Cover for NDC Implementation in India (RECAP4NDC) Project' contributes to the Joint Declaration of Intent on FLR between the Indian and the German Governments. RECAP4NDC, an Indo-German project is funded by the International Climate Initiative of the German Federal Government, with direct commissioning by the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection.

To reduce the pressure on existing forests, to meet the increasing demand of forest produces and to achieve national targets and international commitments, some transformative actions need to be taken for restoration of degraded forest landscape. Forest and tree cover can be increased significantly by taking up plantation and afforestation outside the forests, and restoration of degraded forests and scrub forests. Agroforestry, farm forestry and urban forestry can help in increasing tree cover of the country.

Implementation challenges, access of funds, monitoring, reporting and verification, and knowledge sharing are some of the gaps that exist in restoration of degraded forest landscape and which can be addressed by building the capacities, sharing of knowledge and leveraging stakeholder interest which translates policy goals into action.

The project is being implemented in the selected landscapes in the states of Delhi and National Capital Region, Uttarakhand, Maharashtra and Gujarat. RECAP4NDC project empowering the stakeholders to effectively plan, finance, implement, and monitor initiatives related to forest landscape restoration in project area.

Consortium Partners: The project is being implemented by six consortium partners comprising of GIZ (as the consortium lead), International Union for the Conservation of Nature (IUCN), Forest Survey of India (FSI), The Energy and Resources Institute (TERI), Indian Council of Forestry Research and Education (ICFRE) and International Centre for Integrated Mountain Development (ICIMOD).

Project Goal: To contribute to India's forestry NDC target, National Forest Policy 1988 target, Bonn Challenge target, and the National Action Plan on Climate Change by improving degraded forest landscapes, livelihoods and ecosystem services.

Project Outcome: Stakeholders at national, regional, and local levels benefit from forest landscape restoration through improved ecological integrity, enhanced socio-economic opportunities, strengthened governance systems, and increased resilience to climate change. Project outcome will be achieved through the following five outputs:

I. FLR Model Implementation: This output aim to provide technical assistance to implement different FLR approaches in selected model sites. Model sites implemented over 150,000 ha generating ecological, socio-economic, governance and climate change-related benefits in over 400,000 ha.

II. Monitoring, Evaluation and Reporting: Integrated systems for monitoring, evaluation and reporting of ecological and socio-economic benefits of FLR aims at establishing and using integrated systems for monitoring, evaluation and reporting of climate, ecological and socio-economic benefits.

III. Financing FLR: Models and tools for financing FLR from private, public, and international sources for piloting and upscaling.

IV. Policies and guidelines for FLR are anchored in existing policy and planning processes: It aims to anchor FLR in existing policy and planning processes.

V. Capacities, Knowledge and Communication: It aims to transfer knowledge and capacitate national and international stakeholder groups. Capacity development includes trainings, induction courses/curricula development on FLR for public staff across different sectors and levels. ICFRE is mainly responsible for execution of the activities pertaining to Output V of the project along with ICIMOD and GIZ.

Objectives of Output V:

- To build the capacities of the local, national, and international stakeholders on FLR through conducting trainings, induction courses, curricula development on gender responsive FLR for public staff across different sectors and levels.

- To develop suitable mechanism for sharing of knowledge on FLR and its topics.

- To develop suitable mechanism for communicating the messages on FLR and its topics.

- Efforts are being made to work extensively with premier forestry institutions such as Indira Gandhi National Forest Academy, Central Academy for State Forest Services, Centre of Excellence on Sustainable Land Management, Forest Research Institute (Deemed to be University) etc. on FLR and its topics.

Capacity buildings of the state of Delhi and National Capital Region, Uttarakhand, Maharashtra and Gujarat actors are being undertaken based on training need assessment. Capacity building and knowledge sharing provide an excellent opportunity to all the stakeholders for enhancing their knowledge base and upgrading their skills on various aspects of FLR for climate change mitigation and adaptation. Development of capacities, knowledge sharing and communication mechanisms is one

of the key outputs for successful implementation of the RECAP4NDC project. This output includes community empowerment and concrete community action for on-ground activities pursued in cooperation with Gram Panchayats, Van Panchayats, Forest Development Committees, Joint Forest Management Committees, Biodiversity Management Committees, Resident Welfare Associations and Civil Society Organisations/ Non-Governmental Organisations.

12 LANDSCAPES SELECTED FOR IMPLEMENTATION OF INTERVENTIONS OF RECAP4NDC PROJECT

The RECAP4NDC project has laid a robust foundation for forest landscape restoration in the state of Gujarat. Leveraging advanced geospatial technologies and multi-criteria decision analysis, combined with extensive field validation and active stakeholder engagement, the project has identified and prioritized over 40,302 hectares of potential areas of the forest landscapes for restoration. This comprehensive approach serves as a model for addressing the degradation of forest landscapes, aligning restoration efforts with ecological priorities and enhancing community resilience. Four forest landscapes have been selected for restoration in the state of Gujarat viz. Banaskantha, Sabarkantha and two distinct ecosystems (grasslands and mangroves) in Bhavnagar (Table 7), (Fig 2).

Table 7: Selected Landscapes in Gujarat for Forest Landscape Restoration

Model Site	Banaskantha	Sabarkantha	Bhavnagar (Mangroves)	Bhavnagar (Grassland)
Division	Banaskantha	Sabarkantha	Bhavnagar & Botad (Social Forestry)	Bhavnagar & Botad (Social Forestry)
Range	Ambaji North	RDF Poshina & RDF Khedbhramha	Talaja	Jessar
Villages	21	27	20	21
Total Landscape Area (ha)	15116	12970	17513	17646
Degraded area within forest (ha)	9964	1435	470	2522
Degraded area outside forest (ha)	0	5393	8601	11917
Total degraded area (ha)	**9964**	**6828**	**9071**	**14439**
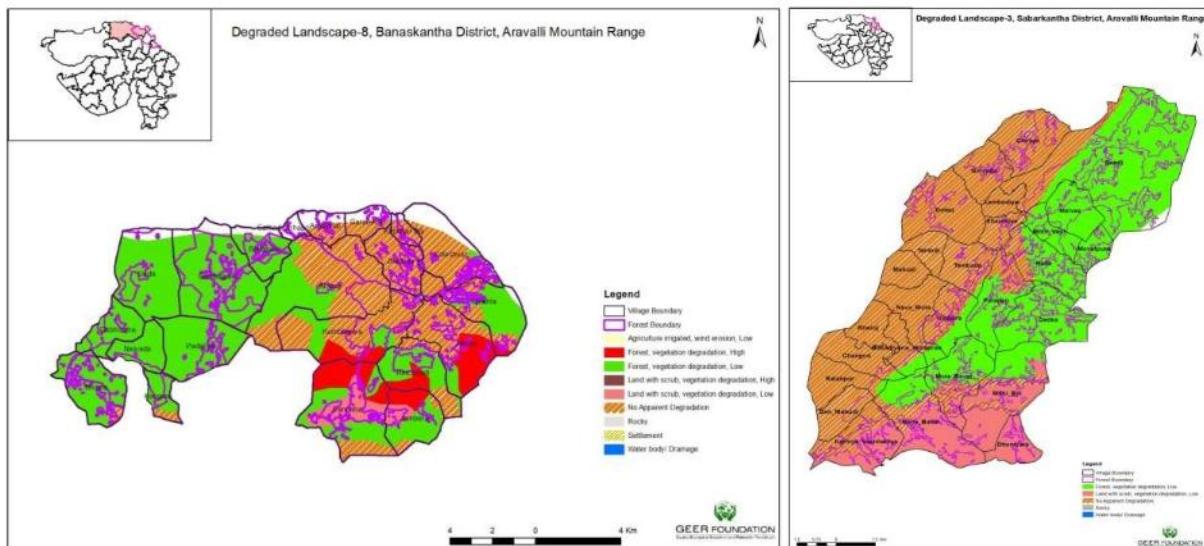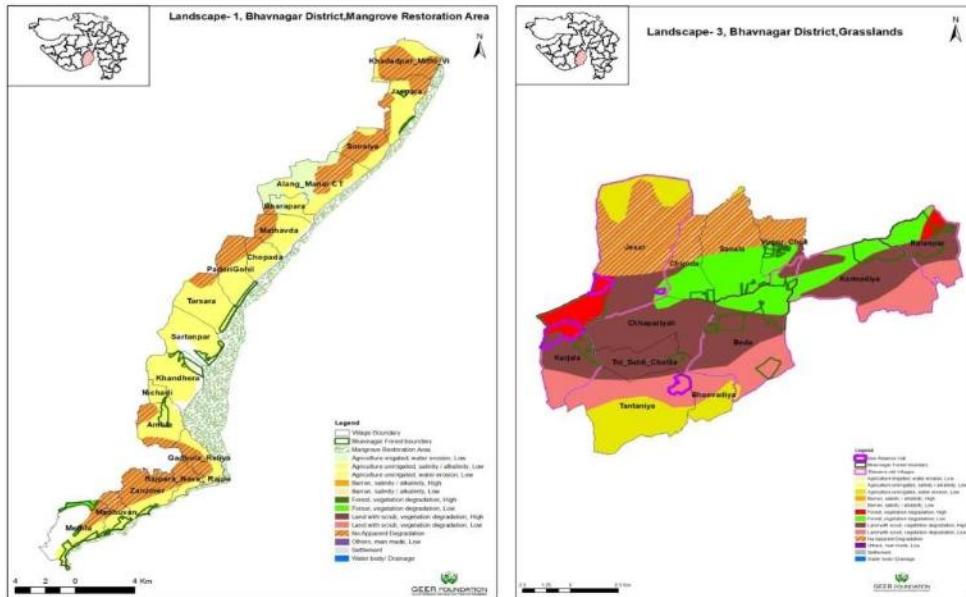
Fig. 2: Selected Landscapes in Gujarat for Forest Landscape Restoration

13 TRAINING NEEDS ASSESSMENT AND ITS OBJECTIVES

Forest Landscape Restoration (FLR) is a holistic, long-term strategy focused on restoring ecological functionality and improving human well-being across degraded and deforested landscapes. To support the Gujarat State Forest Department and other stakeholders in effectively implementing FLR initiatives, it is essential to conduct a comprehensive training need assessment (TNA). The TNA identifies knowledge and capacity gaps among officers and staff at various levels and local community members involved in planning, implementing and monitoring FLR interventions. TNA informs the development of targeted training programs tailored to address capacity gaps, local challenges, and align with national priorities and international commitments related to forest, climate change, biodiversity conservation, land restoration and the Sustainable Development Goals.

The implementation of FLR interventions requires effective cross-sectoral coordination among key departments and stakeholders to ensure policy integration and collaborative planning. Conducting a thorough TNA facilitates the creation of targeted, need-based training modules that strengthen the capacities of the key stakeholders, thereby fostering more resilient and sustainable forest landscapes. The primary objective of TNA is to pinpoint specific knowledge and capacity gaps related to FLR among all key stakeholders. These insights will guide the design of targeted training modules to strengthen the capacities of the key stakeholders for the successful implementation of FLR programs and projects, contributing to national targets and international commitments related to forests and environment. Based on the findings of the TNA, customized training modules on FLR and related topics to be developed under the RECAP4NDC Project. These modules are designed to enhance the capacity of the Gujarat State Forest Department, Other Line Departments and local communities.

