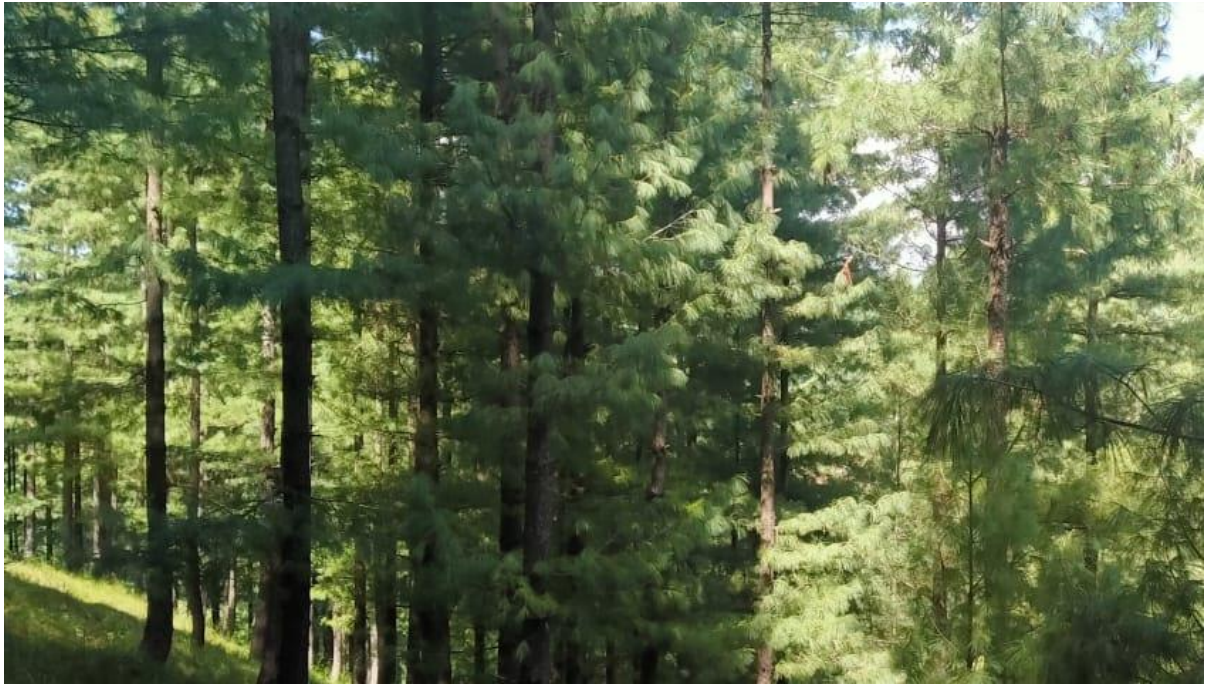




# **Participatory Forests Management Plan (PFMP)**

**Forest Range Lachrat,  
Muzaffarabad Forests Division  
(Designated Forests Area Lachrat / DFA Lachrat)**

**2022-2031**



**Forests Department  
Azad Government of the State of Jammu & Kashmir  
&  
Village Community Organizations,  
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# Participatory Forest Management Plan (PFMP)

## Forest Range Lachrat, Muzaffarabad Forests Division

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#### **Disclaimer:**

This Participatory Forest Management Plan is not a funding commitment from Forestry, Wildlife & Fisheries Department AJK. It is a proposal to be considered for future implementation of REDD+ Programme if funds are committed by the AJK government and/or any other donor(s). The success of this plan is contingent to the commitment of all stakeholders involved in the implementation of this plan. Benefit Sharing Mechanism and institutional setup for implementation of REDD+ approved by the Government of AJK will form the basis for implementing this Plan. Information on these aspects are suggestive and not binding on the Forestry, Wildlife & Fisheries Department AJK and any other stakeholders mentioned in this document.

وضاحت

آزاد جموں و کشمیر کے محکمہ جنگلات و جنگلی حیات اس منصوبے کے لیے مالی وسائل فراہم کرنے کا پابند نہیں ہوگا۔ اس منصوبہ پر عمل درآمد کرنے کے لیے مالی اور انتظامی سفارشات دی گئی ہیں۔ تاہم ان پر عمل آزاد جموں و کشمیر کے محکمہ جنگلات و جنگلی حیات کے بنائے گئے انتظامی و مالی رہنما اصولوں کے تحت ہوگا۔

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## Acronyms

AJ&K	Azad Jammu and Kashmir
ADP	Annual Development Programme
FD	Forest Department
BURs	Biennial Update Reports
CERs	Certified Emission Reduction
C & I	Criteria & Indicators
COP	Conference of Parties
Corg	Organic Carbon
DFA	Designated Forest Area
DDFD	Drivers of Deforestation & Forest Degradation
ERPA	Environmental Reduction Payment Agreement
EBA	Ecosystem Based Approach
FPIC	Free, Prior, Informed Consent
FREL	Forest Reference Emission Level
FCPF	Forest Carbon Partnership Facility
GDP	Gross Domestic Product
GHGs	Green House Gas Emissions
GLDs	Government Line Departments
IPCC	Intergovernmental Panel on Climate Change
LULUCF	Land Use, Land Use Change & Forestry
MRV	Measurement, Reporting and Verification
NAPAs	National Adaptation Programme of Actions
NAMs	Nationally Approved Mitigation Actions
PAMs	Policies & Measures
PIU	Plan Implementation Unit
PRA	Participatory Rapid Assessment
PLRs	Policies, Laws & Regulations
PES	Payment for Ecosystem Services
R-PP	Readiness Preparation Project
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SIS	Safeguard Information System
SGRM	Safeguard Grievance Redressal Mechanism
SFM	Sustainable Forest Management
UNEP	United Nations Environment Programme
UNFCCC	UN Framework Convention on Climate Change
VCS	Verified Carbon Standard

## Executive Summary

Lachrat Forest located in Muzaffarabad Forest Division of Azad Jammu and Kashmir is one of the two sites selected by the Forest, Wildlife and Fisheries Department (FD) in consultation with key stakeholders as a pilot site to demonstrate implementation of REDD+. This is part of a larger project being implemented by the Ministry of Climate Change, Government of Pakistan and the Provincial Forest departments in which a total of 15 Participatory Forest Management Plans (PFMP) are being developed for REDD+ implementation in all six entities of Pakistan.

The Government of Pakistan has joined global efforts to address deforestation and forest degradation to mitigate climate change and its impact by initiating REDD+ activities. REDD+ has three phases; i. readiness, ii. demonstration through implementation, and iii. result-based payments. The first two phases when combined are known as the REDD+ Readiness Phase. Pakistan has made substantial progress in meeting REDD+ readiness requirements. Pakistan has developed a National REDD+ Strategy in 2021. Whereas the Gilgit-Baltistan Forests, Wildlife and Environment department has developed a Subnational / Provincial REDD+ Action Plan. This action plan is a decentralised framework for AJK to proceed with REDD+ implementation. Preparation of PFMP is an important step to implement this action plan by integrating and implementing REDD+ activities in forest management in various socio-ecological systems.

The local stakeholders were engaged in preparation of this Participatory Forest Management Plan. The plan will guide the implementation of REDD+ by projecting business as usual and reduced emission scenarios derived from detailed participatory assessment of socio-economic circumstances, ecological condition, and challenges (drivers), and assessment of the forest resource which have been described in this plan. The plan also presents stakeholders' analysis with their roles and obligations, use rights of forest dependent communities, conflict resolution and benefit-sharing mechanisms. This information is crucial for determining an inclusive set of activities and successful implementation of REDD+.

The analysis of forest cover revealed that since 2010 the Forest in Lachrat is decreasing at the rate of 4.02 hectares per year, emitting 659 tonnes CO<sub>2</sub> eq annually. This shows an increasing pressure on these forests due to various drivers. The activities included in this PFMP if properly implemented, will curtail this trend and enhance resource base through collaborative forest management efforts of the stakeholders. This plan has proposed distribution of carbon and non-carbon benefits accrued by the implementation of plan according to which 80% benefits will go to the Government, and 20% will go to the customary right holders / concessionists. These benefits will only be distributed if the targets are achieved. The plan therefore provides scenarios to reduce or increase benefits so that the stakeholders can enjoy results-based payment and benefits. The success of this plan, therefore, is contingent to the commitment of all the stakeholders involved.

The initial period of this plan will be 10 years; however, the plan will be a living document and open for annual reviews. A budget forecast to implement activities mentioned is also provided in this plan. The major focus of the plan will be on enhancing forest cover by reforestation and regeneration of forest blanks and reducing the demand for fuel wood from the forest through promotion of energy efficiency and alternate sources of energy.

The implementation of activities described in the plan will be guided by annual operational plans to be developed by the provincial FD in consultation with the relevant stakeholders. The plan will be implemented by village and district committees to be notified by the provincial FD in consultation with the relevant stakeholders.



## خلاصہ

آزاد جموں و کشمیر کے مظفر آباد فارسٹ ڈویژن میں واقع لچراٹ جنگل محکمہ جنگلات، جنگلی حیات اور ماہی پروری کی جانب سے منتخب کردہ اُن دو مقامات میں سے ایک ہے جہاں ایک پائلٹ سائٹ کے طور پر اہم فریقین سے مشاورت کے ساتھ ریڈ پلس کے نفاذ کا عملی مظاہرہ کیا جائے گا۔ یہ ایک بڑے منصوبے کا حصہ ہے جو وزارت موسمیاتی تبدیلی، حکومت پاکستان اور صوبائی محکمہ جنگلات کے ذریعے لاگو کیا جا رہا ہے جس میں پاکستان کے تمام چھ علاقوں میں ریڈ پلس پر عمل درآمد کی غرض سے مجموعی طور پر جنگلات کے شراکتی انتظام کے لیے پندرہ منصوبے بنائے جا رہے ہیں۔

حکومت پاکستان نے جنگلات کی کٹائی اور ترقی سے نمٹنے اور موسمیاتی تبدیلی کے اثرات کم کرنے کے لیے ریڈ پلس سرگرمیوں کا آغاز کرنے کے عالمی کوششوں میں شمولیت اختیار کی ہے۔ ریڈ پلس کے تین مراحل ہیں۔ (i) تیاری (ii) عمل درآمد کے ذریعے مظاہرہ، اور (iii) نتائج پوچنی اور نیکو بنانا۔ پہلے دو مراحل کو مشترکہ طور پر ریڈ پلس کی تیاری کا مرحلہ کہا جاتا ہے۔ پاکستان نے ریڈ پلس کی تیاری کی ضروریات کو پورا کرنے کے لیے خاطر خواہ پیش رفت کی ہے۔ پاکستان نے 2021ء میں ایک قومی ریڈ پلس حکمت عملی تیاری کی ہے۔ جب کہ آزاد جموں و کشمیر کے جنگلات، جنگلی حیات اور ماہی پروری کے محکمے نے ریاستی سطح پر ایک جامع ریڈ پلس ایکشن پلان تیار کیا ہے۔ آزاد جموں و کشمیر میں ریڈ پلس پر عمل درآمد کو آگے بڑھانے کے لیے یہ ایکشن پلان ایک ریاستی فریم ورک ہے۔ مختلف سماجی ماحولیاتی نظاموں میں جنگل کے انتظام کے لیے ریڈ پلس سرگرمیوں کو مربوط اور لاگو کر کے جنگلات کے شراکتی انتظام کے منصوبوں کی تیاری اس ایکشن پلان پر عمل درآمد کے لیے ایک اہم قدم ہے۔

مقامی فریقین نے جنگلات کے شراکتی انتظام کے منصوبے کی تیاری میں حصہ لیا۔ ریڈ پلس پر عمل درآمد میں رہنمائی کے لیے اس منصوبے کے تحت دو مختلف منظر ناموں یعنی موجودہ حالات اور اخراج میں کمی کا اندازہ لگایا جائے گا۔ اس مقصد کے لیے سماجی اقتصادی حالات کے تفصیلی شراکتی تجزیے، ماحولیاتی صورت حال اور چیلنجز اور منصوبے میں واضح کردہ جنگلاتی وسائل کا جائزہ لیا جائے گا۔ یہ منصوبہ فریقین کے کردار اور ذمے داریوں کے ساتھ اُن کے تجزیے، جنگلات پر انحصار کرنے والی لوگوں کے حقوق کے استعمال، تنازعات کے حل اور مشترکہ فوائد کے حصول کا طریقہ کار بھی پیش کرتا ہے۔ ریڈ پلس پر کامیاب عمل درآمد اور شراکتی سرگرمیوں کی تفصیلات کا تعین کرنے کے لیے یہ معلومات ضروری ہیں۔

جنگل کے رقبے کے تجزیے سے پتا چلتا ہے کہ 2010ء کے بعد سے لچراٹ کے جنگل میں 4.02 ہیکٹر سالانہ کی شرح سے کمی ہو رہی ہے جس سے سالانہ 659 ٹن کاربن ڈائی آکسائیڈ کا اخراج عمل میں آ رہا ہے۔ جنگلات کے شراکتی انتظام کا اس منصوبے میں شامل اقدامات کے عملی اطلاق سے نہ صرف ان نقصانات میں کمی آئے گی بلکہ فریقین کے مشترکہ جنگلات کے انتظامی اقدامات سے جنگلات کے وسائل میں مزید اضافہ ہوگا۔

مجوزہ منصوبے کے مطابق اس منصوبے پر عمل درآمد سے حاصل ہونے والے کاربن اور نان کاربن محصولات میں سے 80 فی صد حکومت کو حاصل ہوں گے اور 20 فی صد جنگل کے حقوق رکھنے والوں اور صارفین کو ملیں گے۔ یہ فوائد صرف اہداف حاصل ہونے کی صورت میں تقسیم کیے جائیں گے اس لیے یہ منصوبہ فوائد میں کمی یا اضافے کا منظر نامہ پیش کرتا ہے تاکہ فریقین نتائج پوچنی اور فوائد سے مستفید ہو سکیں۔ لہذا اس منصوبے کی کامیابی اس میں شامل تمام فریقین کے عزم پر منحصر ہے۔

حکومت کی طرف سے ریڈ پلس پروگرام کے معاملے میں فوائد کی ایک مخصوص اور قطعی تقسیم فی الحال تیار نہیں ہوئی ہے جو جنگلات کے سلسلے میں فوائد کے اشتراک کی بنیاد بنائے گی۔ مشترکہ فوائد پوچنی آزاد جموں و کشمیر کے طریقہ کار کے طے ہونے کے بعد ہی اس مجوزہ تناسب کو حتمی شکل دی جائے گی یا اس کی تصدیق کی جائے گی۔

اس منصوبے کی ابتدائی مدت دس سال ہوگی تاہم یہ منصوبہ ایک زندہ دستاویز ہوگا اور سالانہ جائزے کے لیے پیش ہوگا۔ اس منصوبے میں مذکورہ سرگرمیوں پر عمل درآمد کے لیے رہنمائی متعلقہ فریقین کی مشاورت سے ریاستی محکمہ جنگلات کی طرف سے تیار کیے جانے والے سالانہ آپریشنل منصوبوں کی مدد سے کی جائے گی۔ اس منصوبے کو گاؤں اور ضلعی کمیٹیوں کے ذریعے لاگو کیا جائے گا اور اس کے بارے میں متعلقہ فریقین کی مشاورت سے ریاستی محکمہ جنگلات کے ذریعے مطلع کیا جائے گا۔

# 1 Introduction

## 1.1 The Context of PFMP

The Government of Pakistan (GoP) has joined global efforts to address deforestation and forest degradation to mitigate climate change and its impacts by initiating REDD+ activities. REDD+ has three phases; (1) readiness, (2) demonstration through implementation, and (3) result-based payments. The first two phases when combined are known as the readiness phase. Pakistan has made substantial progress in meeting REDD+ readiness requirements. Currently, efforts are underway to meet the fundamental requirements set by the United Nations Framework Convention on Climate Change (UNFCCC) for participating in REDD+ programme. These include development of a National REDD+ Strategy, Forest Reference Emissions Level (FREL), and National Forest Monitoring System (NFMS) inclusive of Monitoring Reporting and Verification (MRV) System, Satellite-based Land Management System (SLMS) and Safeguard Information System (SIS).

Pakistan has been implementing REDD+ activities since 2010 to mitigate climate change through reduced carbon emissions from the forestry sector and carbon sequestration. The Ministry of Climate Change (MOCC), Government of Pakistan (GoP), is implementing a REDD+ readiness programme funded by the Forest Carbon Partnership Facility (FCPF) of the World Bank. This Participatory Forest Management Plan (PFMP) of Lachrat Forest Range, Muzaffarabad Forests Division has been developed under this REDD+ Readiness Programme.