14 METHODOLOGY FOR TRAINING NEEDS ASSESSMENT

14.1. Training Needs Assessment for State Forest Department and Other Line Departments

Primary data for the study was collected through field surveys using a structured questionnaire. The questionnaire included a limited number of close-ended questions and was administered to a targeted group of respondents comprising

officers and staff of the State Forest Department and Other Line Departments of Gujarat. The Forest Divisions selected randomly for conducting training need assessment surveys in the state of Gujarat.

A structured and systematic approach was undertaken to conduct the Training Needs Assessment in the State of Gujarat. As a key preparatory step, separate and customized questionnaires were developed for three major stakeholder groups: Officers (Forest Range Officer and above) of the State Forest Department, Frontline Staff (Forest Guard to Dy. Rangers) of the State Forest Department, and Officers and Staff of Other Line Departments. These tailored questionnaires were designed to ensure contextual relevance for each group and to facilitate meaningful comparisons of training needs across categories. To ensure representativeness, respondents from each stakeholder group were selected through a random sampling process. This method was employed to minimize selection bias and to ensure that the survey findings reflected a diverse and balanced range of perspectives across departments and functional levels.

The questionnaire designed for Officers of the State Forest Department aimed to collect comprehensive information on their understanding of FLR. It sought details on the types of FLR-related trainings they had previously attended, as well as the current schemes or projects being implemented in the State of Gujarat. Additionally, the questionnaire explored the restoration practices currently in use for degraded forest landscapes, the most effective knowledge products for knowledge sharing on FLR information, and their preferences pertaining to modes of training, timing and duration of capacity-building initiatives (Annexure 1). The questionnaire for the frontline staff of the State Forest Department was designed to gather information on their familiarity with FLR and related topics, participation in relevant trainings, restoration practices currently being followed, and the knowledge products they found most effective for learning and knowledge sharing. It also explored their preferred training methods, as well as suitable timings and durations for trainings (Annexure 2). The questionnaire for officers and staff of Other Line Departments was designed to assess their awareness and understanding of FLR, assess their department's involvement in FLR-related activities and document the restoration practices currently being followed. It also explored their preferred training methods as well as suitable timings and durations of trainings (Annexure 3).

Primary data from the selected Forest Divisions and Districts of the state were collected during the months of June to September 2024. Data on training needs assessment were also collected from officers at the headquarters of the Gujarat State Forest Department. To validate and enrich findings of the surveys, follow-up discussions were conducted with selected respondents. These consultations served to clarify responses, elicit deeper insights, and facilitate qualitative interpretation. This comprehensive approach enhanced the overall analysis, ensuring that the identified training needs accurately reflected on-the-ground realities. The details of respondents of TNA surveys are given in Table 8.

Table 8: Details of respondents of State Forest Departments and Other Line Departments

S. No.	Departments	Male	Female	No of Respondent
1	Department of Forest			
	▪ Sabarkantha Forest Division	9	00	9
	▪ Sabarkantha Social Forestry Division	6	00	6
	▪ Aravalli (T) Forest Division	13	02	15
	▪ Kutch East Forest Division	08	00	08
	▪ Narmada Forest Division	04	00	04
	▪ Narmada Social Forestry Division	09	00	09
	▪ Gujarat Forestry Research and Training Institute	02	01	03
	▪ Gujarat Forest Rangers College	10	02	12
	▪ Forest Headquarter	00	01	01
	▪ Bhavnagar Forest Division	21	02	23
	▪ Gujarat Ecological Education and Research Foundation	02	00	02
	▪ Banaskantha Forest Division	18	03	21
	▪ Mahesana Social Forestry Division	13	07	20

2	Department of Agriculture	04	00	04
3	Department of Horticulture	01	00	01
4	Gujarat State Watershed Management Agency	02	00	02
5	Department of Animal Husbandry	02	02	02
	Total	**124**	**20**	**142**

14.2. Training Needs Assessment for Local Communities

The development of a questionnaire for assessing training needs in FLR is a critical step in designing effective capacity-building programs. A well-structured questionnaire helps to systematically gather information about the existing knowledge, skills and competencies required by local communities for implementation of FLR initiatives. The primary goal is to identify gaps between existing capabilities and those needed for successful planning, implementation and monitoring of FLR activities. Key areas covered may include understanding of FLR concepts, technical skills (such as soil and water conservation, species selection and restoration techniques), institutional roles, policy awareness, community engagement and monitoring & evaluation practices. The development of a questionnaire for assessing training needs in FLR is a crucial step in designing effective capacity-building programs. A well-structured questionnaire enables the systematic collection of information regarding the current knowledge, skills and competencies of local communities related to FLR initiatives. Its primary objective is to identify gaps between existing capabilities and those required for the successful planning, implementation and monitoring of FLR activities. The questionnaire is designed to cover a range of key areas essential to effective restoration efforts. The questionnaire for assessing the training needs of the local communities was designed to evaluate both their existing knowledge and skills, as well as the areas where capacity enhancement is necessary (Annexure IV).

Focused Group Discussion is one of the data collection methods in the qualitative research approach emerged as an alternative to one-on-one interviews. This method involves an interactive discussion about a specific issue with a group of participants led by a moderator. Focus group discussion brings together people with certain characteristics which is relevant to the topic (Krueger and Casey, 2015). The key element of this method is the interaction among participants which enables researchers to explore different perspectives, thoughts and feelings (Hennink, 2014). To ensure relevance and contextual accuracy, the questionnaire-based survey was conducted through Focus Group Discussions in the villages. This participatory approach allowed for the inclusion of diverse perspectives and facilitated deeper insights into local needs. This ensures that the findings are both meaningful and actionable for informing targeted training interventions in FLR. As per Cochran's formula (1963, 1977) at confidence interval 90% and standard error of 15%, sample size of 21 was determined to carry out survey for data collection from the local communities of the selected forest landscapes of Gujarat (Table 9).

Table 9: Distribution of villages in the Intervention Landscapes

S. No.	Landscapes	Total villages	Sampled village
1	Banaskantha	21	5
2	Sabarkantha	28	7
3	Bhavnagar (Grassland)	20	5
4	Bhavnagar (Mangroves)	12	4
	Total	**81**	**21**

A total of 21 villages (Table 10) from selected forest landscapes of Gujarat were selected for conducting TNA of communities.

Table 10: List of villages surveyed for TNA

District Name	Sub District Name	Taluka	Village Name	Gram Panchayat Name	Total Geographical Area (in Hectares)	Total Households	Total Population of Village
Banaskantha	Danta	Danta	Bedapani	Sembalpani	498.12	117	644
			Koteshvar	Kumbhariya	844.76	236	1316
			Naivada	Sembalpani	356.33	55	360
			Panchha	Panchha	1385.04	313	1894
	Amirgadh	Amirgadh	Bhayla	Kanpura	790.03	197	1207
Sabarkantha	Khedbrahma	Poshina	Golvada	Lambadiya	348.5	223	1394
			Demti	Demti	2444.77	1285	8577
			Tembdi	Kheroj	187.34	199	1342
			Nada	Nada	534.3	288	1908
		Khedbrahma	Changod	Kheroj	367.69	358	2360
			Mithi Bili	Kheroj	1140.26	360	2406
			Kathiya Vachhadiya	-	-	-	-
Bhavnagar	Talaja	Talaja	Mathavda	Mathavda	753.77	554	3349
			Padari Gohil	Padari (Gohil)	950.19	450	2592
			Sartanpar	Sartanpar	1119.79	2329	12490
			Pithalpur	Pithalpur	756.76	948	5703
			Methla	Methla	1259	385	2129
	Mahuva	Jesar	Beda	Beda	2467.81	370	2454
			Chhapariyali	Chhapariyali	1472.19	296	1630
			Tantaniya	Tantaniya	2134.99	484	2749
			Tol Saldi Chotila	Tol Saldi Chotila	737.62	58	295

Overall, the focused group discussions enriched the study by capturing the perspectives of local communities, making the training needs assessment more grounded and context-specific. They contributed to a deeper understanding of local priorities and helped shape capacity-building strategies that are more aligned with the realities and needs of local communities. Surveys to the project villages in Sabarkantha, Banaskantha and Bhavnagar districts of Gujarat were conducted during the month of February 2025 for collection of data on training need assessment on FLR from the local communities.

15 FINDINGS OF THE TRAINING NEED ASSESSMENT

15.1. Familiarity with Forest Landscape Restoration and Related topics: State Forest Department and Other Line Departments

15.1.1. Officers of State Forest Department

The data analysis highlights substantial knowledge gaps among respondents regarding critical aspects of FLR, as shown in Table 11. Among the officers of the State Forest Department, approximately 86% reported unfamiliarity with both

domestic and international funding mechanisms for FLR. Similarly, 81% lacked knowledge of forest carbon stock measurement, while 75% were not familiar with carbon market mechanisms. Additionally, 67% were unfamiliar with concepts such as REDD+, forest carbon projects, forest certification and springshed management. Furthermore, 56% indicated limited awareness of nature-based solutions, ecosystem-based approaches and international agreements related to forests and the environment. Approximately 44% to 47% of respondents reported limited familiarity with key concepts such as LiFE (Lifestyle for Environment), value chains, ecosystem services and their valuation, as well as climate change mitigation and adaptation in the forest sector.

Table 11: Percentage of respondents unfamiliar with topics related to FLR

S. No.	Topics related to FLR	Not Familiar (Responses in %)
1	Domestic and International funding for FLR	86
2	Forest carbon stocks measurement	81
3	Carbon market mechanism - finance and carbon credit	75
4	REDD+ (reducing emissions from deforestation and forest degradation) and forest carbon projects	67
5	Forest certification	67
6	Springshed management	67
7	Nature - based solutions/ ecosystem based approaches	56
8	International agreement/ conventions related to forest and environment and India's commitment	56
9	Green credit programme	53
10	Climate change mitigation and adaptation in forest sector	47
11	Ecosystem services and its valuation	44
12	Value chain for NWFPs	44
13	LiFE : Life style for environment	44
14	Climate change impact and vulnerability in forest sector	42
15	Gender mainstreaming in forest management	42
16	Sustainable development goals	39
17	Legal framework (Policies, laws and regulations) for conservation and protection of forest and environment	31
18	Forest landscape restoration	28
19	Invasive species and their management	25
20	Sustainable harvesting of NWFP and their role in livelihood generation	17
21	Forest fire and its management	11
22	Community forest management (JFMCs/ BMCs etc.)	11
23	Sustainable forest management	6
24	Restoration of degraded forests/ landscapes	6
25	Nursery and plantation techniques of forestry species	3
26	Eco-tourism	3
27	Soil and water conservation measures	-

As evident from Table 11, the topics related to forest landscape restoration as listed below have been identified and prioritized based on the responses of 40% or more of the respondents, for the purpose of capacity building of the officers of State Forest Department:

❖ Domestic and international funding
❖ Forest carbon stocks measurement
❖ Carbon market mechanism - finance and carbon Credit
❖ REDD+ and forest carbon projects
❖ Forest certification
❖ Springshed management
❖ Nature-based solutions/ecosystem-based approaches
❖ International agreement/conventions related to forest and environment and India's commitment
❖ Green Credit Programme
❖ Climate change mitigation and adaptation in forest sector
❖ Ecosystem services and its Valuation
❖ Value chain for NWFPs
❖ LiFE: Life style for environment
❖ Climate change impact and vulnerability in forest sector
❖ Gender mainstreaming in forest management

15.1.2 Frontline Staff of State Forest Department

The Training Needs Assessment of frontline staff in the State Forest Department reveals significant knowledge gaps in key areas essential for effective forest management. Notably, 89% of respondents reported unfamiliarity with India's Nationally Determined Contribution targets under the Paris Agreement, and 88% lacked awareness of forest carbon stock measurement mechanisms. Other important areas identified include spring-shed management (79%) and nature-based solutions (69%), underscoring the need for capacity building in sustainable resource management and ecosystem resilience. Additionally, invasive species management (37%) and gender mainstreaming in forest management (28%) emerged as priority areas requiring focused training interventions. Training needs in sustainable harvesting of non-wood forest products and biodiversity conservation, each reported at 13%, highlight their importance in supporting local livelihoods and ecological integrity. Empowering communities through training in sustainable harvesting practices can ensure the responsible use of forest resources, contributing to both economic development and long-term ecosystem sustainability. Similarly, strengthening capacity in biodiversity conservation is vital for conservation of species and habitats that underpin ecological balance.

Overall, the assessment underscores the need for comprehensive, targeted training programs across a diverse range of subjects to enhance the effectiveness of forest management and restoration initiatives. The detailed results of the analysis are presented in Table 12.

Table 12: Percentage of respondents unfamiliar with topics related to FLR

S. No.	Topics related to FLR	Unfamiliar (Responses in %)
1	India's Nationally Determined Contribution targets under the Paris Agreement	89
2	Forest carbon stocks measurement	88
3	Springshed management	79

4	Nature-based solutions/approaches	69
5	Forest landscape restoration concept/approach	53
6	Invasive species and their management	37
7	Gender mainstreaming in forest management	28
8	Policies, laws and regulations for conservation of forest biodiversity in India	23
9	Community forest management (JFMC/BMC/SHG)	20
10	Legal framework for conservation and protection of forest and environment in India	19
11	Sustainable harvesting of NTFP and their role in livelihood generation	13
12	Biodiversity conservation	13
13	Nursery and plantation techniques of forestry species	11
14	Village eco-tourism	10
15	Soil and water conservation measures	8
16	Forest fire and its management	8
17	Sustainable forest management	5
18	Restoration of degraded forests	4

As evident from Table 12, the topics related to FLR as listed below have been identified and prioritized based on the responses of 40% or more of the respondents, for the purpose of capacity building of the Frontline Staff of State Forest Department:

- ❖ India's Nationally Determined Contribution targets under the Paris Agreement
- ❖ Forest carbon stocks measurement
- ❖ Springshed management
- ❖ Nature-based solutions/approaches
- ❖ Forest landscape restoration concept/approach

15.1.3 Officers and Staff of Other Line Departments

Officers and staff from the Departments of Agriculture, Animal Husbandry, Horticulture and Watershed Management Authority, participated in the Training Needs Assessment survey and completed the corresponding questionnaires. The analysis of the collected data highlights key thematic areas requiring capacity building. These include the management of invasive species, the legal framework for environmental conservation and protection in India, springshed management, international environmental agreements and conventions and the concept of "LiFE" (Lifestyle for Environment). The detailed results of this analysis are presented in Table 13.

Table 13: Percentage of respondents unfamiliar with topics related to FLR

S. No.	Topics related to FLR	Unfamiliar (Responses in %)
1	Invasive species and their management	100
2	Legal framework for conservation and protection of environment in India	89
3	Spring shed management	89
4	International Agreement/ Conventions related to environment	78
5	LiFE Style for Environment	67
6	Participatory natural resource management	56
7	Sustainable development goals	56
8	Restoration of degraded areas	44
9	Sustainable livelihood generation	44
10	Agroforestry/ farm forestry/ urban forestry	44
11	Gender mainstreaming in natural resource management	44
12	Eco-tourism	44
13	Sustainable land management	33
14	Nature-based Solution/ Ecosystem based Approaches	33
15	Climate change mitigation and adaptation	33
16	Natural resource management	22
17	Disaster management / Disaster risk reduction	22
18	Climate change impacts and vulnerability	22
19	Soil and water conservation	11

As evident from Table 13, the topics related to FLR as listed below have been identified and prioritized based on the responses of 40% or more of the respondents, for the purpose of capacity building of the officers and staff of Other Line Department:

> ❖ Invasive species and their management
> ❖ Legal framework for conservation and protection of environment in India
> ❖ Spring shed management
> ❖ International Agreement/ Conventions related to environment
> ❖ LiFE style for environment
> ❖ Participatory natural resource management
> ❖ Sustainable development goals
> ❖ Restoration of degraded areas
> ❖ Sustainable livelihood generation
> ❖ Agroforestry/ farm forestry/ urban forestry
> ❖ Gender mainstreaming in natural resource management
> ❖ Eco - tourism

15.1.4 Practices being followed by the State Forest Department for Restoration of Degraded Forest Landscape

The analysis of data on practices followed by the State Forest Department for restoration of degraded forest landscapes reveals a strong emphasis on sustainable land management techniques. Officers have highlighted key interventions such as assisted natural regeneration/ enrichment plantations, fencing, construction of check dams, forest fire management, rainwater harvesting, contour trenching, cattle-proof trenching and invasive species management. Similarly, the Frontline

Staff have also identified assisted natural regeneration/enrichment plantations, rainwater harvesting, contour and cattle-proof trenching, fencing, invasive species management and forest fire control as essential practices for effective landscape restoration. The practices being followed by the state forest department are listed below:

> ❖ Assisted natural regeneration practices/ enrichment plantations
> ❖ Fencing
> ❖ Rain water harvesting
> ❖ Contour trench
> ❖ Cattle proof trench/wall
> ❖ Check dam construction
> ❖ Forest fire management
> ❖ Invasive species management

However, the analysis of data of Other Line Departments depicted that the following sustainable land management practices are being followed for restoration of degraded forest landscapes:

> ❖ Organic farming
> ❖ Micro - irrigation
> ❖ Quality planting materials
> ❖ Improved variety of seed distribution
> ❖ Farm bunding

15.1.5 Type of Knowledge Products

The analysis of data collected on the most effective types of knowledge products for sharing information on the restoration of degraded forest landscapes highlights clear preferences among different stakeholder groups. Notably, videos emerged as the most popular format, with an overwhelming 97% of respondents indicating them as highly effective for building the capacity of the State Forest Department. E-books, e-booklets, and e-manuals also ranked highly, with an 89% effectiveness rating, underscoring their value as accessible and informative resources. Among frontline staff of the State Forest Department, 90% identified videos as their preferred knowledge product, followed by posters, manuals, e-booklets/e-manuals and printed books, with preference levels ranging from 61% to 86%. Respondents from Other Line Departments showed a slightly different trend and 78% favoured books, while 56% to 67% found manuals, flyers, videos, pamphlets and brochures to be effective for knowledge dissemination on forest landscape restoration. In summary, videos are the most preferred format among officers and frontline staff of the State Forest Department, while books are particularly favored by officers from Other Line Departments. These findings are summarized in Table 14.

Table 14: Preference of Knowledge Products

S. No	Type of Knowledge Product	Preference (in %)		
		Officers SFD	Frontline Staff SFD	Other Line Deptartments
1	Flyer	61	48	56
2	Book	69	86	78
3	Manual	67	62	56
4	Brochure	61	48	67
5	Pamphlets	64	55	67
6	Infographics	61	51	33

7	Videos	97	90	67
8	Posters	61	61	44
9	e-book/e-booklet/e-manual	89	63	44

15.1.6 Modes of Training

The TNA survey also assessed about the more effective modes of training for capacity building of the State Forest Department and Other Line Departments. The analysis of the data reveals that the physical mode- interactive sessions (expert lectures, audio-visual, hands on exercise, case studies, group exercises) has been ranked the high priority by State Forest Department Officers, Frontline Staff as well as Other Line Departments.

The virtual mode-interactive sessions (expert lectures, audio-visual, case studies, group exercises) and e-Learning mode have been ranked either 'medium' or 'high' priority as modes of training by all the three groups of respondents (Fig. 2). The e-learning mode has been ranked in the low priority by all of the respondents (Frontline staff, Officers of State Forest Department and Other Line Department). It is concluded that the most preferred mode of training is physical.
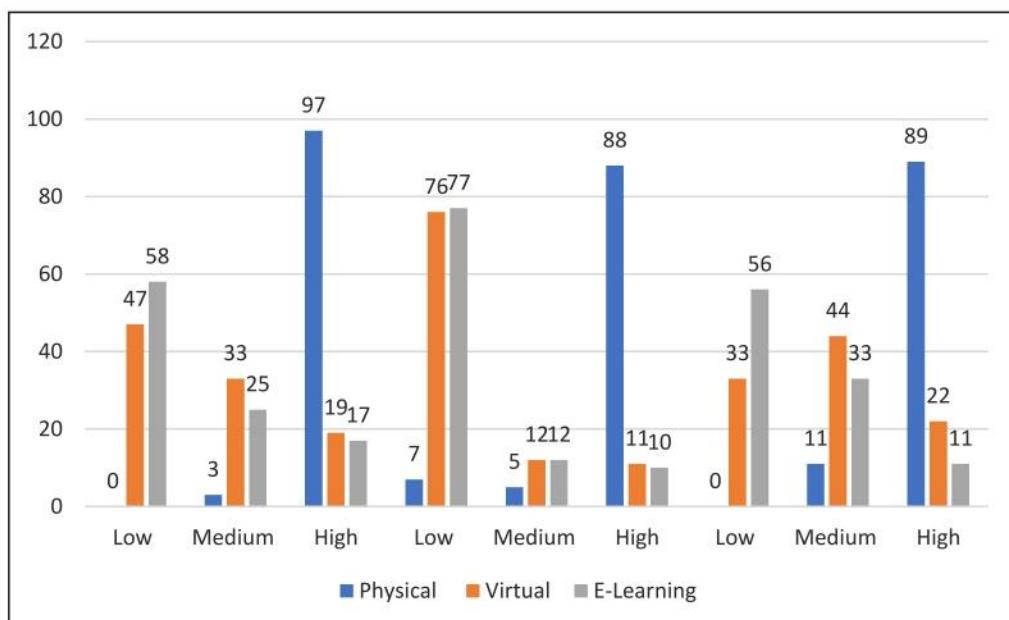
Fig. 2: Preference for mode of training