Within the prevailing socio-economic setting, the Government of Azad Jammu and Kashmir (GoAJ&K) is making modest efforts to create REDD+ enabling environment by reforming the existing institutional structures, awareness raising and capacity building of the partners, preparation and implementation of PFMP of the two pilot sites, review of policies, laws and regulations of all the sectors concerned, prior to entering into pilot and full-scale REDD+ Programme implementation the State.

The PFMP is meant to demonstrate integration and implementation of REDD+ interventions with forest management in Lachrat Forest. The Plan has been developed with extensive professional input from experts of various sectors linked with the climate change mitigation and adaptation and in consultation with the forest dependent/ beneficiary communities.

The PFMPs translate REDD+ concepts and processes at practical level considering complex socio-economic conditions, burden of rights/ concessions, as well as obligations in the forest. This is the reason that in addition to forest stock assessment, the preparation of PFMPs required a detailed assessment of the roles and rights of stakeholders in forest management and revenues so that trade-offs become clearer for redressal and communities are not deprived of their legitimate access to forest for their livelihoods. The core thrust of PFMPs in REDD+ perspective is to find contextually relevant options to address drivers of deforestation and forest degradation and to mitigate local and global climate change adverse impacts. REDD+ Programme also provides mechanisms for the enhancement, measurement and trade of forest Carbon.

It is expected that the implementation of the PFMP will enable the stakeholders of Lachrat forest, to trade Carbon Credits in the national and international markets in the foreseeable future, like any other product, by increasing and maintaining the forest Carbon stock. The PFMP will thus act as a road map for implementation, monitoring, reporting and verification of forestry resources improvement and distribution of benefits among the stakeholders.

A budget forecast to implement activities identified is also provided. The planned activity packages include but not limited to; 1) Restoration of Forestry Ecosystems, 2) Introduction of Pasture and

Rangeland Management, 3) Social Mobilization for Planning and Implementing REDD+ Support Interventions 4) Sustainable Livelihood Generation, 5) Promotion of Wood Alternative and Energy Conservation, and 6) Human and Institutional Capacity Development (HICD), for successful implementation of current Readiness Phase and the full scale implementation of REDD+ Programme in AJ&K subsequently.

## 1.2 Objectives of PFMP

**The specific objectives of this plan are as under:**

1. To promote sustainable Forest management in Lachrat Forests.
2. To protect, improve forest health and enhance Carbon stocks in Lachrat Forests while addressing drivers of deforestation and forest degradation
3. To enable the Lachrat Forest community and Forest Department staff to manage forests jointly and efficiently for multiple uses.

## 1.3 Methodology

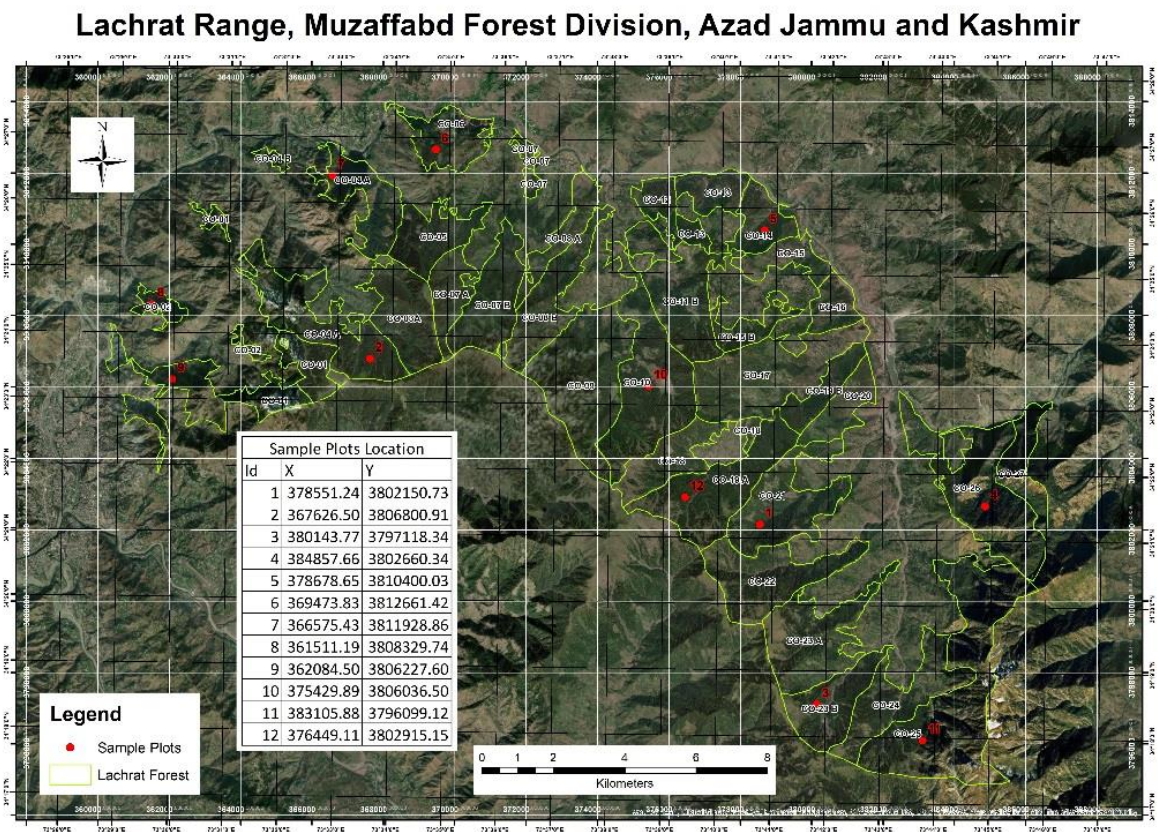
A multi-disciplinary team consisting of two Participatory Forest Management experts, a sociologist, a GIS specialist, two Range Forest Officers, two Forest Guards and three community representatives (nominated by the community) collected data for preparation of the management plan.

The overall methodology for preparation of the plan has been guided by PFMP Manual (version 1.0, 2021) for practitioners prepared under Forest Carbon Partnership Facility (FPCF) of the Ministry of Climate Change (MOCC), Islamabad. A multi-layered methodology was adapted for the preparation of PFMP, which includes the following steps:

- i. Selection of site in light of the REDD+ guidelines and procedure. Lachrat DFA was one of the two potential sites selected for preparation of PFMP.
- ii. Participatory data collection. Local community of Lachrat participated in providing socio-economic data and sharing details on forest-community interaction., They also participated in collecting forest resource assessment data. They also participated in identifying forest management activities and implementation mechanism. Under the Free Prior Informed Consent (FPIC), the community was briefed on relevant concepts, causes and effects of activities. They participated in identifying drivers of deforestation and forest degradation and demand of timber and firewood. The solutions to problems and demands of community were translated into interventions in prioritised order and listed. The exercise was conducted through PRA using spot observations, Focused Group discussion, mapping, semi structure interviews, transect walk and ranking.
- iii. Participator Forest Inventory was conducted to collect data from 10 sample plots selected in Lachrat Forest. The location of sample plots is provided in following map (**Figure 1**). The sample plots were chosen through stratified random sampling among each forest stratum. The soil, topography, water availability, and status of vegetation vary spatially within a land-use category and the overall area proposed for the site. Trees, biomass stock, and growth rate are not distributed uniformly in a site. Therefore, a sampling design is followed for locating the sample plots in each of the selected forest strata. The location of sampling plots could determine the biomass stock or growth rate estimates. Based on forest type and forest density, three forest stratum (>70%, 40%-70%, 10%-40% tree canopy cover) were formed to carry out the systematic stratified sample on the map.
- iv. Sample points were nested circular plots of 17.64 m, 5.64 m, and 0.56 m radius. All living trees and standing dead woods with DBH above 5cm, and stumps were measured from the full plot of 17.84 meters (~1000 m<sup>2</sup>). Fallen trees and stumps, dead wood with diameter above 5cm were also recorded from the plot. The plot included two subplots; 5.64 meters (~100 m<sup>2</sup>) for

collecting data of seedlings and shrubs and 0.56-meter plots (~1 m<sup>2</sup>) for data on litter, leaves, grasses, etc. From a plot of 5.64 m, all seedlings were counted, and shrubs were cut down and fresh weight of the sample was recorded. This sample was clipped and collected in the bags to find out oven dried biomass in the lab. The above-ground non-tree biomass including leaves, litter, grasses, etc. collected from 0.56 m radius sub-plot and weighed. Soil organic carbon values were taken from the national forest inventory, carried out in 2018. The data from these samples was analysed for estimation of carbon stock. The coordinates of each sample plot were noted, and fixed-point photos were taken during the inventory

- v. Data analysis and development of PFMP: The data were analysed, GIS map prepared and put together in the form of PFMP with a 10-year perspective including an annual forestry operational plan. The plan was reviewed individually, jointly and sent to experts for peer review.
- vi. The plan was sent for endorsement by the AJK Forest Department and relevant community.



**Figure 1: Locations of Sample Plots**

## 1.4 Policy Alignment

The objectives of this local PFMP are aligned with the following provincial, national, and global policies/ strategies/ commitments related to REDD+.

### 1.4.1 Global Commitment

“Reducing Emissions from Deforestation and forest Degradation, plus the sustainable management of forests, and the conservation and enhancement of forest carbon stocks (REDD+), is an essential part of the global efforts to mitigate climate change” [10].

#### 1.4.2 National Commitments

Pakistan's report on intended Nationally Determined Contributions (NDCs) 2021, seeks 50% reduction of the national Green House Gas (GHG) emissions by 2030.

The National Climate Change Policy (NCCP) 2012 under Section 4.4 on Forestry Sector, states that the climate change is likely to have multi-faceted adverse effects on the ecosystem as a whole, particularly on the already vulnerable forestry sector in Pakistan. Mitigations in the forestry sector entail restoration of Pakistan's forests through sustainable forest management, with particular focus on how these are affected by climate change. This will not only benefit the State forests but forest dependent communities and the whole society in general. The most likely impacts of climate change will be decreased productivity, changes in species composition, reduced forest cover, unfavourable conditions for biodiversity, higher flood risks and the like, as portrayed in the Planning Commission Task Force on Climate Change (TFCC) Report (GoP, 2008).

#### 1.4.3 National Forests Policy 2015

The Section 7 obligates the federal and provincial governments, which reads; "the UNFCCC Agreements on Reducing Emissions from Deforestation and Forest Degradation (REDD+) shall provide opportunities to forest-dependent communities to get non-market incentives for controlling deforestation as well as market-based cash receipts for quantified and verified emission reductions from forests. Goal 15 of the Sustainable Development Goals (SDGs) shall be pursued vigorously for compliance by Pakistan by tapping local resources as well as international funding".

#### 1.4.4 State Policies/ Commitments

the AJ&K Climate Change Policy 2017, AJ&K Sectoral Action Plan for Climate Change (2019-2030), Strategy for Sustainable Development AJ&K 2018 and Draft AJ&K Forest Policy; call for improvement of the health and condition of forests, acknowledge the role of forests in climate change mitigation and adaptation and most importantly to improve resilience of communities toward disaster risk management and sustainable livelihood generation. The activities mentioned in this PFMP align well with the actions suggested in the policy documents, for managing the State forests and pastures in the DFA Lachrat.

## 2 Participatory Forest Management Planning

The data and information gathered during PFMP survey through, participatory planning with communities were analysed, results compiled, and interventions identified (Annex 1, data). The results are presented in this chapter.

### 2.1 Ecological background

#### 2.1.1 Site description

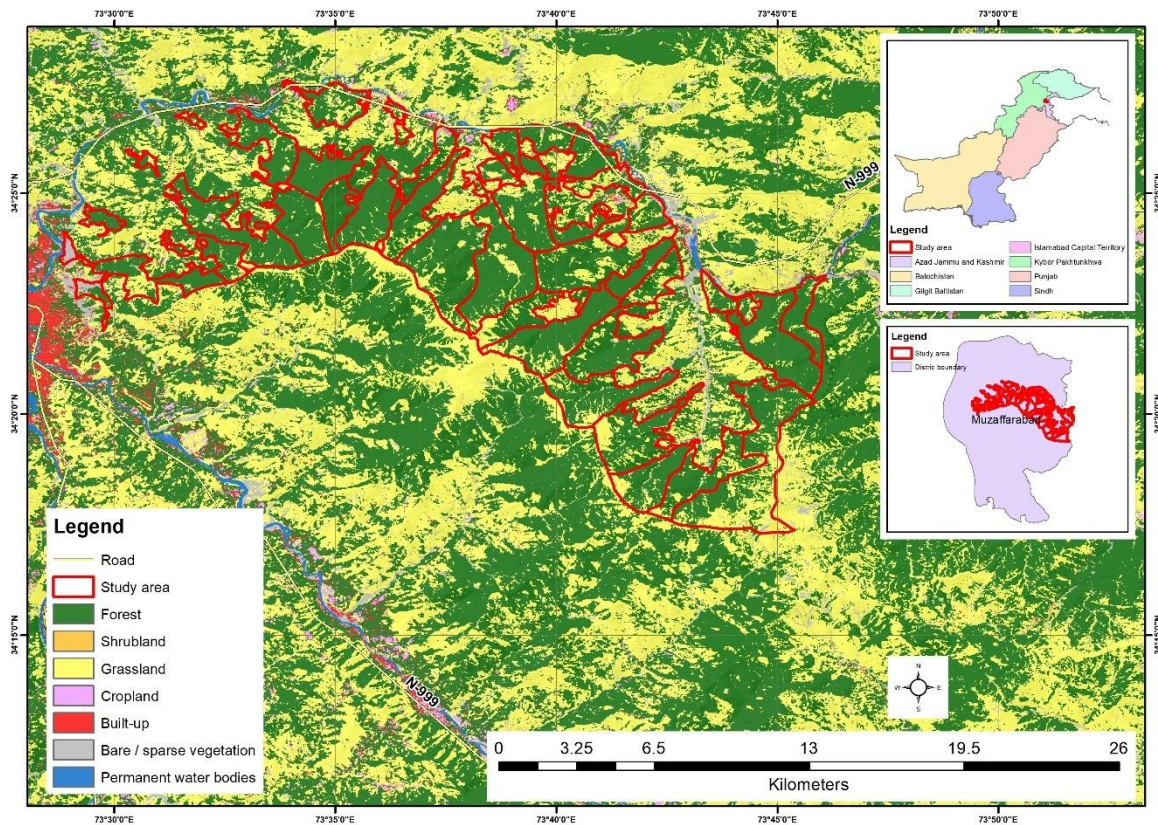
Muzaffarabad Forest Division comprises two ranges, namely; Kutla and Lachrat. Lachrat Range has been selected as one of the two pilot sites for implementing REDD+ interventions as demonstration, with forestland area of 12,946 hectares. The forests are the property of the State and are under the control of the Forest Department. The Lachrat REDD+ pilot site starts from the middle of Muzaffarabad Town on the left bank of Neelum River and extends 42 kilometres upstream beyond the village Nausehri. The last point of this range is Alikoh along the Line of Control (LOC). The track is mountainous with narrow valleys. The elevation of Neelum River at Muzaffarabad is 671 meters MSL. It gradually rises to 1036 meters MSL at Nausehri. The gradient is generally steep to precipitous, while moderate slopes are also met with. The slopes along nullahs are invariably very steep. Aspects are very much variable due to formation of side valleys by the spurs originating from the main hill range.

#### 2.1.2 Current Land Use and Land Cover

The total geographical area of Lachrat Forests Range site is 24,514 hectares and demarcated forestland is 12,946 hectare. Private land, community land and crown land is 11,568 hectares. Soil erosion rate for DFA Lachrat is estimated between 7 to 18 tons /Ha / year under various land uses. The current land use types in real terms and percent is given in the **Table 1** below:

Table 1: Current Land Use Pattern DFA Lachrat

S#	Land Use Type	Area in Hectare	Percent
1	Tree cover (forests & farmland trees)	15,808.32	64.49
2	Shrub-land	1.56	0.01
3	Grassland	7115.03	29.02
4	Cropland	106.54	0.43
5	Built-up area	280.08	1.14
6	Bare / sparse vegetation	937.09	3.82
7	River & stream bed	265.33	1.08
	TOTAL	24,513.96	100.00



**Figure 2: Land Use Map of DFA Lachrat**

### 2.1.3 Climate

In general, the climate is Sub-tropical at foothills, Moist Temperate at middle altitude, Sub-alpine and Alpine at higher altitude. Summer Monsoons are common throughout the area and are followed by dry months of October and November. Snowfall starts on high elevations by about mid-November and descends to the forest belt by the end of December. The snowfall, which usually terminates by the end of February, sometimes extends up to as late as April in the higher elevations. The thaw sets in by early April and is at its peak by the middle of May. As a result of a wide range of altitudinal variations, different climatic conditions prevail in the area. These, in turn, generate certain microclimatic conditions based on aspect and other locality factors. Frost is a common occurrence and starts by mid-November, it is severe in December and January.

May, June and November are dry months, while drought prevails during December. July and August receive the maximum rainfall with an annual average of 1,478.91 millimeter (mm). There is a rapid rise in temperature from February to June, with the start of Monsoon there is steady decrease up to the month of September. After this a marked drop in temperature occurs. The highest maximum and the lowest minimum temperatures recorded are in May and in January. The humidity is at the lowest during the period from April to June. It abruptly rises with the commencement of the Monsoon season in July and August.

### 2.1.4 Vegetation Types

The total area of Lachrat REDD+ Pilot site is 12,946 hectares, while productive/ commercial forests extend to 3,950 hectares and non-commercial forest area is 1,168 hectares. Estimated total growing stock of commercial forests is 0.762 million cubic meters, equalling to 192.851 cubic meters per hectare. Estimated annual increment put on by the growing stock is 19,458 cubic meters. Species-wise area distribution in hectares is; Deodar 119, Blue Pine 2,172, Silver Fir 1582, Chir Pine 79, respectively. Per capita forest growing stock is 187.45 cubic meters, demarcated forestland 0.22 hectare and

commercial forest area 0.0.10 hectare (Working Plan Forests Division Muzaffarabad). The general vegetation types can be broadly classified as follows;

- 1) Chir Pine Forests
- 2) Mixed Coniferous Forests
- 3) Sub-Alpine / Alpine Scrubs and Pastures

At foothills Chir Pine (*Pinus roxburghii*) mingles with Blue Pine (*Pinus wallichiana*) and Oaks (*Quercus incana* and *Quercus dilatata*). The Chir Pine extends to higher elevation on the slopes facing the Southern/ hotter aspect and on exposed spurs and ridges but has generally dropped out by 6,000 feet MSL altitude. Chir Pine occurs in pure patches at the lower elevations and hotter aspects. The crop is generally of fair density, except at its lower limits near habitations and where it occurs on very steep to precipitous slopes. Blue Pine constitutes 49.5% of the bulk and Silver Fir (*Abies pindrow*) constitutes 38.8% of the growing stock. The altitude at which the transition takes place mostly depends on the aspect. Deodar (*Cedrus deodara*) which occurs sporadically constitutes 1.8% of the coniferous growing stock. All age classes are better represented in Blue Pine (*Pinus wallichiana*) than Silver Fir (*Abies pindrow*). Lower age classes in Silver Fir are very deficient, while mature stock in Blue Pine seems to be somewhat overdue. Major part of the forest area is fairly/ adequately stocked except for a few blanks and scattered trees at some places. Regeneration in general is adequate and established in Blue Pine areas, while it is inadequate in Silver Fir areas, broad leaved trees mainly; Horse-chestnut (*Aesculus indica*), Walnut (*Juglans regia*), *Poplar spp.* and Maple (*Acer cesium*), occupy the depressions and cooler places. Broad-leaved trees also occur as understory or mixture in several compartments.

**Sub-Alpine /Alpine Pastures** generally occupy over 10,500 feet MSL elevation. The transition belt is the mixed Coniferous forests with Alpine vegetation, which is marked by occurrence of trees in scattered groups of Birch (*Betula utilis*) with other scrubs growth of *Juniperus* spp. and *Salix* spp. However, this belt has invariably been destroyed by the activities of summer graziers, with thousands of livestock, who migrate to these areas and find the Birch (*Betula utilis*) a convenient source of fuel wood. Occasional avalanche tracks have cut across this transition belt and brought down the alpine vegetation below the forest line. The common shrubs are *Juniperus spp.*, *Salix spp.*, and *Rhododendron arborum*. Ground flora consists of *Anemone spp.*, *Artemisia spp.*, *Primula spp.*, *Euphorbia spp.*, *Saxifraga spp.*, *Aconitum spp.*, *Chenopodium spp.*, *Polygonum spp.*, *Digitalis purpurea*. The upper reaches of most of the compartments are potential rangelands and pastures.

### 2.1.5 Causes of Forest Damages

Causes of forest damages are multiple and diverse in nature, stem from edaphic, social, economic, political, administrative and technical reasons, which include but not limited to;

- 1) Harsh weather conditions in the upper reaches of forests put pressure on forests for unavoidable needs like heating, cooking, etc.;
- 2) Influential people steal away trees from public forests for personal gains;
- 3) Escalation of timber prices and road access to all forests, power chain saws and firearms spread, deteriorating law and order situation, high rate of unemployment and the rural poverty, rendered forests difficult to protect;
- 4) Dense population, land hunger and resource scarcity, and encroachment on forest land by adjacent communities is widespread and a major cause;
- 5) With environmental degradation, the tree diseases and pest attacks are on increase;
- 6) Forest fires sweep across Sub-tropical Chir Pine forests each year during the hot summer season and moist temperate forests during the drought periods, no comprehensive bush fire preventive mechanism is in place on a permanent basis. There is repeated occurrence of bush fire incidents.



There have been following major incidents of disasters, disease attacks and fire hazard in the recent past:

- 1) Dying-back and drying of Blue Pine (*Pinus wallichiana*) crop in year 2002-03 throughout AJ&K, around 3-5% crop was impaired.
- 2) Dying-back of *Rubinia pseudoacacia*, stem-borer attack on Poplar (*Popular spp.*), Walnut (*Juglans regia*) and *Ulmus spp.* are widespread.
- 3) Earthquake of 2005 and super floods of 2010, 2011 and 2014 have multiple impacts on overall health and productivity of the forestry ecosystems throughout the State.

## 2.2 Socio-economic Analysis

Findings of the participatory socio-economic and ecological analysis are reproduced in the succeeding sub-sections. The socio-economic data matrix is placed at Annexure-4.

### 2.2.1 Human Population

The density of human population in Lachrat is comparatively high. The river/ stream banks and lower plains of the valley sides are thickly populated. According to Population Census 2017 (projected 2019), the human population of the Lachrat is 58,151, with the average growth rate of 1.91 per annum. In segregated terms, the population comprises of 49% male and 51% female, whereas almost 100% population is Muslim. The average household size is 6 family members. The population density of the Lachrat site is worked out to be 411 persons per KM<sup>2</sup>, excluding urban population of Muzaffarabad.

### 2.2.2 Community Rights

No rights are recognized in the Demarcated State Forests, but the grant of “*concession*” is liberal for Zamindars (cultivable landowners) residing within 4.8 KM (3 miles) of the Demarcated State Forests. However, these concessions which are for the bonafide domestic and agricultural uses of the Zamindars, cannot be sold, bartered or exchanged. The concessionary rights include; grazing, grass cutting and collection of forage and timber (excluding deodar wood) for domestic/ personal uses.

Zamindars are allowed to enjoy free and unrestricted grazing in the forest areas, except areas which are notified as reforestation enclosures. Grazing is one of the most important factors responsible for the depletion of the State forests. Large numbers of sheep and goats invade range areas and pastures every year, for summer grazing. During this nomadic activity of 4-5 months heavy and unregulated grazing causes tremendous damage to the vegetation cover. Besides, the soil is trampled, and the regeneration is disturbed.

**Conservation CVOs and Traditional Jirga:** Leadership in the area is not vested with a particular ethnic or socio-economic group. The **Traditional Jirga** is formed by a loose assembly of respectable elderly men who have a proven track record of problem solving and consensus building ability amongst the communities. Jirga members are not necessarily the ones that were chosen to represent sections of the community with outsiders. Qualities such as concern for the community, fairness, honesty, honour and integrity are considered more important than outside exposure and social contacts.

### 2.2.3 Local Livestock Population

According to the Census for the Year 2010, the projected figures of livestock for 2020 for Lachrat are as the following;

a) Cattle	67,407
b) Buffaloes	47,178
c) Sheep	23,790
d) Goats	125,222
e) Asses /mules	5,975
f) Poultry	354,723

**Transhumant Graziers** \_ in addition to the above local livestock, large number of nomadic animals visit the alpine pastures for summer grazing each year.

#### 2.2.4 Rural Economy

The mainstay of Lachrat rural economy is agriculture, livestock, forest and daily wage employment. The agriculture sector is very important to people's livelihoods and depends on rain-fed agriculture with only an insignificant contribution from land irrigated by means of small diversion channels to irrigate paddy fields. Land holdings are small and fragmented. Out of the total household average income, 10-18% comes from crop production and 16-40% from livestock, while an average of 60% is from off-farm wages.

On an average livestock consists of 2 and 1 heads per household for small ruminants and cattle/buffalo, respectively. Livestock is kept either to supplement agricultural income or as primary source of livelihood. Poor livestock management practices, poor quality of livestock and sub marginal agriculture practices result into low farming productivity

The high pressure of population on land has led to very small landholdings, which is roughly 0.457 ha per household. About 51% of the farmland area is cultivated while the remaining 49% is used as grassland. About 10% of the total area under farmland, which is now set aside as grassland, is classified as culture-able waste. Although a vast majority of the farms are owner operated (72%), some farms are jointly managed by the owners and tenants (25%), and only 3% are totally tenant operated. The farm areas comprising slopes where grass is available, are generally utilized for grazing cattle. Wheat, Rice and Maize are the staple food of the people. Local production is less than the requirement, deficiency is made up by importing food grains from plains downstream. Fruit trees are also raised along the cultivated fields. Due to subsistence agriculture, livestock production is an integral part of the economy. There exist vast potentials of fruit orchards and vegetable cultivation. Recognizing that the main economy of the farmers in the mountainous areas is agro-silvo-pastoral, and that the improvement and management of the farming system at the field level needs to be treated holistically rather than sectoral, three firm consensus opinions that emerged during the consultation process are;

- 1) the agriculture, forestry and livestock extension cadres at the field level be integrated into a single cadre of natural resource management specialists or should be teamed together to approach the farmers together;
- 2) to make the outreach effective, the extension workers should be field based, their jurisdictions should be smaller to overcome the constraints of mobility and to ensure easy reach of the clients, and;
- 3) As the largest economic sector and significant generator of employment, support to the recovery of subsistence and commercial agriculture is needed to generate sustainable livelihoods, as well as its long-term restructuring to build growth and employment.

#### 2.2.5 Dependence on Forests

The entire population of the area depends on forests for meeting their demands for timber, fuel wood, grazing and grass cutting. Timber is still used for construction of houses. Based on projected rural population 2019 (58,151), **the per capita standing volume of public forests is 187.45 cubic meters, per capita forest area is 0.22 hectares and commercial forest area 0.10 hectares.** The local communities have traditional rights in terms of use of the forests and on an average 3 trees are used by one household every year for the fuel-wood requirements in the absence of alternate energy sources. Similarly, about 5 trees on average are required to construct a house as the wood roofs have to be replaced after every 8-10 years. Chir Pine, Blue Pine and Fir are important forest tree species for construction. Broadleaved trees are important for fuel wood and fodder. Most of the area having been cleared for the purpose of fuel wood and fodder, the fuel wood supply problems are becoming acute

day by day. Free grazing and trampling leave no chance for the natural regeneration of forests and rejuvenation of pastures.

#### 2.2.6 Social and Power Structure

Village settlements in the DFA Lachrat are called *dhoks*/ sub-hamlets and may consist of several *rakbas*, or smaller clusters of houses/ hamlets, which may be a *mohalla* in the plains. For administrative purposes, a group of approximately 500 households makes up a revenue village. This can be geographically a fairly vast area as it may take up 15 minutes to walk from one house to the other on an average basis. A *rakba* is anything from 70 to 150 households and is the functional unit for development implementation.

In Lachrat overall, there are no clearly dominant ethnic groups, although certain groups may be numerically dominant in a specific area. These groupings are important in social spheres and play a vital role in social ceremonies and relations. Every household owns a piece of land, with a house constructed on it, no landlord-ship, in a sense an egalitarian society. The main tribes that constitute the population of the area are *Gujars*, *Syeds*, *Kashmiris*, *Moghals*, *Awans*, *Mirs* and *Rajputs*. The most commonly spoken dialect, all over the area is *Pahari*. *Kashmiri* language is also spoken in Kashmiri families. However, all rural population is entitled to get forest concessions.

The religion plays an important role in everyday life, and religious leaders participate in development related decision-making. The clergy and religious groups are represented in the village body of elders. The religious events are taken as occasions for gathering and school is used as a venue to announce development activities and gather common purpose meetings. The elders' group in each village is an important focus for gathering and meeting. They believe much in their customs and are governed by a set rules of customs from cradle to graveyards.

#### 2.2.7 Role of the Rural Woman

Women in Lachrat are mostly engaged in traditional work that is consistent with their domestic role. The rural women are responsible for collecting firewood, grasses, medicinal herbs, animal grazing etc. They are also responsible for cleaning, cooking, fetching water, taking care of children, feeding and milking livestock and many other household tasks.

### 2.3 Results of the Stakeholders' Analysis

Focused group discussion (FGD) and consultative meetings were held with various stakeholder groups, professionals and the general public for data collection. The stakeholder analysis was conducted to acquire information about major actors, and their interests and influences on forest resources utilization, management, or restoration.

#### 2.3.1 Stakeholders' Identification

Important stakeholders identified were beneficiary communities, concessionists and their organisations (CBOs, LSOs), transhumant graziers, construction material contractors/ miners, Forest department, Agriculture, Irrigation, Livestock, Mineral, Tourism, Wildlife and Fisheries, Revenue Land Use Planning Cell, Environment Protection Agency, NGOs/ INGOs, Ministry of Forests and the political government were identified as most important stakeholders. The FGD analysed roles and responsibilities of the identified direct and indirect stakeholders with respect to REDD+ implementation in Lachrat and their level of interest and influence in the forest Carbon pools, which are presented in a tabulated form and placed at the Annexure-2.

### 2.3.2 Interests and Influence of Various Stakeholders

The FGD also conducted an analysis of the interests of various stakeholders and their activities. Timber distribution quota (TDQ), fuel wood and forage collection, animal grazing, NTFPs, medicinal herbs, condiments, spices, honey, wild fruits, mushrooms, wild vegetables, grasses, water appropriation and access rights were identified as the key interests of the various stakeholders. Construction material contractors and miners were found having negative interest in the forests, in favour of their businesses. The stakeholders identified were categorized as primary and secondary based on the level of their participation and partnership in social, technical, financial, and legal aspects of forest management and REDD+ Programme. The interest and influence explored through stakeholder analysis indicate who is doing what in managing forest and who has the legal rights in the forest. The stakeholders' analysis was conducted at two levels, as the following;

- 1) Stakeholder interest and influence on forest management, and;
- 2) Their interest and influence on forest Carbon pools.

The analysis is presented in Annexure 3.

An overview of the stakeholder analysis findings is reproduced in the succeeding sections.

### 2.3.3 Stakeholders' Categorization

- 1) *Primary or Direct Stakeholders:* Forests Department, Wildlife Department, Local Concessionary Communities and Transhumant Graziers, and;
- 2) *Secondary or Indirect Stakeholders:* Departments of Forests, Agriculture, Irrigation, Livestock, Minerals, Tourism, Revenue, Land Use Planning Cell, Environment Protection Agency, CBOs, LSOs, NGOs/ INGOs, philanthropists.

### 2.3.4 Stakeholders' Influence and Interests' Categorization

- 1) **Controllers:** The Political Governments and Forest Ministry\*
- 2) **Major Players:** Forests Department, Wildlife Department and forest Concessionists
- 3) **Neglected Players:** Landless people, services cast groups, destitute
- 4) **Marginal Players:** GLDs linked with climate change mitigation and adaptation  
(\*FGD contended to include the political government and the Ministry of Forests having high influence in forest management and carbon pools both)

The community activists reported dolomite and coal mining activities by some business enterprises and contractors without necessary environment protection, debris disposal, spoiled sites restoration and other safeguard measures.