15.1.7. Suitable Months and Duration for Conducting Trainings

According to the TNA data and its analysis (Fig. 3), April and May have been preferred by Other Line Department while November and December are preferred by the Officers and Staff of State Forest Department for conducting the training.
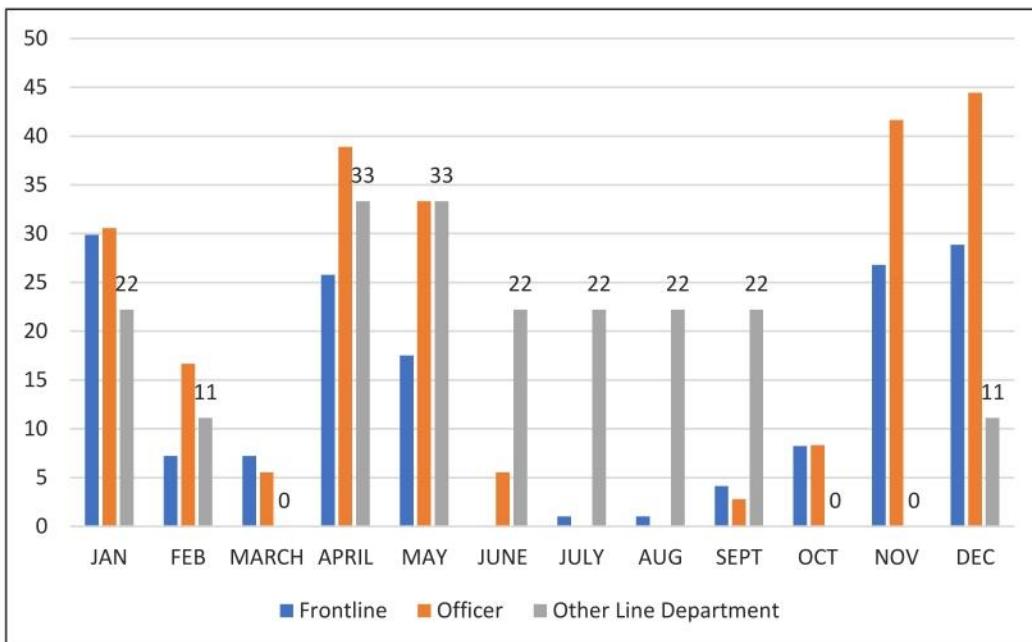
Fig. 3: Preference for suitable month for conducting training

Similarly, in response to the duration of training more than 40% to 50% of the respondents State Forest Department have preferred 5 days and 3 days duration of training. About 44% respondents from Other Line Departments have also opted for 3 days duration of training programme. Training programme of 5 days duration is most preferred by Officers and Staff of State Forest Department while 3 days duration of training programme is preferred by Other Line Department. The results of the analysis are depicted in the Fig. 4.
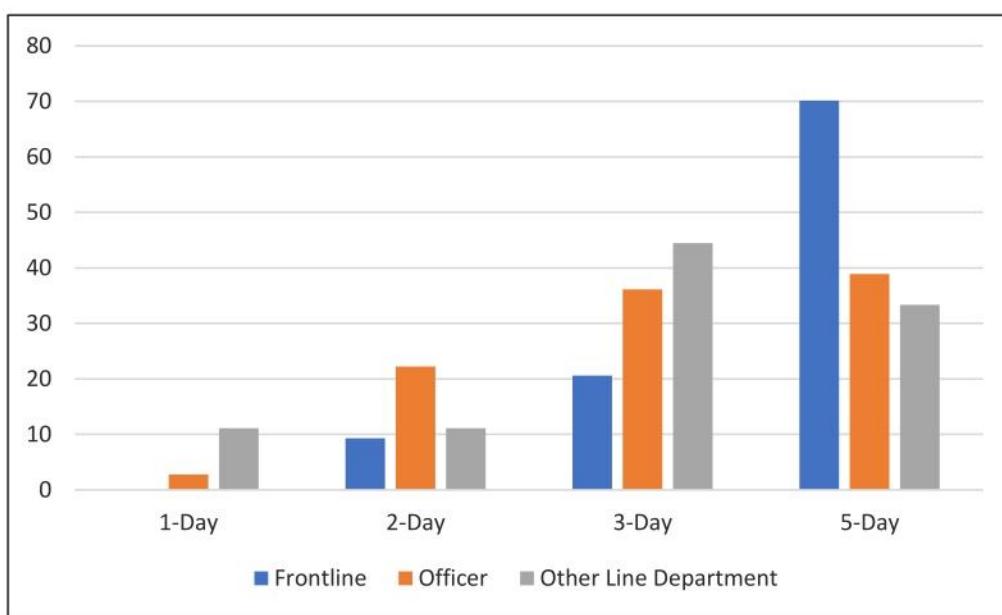
Fig. 4: Preference for duration of training

15.2 Familiarity with Forest Landscape Restoration and Related topics: Local Communities

The training needs assessment conducted for local communities aimed to evaluate their existing knowledge, practices and capacity gaps across key thematic areas, including natural resource management, climate resilience and sustainable livelihoods. During focus group discussions, community members raised several questions, reflecting their interest and

need for capacity-building support. The data collected reveals a significant gap in training and awareness, and maximum number of participants reported that they had not received any training or awareness programs on restoration of degraded forest land, forest fire management, community forest management, sustainable land management practices, agroforestry, farm forestry, livelihood generation through non-wood forest products, climate change and its impacts, disaster risk management, spring shed management, eco-tourism, biodiversity conservation and value addition of agricultural and non-wood forest products. Only 1.23% of participants had attended training on horticulture and 5.46% had participated in training on agricultural practices (Table 15).

Table 15: Response percentage of awareness for topics related to FLR

S. No.	Topics of Awareness Programmes	Unfamiliar (Responses in %)
1	Restoration of degraded forest land	100
2	Forest fire management	100
3	Community forest management	100
4	Sustainable land management practices	100
5	Agroforestry	100
6	Farm forestry practices	100
7	Horticulture	99
8	Agriculture practices	95
9	Livelihood generation through non-wood forest products	100
10	Climate change and its impacts	100
11	Disaster risk management	100
12	Spring shed management	100
13	Eco-tourism	100
14	Biodiversity conservation	100
15	Value addition of agricultural products	100
16	Value addition of non-wood forest products	100

15.2.1 Awareness on Soil and Water Conservation Measures and Practices

The analysis reveals that several soil and water conservation practices are not widely adopted by the majority of communities. Practices such as organic farming, terrace farming, mixed cropping, rainwater harvesting, mulching, contour/staggered trenches, drip irrigation and sprinkler irrigation are not implemented by 100% of the communities. This limited adoption may stem from factors such as lack of awareness, insufficient resources or context-specific local challenges. Among the practices assessed, farm bunding stands out, with 31.16% of communities not following it, indicating a significant gap in adoption. Similarly, crop rotation, although more commonly practiced, is still not adopted by 11.62% of communities, suggesting that there remains potential for wider implementation (Table 16).

Table 16: Responses of the communities for soil and water conservation measures/ practices

S. No.	Soil and Water Conservation Measure/Practices	Response (in %)
1	Organic farming	100
2	Terrace farming	100
3	Crop rotation	88

4	Mixed cropping	100
5	Rain water harvesting	100
6	Mulching	100
7	Contour/ staggered trenches	10
8	Farm bunding	31
9	Drip irrigation	100
10	Sprinkler irrigation	100

15.2.2 Awareness on Changes in Climate Patterns

The local communities have observed notable shifts in climate patterns (Table 17). All respondents (100%) reported a decrease in rainfall and an increase in temperature. However, there were no reported changes in the frequency of extreme weather events such as floods or droughts. Additionally, no respondents reported an increase in rainfall or a decrease in temperature. These findings suggest that while communities are experiencing changes in rainfall and temperature, the frequency of extreme weather events has remained unchanged.

Table 17: Change in Climate Patterns observed by local communities

S. No.	Changes in climate patterns	Yes (%)	No (%)
1	Flood –increased (frequency)	0	100
2	Flood –decreased (frequency)	0	100
3	Drought –increased (frequency)	0	100
4	Drought –decreased (frequency)	0	100
5	Change in rain fall pattern (Increase)	0	100
6	Change in rain fall pattern (Decrease)	100	0
7	Change in temperature pattern (Increase)	100	0
8	Change in temperature pattern (Decrease)	0	100

15.2.3. Awareness on Changes in Quality of Forests

Local communities expressed significant concern about the declining quality of the forests. Many noted visible changes in forest health such as reduced biodiversity, increased degradation and diminishing availability of forest resources. These changes have not only affected the ecological balance but also impacted livelihoods, particularly for those who rely heavily on forests for their livelihoods. The communities emphasized the urgent need for improved forest management and restoration efforts for improving the forest health. A large majority of respondents reported negative changes in forest conditions. Specifically, 83% observed increased tree felling, 86% noted a decline in plant species and 87% reported overall forest degradation. Additionally, 97% cited a rise in weeds and invasive species, indicating a shift in forest composition and growing ecosystem imbalance. Equally concerning, 88% of respondents reported a decline in the availability of non-wood forest products such as fruits and honey, highlighting the adverse impacts on local livelihoods and subsistence resources. Alarmingly, 100% of respondents indicated no improvement in forest quality, while 85% observed reduced natural regeneration, further underscoring the ongoing decline in forest health. Moreover, 100% confirmed that there had been no decrease in invasive species, pointing to their continued and unchecked spread (Table 18).

Table 18: Change in Forest Quality observed by local community

S. No.	Changes in forest quality	Yes (%)	No (%)
1	Trees felling	83	17
2	Plant species reduced	86	14
3	Forest degraded	87	13
4	Increase in weeds/ invasive species in the forest	97	3
5	Decrease in weeds/ invasive species in the forest	0	100
6	Natural regeneration reduced	85	15
7	Reducing NWFPs (fruits, Honey, etc.)	88	13
8	Improving the quality of forests	0	100

15.2.4. Forest Fire

The interaction with the local communities revealed that no forest fires have occurred in the forest near to surveyed villages.

15.2.5. Community-based Institutions

In the surveyed villages, key community-based institutions such as the Joint Forest Management Committees (JFMCs), Biodiversity Management Committees (BMCs), Self-Help Groups (SHGs), and Mahila Mangal Dals were found to be non-operational. This lack of active local institutions reflects a critical gap in community participation and local governance, particularly in areas related to forest conservation, biodiversity management and rural development. These groups play a vital role in empowering local communities especially women, by facilitating collective decision-making, promoting sustainable natural resource management and supporting livelihoods. Their inactivity poses a significant challenge to the effective implementation of restoration efforts at the grassroots level.

15.2.6. Livelihood Opportunities from Forest

Grass collection for livestock fodder is a vital livelihood activity in rural and forest-adjacent communities. It provides a primary source of nutrition for animals, especially during dry seasons when alternative fodder is scarce. This practice is essential for sustaining animal husbandry, contributing to consistent milk production, improved animal health and increased household income. Similarly, honey collection from forests is a traditional occupation for many forest-dependent communities. It involves harvesting wild honey from natural beehives found in trees. This activity not only serves as a significant source of income but also fulfills nutritional and medicinal needs. Forest honey is particularly valued for its rich nutrient profile and is often esteemed for its therapeutic properties.