### 2.3.5 Roles and Responsibility of Stakeholders

Roles, responsibilities and interests of three key players in implementing REDD+ interventions are jotted down, as follows:

- 1) **Forests Department:** State owns the forests and management is entrusted to FD, main interests include but not limited to; forests management planning and implementation, policing forest, dispensing forest concessions, facing accountability etc. Besides, as the owner, regulator and manager of forest carbon pools; draw legal framework and implement, control management, takes admin & technical decisions, owns rights of carbon credit in the State Forests.
- 2) **Beneficiary Communities/ Forest Concessionists** \_ joint or collaborative management is not possible if the rural communities remain unorganized. Therefore, an essential pre-requisite is to nurture grassroots institutions, and enhance their management and technical skills on the

pattern of various rural support programmes operative in the country. As a first step, this process should involve rural communities within the 4.8 KM radius of the demarcated forests. These communities tend to protect forests hence cooperate with FD generally. They are supportive, while retaining concessionary rights. Their interests include but are not limited to; wood/ timber, forage and grazing domestic animals, besides other economic products. VCOs would have to be engaged with implementation of participatory planned intervention packages i.e., joint forest management of DFA Lachrat, biodiversity conservation and Carbon sequestration. The role and responsibilities of participating VCOs have been further elaborated in section 4.2; REDD+ Institutional Arrangement.

- 3) **Wildlife and Fisheries Department** \_ like basic human rights, it is the basic wildlife right to live peacefully in the forest landscape. Since creation of a separate Wildlife Department, confusion persists with respect to wildlife management in the State forests, which is not notified as part of the protected area network. Under Rules of Business of GoAJ&K, wildlife management is vested in the Wildlife and Fisheries Department. DFA Lachrat is not included in any of the protected areas as such.

## 2.4 Analysis of drivers of deforestation, forest degradation and barriers to enhancement

A comprehensive review of the REDD+ mitigation actions including; deforestation, forest degradation, sustainable forests management, conservation and forest carbon stock enhancement, along with potential indicators, is placed at the Annex-5. An overview of the main drivers of deforestation and forest degradation, as emerged from the participatory analysis, is presented as follows;

### 2.4.1 Forests Degradation

- 1) **Unsustainable and unscientific wood extraction**, through legal and illegal means and selective logging of high value trees by local population and forest department resulting in losses in the past and unscientific logging by AKLASC.
- 2) **Year-round uncontrolled and indiscriminate grazing of animals** throughout demarcated forests and overgrazing of the pastures beyond their carrying capacity, leave no rest period for flowering and seeding of good grass, fodder and forage species and cause weeds' spread. Lopping of fodder trees to the top hampers their growth.
- 3) **Weak forest governance lead to illegal timber extraction**, misuse of timber distribution quota, poorly enforced conservation and protection areas and the inability of government line agencies to ensure that infrastructure, mining and hydropower projects abide by their environmental approval conditions i.e., EIA & IEE.
- 4) **Pressure of increasing population demand** exceeds the rejuvenation capacity of nearby forests. Overuse of forest resources led to shrinking of forest cover to far flung areas and the mountain tops.
- 5) Natural and human induced calamities e.g., floods, landslides, fires, pests etc.

### 2.4.2 Deforestation

- 1) **Public infrastructure development**, especially rural roads to improve access and hydropower development, leading to further opening and clearing of forest, besides permanent forest land use change;
- 2) Forest **encroachment for resettlement due to disasters** (earthquake 2005, repeated super flood, landslides, snow avalanches, internally displaced people and refugees of freedom wars) and habitation expansion.
- 3) Land hunger coupled with **inadequate forest boundary demarcation** and maintenance, leading to illicit forest cutting and **encroachment** of the forestland, and;

### 2.4.3 Barriers to enhancement

- 1) **Forest fires** sweep across Sub-tropical Chir Pine forests each year during the hot summer season and moist temperate forests during the drought periods, no comprehensive bush fire preventive mechanism is in place on a permanent basis. There is repeated occurrence of bush fire incidents.
- 2) **Livestock grazing** is a major barrier to forest enhancement particularly in the regeneration areas. Trampling adds to the forest injuries i.e., loss of regeneration, soil erosion and the most importantly lack of grazing management resulted into around 35% loss of range productivity.

## 2.5 Carbon stock assessment of Lachrat Forests

This part of field survey was conducted in August 2021 to collect data from 10 sample plots selected in Lachrat Forest. The location of sample plots is provided in Figure 1 above. At the observation points, sample plots were nested circular plots of 17.64 m, 5.64 m, and 0.56 m radius. All living trees and standing dead woods with DBH above 5cm and stumps were measured from the full plot of 17.84 meters (~1000 m<sup>2</sup>). Fallen trees and stumps, dead wood with diameter above 5cm were also recorded from 17.84-meter plot. The plot included two subplots; 5.64 meters (~100 m<sup>2</sup>) for collecting data of seedlings and shrubs and 0.56-meter plots (~1 m<sup>2</sup>) for data on litter, leaves, grasses, etc. From a plot of 5.64 m, all seedlings were counted, and shrubs were cut down and fresh weight of the sample was recorded, collected the sample in bags to find the oven dried biomass in the lab. The above-ground non-tree biomass including leaves, litter, grasses, etc. was collected from 0.56 m radius sub-plot and weighed and soil organic carbon values are taken from the national forest inventory, which was carried out in 2018 as the time required to detect a significant change in soil organic carbon is generally more than 10 years. The data from these samples was analysed for estimation of carbon stock (table 5). The coordinates of each sample plot were noted, and fixed-point photos taken during the inventory.

### 2.5.1 Plot level Carbon Stock Estimation

Based on the field data carbon stock (tons per hectares) for Above Ground Carbon (AGB) and Below Ground Carbon (BGB) was worked out using the standard sets for tree species, tree DBH and height, and dry biomass of shrubs and litter (**Table 2**). The tree species level carbon stock is given in Annex 1. Based on this data individual plots level carbon stock values are given in table 5. The estimated stock of carbon per hectares (ha) was then used to estimate the total carbon stock in the selected site of Lachrat Forest.

Table 2. Plot level above and below ground carbon stock

Plot no.	Average of AGC (tons/ha)	Average of BGC (tones/ha)	Average of Annual C stock Accumulation (tons/ha/year)	Average of CO <sub>2</sub> sequestration (CO <sub>2</sub> -e tones/ha/year)
1	9.50	2.37	0.06	0.22
2	7.04	1.76	0.03	0.09
3	21.94	5.49	0.09	0.34
4	7.67	1.92	0.07	0.25
5	11.91	2.98	0.10	0.37
6	12.27	3.07	0.10	0.38
7	3.30	0.82	0.04	0.15
8	4.76	1.19	0.04	0.16
9	0.02	0.00	0.00	0.01
10	0.01	0.00	0.00	0.00
<b>Average</b>	<b>8.64</b>	<b>2.16</b>	<b>0.05</b>	<b>0.19</b>

### 2.5.2 Forest Cover Assessment

The change in forest cover was assessed by using Landsat multispectral 30m spatial resolution satellite images on the path (150) and row (36) and google Earth Engine Cloud Computing platform for the classification of forest cover by applying Random Forest Machine Learning Algorithm. The analysis indicates decrease of 162.04 ha in forest cover in the past 10 years at an average rate of 3.66 hectare (ha) per year (**Table 3**).

Table 3. Forest cover assessment (2010 -2020)

No	Landsat Satellite Sensor	Landsat data acquisition	Forest Cover (ha)
1	Landsat-8	2020-10-19	12352
2	Landsat-5	2010-09-11	12392
Change in Forest Cover in last 10 years			-40.23
Per year change in forest cover			-4.02

Table 6a provides **three scenarios** of forest cover in the coming ten years that can be followed:

1. Adding 10% more forest cover in addition to reversing the current average annual reduction of 4.02 ha.
2. Adding 20% more forest cover in addition to reversing the current average annual reduction of 4.02 ha.
3. Adding 50% more forest cover in addition to reversing the current average annual reduction of 4.02 ha.

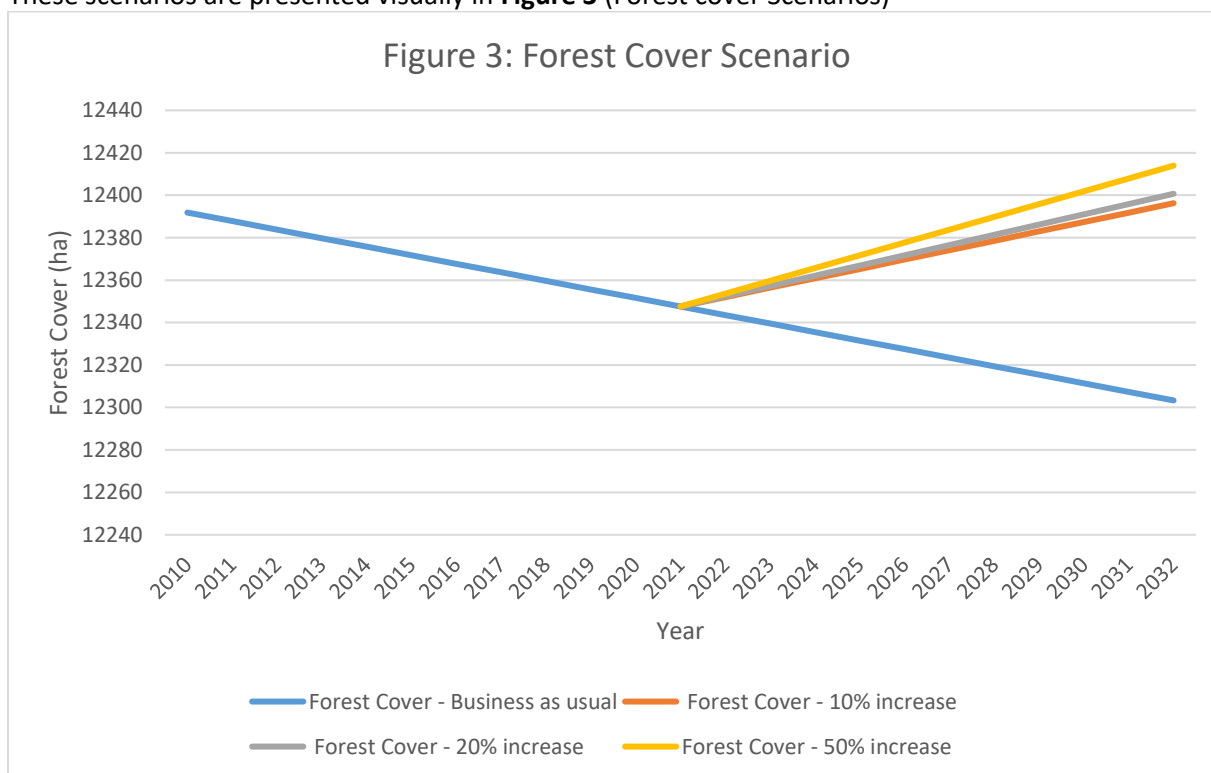
The above scenarios mean that for the forest cover to recover from the current annual loss of 4.02 ha (as observed in the last 10 years) and enhancing it by 10%, 8 ha of forest cover per annum would be required to be added, which will increase the forest cover to 12,396 ha instead of 12,303 ha in the business-as-usual scenario. Similarly, in 20% and 50% scenarios an annual increase in forest cover would be 9 ha and 10 ha per annum which will extend the forest cover to 12,401 ha and 12,414 ha respectively.

Table 4: Forest Cover Scenarios based on trend in the past 10 years

Rate of change per year	-4.02	-0.4	-0.8	-2.01
Year	Forest Cover - Business as usual	Forest Cover - 10% increase	Forest Cover - 20% increase	Forest Cover - 50% increase
2010	12392			
2011	12388			
2012	12384			
2013	12380			
2014	12376			
2015	12372			
2016	12368			
2017	12364			
2018	12360			
2019	12356			
2020	12352			
2021	12348	12348	12348	12348
2022	12344	12352	12353	12354

2023	12340	12357	12357	12360
2024	12336	12361	12362	12366
2025	12332	12365	12367	12372
2026	12328	12370	12372	12378
2027	12324	12374	12377	12384
2028	12320	12379	12382	12390
2029	12316	12383	12386	12396
2030	12312	12388	12391	12402
2031	12308	12392	12396	12408
2032	12303	12396	12401	12414

These scenarios are presented visually in **Figure 3** (Forest cover Scenarios)

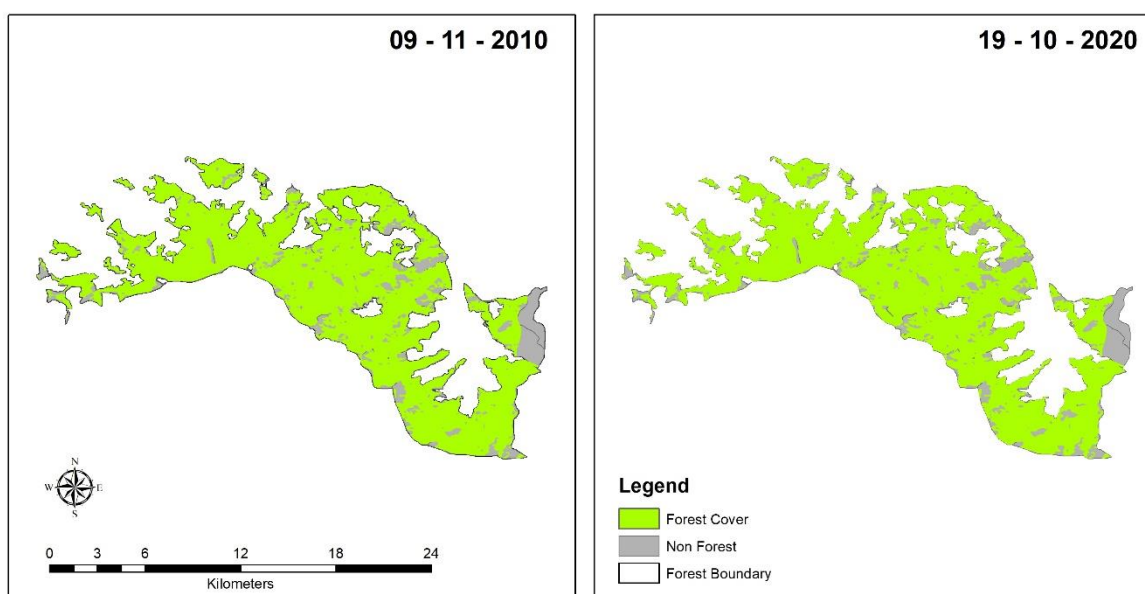


**Figure 3. Forest Cover Scenarios**

### 2.5.3 Carbon stock estimation and CO<sub>2</sub> emissions

The field data and biomass collected from 10 samples was used to calculate Above Ground Biomass (AGB) using locally developed allometric equations (Khan et al., 2021) for 2010-2021 (**Table 5**). In Lachrat forest, the cumulative carbon stock in three carbon pools (above, below and soil) was estimated to as 553,258 tonnes back in 2010 which decreased to 551,462 tonnes in 2020. This change corresponds to the decrease in forest cover from 12,392 ha in 2010 to 12,352 ha in year 2020 causing CO<sub>2</sub> emissions at the rate of 659 tonnes of CO<sub>2</sub> eq. per annum (see figure 4 and table 7).