15.2.7. Measures for Improving Forest Quality

Gando Bawal (commonly known as the Mad Tree by locals in Gujarat) refers to *Prosopis juliflora*, a non-native species introduced to the region in the 1960s. It was initially planted to rehabilitate sodic soils and act as a natural barrier to prevent the Rann desert from encroaching upon the Banni grasslands. However, due to its highly invasive nature, *Prosopis juliflora* has rapidly spread, overtaking vast areas of Gujarat. Its aggressive growth is now being linked to increasing drought conditions in the region. Locals hold the tree responsible for the depletion of groundwater, as it taps deep underground water reserves through its extensive root system. During survey it was revealed that local communities has suggested to remove *Prosopis juliflora and* other invasive species like *Lantana* for improving the quality of forests in nearby area.

15.2.8. Agroforestry in Project Villages

Agroforestry is not practiced in the surveyed villages of Gujarat state. In Pithalpur village some farmers near to sea grow coconut on their agricultural lands. Farmers are interested in learning about the agroforestry.

15.2.9. Topics Suggested for Capacity Building of Local Communities on FLR and Related Topics

To promote sustainable livelihoods and environmental stewardship in rural and semi-arid regions, training programs must adopt a holistic and integrated approach. These initiatives should empower communities by building skills and awareness across multiple sectors, encouraging both economic development and ecological responsibility. Ecotourism presents a valuable opportunity for communities to generate income by showcasing their natural landscapes and cultural heritage. This not only creates local employment but also encourages environmental protection. Agriculture-focused training is essential for building climate resilience and enhancing productivity. Promoting practices such as organic farming, crop diversification and agroforestry can improve soil health, reduce chemical input costs and increase on-farm biodiversity. Additionally, training on preparation of biofertilizers and biopesticides supports more sustainable, low-cost farming methods. Biogas production through gobar gas systems offers a clean energy alternative while addressing waste management. Fodder cultivation, especially in drought-prone areas, ensures livestock nutrition and reduces pressure on forest resources. Water conservation is also critical areas of focus. Community-led biodiversity conservation initiatives help to conserve and protect native plant and animal species, while creating local stewardship over natural resources. Promoting micro-irrigation techniques like drip and sprinkler systems allows for more efficient water use, increasing agricultural productivity even in water-scarce regions. Training in human-wildlife conflict prevention and mitigation is vital to protect both rural livelihoods and wildlife, fostering coexistence and safety. Alternative income sources can further strengthen rural economies. Pisciculture (fish farming), when integrated with agriculture, offers a supplementary livelihood and improves nutritional security. The cultivation of medicinal and aromatic plants provides high-value crops that require less water and can be grown on marginal land. Training in value chain development ensures fair market access, and improved returns.

Restoration of degraded forest land is fundamental for ecological stability and community resilience. Training programs should include techniques for restoration of degraded lands and community-based forest management. These practices improve biodiversity, sequester carbon and enhance ecosystem services such as water retention and soil stabilization. Community forest management strengthens local ownership and ensures long-term sustainability by involving people directly in conservation and protection efforts. Sustainable land use practices like agroforestry and farm forestry help integrate trees with crops and livestock systems, enhancing soil fertility, reducing erosion, and diversifying income streams. Region-specific training in horticulture and agriculture also plays a vital role in boosting food security and rural incomes (Table 18).

To address the growing impacts of climate change, communities must be trained in both mitigation and adaptation strategies. Raising awareness about climate risks and equipping people with disaster preparedness and risk management skills are essential steps. Such training is critical for reducing vulnerability and strengthening long-term resilience. Furthermore, training on livelihood generation through non-wood forest products like bamboo, honey and medicinal plants can provide sustainable income while conserving forest resources.

Table 18: Topics suggested for capacity building on FLR and related topics

1	Organic farming
2	Human wildlife conflict
3	Crop diversification
4	Micro irrigation techniques
5	Cultivation of medicinal plants
6	Restoration of degraded forest land
7	Community forest management
8	Sustainable land management practices
9	Agroforestry/ farm forestry practices
10	Livelihood generation through non-wood forest products

15.2.10. Choice of Mode of Training

During the focus group discussion, community members clearly expressed a preference for interactive, hands-on training methods over conventional classroom instruction. While 85% of respondents favored the use of audio-visual aids in classroom settings and even 92% of respondents preferred exposure visits and live demonstrations. These experiential techniques effectively bridge the gap between theory and practice by offering firsthand observation in real-world contexts. Based on these findings, training programs should prioritize experiential learning through a blended approach that combines classroom instruction with demonstrations and exposure visits. This structure aligns with learners' strong preference for active, participatory learning and enhances engagement, knowledge retention and practical skill development.

15.2.11. Suitable Months for Conducting Training

Training Need Assessment revealed that the communities preferred November and December month for conducting the training.

16 DEVELOPMENT OF TRAINING MODULES ON FOREST LANDSCAPE RESTORATION

Based on the findings of the Training Needs Assessment, training modules on forest landscape restoration and related topics have been developed to build the capacity of State Forest Departments, other relevant line departments and local communities of the Gujarat, as detailed below.

16.1. Training Module on Forest Landscape Restoration for Forest Officers (Forest Range Officers and above) of State Forest Department

Session 1: Introduction to Forest Landscape Restoration (FLR)

- Principles of FLR
- FLR in the Indian context (NDCs, LDN and Bonn Challenge)

Session 2: Measurement of Forest Carbon Stocks

- Forest carbon stocks and carbon pools
- Methods, tools and techniques for measurement of forest carbon stocks
- Application of GIS and remote sensing in measurement of forest carbon stocks
- Hands-on exercise on measurement of forest carbon stocks using sample data

Session 3: Climate Change in Forest Sector

- Impacts and vulnerabilities of forests to climate change
- Climate change mitigation and adaptation in forests
- Forest-based climate change vulnerabilities and adaptation measures

Session 4: REDD+ Mechanism

- REDD+ mechanism under UNFCCC
- National REDD+ Strategy
- REDD+ safeguards
- Forest Reference Level
- National Forest Monitoring System
- Case studies of REDD+ pilot projects

Session 5: International Conventions and India's Commitments

- UNFCCC, UNCCD, CBD, UNFF, SDGs
- India: NDCs, LDN targets, National Biodiversity Strategy and Action Plan

Session 6: Carbon Markets for Forestry Projects

- Carbon markets (Compliance and Voluntary markets)
- Carbon offset project development lifecycle
- Carbon registries and carbon trading
- Indian Carbon Market

Session 7: Gender Mainstreaming in FLR

- Role of gender in FLR
- Gender-responsive planning and monitoring

Session 8: Forest Certification

- Principles and certification mechanism for sustainable forest management

Session 9: Valuation of Ecosystem Services

- Concept of ecosystem services
- Valuation methods for ecosystem services

Session 10: Green Credit Programme (GCP)

- Overview of India's GCP framework
- Eligible activities and implementation modalities
- Linkage with state-level programs

Session 11: Funding Mechanisms for FLR

- CAMPA, GIM, NABARD, CSR, GCF, GEF, UNDP, JICA etc.
- Project proposal designing and preparation

Session 12: Nature-based Solutions/ Approaches and NWFPs Value Chains

- Nature-based solutions/ approaches for FLR
- Sustainable harvesting, processing, and marketing of NWFPs
- Promoting community enterprise and value addition

Session 13: LiFE Mission: Life Style for Environment

- Concept and objectives
- Individual and institutional behavioural changes
- Integration with departmental activities

16.2. Training Module on Forest Landscape Restoration for Frontline Forest Staff (Forest Guards up to Dy. Rangers) State Forest Department

Session 1: Forest Landscape Restoration – Concept and Approach

- Definition and principles of FLR
- Restoration vs afforestation
- Importance of multi-stakeholder and participatory approaches in FLR
- Integrated FLR Planning, tools and techniques
- Cross-sectoral coordination
- Monitoring and evaluation indicators

Session 2: India's Nationally Determined Contributions (NDCs) under the Paris Agreement

- Paris Agreement
- Overview of India's NDCs
- NDC Forest Sector target

Session 3: Measurement of Forest Carbon Stocks

- Basics of forest carbon pools
- Tools and techniques (transect walks, sample plots, GPS)
- Methodology for forest carbon stocks measurement/ estimations

Session 4: Spring Shed Management

- Importance of springs for local communities
- Spring inventorying and mapping
- Recharge techniques and catchment protection

Session 5: Nature-based Solutions (NbS)/ / Approaches and Ecosystem Services

- Nature-based Solutions/ Approaches for climate resilience, FLR and biodiversity conservation
- Ecosystem services and their valuation

Session 6: Sustainable Harvesting of NWFPs and Livelihoods

- NWFPs and value chains
- Guidelines for sustainable harvesting of NWFPs
- Market linkages and community enterprises

Session 7: Invasive Species and their Management

- Major invasive species
- Ecological impacts and mechanical/biological control

Session 8: FLR Action Plan Preparation

- Participants prepare site-specific FLR action plan
- Group presentations

16.3. Training Module on Forest Landscape Restoration for Officers and Staff of Other Line Departments

Session 1: International Agreements and Conventions on Environment

- International Convention and agreements (UNFCCC, CBD, UNCCD, Paris Agreement)
- Bonn Challenge and New York Declaration on Forests

Session 2: Legal Framework for Environmental Protection in India

- Forest (Conservation) Act, 1980
- Environment (Protection) Act, 1986
- Biological Diversity Act, 2002

Session 3: Invasive Species and Their Management

- Major invasive species and their impacts
- Mechanical and biological control measures of invasive species

Session 4: Restoration of Degraded Areas

- Principles of forest landscape restoration
- Agroforestry, afforestation and silvipasture
- Monitoring indicators

Session 5: Spring Shed Management

- Hydrogeology basics
- Community-based springshed management

Session 6: SDGs and Forest Landscape Restoration

- SDGs and their targets related to forest landscape restoration

Session 7: Gender Mainstreaming in FLR

- Gender-differentiated roles in FLR
- Gender-responsive planning and monitoring

Session 8: Participatory Natural Resource Management

- Community institutions
- Participatory rural appraisal and resource mapping
- Policy support

Session 9: Eco-tourism as a tool for Conservation

- Principles of eco-tourism
- Revenue and conservation synergy
- Local governance models

Session 10: LiFE (Lifestyle for Environment) Mission

- Concept and objectives
- Individual and institutional behavioural changes
- Integration with departmental activities

Session 11: Sustainable Livelihood Generation

- Role of forests in rural and tribal livelihoods
- Overview of forest goods
- Sustainable harvesting techniques
- Value addition, storage, processing and packaging

Session 12: Agroforestry/ farm forestry/ urban forestry

- Definition and components of agroforestry
- Differences between agriculture, forestry and agroforestry
- Historical practices and indigenous knowledge
- Agroforestry Models

16.4. Awareness and Training Program Module on Forest Landscape Restoration and Related topics for Local Communities

Session 1: Introduction to Forest Landscape Restoration

- Forest landscape
- Causes of degradation (deforestation and forest degradation)
- Forest landscape restoration (definition, goals)
- Importance of Forest Landscape Restoration

Session 2: Soil and Water Conservation

- Soil erosion causes and impact
- Techniques: contour bunding, check dams, vegetative barriers
- Rainwater harvesting, trenching

Session 3: Climate Change

- Observed changes/ impacts (rainfall, temperature, phenology)
- Local impacts on crops, water, health

- Mitigation (tree planting, carbon sinks)
- Adaptation: Drought-resistant crops, mulching, rainwater use