**Figure 4: Forest Cover Maps used for Change Analysis**

Table 5. Carbon stock estimation (2010-2020)

Carbon pool	Mean carbon stock (tons C stock per hectare)	Forest Cover (ha)	Total stock (tons C stock)	CO <sub>2</sub> (tons CO <sub>2</sub> eq)
<b>2010 (2010-Nov-09)</b>				
Above	8.64	12392	107,065	
Below	2.16		26,766	
Deadwood	0.30		3,718	
Litter	0.05		582	
Soil*	33.5		415,126	
<b>Cumulative</b>			553,258	2,028,612
<b>2020 (2020-Oct-19)</b>				
Above	8.64	12352	106,718	
Below	2.16		26,679	
Deadwood	0.30		3,705	
Litter	0.05		580	
Soil	33.5		413,779	
<b>Cumulative</b>			551,462	2,022,026
<b>Rate of change per year</b>				
<b>2020-2010</b>		<b>- 4.02</b>	<b>- 179.61</b>	<b>659</b>

\*Soil Carbon Value taken from NRO Inventory

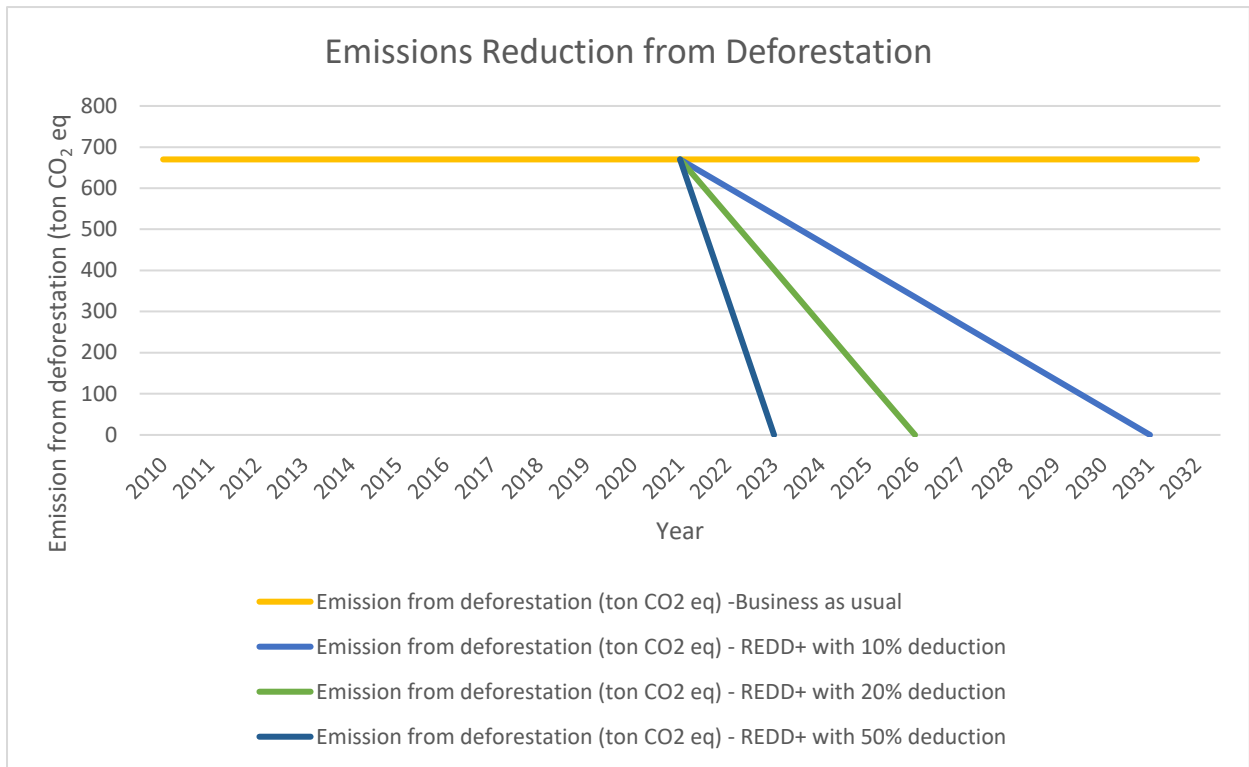
#### 2.5.4 CO<sub>2</sub> emissions reduction Scenarios for deforestation

This section presents the future CO<sub>2</sub> emissions reduction scenarios applying 10%, 20% and 50% reduction to current emissions rate over the past 10 years due to deforestation (As per definition of forest adopted by Pakistan for REDD+).

Table 6: Deforestation Emissions trend and Different Emissions reduction scenarios

Rate of change per year	659	-66	-132	-329
Year	Emission from deforestation (tons CO <sub>2</sub> eq) - Business as usual	Emission from deforestation (tons CO <sub>2</sub> eq) - REDD+ with 10% reduction	Emission from deforestation (tons CO <sub>2</sub> eq) - REDD+ with 20% reduction	Emission from deforestation (tons CO <sub>2</sub> eq) - REDD+ with 50% reduction
2010	659			
2011	659			
2012	659			
2013	659			
2014	659			
2015	659			
2016	659			
2017	659			
2018	659			
2019	659			
2020	659			
2021	659			
2022	659	593	527	329
2023	659	527	395	0
2024	659	461	263	
2025	659	395	132	
2026	659	329	0	
2027	659	263		
2028	659	198		
2029	659	132		
2030	659	66		
2031	659	0		
2032	659			

The above table shows that under REDD+ implementation if the deforestation trend is reversed at a rate of 10% then the forest will stop CO<sub>2</sub> emissions due to deforestation by the 10th year, if the deforestation rate is reduced by 20% then the deforestation will be controlled by the 5<sup>th</sup> year and at 50% reduction the CO<sub>2</sub> emissions because of deforestation can be set aside by the end of 2<sup>nd</sup> year as shown in the figure 5 below.



**Figure 5: Emissions reduction scenarios - Deforestation**

**2.5.5 CO<sub>2</sub> Emissions Trend – forest degradation**

Fuelwood and Timber consumption for the pilot site was estimated based on population of the area, population growth rate and per capita fuelwood and timber consumption statistics collected during the field survey. The total population of the pilot site in 2017 was 58,151 with a growth rate of 1.91 per annum. The fuelwood and timber consumption per capita per annum was calculated as 1.395 m<sup>3</sup> and 0.0239 m<sup>3</sup>, respectively. Based on this data emissions from forest degradation are calculated and presented in the Table 9.

Table 7: Forest Degradation Emissions trend

Year	Population	Fuelwood Consumption (FC) (m <sup>3</sup> /year)	Timber Consumption (TC) (m <sup>3</sup> /year)	Fuelwood Emissions <sup>1</sup> (FC*D*BEF2*CF*44/12) (ton CO <sub>2</sub> eq)	Timber Emission (TC*D*BEF2*CF*44/12) (ton CO <sub>2</sub> eq)	Emission from Forest Degradation (ton CO <sub>2</sub> eq) -Business as usual
2010	50808	70877	1214	68892	1180	70073
2011	51797	72257	1238	70234	1203	71437
2012	52806	73664	1262	71601	1227	72828
2013	53834	75098	1287	72996	1251	74246
2014	54882	76561	1312	74417	1275	75692
2015	55951	78051	1337	75866	1300	77166
2016	57040	79571	1363	77343	1325	78668
2017	58151	81121	1390	78849	1351	80200
2018	59262	82670	1416	80355	1377	81732
2019	60394	84249	1443	81890	1403	83293
2020	61547	85858	1471	83454	1430	84884
2021	62723	87498	1499	85048	1457	86505
2022	63921	89169	1528	86673	1485	88157
2023	65142	90872	1557	88328	1513	89841
2024	66386	92608	1587	90015	1542	91557
2025	67654	94377	1617	91734	1572	93306
2026	68946	96180	1648	93486	1602	95088
2027	70263	98017	1679	95272	1632	96904
2028	71605	99889	1711	97092	1663	98755
2029	72972	101797	1744	98946	1695	100641
2030	74366	103741	1777	100836	1728	102564
2031	75787	105722	1811	102762	1761	104523
2032	77234	107742	1846	104725	1794	106519

<sup>1</sup> Wood Density (D)

<i>Pinus roxburghii</i>	0.43
<i>Pinus wallichiana</i>	0.32
<i>Abies pindrow</i>	0.42
Average	0.39

Biomass Expansion Factor: BEF2 1.35 (IPCC Table 3A.1.10)  
 CF = carbon fraction of dry matter 0.5

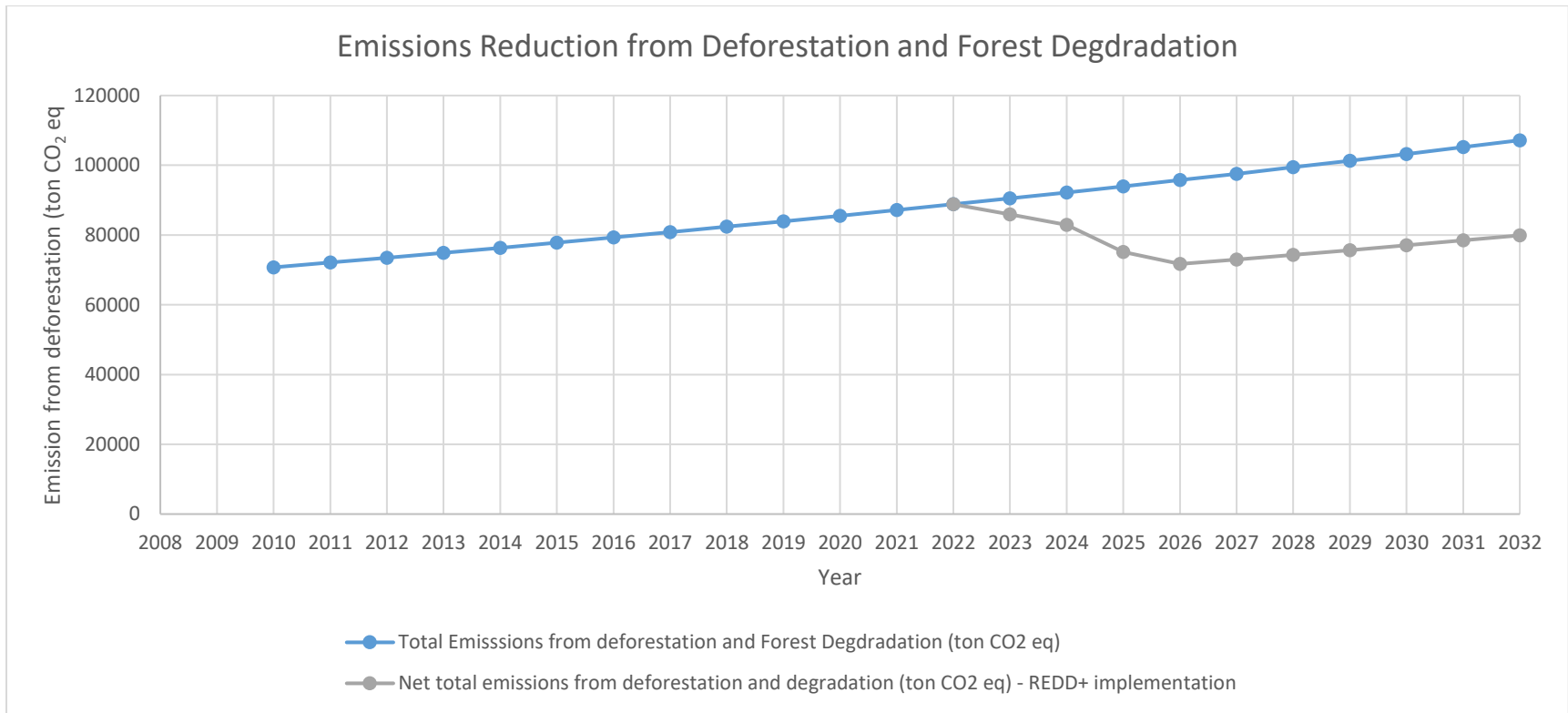
### 2.5.6 Net Emissions from Deforestation and Forest Degradation

The table 10 below provides a net CO<sub>2</sub> sequestration scenario based on 10% forest cover enhancement in addition to addressing existing negative trend and reducing emissions from forest degradation in an incremental manner annually from 5% to 25% with REDD+ activity. In this scenario, the net emissions from the forest will continue declining till 2026 due to cumulative effect of increasing forest cover and reduction in forest degradation due to REDD+ implementation but will again start climbing due to steady increase in population resulting in increase in demand for fuel and local use timber. Since the deforestation rate is negligible in comparison with the forest degradation, more emphasis is needed to address the pressure for fuelwood and local use timber to enhance the forest carbon pools.

Table 8: Sequestration Scenario from Forest Enhancement and Reducing degradation

Rate of change per year	658.59					-66	
Year	Emission from deforestation (ton CO <sub>2</sub> eq) - Business as usual	Emission from Forest Degradation (ton CO <sub>2</sub> eq) - Business as usual	Total Emissions from deforestation and Forest Degradation (ton CO <sub>2</sub> eq)	5-25% Reduction in Degradation emissions	Net emissions from degradation	Emission from deforestation (ton CO <sub>2</sub> eq) - REDD+ with 10% reduction	Net total emissions from deforestation and degradation (ton CO <sub>2</sub> eq) - REDD+ implementation
2010	659	70073	70731				
2011	659	71437	72096				
2012	659	72828	73487				
2013	659	74246	74905				
2014	659	75692	76350				
2015	659	77166	77824				
2016	659	78668	79327				
2017	659	80200	80859				
2018	659	81732	82391				
2019	659	83293	83952				
2020	659	84884	85543				
2021	659	86505	87164				
2022	659	88157	88816		88157	659	88816
2023	659	89841	90500	4492	85349	593	85942

<b>Rate of change per year</b>	658.59					-66	
<b>Year</b>	<b>Emission from deforestation (ton CO<sub>2</sub> eq) - Business as usual</b>	<b>Emission from Forest Degradation (ton CO<sub>2</sub> eq) - Business as usual</b>	<b>Total Emissions from deforestation and Forest Degradation (ton CO<sub>2</sub> eq)</b>	<b>5-25% Reduction in Degradation emissions</b>	<b>Net emissions from degradation</b>	<b>Emission from deforestation (ton CO<sub>2</sub> eq) - REDD+ with 10% reduction</b>	<b>Net total emissions from deforestation and degradation (ton CO<sub>2</sub> eq) - REDD+ implementation</b>
2024	659	91557	92216	9156	82402	527	82928
2025	659	93306	93965	18661	74645	461	75106
2026	659	95088	95747	23772	71316	395	71711
2027	659	96904	97563	24226	72678	329	73008
2028	659	98755	99414	24689	74066	263	74330
2029	659	100641	101300	25160	75481	198	75679
2030	659	102564	103222	25641	76923	132	77054
2031	659	104523	105181	26131	78392	66	78458
2032	659	106519	107178	26630	79889	0	79889



**Figure 6: Sequestration scenarios – Forest Enhancement and Reduced degradation**

Based on the above data analysis using primary and secondary sources of information the key findings are:

- Forest is losing cover at 4.02 ha per annum
- Due to Deforestation the pilot site emits 659 tonnes of CO<sub>2</sub> eq per annum
- Major pressure on the forest is for firewood collection and timber for local use due to increasing population.
- To enhance the carbon pools in the forest the focus needs to be on addressing the issue of energy dependence on the forest and timber demand for local housing.

### 2.5.7 Actions against Drivers of Forests Degradation, Deforestation and Barriers to Enhancement

To avoid repetition, the planned intervention is serially numbered and accordingly entered in the short-, medium- and long-term planning columns of the Action Plan **Table 9** against the relevant driver/ barrier of forest degradation and deforestation, as the following;

Table 9: Actions against the relevant driver/ barrier of forest degradation and deforestation and barriers to enhancement

S#	Drivers/Barriers	Planned Interventions		
		Short term	Medium Term	Long term
<b>A</b>	<b>Forest Degradation</b>			
1)	Unsustainable and unscientific wood extraction	II, III Review and implement forest-related policies, laws, procedures and planning systems to provide a sound basis for implementation of REDD+ Program firstly on pilot basis in Lachrat Range and subsequently throughout the State;	V, VI, VIII Strengthen capacities of Forests Department and dependent communities in co-management of public forests and strict enforcement of the regulatory frameworks, through training and guidelines; To reduce inefficient wood utilization, wasting less wood in dispensing forests concessions, replacing wood with viable alternatives, promoting energy conservation technology and clean energy options i.e., micro-hydel and solar energy;	IV, VII Increasing wood production by planting/ ANR of blank forest areas, crown lands, community and private lands and protecting watershed by soil-bioengineering and engineering control measures;
2)	Uncontrolled and over grazing of	X	XI Enhance range capacities by re-	II, XII Ensure participation of



	pastures and degraded forests	Develop participatory range and grazing management plans	seeding of palatable species and eradication of weeds in pastures, providing animal health and related services;	pastoralist communities in the range management program, manage grazing in alpine pastures through grazing permits and rotational grazing plans;
3)	Weak forest governance	I, II Reform forest management systems to make forest management participatory to ensure people's involvement in protection against encroachment of forestland, reducing theft of timber, control of forest fires and to assist in forest regeneration;	III, V Strengthen capacities of Forests Department and dependent communities in co-management of public forests and strict enforcement of the regulatory frameworks, through training and guidelines; Revisit forest-related policies, laws, procedures and planning systems to provide a sound basis for implementation of REDD+ Program firstly on pilot basis in Lachrat Range and subsequently throughout the State;	XV Creation of permanent REDD+ implementation set-up in Forests Department and devising coordination mechanisms with all the climate change related GLDs.
4)	<b>Pressure of increasing population demand</b>	Study the existing and future demands from the forests and develop forest management plans to cater to these demands	Implement sustainable livelihood generation interventions for the rural poverty alleviation and incentivizing REDD+ implementation e.g., rural enterprise development, ecotourism development, smart agriculture and capacity building of communities;	

5)	Forest fires (natural and intentional)	Put in place adequate forest fire fighting arrangements; Develop forest management plans	Strengthen capacities of Forests Department and dependent communities in fire management	Implement Forest fire management plans
<b>B Deforestation</b>				
1)	Public infrastructure development	Ensure implementation of government policies related to forest use	Review, revise and implement forest-related policies, laws, procedures and planning systems	
2)	<b>Encroachment for resettlement due to disasters</b>	Ensure implementation of government policies related to forest use	Review, revise and implement forest-related policies, laws, procedures and planning systems	
3)	<b>Inadequate forest boundary demarcation</b>	Demarcate forest boundaries particularly in areas under encroachment threat	Maintain record of boundary demarcations and pillars along with digital records of forest boundaries	V
<b>C Barriers to enhancement</b>				
1)	Forest fires (natural and intentional)	Put in place adequate forest fire fighting arrangements and develop forest management plans	Strengthen capacities of Forests Department and communities in fire management	Implement fire management plans
2)	Free Livestock grazing damaging regeneration	Develop participatory grazing plans by involving relevant stakeholders ensuring participation of pastoralist communities in the range management program, manage grazing in alpine pastures through grazing permits and rotational grazing plans;	Build community capacities in livestock management and encourage social fencing of regeneration areas. Facilitate access to animal health and related services;	

### 3 Planned Intervention Packages

#### 3.1 Intervention Packages

The following 6 intervention packages of REDD+ for DFA Lachrat were drawn through the consultative process comprising; FGDs, technical input from the climate change related GLDs, and the experts' advice;

- 1) Social mobilization for planning and implementing REDD+ support interventions under PFMP DFA Lachrat;
- 2) Sustainable livelihood generation interventions for the rural poverty alleviation and incentivizing REDD+ support interventions;
- 3) Restoration of pristine forestry ecosystems through recovery of endangered/ threatened flora and fauna, employing biological, engineering and bio-engineering erosion control measures;
- 4) Introduction of pasture and rangeland management, common land grazing management and livestock management extension services;
- 5) Promotion of wood alternative and energy conservation technologies, and;
- 6) Human and institutional capacity development (HICD).

The justification along with capital costs is give in the section 3.4 below.

#### Summary of Capital Costs

Summary of the capital costs over 10-Year, for REDD+ support interventions under PFMP DFA Lachrat, is given in the table blew:

Table 10: Summary of the Capital costs

S#	Intervention	Justification	Sub-Activity	Unit	Unit Cost (PKR Million)	Quantity	Cost (PKR Million)
1)	Social Mobilization for Planning and Implementing REDD+ Support Interventions under PFMP DFA Lachrat	REDD+ Advisory Forum will be constituted; to guide and direct the managers/ stakeholders in implementing REDD+ Support Interventions in the DFA Lachrat Pilot Site successfully. The beneficiary communities will be organized/ revamped into VCOs based on the Revenue Villages/ sub-watersheds; dependent on the DFA, to participate in REDD+ Programme and meeting their responsibilities. Besides, establishing	Mobilization/ revamping of DFA Dependent Village Community Organizations (VCOs) to meet their responsibilities under JFM	# VCO	0.250/FY	8	20.000
			Board of Conservation CVOs: An independent support structure that works closely with the Forest Department would be created to nurture a network of conservation VCOs in a 4.8 KM radius around the high conservation value forests	# Board of CVOs	2.000	1	2.000
			2) REDD+ Advisory Forum, Forest Range Lachrat, Muzaffarabad Forests Division (Designated Forests Area Lachrat / DFA Lachrat)	# Forum	0.250/FY	1	2.500

S#	Intervention	Justification	Sub-Activity	Unit	Unit Cost (PKR Million)	Quantity	Cost (PKR Million)
		an apex body of conservation VCOs to nurture grassroots institutions, and enhance their management and technical skills					
2)	Sustainable Livelihood Generation Interventions for the rural poverty alleviation and incentivizing REDD+ Support Interventions	1) Establishment of Community Enterprises for Processing and Marketing Wild Foods, Vegetables & Fruits, Economic Herbs, Medicinal Plants and household products etc. 2) Construction of Forests Tracking Facility across DFA Lachrat including interpretation and seasonal camping sites development, with the object of education, research, eco-tourism, awareness raising and community income generation	1) Establishing community development enterprises in DFA Lachrat through provision of revolving working capital and capacity building training and business linkages 1) Construction of Forests Tracking Facility across DFA 2) Capacity Building of Communities in Development of Eco-tourism (camp mgt. tourist guide & hospitality)	# Lump Sum Lump Sum	0.100 10.000 0.050/FY	25 1 8	2.500 10.000 4.000
3)	Restoration of Pristine Forest Ecosystems through Recovery of Endangered/Threatened Flora and Fauna, employing biological, engineering and bio-engineering erosion control measures	1) Establishment of Forestry Ex-closures for recovery of threatened/ endangered plant species through protection and natural regeneration i.e., support to natural regeneration, for rehabilitation of forestry ecosystems and gene pool conservation 2) Recovery of threatened indigenous flora species through artificial planting for genetic resource conservation,	1) Establishment of Forestry Ex-closures on the need-basis for assisted natural regeneration (ANR) 1) Artificial planting in blanks areas including protection for 5-year and beating up failure	50 Ac Unit 000 Sapling #	1.5/5-FY 0.150	20 250	30.000 37.500

S#	Intervention	Justification	Sub-Activity	Unit	Unit Cost (PKR Million)	Quantity	Cost (PKR Million)
		restoration of the stand values e.g., species composition, age class distribution and replanting blanks areas					
4)	Introduction of Pasture and Rangeland Management, common land grazing management and livestock management extension services	Alpine pastures and degraded forests are being used for free grazing by local communities and nomads, besides; private/ community grasslands and crown land, lack any Management System at the present, need to be brought under some grazing management regime for increasing productivity per unit area, continuous supply of community needs and ecosystem services	1) Establishment of 5 Rotational Grazing Demonstrations (RGDs)	# Demos	0.500	5	2.500
			2) Eradication of obnoxious weeds and reseedling of highly palatable grass species in RDGs	Lump Sum	0.500	5	2.500
			3) Construction of 5 watering points through rainwater harvesting and salting	#	0.500	5	2.500
			4) Multipurpose tree planting on community grassland and crown land	000 Sapling #	0.075	250	18.750
5)	Promotion of Wood Alternative and Energy Conservation Technologies	Pressure of the increasing population demands of construction timber and fuel wood has exceeded sustained supply from nearby forests, resulting into their degradation, which needs to be checked	1) Promotion of Micro-hydel Power, Solar and Wind Power, fuel wood alternatives, cooking and space heating energy saving demonstrations, technology transfer and awareness raising etc.	Lump Sum			12.500
6)	Human and Institutional Capacity Development (HICD)	Two Field Units and REDD+ Cell in the Office of CCF (Territorial) would be setup by FD mainly through reorganization and relocation, operating cost will be provided by the Project. However, incremental staff of REDD+ Cell will be provided from the	1) Policy & Legal Reforms	Lump Sum			2.000
			2) Office Support and Incremental Staff of the REDD+ Cell	Lump Sum			20.250
			3) Mobility	Lump Sum			14.500
			4) TA/DA	Lump Sum			10.000
			5) PFMP Communication Strategy, Extension Material, Seminar & Workshops, Training and	Lump Sum			6.000

S#	Intervention	Justification	Sub-Activity	Unit	Unit Cost (PKR Million)	Quantity	Cost (PKR Million)
		project. Capacity building of FD staff and communities through training, project site visits.	Awareness Raising Campaigns				
TOTAL							200.000

### 3.1.1 Activity Cost Break-up in Percentages:

Table 11: Activity Break up in Percentages

S#	Intervention	Cost (Mil. Pak Rs.)	% Percent of Total
1	Social Mobilization for Planning and Implementing of REDD+ Support Interventions	24.5	12.30
2	Sustainable Livelihood Generation Interventions for the Rural Poverty Alleviation	16.5	8.30
3	Restoration of Pristine Forestry Ecosystems through Recovery of Endangered/ Threatened Flora and Fauna	67.5	33.80
4	Introduction of Pasture and Rangeland Management	26.25	13.10
5	Promotion of Wood Alternative and Energy Conservation Technologies	12.5	6.30
6	Human and Institutional Capacity Development (HICD) & Office Support	52.75	26.40

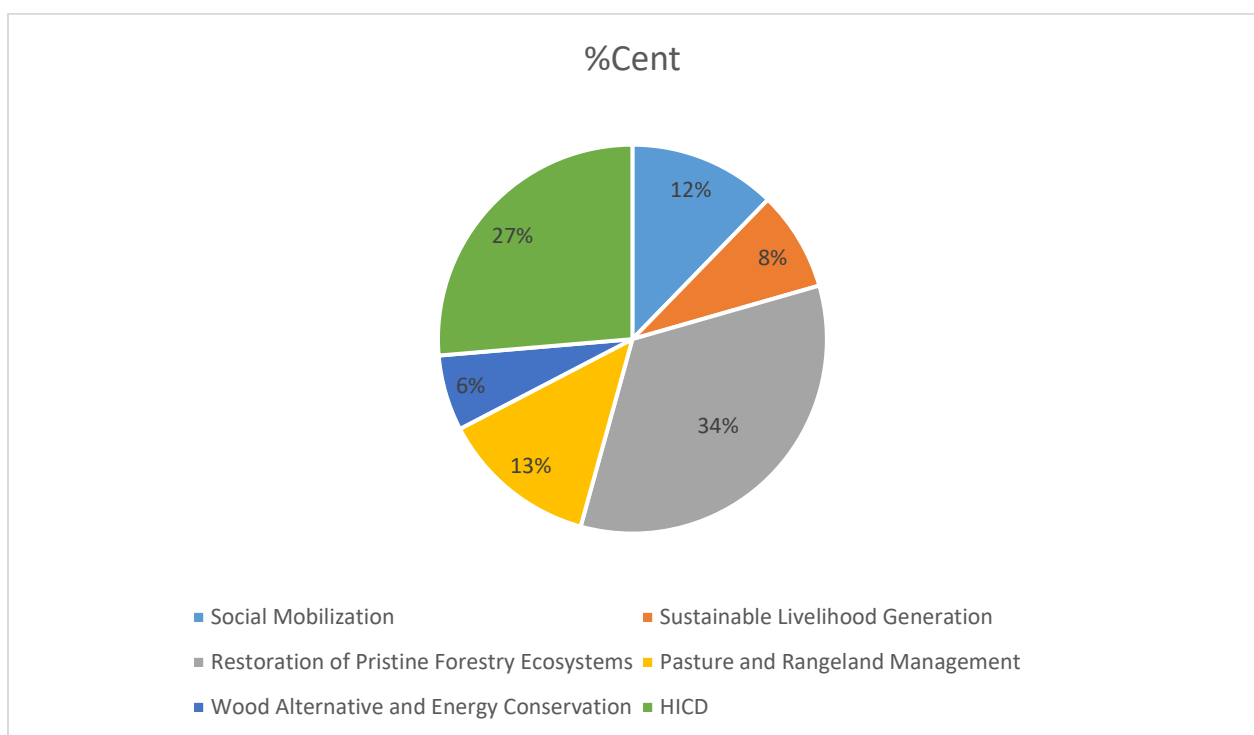


Figure 7: Visualization of Activity Cost in Percentages

### 3.1.2 Activity Implementation Schedule

The proposed implementation schedule for the main activities is given in the table below;

Table 12: Activity Implementation Schedule

Activity Implementation Schedule										
Activity / Sub-Activity	Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	Y-7	Y-8	Y-9	Y-10
<b>1) Social Mobilization</b>										
1) CVO Formulation	X									
2) CVO Operation	X	X	X	X	X	X	X	X	X	X
3) CVO Apex Body Formulation	X									
4) CVO Apex Body Operation	X	X	X	X	X	X	X	X	X	X
5) Preparation of PFMP Information Communication Strategy (ICS)	X									
6) Implementation of ICS	X	X	X	X	X	X	X	X	X	X
<b>2) Staff Fielding</b>										
1) Mobilization of PIU, REDD+ Cell, Advisory Forum	X									
2) REDD+ Institutions Operation	X	X	X	X	X	X	X	X	X	X
<b>3) Human and Institutional Capacity Building</b>										
1) FD Staff & Community Activists' JFM Training	X	X	X							
2) CVO Capacity Building & Management Training	X	X	X							
3) JFM Project Site Visits of FD Staff & Community Activists	X	X	X	X	X					
4) Staff In-service Training	X	X	X	X	X	X	X	X	X	X
5) Micro-credit and Enterprise Development CVO Training	X	X	X	X	X	X	X	X	X	X
6) Diagnostic Studies	X	X	X	X	X	X	X	X	X	X
7) GIS Database Development	X	X	X	X	X	X	X	X	X	X
8) Legal and Policy Reforms	X									
<b>4) Field Interventions</b>										
1) JFM Actions	X	X	X	X	X	X	X	X	X	X
2) Preparation of Participatory Village/ SW Development Plans (VDPs)										
3) Departmental & Community Nurseries	X	X	X	X	X	X	X	X	X	X
4) ANR Interventions	X	X	X	X	X	X	X	X	X	X
5) Artificial Planting of Declining Indigenous Species in Blanks' Areas	X	X	X	X	X	X	X	X	X	X
6) Setting-up of Rotational Grazing Demos & Maintenance	X	X	X	X	X	X	X	X	X	X
7) Rangeland and Pasture Development Extension	X	X	X	X	X	X	X	X	X	X
8) Construction & Maintenance of WHS	X	X	X	X	X	X	X	X	X	X
9) Construction & Maintenance of Forests Tracking Path	X	X	X	X	X	X	X	X	X	X
10) Micro-enterprise Development and Operation	X	X	X	X	X	X	X	X	X	X
11) Promotion of Wood Alternatives & Energy Conservation	X	X	X	X	X	X	X	X	X	X
12) PFMP Joint Review and Improvement	X	X	X	X	X	X	X	X	X	X
13) PFMP Implementation Progress and Performance Reviews	X	X	X	X	X	X	X	X	X	X
14) Mid-term and Completion Review						X				X
<b>5) Office Support</b>	X	X	X	X	X	X	X	X	X	X
1) Office Operation & Maintenance	X	X	X	X	X	X	X	X	X	X
2) Meetings & Training	X	X	X	X	X	X	X	X	X	X
3) Printing of Extension Material	X	X	X	X	X	X	X	X	X	X

## **4 Implementation and Management System**

### **4.1 Implementation:**

The project will be implemented by the Plan Implementation Unit (PIU); headed by the DFO Muzaffarabad Forests Division, comprising forestry staff of Lachrat Range, including Range Officer, within the overall supervision of DFA Advisory Forum, the REDD+ Cell headed by the CCF (Territorial) and the strategic guidance of the PSC, headed by the Secretary Forests and membership from all GLDs concerned with climate change impacts mitigation and adaptation.

### **4.2 Management System**

The management system encompasses all components of the Plan i.e., 1) Planning; 2) Implementing; 3) Checking and Monitoring; and 4) Review and Improvement.

The Management System essentially comprises the following procedures;

- 1) Identify environmental risks;
- 2) Identify standard operating procedures or develop performance measures to address significant risks;
- 3) Develop emergency procedures in the event of an incident causing environmental impacts;
- 4) Review all laws and regulations and reform them to create an enabling situation for PFMP implementation;
- 5) Establish procedures for training (providing updated information and training to ensure that forestry staff and beneficiary communities stay current with evolving joint forest management information and are trained to address and executive, technical, environmental and social issues), and;
- 6) If an incident does occur, conduct an incident review and develop an action plan to take corrective action, based on the preparation undertaken in steps; 1) to 5).

Within the context of the management system, the effectiveness of the PFMP implementation is continuously improved by monitoring and reviewing the management system and the protocols. This includes a review of ongoing participatory planning and implementation, to ensure that the PFMP is being implemented as effectively and efficiently as possible.



## 5 REDD+ Benefits Sharing Mechanism

### 5.1.1 Types of Expected benefits from REDD+

There are three main types of benefits from REDD+ Program; (1) gain from national and international transfers e.g. sale of credits in markets, funds linked to REDD+ readiness and payments based on measurements of the results, deducting implementation costs, (2) benefits in terms of better access to and higher income from forest products and environmental services, in which the cost would include the lost opportunities because some uses would be stopped or down-scaled, and (3) indirect benefits i.e. strengthening of tenure rights, technology transfer, community empowerment and enhanced participation in the decision making. The 3-types of benefits laid out vary greatly in degree to which they can be quantified and monetized. Focusing on easily quantifiable and monetize able benefits from direct financial transfers, deducting implementation and opportunity costs would make local cost higher than what actually they are. There would be hardly any net gain or surplus theoretically. We also need to differentiate vertical benefits sharing between national and local shareholders and horizontal benefits sharing amongst communities and households. Again, the typology of benefit sharing rationale i.e., legal rights, emission reduction, stewardship, cost compensation, facilitation and pro-poor, further complicate the benefit sharing of REDD+ program. However, except sale of credits in the market, all other benefits would have to be dealt locally, could be decided by local shareholders democratically, on need basis.