Session 4: Livelihood Generation through NWFPs

- Common NWFPs - honey, bamboo, wild fruits, medicinal plants
- Harvesting rules (sustainable use)
- Value addition (drying, packaging etc.)
- Market access and involvement of SHG and FPO

Session 5: Agroforestry and Horticulture Practices

- Intercropping with fruit and timber trees/ agroforestry practices
- Benefits of agroforestry
- Nursery development

Session 6: Sustainable Agriculture

- Organic Farming
- Crop Diversification
- Micro Irrigation Techniques

Session 7: Invasive Species and their management

- Common invasive species
- Control measures of invasive species
- Forest fire causes and prevention measures
- Restoration methods: Assisted regeneration and replanting

Session 8: Mitigating Human-Wildlife Conflicts: Tools and Techniques

- Understanding human-wildlife conflict
- Wildlife behavior and identification
- Non-lethal conflict mitigation techniques
- Emergency response and safety protocols
- Compensation mechanisms and reporting
- Community-based conflict management

Session 9: Action Planning

- Community-level FLR action plan preparation

17 CONCLUSION

The findings of training needs assessment (TNA) have yielded valuable insights into the existing knowledge and skill gaps, as well as the capacity development requirements of key stakeholders involved in the restoration of degraded forest landscapes in Gujarat. The assessment reveals a broad awareness of the importance of Forest Landscape Restoration among all the key stakeholders. However, it also underscores the need to strengthen understanding of core FLR principles, landscape-level planning, restoration monitoring, climate resilience strategies and community engagement. Other Line Departments, while playing a complementary and critical role in FLR, often lack coordination and a shared vision of restoration objectives. The TNA findings identify a clear need to foster inter-departmental collaboration through capacity-building efforts that emphasize cross-sectoral coordination, policy coherence and integrated landscape management approaches.

At the community level, there is a strong willingness to engage in restoration initiatives. Nevertheless, significant technical knowledge gaps remain, particularly in practical restoration techniques, sustainable resource management and institutional procedures. Capacity development for these stakeholders should focus on raising awareness, building practical skills and promoting inclusive governance models to enable their meaningful and sustained participation. Overall, the TNA highlights the urgent need for capacity building of the key stakeholders as per the stakeholder specific targeted training modules on FLR. Building the capacities of the stakeholders is essential not only for the effective implementation of FLR initiatives but also for enhancing ecosystem services, strengthening climate resilience and supporting sustainable livelihoods across the state of Gujarat.

18 WAY FORWARD

Training modules on Forest Landscape Restoration have been developed as part of the Training Needs Assessment (TNA) for the capacity building of State Forest Department, Other Line Departments and local communities of the Gujarat. The next step is effective implementation of the training modules, institutional uptake and long-term integration into the capacity-building programmes of the stakeholders. The focus must now shift from planning to action, emphasizing the rollout of trainings across multiple stakeholder levels and selected landscapes under the RECAP4NDC Project within the state of Gujarat.

To begin with a phased training implementation plan, need to be developed. Special attention needs to be given for building the capacities of front-line forest staff, community members and Panchayati Raj Institution. These actors play a pivotal role in on-ground FLR interventions and need to be empowered not only with technical knowledge but also with participatory and governance skills to foster community-led restoration efforts. To ensure sustainability and scalability, a training of trainers' approach can be operationalized using the developed training modules. By building a pool of master trainers at the Forest Division levels of Gujarat state can create a self-sustaining model where capacity building becomes an ongoing, process. Additionally, integrating the FLR training modules into the regular induction and in-service trainings of the State Forest Department and other line departments will help institutionalize the learning. It is also critical to utilize technology enabled platforms to extend the reach and accessibility of the training. Digital learning tools, mobile-based content and community radio can help engage participants in remote areas and promote continued learning beyond the classroom setting.

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GLIMPSES OF THE TNA EXERCISE - SFD AND OTHER LINE DEPARTMENTS

GLIMPSES OF THE TNA SURVEYS - LOCAL COMMUNITIES

QUESTIONNAIRE FOR TRAINING NEED ASSESSMENT FOR CAPACITY BUILDING OF THE OFFICERS OF STATE FOREST DEPARTMENT ON FOREST LANDSCAPE RESTORATION UNDER RECAP4NDC PROJECT

No: TNA-Q1/ICFRE/   **Date:**

Name of the Project: Restore, Conserve and Protect Forest and Tree Cover for NDC Implementation in India (RECAP4NDC Project)

Project Output V: Development of Capacities, Knowledge and Communication Mechanisms for Forest Landscape Restoration

Implementing Agency: Indian Council of Forestry Research and Education (ICFRE), Dehradun

Brief About the Project: German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection has commissioned a project titled Restore, Conserve and Protect Forest and Tree Cover for NDC Implementation in India (RECAP4NDC) under International Climate Initiative. The project is being implemented as part of the Indo-German Partnership for Green and Sustainable Development by a six-member consortium (GIZ, IUCN, FSI, TERI, ICFRE and the ICIMOD). This project aims to enable actors to effectively plan, finance, implement and monitor forest landscape restoration (FLR) and trees outside forests measures. Thereby, it aims to contribute to the achievement of India's NDC forestry target, enhance biodiversity conservation and sustainably improve rural livelihoods through increased forest and tree cover. Output V aims to transfer knowledge and capacitate stakeholders. Capacity development includes trainings, induction courses/curricula development on Forest Landscape Restoration for public staff across different sectors and levels.

Informed Consent: You are requested to participate in the survey being conducted by ICFRE, Dehradun to determine the need of the training required for the capacity building of State Forest Department on various aspects of Forest Landscape Restoration under the RECAP4NDC Project.

Your contribution will help in identification and prioritization of training needs, preparation of training modules, manuals, knowledge products and building capacity of State Forest Departments on various aspects of Forest Landscape Restoration under the project.

There are no foreseeable risks for participating in this survey. You may withdraw your consent or stop participating in the survey at any time. We will make every effort to maintain the confidentiality of your responses. Only the team of the project will have access to the data and information about participation and will not be shared with others.

Details of Respondent:

Name: ....

Designation:..

Age:.. Gender..

Address:...

....

....

Mobile No... Email ....

1. **How familiar are you with the following topics related to Forest landscape restoration?**

   Kindly tick the appropriate option (Yes/ No) against each of the following:

S. No.	Topics related to forest landscape restoration	Yes	No
1	Forest landscape restoration		
2	Sustainable forest management		
3	Restoration of degraded forests/ landscapes		
4	Nursery and plantation techniques of forestry species		
5	Soil and water conservation measures		
6	Invasive species and their management		
7	Forest fire and its management		
8	Nature -based Solutions/ Ecosystem based Approaches		
9	Climate change impact and vulnerability in forest sector		
10	Climate change mitigation and adaptation in forest sector		
11	REDD+ (Reducing emissions from deforestation and forest degradation) & Forest carbon projects		
12	Forest carbon stocks measurement		
13	Carbon Market Mechanism-Finance and Carbon Credit		
14	Forest certification		
15	International Agreement/Conventions related to forest and environment & India's Commitment		
16	Sustainable harvesting of NTFP and their role in livelihood generation		
17	Ecosystem services and its Valuation		
18	Legal framework (Policies, laws and regulations) for conservation and protection of forest and environment		
19	Sustainable development goals		
20	Gender mainstreaming in forest management		
21	Community forest management (Van Panchayat/JFMCs/BMCs etc.)		
22	Springshed Management		
23	Eco-tourism		
24	Value Chain		
25	Green Credit Programme		
26	Domestic and International funding for FLR		
27	Life: Life style for Environment		

2. **Trainings related to Forest Landscape Restoration attended by you:**

S. No.	Name of training attended	Organizing Institution/ Department
1		
2		
3		
4		

3. **Which schemes/projects/programs are being implemented in the state for restoration of degraded forest landscapes? What type of trainings are being provided to the staff under the scheme/project/program?**

S. No.	Name of the scheme/project/program	Type of training provided to staff
1		
2		
3		
4		

4. **Which types of practices are being followed in the department for restoration of degraded forest landscapes? Kindly tick (√) relevant option/options.**

S. No.	Practices	Tick (√) relevant option/options
1	ANR– Enrichment plantation	
2	Soil & Moisture Conservation	
	a) Rain Water Harvesting	
	b) Contour trench	
	c) Cattle proof trench/wall	
	d) Check dams	
3	Fencing	
4	Invasive Species management	
5	Rotation grazing	
6	Forest Fire Management	
7	Others, if any, please specify	

5. Which type of knowledge products would be more effective for sharing of knowledge on restoration of degraded forest landscape? Kindly tick (√) relevant option/options.

S. No.	Type of knowledge products	Tick (√) relevant option/options
1	Flyer	
2	Book	
3	Manual	
4	Brochure	
5	Pamphlets	
6	Infographics	
7	Videos	
8	Posters	
9	e-book/ e-booklet/ e-manual	
10	Others, if any, please specify	

6. Which modes of training would be more effective for capacity building of the Department? Please suggest:

S. No.	Modes of training	Priority		
		Low	Medium	High
1	Physical mode - Interactive sessions (Expert lectures, audio-visual, hands on exercise, case studies, group exercises)			
2	Virtual mode- Interactive sessions (Expert lectures, audio-visual, case studies, group exercises)			
3	e-Learning			
4	Others, if any, please specify			

7. Please suggest best suitable time of the year for conducting trainings for the Department and appropriate duration of training:

Months:_____

Duration: (a) 1 day_____ (b) 2 days_____

(c) 3 days_____ (d) 5 days _____

8. Please provide other comments/suggestions related to training needs for capacity building of the Department on FLR related aspects:

_____

_____

Signature of the respondent

Signature ……………………………………………

Data collected by: ……………………………………

Designation: …………………………………………

QUESTIONNAIRE FOR TRAINING NEED ASSESSMENT FOR CAPACITY BUILDING OF THE FRONTLINE STAFF OF STATE FOREST DEPARTMENT ON FOREST LANDSCAPE RESTORATION UNDER RECAP4NDC PROJECT

No: TNA-Q4/ICFRE/   Date:

Name of the Project: Restore, Conserve and Protect Forest and Tree Cover for NDC Implementation in India (RECAP4NDC Project)

Project Output V: Development of Capacities, Knowledge and Communication Mechanisms for Forest Landscape Restoration

Implementing Agency: Indian Council of Forestry Research and Education (ICFRE), Dehradun

Brief About the Project: German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection has commissioned a project titled Restore, Conserve and Protect Forest and Tree Cover for NDC Implementation in India (RECAP4NDC) under International Climate Initiative. The project is being implemented as part of the Indo-German Partnership for Green and Sustainable Development by a six-member consortium (GIZ, IUCN, FSI, TERI, ICFRE and the ICIMOD). This project aims to enable actors to effectively plan, finance, implement and monitor forest landscape restoration (FLR) and trees outside forests measures. Thereby, it aims to contribute to the achievement of India's NDC forestry target, enhance biodiversity conservation and sustainably improve rural livelihoods through increased forest and tree cover. Output V aims to transfer knowledge and capacitate stakeholders. Capacity development includes trainings, induction courses/curricula development on Forest Landscape Restoration for public staff across different sectors and levels.