### 5.1.2 Sharing Benefits of Carbon Credit

Given the fact that the State Government is the legal owner of the demarcated forests, to incentivize REDD+ implementation, she has to confer the carbon rights to DFA dependent communities, household families, individuals, investors, public and private entrepreneurs through mechanism of the usufruct rights. These usufruct rights in the State demarcated forests have been allocated in the form of concessions to local communities/ Zamindars and imply rights to benefit from natural resources and also ecosystem services (ES). Since these usufruct rights are already allocated widely, it makes sense to align carbon rights with these usufruct rights and the carbon right-holder would have to discharge liability for failure to deliver the specified emission reduction.

Although the State demarcated forests fall within the ambit and domain of the State Government, following the 2016 Paris Agreement, forest Carbon accounting has to be done at the national/ federal level, otherwise forest carbon trading may not be permissible. The benefits to be accrued from result-based REDD+ actions would have to be transferred to legal owners and right holders of forests in accordance with the benefit distribution prescribed in Pakistan's national REDD+ strategy. The implementation of the REDD+ strategy in Pakistan, including AJK, primarily rests with the Ministry of Climate Change at the Federal level. To ensure continuous existence of trees/ forests i.e., permanence of emission reduction, linking of the distribution of financial benefits from REDD+ with the forest management and use-rights is therefore a must. A mechanism needs to be worked out to transfer REDD+ benefits from international Carbon markets to MoCC, down to provinces/ areas and to the end use-right holders.

Presently the right to Carbon as a commodity and the right to benefits, from demarcated and undemarcated forests belong to the State, whereas the right to Carbon on community and private forests belongs to the owners of these forests. The right to Carbon should not necessarily "be based on land ownership and tenure, but should also include customary rights, operating rights, use rights or capital investment". In addition, the State Government should create / transfer public forest Carbon privileges to the concessionaries on equitable proportion basis.

Project proponents should have the right to receive payments for emission reductions and to sell carbon from the REDD+ interventions and be made obliged to manage forests within REDD+

implementation standards. A transparent M & E mechanism to be put in place for disbursement of monetary benefits out of Carbon credit sales.

It might be possible to house REDD+ provisions within existing laws (The AJK Forest Regulation Amendment Act, 2017 & Wildlife Act 2015), however, a wider 'umbrella law' capturing many different aspects of REDD+ implementation might be preferable in the longer-term to coordinate the development of REDD+ related rules and enabling environment.

Safeguards related to REDD+ within UNFCCC COP decisions aim to prevent REDD+ activities to cause harm to biodiversity and the indigenous people, and also help REDD+ realize multiple benefits, beyond simply emission reductions. This appears to follow a 'rights-based approach' to safeguards, prioritizing the protection of the individual rights of those potentially affected by a REDD+ activities, which need to be fully integrated with the Legal and Compliance Frameworks.

Protected Areas' Carbon rights needs to be taken up involving AJ&K Wildlife & Fisheries Department. There are no public concessions with respect to the protected area or wildlife management either. The approach finalized for demarcated forests could be made applicable for protected area network with some amendments.

## 6 Mechanism for REDD+ Conflict Resolution

### 6.1 Drivers of REDD+ Main Conflicts

PRA found the following six drivers of REDD+ main conflicts:

- 1) Restrictions over access and control of forest resources;
- 2) Creation of new forest governance structures that change relationships between local communities and the forest;
- 3) Exclusion of community members from comprehensive project participation;
- 4) High expectations that could not be met with;
- 5) Changes in land tenure policy for any reason, and
- 6) The aggravation of historic land tenure conflicts.

### 6.2 Conflict Thematic Areas

With the current complexity of issues facing forest and land management, the implementation of the REDD+ initiative comes with significant risks, including conflicts. While the exact nature and shape of conflicts in REDD+ implementation is difficult to pinpoint in anticipation. An attempt was made during (participatory rapid assessment) PRA to identify possible sources of conflicts over management of forests and other natural resources. The PRA revealed that most of the sources of impairment are present in the DFA. The conflicts are related to the following thematic areas:

- 1) **REDD+ Programme:** Includes the discrepancies and disputes which may arise during the technical design, implementation and evaluation of activities, which might begin with REDD+ start and would continue for the future.
- 2) **Rights-based approach to REDD:** Includes grievances and disputes over processes to acquire (user) rights to land and resources related to the REDD+ Programme. Historically existing conflict over user rights is automatically embedded in the REDD+ structure and needs to be adequately addressed. Complaints regarding the process of Free and Prior Informed Consent (FPIC) should be handled in compliance with the international guidelines and standards.
- 3) **Engagement of stakeholders before and during REDD+ implementation:** Includes the sharing of REDD+ information, raising of awareness and enabling participation of stakeholders etc. Compared to others, certain groups are structurally marginalized in society and need special attention for awareness raising and effective participation in the REDD+ Programme (such as women, landless people and services cast groups, transhumant grazers). Representation of these groups at various levels should be ensured.
- 4) **Benefit sharing for REDD+:** Includes the distribution of benefits between the different forest users, beneficiary communities and the general public. The majority of forest users are worried about elites capturing the majority benefits when REDD+ is actually implemented. Other forest users worry about poor groups not benefitting from REDD+ and this concern refers to women, landless people, as well as other relatively poor forest users.
- 5) **Customary practices:** Includes the internal practices of communities and the position of these communities within society. With the increasing participation of forest user groups in the market economy, communities are likely to face internal conflicts over power. Women inequity, elite capture and other internal power struggles are expected to increase when

benefits of REDD+ are distributed. Also, with the influx of new forest users' i.e., investors and project proponents' communities may have difficulty maintaining customary balance with their competitors, which may lead to disputes.

### 6.3 Conflict Resolution Forums and Clientele

Forced ejections from forests, acts of violence, and lawsuits are among the events contributing to the conflict pathways. To prevent them, the rights, livelihoods, and benefits of local communities need to be placed at the centre of the REDD+ projects. Dependent communities/ forest concessions' right holders need empowerment by transferring the forest Carbon rights in the DFA, for successful implementation of REDD+ support interventions. REDD+ potential conflicts' resolution matrix is presented below;

Table 13: REDD+ Potential conflicts' Resolution Matrix

S#	Potential Conflict	Client	Resolution Forum
1)	Activities, timeline & implementation	Local communities	DFO Office & Advisory Forum
2)	User boundary disputes	VCOs	VCO apex body, DFO and local level Revenue Deptt. Office, courts of law
3)	Land grabbing	GLDs, Local Elite	VCO apex body, DFO and local level Revenue Deptt. Office and SHO
4)	Encroachments	DFO, Communities	DFO Office, District Administration & Police
5)	Community Participation	REDD+ Programme & FD	VCO apex body
6)	Benefit sharing	Communities & Individuals	DFO, Advisory Forum, REDD+ Cell, VCO apex body, Revenue Deptt.
7)	Identity claims	Landless people, services cast groups, migratory grazers	DFO, Advisory Forum, REDD+ Cell, VCO apex body, Revenue Deptt.
8)	Elite capture	Communities and REDD+ Programme	DFO, Advisory Forum, REDD+ Cell, VCO apex body
9)	Transhumant Grazing	Transhumant grazers	DFO, Advisory Forum, REDD+ Cell, VCO apex body
10)	Technical Issues	PIU & Communities	Advisory Forum, REDD+ Cell, PSC
11)	Policy and legal issues	GLDs, REDD+ Programme, Communities	FD, PSC and the State

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## Plot level Carbon Stock

Plot No.	Latitude	Longitude	Tree ID	Species Name	Scientific Name	DBH (cm)	Tree height (m)	AGB (kg)	AGB (ton/ha)	AGC (ton/ha)	BGC (ton/ha)
1	34.4076	73.4975	1	Chir	<i>Pinus roxburghii</i>	91.44	17.2	2,442.71	24.43	11.48	2.87
1	34.4076	73.4975	2	Chir	<i>Pinus roxburghii</i>	124.968	13	3,420.77	34.21	16.08	4.02
1	34.4076	73.4975	3	Chir	<i>Pinus roxburghii</i>	79.248	11	1,193.60	11.94	5.61	1.40
1	34.4076	73.4975	4	Chir	<i>Pinus roxburghii</i>	67.056	12	937.66	9.38	4.41	1.10
1	34.4076	73.4975	5	Chir	<i>Pinus roxburghii</i>	57.912	13.3	778.58	7.79	3.66	0.91
1	34.4076	73.4975	6	Chir	<i>Pinus roxburghii</i>	64.008	10.8	772.49	7.72	3.63	0.91
1	34.4076	73.4975	7	Chir	<i>Pinus roxburghii</i>	106.68	19.5	3,731.49	37.31	17.54	4.38
1	34.4076	73.4975	8	Chir	<i>Pinus roxburghii</i>	73.152	14	1,291.96	12.92	6.07	1.52
1	34.4076	73.4975	9	Chir	<i>Pinus roxburghii</i>	134.112	16	4,809.58	48.10	22.61	5.65
1	34.4076	73.4975	10	Chir	<i>Pinus roxburghii</i>	103.632	11.6	2,123.10	21.23	9.98	2.49
1	34.4076	73.4975	11	Chir	<i>Pinus roxburghii</i>	115.824	12.5	2,838.08	28.38	13.34	3.33
1	34.4076	73.4975	12	Chir	<i>Pinus roxburghii</i>	76.2	15	1,496.74	14.97	7.03	1.76
1	34.4076	73.4975	13	Chir	<i>Pinus roxburghii</i>	109.728	19.2	3,883.33	38.83	18.25	4.56
1	34.4076	73.4975	14	Chir	<i>Pinus roxburghii</i>	109.728	9	1,852.73	18.53	8.71	2.18
1	34.4076	73.4975	15	Chir	<i>Pinus roxburghii</i>	88.392	18.3	2,428.89	24.29	11.42	2.85
1	34.4076	73.4975	16	Chir	<i>Pinus roxburghii</i>	106.68	15.2	2,925.58	29.26	13.75	3.44
1	34.4076	73.4975	17	Chir	<i>Pinus roxburghii</i>	112.776	11.3	2,441.12	24.41	11.47	2.87
1	34.4076	73.4975	18	Chir	<i>Pinus roxburghii</i>	67.056	12.7	991.05	9.91	4.66	1.16
1	34.4076	73.4975	19	Chir	<i>Pinus roxburghii</i>	91.44	15.8	2,248.33	22.48	10.57	2.64
1	34.4076	73.4975	20	Chir	<i>Pinus roxburghii</i>	103.632	13.7	2,497.75	24.98	11.74	2.93
1	34.4076	73.4975	21	Chir	<i>Pinus roxburghii</i>	54.864	7.9	421.20	4.21	1.98	0.49
1	34.4076	73.4975	22	Chir	<i>Pinus roxburghii</i>	30.48	4	68.73	0.69	0.32	0.08
1	34.4076	73.4975	23	Chir	<i>Pinus roxburghii</i>	182.88	6.3	3,547.15	35.47	16.67	4.17
1	34.4076	73.4975	24	Chir	<i>Pinus roxburghii</i>	24.384	3.8	42.28	0.42	0.20	0.05
1	34.4076	73.4975	25	Chir	<i>Pinus roxburghii</i>	24.384	2.9	32.47	0.32	0.15	0.04
1	34.4076	73.4975	26	Chir	<i>Pinus roxburghii</i>	106.68	17.3	3,319.75	33.20	15.60	3.90
2	34.4080	73.4927	1	Chir	<i>Pinus roxburghii</i>	228.6	13.4	11,463.33	114.63	53.88	13.47
2	34.4080	73.4927	2	Chir	<i>Pinus roxburghii</i>	234.696	23.3	20,715.26	207.15	97.36	24.34
2	34.4080	73.4927	3	Chir	<i>Pinus roxburghii</i>	259.08	23.7	25,548.56	255.49	120.08	30.02
2	34.4080	73.4927	4	Chir	<i>Pinus roxburghii</i>	88.392	12.6	1,686.95	16.87	7.93	1.98
2	34.4080	73.4927	5	Chir	<i>Pinus roxburghii</i>	60.96	6.8	446.96	4.47	2.10	0.53
2	34.4080	73.4927	6	Chir	<i>Pinus roxburghii</i>	51.816	6.6	316.03	3.16	1.49	0.37

Plot No.	Latitude	Longitude	Tree ID	Species Name	Scientific Name	DBH (cm)	Tree height (m)	AGB (kg)	AGB (ton/ha)	AGC (ton/ha)	BGC (ton/ha)
2	34.4080	73.4927	7	Chir	<i>Pinus roxburghii</i>	51.816	5.7	273.87	2.74	1.29	0.32
2	34.4080	73.4927	8	Chir	<i>Pinus roxburghii</i>	24.384	2.9	32.47	0.32	0.15	0.04
2	34.4080	73.4927	9	Chir	<i>Pinus roxburghii</i>	24.384	2.8	31.37	0.31	0.15	0.04
2	34.4080	73.4927	10	Chir	<i>Pinus roxburghii</i>	51.816	5.8	278.56	2.79	1.31	0.33
2	34.4080	73.4927	11	Chir	<i>Pinus roxburghii</i>	39.624	4.11	117.83	1.18	0.55	0.14
2	34.4080	73.4927	12	Chir	<i>Pinus roxburghii</i>	57.912	9.1	537.45	5.37	2.53	0.63
2	34.4080	73.4927	13	Chir	<i>Pinus roxburghii</i>	30.48	5.2	88.81	0.89	0.42	0.10
2	34.4080	73.4927	14	Chir	<i>Pinus roxburghii</i>	30.48	2.2	38.33	0.38	0.18	0.05
2	34.4080	73.4927	15	Chir	<i>Pinus roxburghii</i>	54.864	4.1	221.96	2.22	1.04	0.26
2	34.4080	73.4927	16	Chir	<i>Pinus roxburghii</i>	27.432	3.2	44.99	0.45	0.21	0.05
2	34.4080	73.4927	17	Chir	<i>Pinus roxburghii</i>	36.576	4.1	100.53	1.01	0.47	0.12
2	34.4080	73.4927	18	Chir	<i>Pinus roxburghii</i>	18.288	2	12.88	0.13	0.06	0.02
2	34.4080	73.4927	19	Chir	<i>Pinus roxburghii</i>	27.432	2.5	35.35	0.35	0.17	0.04
2	34.4080	73.4927	20	Chir	<i>Pinus roxburghii</i>	48.768	2.5	108.77	1.09	0.51	0.13
2	34.4080	73.4927	21	Chir	<i>Pinus roxburghii</i>	27.432	3.5	49.11	0.49	0.23	0.06
2	34.4080	73.4927	22	Chir	<i>Pinus roxburghii</i>	27.432	3.5	49.11	0.49	0.23	0.06
2	34.4080	73.4927	23	Chir	<i>Pinus roxburghii</i>	21.336	4.6	39.25	0.39	0.18	0.05
2	34.4080	73.4927	24	Chir	<i>Pinus roxburghii</i>	30.48	5.5	93.81	0.94	0.44	0.11
2	34.4080	73.4927	25	Chir	<i>Pinus roxburghii</i>	27.432	5.4	75.00	0.75	0.35	0.09
2	34.4080	73.4927	26	Chir	<i>Pinus roxburghii</i>	39.624	5.3	151.04	1.51	0.71	0.18
2	34.4080	73.4927	27	Chir	<i>Pinus roxburghii</i>	33.528	5.8	119.02	1.19	0.56	0.14
2	34.4080	73.4927	28	Chir	<i>Pinus roxburghii</i>	45.72	7	262.12	2.62	1.23	0.31
2	34.4080	73.4927	29	Chir	<i>Pinus roxburghii</i>	36.576	4	98.14	0.98	0.46	0.12
2	34.4080	73.4927	30	Chir	<i>Pinus roxburghii</i>	85.344	2.8	362.53	3.63	1.70	0.43
2	34.4080	73.4927	31	Chir	<i>Pinus roxburghii</i>	85.344	2.8	362.53	3.63	1.70	0.43
2	34.4080	73.4927	32	Chir	<i>Pinus roxburghii</i>	33.528	3	62.51	0.63	0.29	0.07
2	34.4080	73.4927	33	Chir	<i>Pinus roxburghii</i>	33.528	3.1	64.55	0.65	0.30	0.08
2	34.4080	73.4927	34	Chir	<i>Pinus roxburghii</i>	33.528	3.3	68.61	0.69	0.32	0.08
2	34.4080	73.4927	35	Chir	<i>Pinus roxburghii</i>	27.432	2.5	35.35	0.35	0.17	0.04
2	34.4080	73.4927	36	Chir	<i>Pinus roxburghii</i>	27.432	2.3	32.59	0.33	0.15	0.04
2	34.4080	73.4927	37	Chir	<i>Pinus roxburghii</i>	27.432	2.2	31.20	0.31	0.15	0.04
2	34.4080	73.4927	38	Chir	<i>Pinus roxburghii</i>	33.528	3	62.51	0.63	0.29	0.07
2	34.4080	73.4927	39	Chir	<i>Pinus roxburghii</i>	33.528	3.1	64.55	0.65	0.30	0.08
2	34.4080	73.4927	40	Chir	<i>Pinus roxburghii</i>	30.48	3	51.90	0.52	0.24	0.06
2	34.4080	73.4927	41	Chir	<i>Pinus roxburghii</i>	30.48	3.2	55.27	0.55	0.26	0.06
2	34.4080	73.4927	42	Chir	<i>Pinus roxburghii</i>	27.432	2.6	36.73	0.37	0.17	0.04
2	34.4080	73.4927	43	Chir	<i>Pinus roxburghii</i>	27.432	2.7	38.11	0.38	0.18	0.04
3	34.3876	73.5011	1	Chir	<i>Pinus roxburghii</i>	67.056	13.6	1,059.59	10.60	4.98	1.25
3	34.3876	73.5011	2	Chir	<i>Pinus roxburghii</i>	67.056	13.3	1,036.76	10.37	4.87	1.22
3	34.3876	73.5011	3	Chir	<i>Pinus roxburghii</i>	64.008	12	856.21	8.56	4.02	1.01