Informed Consent: You are requested to participate in the survey being conducted by ICFRE, Dehradun to determine the need of the training required for the capacity building of State Forest Department on various aspects of Forest Landscape Restoration under the RECAP4NDC Project.

Your contribution will help in identification and prioritization of training needs, preparation of training modules, manuals, knowledge products and building capacity of State Forest Departments on various aspects of Forest Landscape Restoration under the project.

There are no foreseeable risks for participating in this survey. You may withdraw your consent or stop participating in the survey at any time. We will make every effort to maintain the confidentiality of your responses. Only the team of the project will have access to the data and information about participation and will not be shared with others.

Details of Respondent:

Name: ....

Designation: ....

Gender .... Age ....

Qualification   a)   10th

                 b)   12th

                 c)   Graduation

                 d)   Post-graduation

                 e)   Others (specify)

Address:

Forest Division:..

Forest Range: ....

Mobile No... Email ....

1. **How familiar are you with the following topics related to Forest landscape restoration?**
   Kindly tick the appropriate option (*Yes/ No*) *against* each of the following:

S. No.	Topics related to forest landscape restoration	Yes	No
1	Forest Landscape Restoration concept/Approach		
2	Sustainable forest management		
3	Restoration of degraded forests		
4	Nursery and plantation techniques of forestry species		
5	Soil and water conservation measures		
6	Invasive species and their management		
7	Forest fire and its management		
8	Nature-based Solutions/Approaches		
9	Forest carbon stocks measurement		
10	India's Nationally Determined Contribution targets under the Paris Agreement		
11	Policies, laws and regulations for conservation of forest biodiversity in India		
12	Sustainable harvesting of NTFP and their role in livelihood generation		
13	Legal framework for conservat ion and protection of forest and environment in India		
14	Gender mainstreaming in forest management		
15	Community forest management (Van Panchayat/JFMC/BMC/SHG)		
16	Spring shed Management		
17	Village eco-tourism		
18	Biodiversity Conservation		

2. **Trainings related to Forest Landscape Restoration attended by you:**

S. No.	Name of training	Organizing Agency/ Department
1		
2		
3		
4		

3. **Which types of practices are being followed by your department for restoration of degraded forest landscapes? (Please tick (√) relevant option/options)**

S. No.	Practices	Tick (√) relevant option/options
1	ANR– Enrichment plantation, adoption etc.	
2	Soil & Moisture Conservation	
	a) Rain Water Harvesting	
	b) Contour trench	
	c) Cattle proof trench/wall	
	d) Check dams	
3	Fencing	
4	Invasive Species management	
5	Rotation grazing	
6	Forest Fire Management	
7	Others, if any, please specify	

4. **Which type of knowledge products would be more effective for sharing of knowledge on restoration of degraded forest landscape? (Please tick (√) relevant option/options)**

S. No.	Type of knowledge products	Tick (√) relevant option/options
1	Flyer	
2	Book	
3	Manual	
4	Brochure	
5	Pamphlets	
6	Infographics	
7	Videos	
8	Posters	
9	e-book/ e-booklet/ e-manual	
10	Others, if any, please specify	

5. **Which modes of training would be more effective for capacity building for Frontlines Staff of State Forest Department? Please suggest:**

S. No.	Modes of training	Priority		
		Low	Medium	High
1	Physical mode- Interactive sessions (Expert lectures, audio-visual, hands on exercise, case studies, group exercises)			
2	Virtual mode-Interactive sessions (Expert lectures, audio-visual, case studies, group exercises)			
3	e-Learning			
4	Others, please specify……………………………………………………. ……………………………………………………………………… ………………………………………………………………………			

6. **Please suggest best suitable time of the year for conducting trainings for the Department:**
    Months:_____
    Duration: (a) 1 day_____ (b) 2 days_____
    (c) 3 days_____ (d) 5 days _____

7. **Please provide other comments/suggestions related to training needs for capacity building of the Department:**
    _____
    _____
    _____

                                               Signature of the respondent

                                        Signature ……………………………………………
                            Data collected by: ……………………………………………
                                  Designation: ……………………………………………

QUESTIONNAIRE FOR TRAINING NEED ASSESSMENT FOR CAPACITY BUILDING OF THE OFFICERS/ STAFF OF OTHER LINE DEPARTMENT ON FOREST LANDSCAPE RESTORATION UNDER RECAP4NDC PROJECT

No: TNA-Q2/ICFRE/   Date:

Name of the Project: Restore, Conserve and Protect Forest and Tree Cover for NDC Implementation in India (RECAP4NDC Project)

Project Output V: Development of Capacities, Knowledge and Communication Mechanisms for Forest Landscape Restoration

Implementing Agency: Indian Council of Forestry Research and Education (ICFRE), Dehradun

Brief About the Project: German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection has commissioned a project titled Restore, Conserve and Protect Forest and Tree Cover for NDC Implementation in India (RECAP4NDC) under International Climate Initiative. The project is being implemented as part of the Indo-German Partnership for Green and Sustainable Development by a six-member consortium (GIZ, IUCN, FSI, TERI, ICFRE and the ICIMOD). This project aims to enable actors to effectively plan, finance, implement and monitor forest landscape restoration (FLR) and trees outside forests measures. Thereby, it aims to contribute to the achievement of India's NDC forestry target, enhance biodiversity conservation and sustainably improve rural livelihoods through increased forest and tree cover. Output V aims to transfer knowledge and capacitate stakeholders. Capacity development includes trainings, induction courses/curricula development on Forest Landscape Restoration for public staff across different sectors and levels.

Informed Consent: You are requested to participate in the survey being conducted by ICFRE, Dehradun to determine the need of the training required for the capacity building of other Departments on various aspects of Forest Landscape Restoration under the RECAP4NDC Project.

Your contribution will help in identification and prioritization of training needs, preparation of training modules, manuals, knowledge products and building capacity of your department on various aspects of Forest Landscape Restoration under the project.

There are no foreseeable risks for participating in this survey. You may withdraw your consent or stop participating in the survey at any time. We will make every effort to maintain the confidentiality of your responses. Only the team of the project will have access to the data and information about participation and will not be shared with others.

Details of Respondent:

Name: ....

Designation:..

Age:...……........ **Gender**...

Address:..

....

Mobile No...…… **Email**..

1. **How familiar are you with the following topics related to Forest landscape restoration? Kindly tick the appropriate option (Yes/ No) against each of the following:**

S.No.	Topics related to forest landscape restoration	Yes	No
1	Natural resource management (NRM)		
2	Sustainable land management		
3	Restoration of degraded areas		
4	Soil and water conservation		
5	Nature -based Solution/ Ecosystem based Approaches		
6	Invasive species and their management		
7	Disaster management / Disaster risk reduction		
8	Climate change impacts and vulnerability		
9	Climate change mitigation and adaptation		
10	International Agreement/ Conventions related to environment		
11	Legal framework for conservation and protection of environment in India		
12	Sustainable livelihood generation		
13	Agroforestry/ farm forestry/ urban forestry		
14	Participatory natural resource management		
15	LiFE: Life Style for Environment		
16	Sustainable development goals		
17	Gender mainstreaming in NRM		
18	Spring shed management		
19	Eco-tourism		

2. **Contributions of Line Departments towards Forest Landscape Restoration. Please tick (√) relevant option/ options.**

S.No.	Department	Tick √ relevant option/options
1	**Rural Development Department**	
	a Soil Moisture Conservation	
	b Plantation	
	c Others, if any, please specify	
2	**Agriculture Department**	
	a Micro-irrigation	
	b Rashtriya Krishi Vikas Yojana	
	c Improved agricultural practices	

	d	Mulching	
	e	Organic farming	
	f	Rain water harvesting	
	g	Percolation tanks	
	h	Others, if any, please specify	
3	**Horticulture Department**		
	a	Plantation of horticultural crops	
	b	Micro-irrigation	
	c	Green house development	
	d	Percolation tanks	
	e	Rain water harvesting	
	f	Mulching	
	g	Others, if any, please specify	
4	**Watershed Management Department**		
	a	Plantation	
	b	Check dams	
	c	Irrigation	
	d	Livelihood	
	e	Others, if any, please specify	
5	**Irrigation and Water Resources Department**		
	a	Canals	
	b	Tube wells	
	c	Ponds	
	d	Micro-irrigation	
	e	Water harvesting	
	f	Chauka	
	g	Others, if any, please specify	
6	**Animal Husbandry Department**		
	a	Grassland development	
	b	Plantation of fodder trees/grasses	
	c	Controlled grazing	
	d	Stall feeding	
	e	Others, if any, please specify	

3. Trainings related to NRM attended by you:

S. No.	Name of training attended	Organizing Institution/ Department
1		
2		
3		
4		

4. Which types of sustainable land management practices are being followed by your department for restoration of degraded landscapes? Please tick (√) relevant option/options

S.No.	Name of the Practices	Tick (√) relevant
1	Organic farming	
2	Micro-irrigation	
3	Rain Water Harvesting	
4	Improved variety of seed distribution	
5	Quality Planting Materials	
6	Land-levelling	
7	Chaukas practice	
8	Agroforestry	
9	Farm Bunding	
10	Others, if any, please specify	

5. Which type of knowledge products would be more effective for sharing of knowledge on restoration of degraded landscape? Kindly tick (√) relevant option/options

S.No.	Type of knowledge products	Tick (√) relevant option/options
1	Flyer	
2	Book	
3	Manual	
4	Brochure	
5	Pamphlets	
6	Infographics	
7	Videos	
8	Posters	
9	e-book/e-booklet/e-manual	
10	Others, if any, please specify	

6. **Which modes of training would be more effective for capacity building of your department? Please suggest:**

S.No.	Modes of training	Priority		
		Low	Medium	High
1	Physical mode - Interactive sessions (Expert lectures, audio - visual, hands on exercise, case studies, group exercises)			
2	Virtual mode - Interactive sessions (Expert lectures, audio - visual, case studies, group exercises)			
3	e - Learning			
4	Others, please specify			

7. **Please suggest best suitable time of the year for conducting trainings for your department and appropriate duration of training:**
   Months:_____
   Duration: (a) 1 day_____ (b) 2 days_____
   (c) 3 days_____ (d) 5 days _____

8. **Please provide other comments/suggestions related to training needs for capacity building of your department:**
   _____
   _____
   _____

Signature of the respondent

Signature ……………………………………………

Data collected by: ……………………………………………

Designation: ……………………………………………

ANNEXURE 4

QUESTIONNAIRE FOR TRAINING NEED ASSESSMENT FOR CAPACITY BUILDING OF THE LOCAL COMMUNITIES ON FOREST LANDSCAPE RESTORATION UNDER RECAP4NDC PROJECT

No: TNA-Q3/ICFRE/   Date: /   /2025

Name of the Project: Restore, Conserve and Protect Forest and Tree Cover for NDC Implementation in India (RECAP4NDC) Project

Project Output V: Development of Capacities, Knowledge and Communication Mechanisms for Forest Landscape Restoration

Implementing Agency: Indian Council of Forestry Research and Education (ICFRE), Dehradun

Brief About the Project: German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection has commissioned a project titled Restore, Conserve and Protect Forest and Tree Cover for NDC Implementation in India (RECAP4NDC) under International Climate Initiative. The project is being implemented as part of the Indo-German Partnership for Green and Sustainable Development by a six-member consortium (GIZ, IUCN, FSI, TERI, ICFRE and the ICIMOD). This project aims to enable actors to effectively plan, finance, implement and monitor forest landscape restoration and trees outside forests measures. Thereby, it aims to contribute to the achievement of India's NDC forestry target, enhance biodiversity conservation and sustainably improve rural livelihoods through increased forest and tree cover. Output V of the project aims to transfer knowledge and capacitate stakeholders. Capacity development includes trainings on Forest Landscape Restoration.

Informed Consent: You are requested to participate in the survey being conducted by ICFRE, Dehradun to determine the need of the training required for the capacity building of the local communities on various aspects of Forest Landscape Restoration under the RECAP4NDC Project.

Your contribution will help in identification and prioritization of training needs, preparation of training modules, manuals, knowledge products and building capacity of the local communities on various aspects of Forest Landscape Restoration under the project.

There are no foreseeable risks for participating in this survey. You may withdraw your consent or stop participating in the survey at any time. We will make every effort to maintain the confidentiality of your responses. Only the team of the project will have access to the data and information about participation and will not be shared with others.

Details of Village

Name of Village	
Population of Village	
No. of Males .... **No. of Females…………** Children (below age of 18 years)…………	
No. of Household:	
Gram Panchayat	

Tehsil	
Forest Range	
District	
State	
Comfortable in Language	(a) Hindi (b) English (c) Gujarati (d) Marathi

1.   Have you attended any awareness programs on following subject? (Please tick (√)

S. No.	Awareness on the subject	Yes	No
1	Restoration of degraded forest land		
2	Forest fire management		
3	Community forest management		
4	Sustainable land management practices		
6	6 (a). Agroforestry		
	6 (b). Farm forestry practices		
7	7 (a). Horticulture		
	7 (b). Agriculture practices		
8	Livelihood generation through Non-wood Forest Products		
9	Climate Change and its impacts		
10	Disaster risk management		
11	Spring shed management		
12	Eco -tourism		
13	Biodiversity conservation		
14	Value addition of agricultural products		
15	Value addition of Non-Wood Forest Produce		
16	Agriculture Practices		
17	Others, if any, please specify: 1. ……………………………………………………………………… 2. ………………………………………………………………………		

2.   Which soil and water conservation measures are being followed by you? (Please tick (✓)

S. No.	Soil and water conservation measure practices	Yes	No
1	Organic Farming		
2	Terrace Farming		
3	Crop Rotation		
4	Mixed Cropping		
5	Rain Water Harvesting		
6	Mulching		
7	Contour/ Staggered Trenches		
8	Farm bunding		
9	Drip Irrigation		
10	Sprinkler Irrigation		
11	Others, if any, please specify: 1. …………………………………………………………………………………………………… 2. …………………………………………………………………………………………………		

3.   Have you observed any changes in climate patterns? (Please tick ✓)

S.No.	Changes in climate patterns	Yes	No
1	a) Flood−increased (frequency)		
	b) Flood−decreased (frequency)		
2	a) Drought−increased (frequency)		
	b) Drought−decreased (frequency)		
3	a) Cloud burst−increased (frequency)		
	b) Cloud burst−decreased (frequency)		
4	a) Change in rain fall pattern (Increase)		
	b) Change in rain fall pattern (Decrease)		
5	a) Change in snowfall pattern (Increase)		
	b) Change in snowfall pattern (Decrease)		
6	a) Change in temperature pattern (Increase)		
	b) Change in temperature pattern (Decrease)		
7	Others, if any, please specify: 1. …………………………………………………………………………………………… 2. ………………………………………………………………………………		

4. Have you observed any changes in forest quality in last 20 years in your areas? (Please tick ✓)

S. No.	Changes in forest quality	Yes	No
1	Trees felling		
2	Plant species reduced		
3	Forest Degraded		
4	a) Increase in Weeds/ invasive species in the forest		
	b) Decrease in Weeds/ invasive species in the forest		
5	Natural regeneration reduced		
6	Reducing NWFPs - (fruits, Honey, etc.)		
7	Improving the quality of forests		
8	Others, if any, please specify: 1. ……………………………………………………………………………… 2. ………………………………………………………………………		

5. **Does forest fire occur in nearby forest areas?** | Yes | No |

    If yes, please mention its frequency per year, Kindly tick ✓
    (a)   Once (b) Twice (c) Thrice (d) More than thrice

6. **What control measures are being followed for controlling forest fire in your area?**

    1.   _____

    2.   _____

7   **Are you member of any of the following committee?**

S.No.	Committee/group	Yes	No
i.	Joint Forest Management Committee (JFMC)		
	If yes, your role ……………………………………………………………………… ……………………………………………………………………… **Role of Women in JFMC** ……………………………………………………………………… ………………………………………………………………………		
ii.	Biodiversity Management Committee (BMC)	Yes	No
	If yes, your role ……………………………………………………………………… ……………………………………………………………………… **Role of Women in BMC** ……………………………………………………………………… ………………………………………………………………………		

iii.	Self Help Group (SHG)	Yes	No
	If yes, your role .... **Role of Women in SHG**		
iv.	Farmer Producer Organization (FPO)	Yes	No
	If yes, your role .... **Role of Women in FPO**		
v.	Mahila Mangal Dal	Yes	No
	If yes, your role		
vi.	Attended training programmes as member of above mentioned committees	Yes	No
	If yes, your role		
vii.	Details of important tasks performed by the above mentioned committees		
viii.	Others, if any, please specify:		

8. **Role of women in above mentioned committees/Group and Gram Panchayat**

   1. _____
   2. _____

9. **Livelihood opportunities from forest in your area?**

   1. _____
   2. _____

10. **Suggest any measures for improving forest quality in your areas.**

    1. _____
    2. _____

11. **Is agroforestry being practiced in your area? If yes, mention the tree species being used for agroforestry in your area.**

    1. _____
    2. _____

12. Kindly tick (√) topics and suggest additional topics for capacity need on restoration of degraded landscape for local communities:

S. No.	Suggested Topics for capacity building	Tick (√) your choice
1	Restoration of degraded forest land	
2	Forest fire management	
3	Community forest management	
4	Sustainable land management practices	
5	Agroforestry/ farm forestry practices	
6	Horticulture/agriculture practices	
7	Livelihood generation through Non-wood Forest Products	
8	Climate Change and its impacts, Climate Change Mitigation and Adaptation	
9	Disaster risk management	
10	Soil and water conservation	
11	Others, if any, please specify:	

13. Which mode of training would be more effective for capacity building of local communities of your areas? Please suggest:

S. No.	Modes of training	Tick (√) your choice
1	Classroom lectures followed by audio-visual	
2	Demonstrations	
3	Exposure visits	
4	Others, if any, please specify:	

14. Please suggest best suitable time of the year for conducting trainings:
Months:_____

15. Please provide other comments/suggestions related to training needs for capacity building of local communities
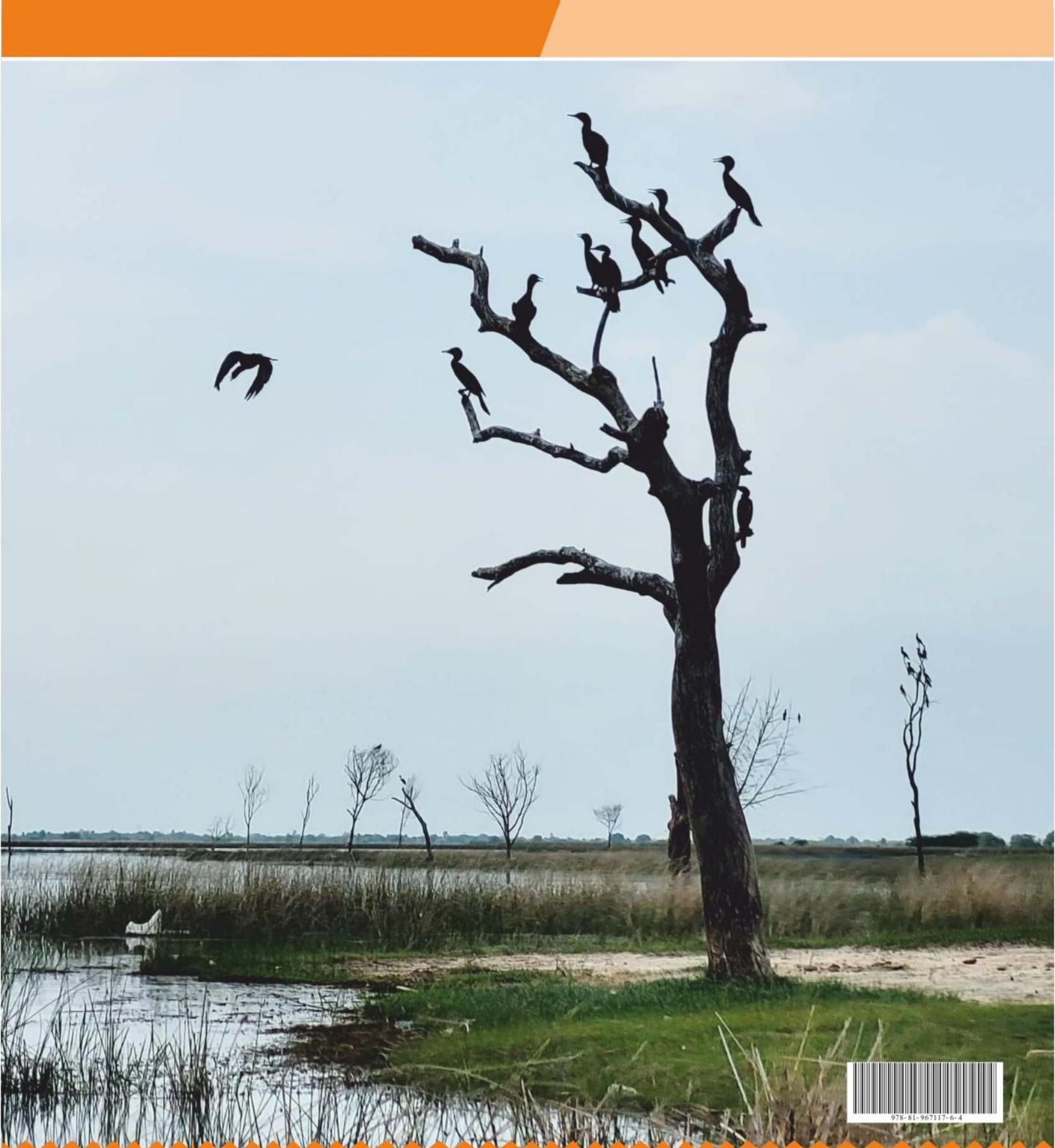_____
_____
_____

16 Details of ongoing or completed projects related to management of natural resources, agriculture, horticulture, industry, livelihood, biodiversity, soil and water conservation, animal husbandry etc. in your village

S. No.	Name of the Project	Year	Department/ Organisation
1.			
2.			
3.			

Data collected by: …………………………………………
Signature …………………………………………
Designation …………………………………………