Plot No.	Latitude	Longitude	Tree ID	Species Name	Scientific Name	DBH (cm)	Tree height (m)	AGB (kg)	AGB (ton/ha)	AGC (ton/ha)	BGC (ton/ha)
3	34.3876	73.5011	4	Chir	<i>Pinus roxburghii</i>	79.248	10.5	1,140.58	11.41	5.36	1.34
3	34.3876	73.5011	5	Chir	<i>Pinus roxburghii</i>	64.008	6.5	470.46	4.70	2.21	0.55
3	34.3876	73.5011	6	Chir	<i>Pinus roxburghii</i>	54.864	7.1	379.49	3.79	1.78	0.45
3	34.3876	73.5011	7	Chir	<i>Pinus roxburghii</i>	48.768	11.4	478.77	4.79	2.25	0.56
3	34.3876	73.5011	8	Chir	<i>Pinus roxburghii</i>	48.768	11.5	482.87	4.83	2.27	0.57
3	34.3876	73.5011	9	Chir	<i>Pinus roxburghii</i>	48.768	11.7	491.08	4.91	2.31	0.58
3	34.3876	73.5011	10	Chir	<i>Pinus roxburghii</i>	137.16	18.2	5,699.28	56.99	26.79	6.70
3	34.3876	73.5011	11	Chir	<i>Pinus roxburghii</i>	73.152	8.4	784.46	7.84	3.69	0.92
3	34.3876	73.5011	12	Chir	<i>Pinus roxburghii</i>	192.024	24.4	14,642.60	146.43	68.82	17.21
3	34.3876	73.5011	13	Chir	<i>Pinus roxburghii</i>	182.88	21.5	11,764.03	117.64	55.29	13.82
3	34.3876	73.5011	14	Chir	<i>Pinus roxburghii</i>	76.2	12.4	1,242.81	12.43	5.84	1.46
3	34.3876	73.5011	15	Chir	<i>Pinus roxburghii</i>	60.96	12.6	816.37	8.16	3.84	0.96
3	34.3876	73.5011	16	Chir	<i>Pinus roxburghii</i>	228.6	32.3	27,071.08	270.71	127.23	31.81
3	34.3876	73.5011	17	Chir	<i>Pinus roxburghii</i>	88.392	12.5	1,673.88	16.74	7.87	1.97
3	34.3876	73.5011	18	Chir	<i>Pinus roxburghii</i>	73.152	12	1,111.38	11.11	5.22	1.31
3	34.3876	73.5011	19	Chir	<i>Pinus roxburghii</i>	91.44	15.6	2,220.53	22.21	10.44	2.61
3	34.3876	73.5011	20	Chir	<i>Pinus roxburghii</i>	64.008	12.8	911.92	9.12	4.29	1.07
3	34.3876	73.5011	21	Chir	<i>Pinus roxburghii</i>	70.104	12.1	1,031.05	10.31	4.85	1.21
3	34.3876	73.5011	22	Chir	<i>Pinus roxburghii</i>	188.976	27.7	16,063.89	160.64	75.50	18.88
3	34.3876	73.5011	23	Chir	<i>Pinus roxburghii</i>	188.976	27.5	15,950.60	159.51	74.97	18.74
4	34.4431	73.5324	1	Chir	<i>Pinus roxburghii</i>	79.248	28	2,972.84	29.73	13.97	3.49
4	34.4431	73.5324	2	Chir	<i>Pinus roxburghii</i>	79.248	31	3,283.56	32.84	15.43	3.86
4	34.4431	73.5324	3	Chir	<i>Pinus roxburghii</i>	70.104	30.6	2,551.68	25.52	11.99	3.00
4	34.4431	73.5324	4	Chir	<i>Pinus roxburghii</i>	60.96	32	2,028.78	20.29	9.54	2.38
4	34.4431	73.5324	5	Chir	<i>Pinus roxburghii</i>	83.82	36.3	4,274.41	42.74	20.09	5.02
4	34.4431	73.5324	6	Chir	<i>Pinus roxburghii</i>	48.768	26.1	1,075.19	10.75	5.05	1.26
4	34.4431	73.5324	7	Chir	<i>Pinus roxburghii</i>	24.384	3	33.56	0.34	0.16	0.04
4	34.4431	73.5324	8	Chir	<i>Pinus roxburghii</i>	24.384	3	33.56	0.34	0.16	0.04
4	34.4431	73.5324	9	Chir	<i>Pinus roxburghii</i>	18.288	2.5	16.01	0.16	0.08	0.02
4	34.4431	73.5324	10	Chir	<i>Pinus roxburghii</i>	27.432	3	42.24	0.42	0.20	0.05
5	34.4550	73.5779	1	Chir	<i>Pinus roxburghii</i>	91.44	28.7	4,027.59	40.28	18.93	4.73
5	34.4550	73.5779	2	Chir	<i>Pinus roxburghii</i>	76.2	25	2,465.06	24.65	11.59	2.90
5	34.4550	73.5779	3	Chir	<i>Pinus roxburghii</i>	73.7	27	2,487.20	24.87	11.69	2.92
5	34.4550	73.5779	4	Chir	<i>Pinus roxburghii</i>	66.0	26	1,936.71	19.37	9.10	2.28
5	34.4550	73.5779	5	Chir	<i>Pinus roxburghii</i>	73.7	31	2,846.50	28.47	13.38	3.34
5	34.4550	73.5779	6	Chir	<i>Pinus roxburghii</i>	66.0	27.6	2,053.03	20.53	9.65	2.41
5	34.4550	73.5779	7	Chir	<i>Pinus roxburghii</i>	73.7	19.7	1,828.12	18.28	8.59	2.15
5	34.4550	73.5779	8	Chir	<i>Pinus roxburghii</i>	78.7	29.7	3,109.69	31.10	14.62	3.65
5	34.4550	73.5779	9	Chir	<i>Pinus roxburghii</i>	78.7	23.5	2,473.99	24.74	11.63	2.91
5	34.4550	73.5779	10	Chir	<i>Pinus roxburghii</i>	63.5	31.9	2,190.48	21.90	10.30	2.57



Plot No.	Latitude	Longitude	Tree ID	Species Name	Scientific Name	DBH (cm)	Tree height (m)	AGB (kg)	AGB (ton/ha)	AGC (ton/ha)	BGC (ton/ha)
5	34.4550	73.5779	11	Chir	<i>Pinus roxburghii</i>	91.4	35.5	4,957.24	49.57	23.30	5.82
5	34.4550	73.5779	12	Chir	<i>Pinus roxburghii</i>	50.8	36.7	1,624.39	16.24	7.63	1.91
5	34.4550	73.5779	13	Chir	<i>Pinus roxburghii</i>	76.2	35	3,424.13	34.24	16.09	4.02
5	34.4550	73.5779	14	Chir	<i>Pinus roxburghii</i>	63.5	32	2,197.18	21.97	10.33	2.58
5	34.4550	73.5779	15	Chir	<i>Pinus roxburghii</i>	73.7	3.9	375.83	3.76	1.77	0.44
6	34.3438	73.6763	1	Chir	<i>Pinus roxburghii</i>	73.7	35.6	3,258.36	32.58	15.31	3.83
6	34.3438	73.6763	2	Chir	<i>Pinus roxburghii</i>	50.8	22.6	1,011.67	10.12	4.75	1.19
6	34.3438	73.6763	3	Chir	<i>Pinus roxburghii</i>	68.6	31.3	2,499.05	24.99	11.75	2.94
6	34.3438	73.6763	4	Chir	<i>Pinus roxburghii</i>	58.4	24.1	1,415.36	14.15	6.65	1.66
6	34.3438	73.6763	5	Chir	<i>Pinus roxburghii</i>	81.3	34.3	3,808.31	38.08	17.90	4.47
6	34.3438	73.6763	6	Chir	<i>Pinus roxburghii</i>	63.5	33.9	2,324.51	23.25	10.93	2.73
6	34.3438	73.6763	7	Chir	<i>Pinus roxburghii</i>	83.8	28.8	3,409.60	34.10	16.03	4.01
6	34.3438	73.6763	8	Chir	<i>Pinus roxburghii</i>	99.1	21.6	3,567.77	35.68	16.77	4.19
6	34.3438	73.6763	9	Chir	<i>Pinus roxburghii</i>	83.8	26.3	3,120.23	31.20	14.67	3.67
6	34.3438	73.6763	10	Chir	<i>Pinus roxburghii</i>	81.3	28	3,123.56	31.24	14.68	3.67
6	34.3438	73.6763	11	Chir	<i>Pinus roxburghii</i>	61.0	18.5	1,187.96	11.88	5.58	1.40
7	34.4189	73.6932	1	Kail	<i>Pinus wallichiana</i>	45.72	19.8	693.83	6.94	3.26	0.82
7	34.4189	73.6932	2	Kail	<i>Pinus wallichiana</i>	53.3	17.4	812.41	8.12	3.82	0.95
7	34.4189	73.6932	3	Kail	<i>Pinus wallichiana</i>	58.4	26	1,358.50	13.58	6.38	1.60
7	34.4189	73.6932	4	Kail	<i>Pinus wallichiana</i>	40.6	18.4	528.53	5.29	2.48	0.62
7	34.4189	73.6932	5	Kail	<i>Pinus wallichiana</i>	52.1	22.7	984.18	9.84	4.63	1.16
7	34.4189	73.6932	6	Kail	<i>Pinus wallichiana</i>	47.0	19.9	731.39	7.31	3.44	0.86
7	34.4189	73.6932	7	Kail	<i>Pinus wallichiana</i>	48.3	18.8	729.12	7.29	3.43	0.86
7	34.4189	73.6932	8	Kail	<i>Pinus wallichiana</i>	41.9	21.9	650.49	6.50	3.06	0.76
7	34.4189	73.6932	9	Kail	<i>Pinus wallichiana</i>	41.9	22.6	668.77	6.69	3.14	0.79
7	34.4189	73.6932	10	Kail	<i>Pinus wallichiana</i>	53.3	26.9	1,192.52	11.93	5.60	1.40
7	34.4189	73.6932	11	Kail	<i>Pinus wallichiana</i>	50.8	17.7	756.80	7.57	3.56	0.89
7	34.4189	73.6932	12	Kail	<i>Pinus wallichiana</i>	50.8	20.1	846.51	8.47	3.98	0.99
7	34.4189	73.6932	13	Kail	<i>Pinus wallichiana</i>	40.6	19.8	563.80	5.64	2.65	0.66
7	34.4189	73.6932	14	Kail	<i>Pinus wallichiana</i>	7.6	5.3	9.24	0.09	0.04	0.01
7	34.4189	73.6932	15	Kail	<i>Pinus wallichiana</i>	5.1	4.1	3.61	0.04	0.02	0.00
8	34.3172	73.7071	1	Fir	<i>Abies pindrow</i>	61.0	36.4	1,941.29	19.41	9.12	2.28
8	34.3172	73.7071	2	Fir	<i>Abies pindrow</i>	55.9	35.5	1,621.94	16.22	7.62	1.91
8	34.3172	73.7071	3	Fir	<i>Abies pindrow</i>	61.0	37.5	1,994.19	19.94	9.37	2.34
8	34.3172	73.7071	4	Kail	<i>Pinus wallichiana</i>	40.6	32.7	877.16	8.77	4.12	1.03
8	34.3172	73.7071	5	Kail	<i>Pinus wallichiana</i>	50.8	33.7	1,334.63	13.35	6.27	1.57
8	34.3172	73.7071	6	Kail	<i>Pinus wallichiana</i>	38.1	30	725.64	7.26	3.41	0.85
8	34.3172	73.7071	7	Fir	<i>Abies pindrow</i>	61.0	33.8	1,815.65	18.16	8.53	2.13
8	34.3172	73.7071	8	Fir	<i>Abies pindrow</i>	74.9	36	2,789.83	27.90	13.11	3.28
8	34.3172	73.7071	9	Kail	<i>Pinus wallichiana</i>	10.2	3.5	10.65	0.11	0.05	0.01

Plot No.	Latitude	Longitude	Tree ID	Species Name	Scientific Name	DBH (cm)	Tree height (m)	AGB (kg)	AGB (ton/ha)	AGC (ton/ha)	BGC (ton/ha)
8	34.3172	73.7071	10	Kail	<i>Pinus wallichiana</i>	10.2	3.4	10.38	0.10	0.05	0.01
8	34.3172	73.7071	11	Kail	<i>Pinus wallichiana</i>	10.2	3.5	10.65	0.11	0.05	0.01
8	34.3172	73.7071	12	Kail	<i>Pinus wallichiana</i>	12.7	5	21.60	0.22	0.10	0.03
8	34.3172	73.7071	13	Kail	<i>Pinus wallichiana</i>	0.4	5	0.05	0.00	0.00	0.00
9	34.3163	73.7026	1	Fir	<i>Abies pindrow</i>	0.8	19.4	0.47	0.00	0.00	0.00
9	34.3163	73.7026	2	Kail	<i>Pinus wallichiana</i>	1.7	32.2	3.11	0.03	0.01	0.00
9	34.3163	73.7026	3	Kail	<i>Pinus wallichiana</i>	1.3	34.8	2.25	0.02	0.01	0.00
9	34.3163	73.7026	4	Kail	<i>Pinus wallichiana</i>	2.2	36.9	5.57	0.06	0.03	0.01
9	34.3163	73.7026	5	Kail	<i>Pinus wallichiana</i>	1.7	34.2	3.28	0.03	0.02	0.00
9	34.3163	73.7026	6	Kail	<i>Pinus wallichiana</i>	1.3	30.1	1.98	0.02	0.01	0.00
9	34.3163	73.7026	7	Kail	<i>Pinus wallichiana</i>	2.3	41.8	7.09	0.07	0.03	0.01
9	34.3163	73.7026	8	Kail	<i>Pinus wallichiana</i>	2.2	39.6	5.93	0.06	0.03	0.01
9	34.3163	73.7026	9	Kail	<i>Pinus wallichiana</i>	1.7	32.4	3.13	0.03	0.01	0.00
9	34.3163	73.7026	10	Kail	<i>Pinus wallichiana</i>	1.2	26.8	1.41	0.01	0.01	0.00
9	34.3163	73.7026	11	Kail	<i>Pinus wallichiana</i>	1.8	33.5	3.81	0.04	0.02	0.00
9	34.3163	73.7026	12	Kail	<i>Pinus wallichiana</i>	1.7	35.1	3.36	0.03	0.02	0.00
9	34.3163	73.7026	13	Kail	<i>Pinus wallichiana</i>	2.7	43.2	9.23	0.09	0.04	0.01
9	34.3163	73.7026	14	Kail	<i>Pinus wallichiana</i>	2.2	15.1	2.54	0.03	0.01	0.00
9	34.3163	73.7026	15	Kail	<i>Pinus wallichiana</i>	2.4	42	7.57	0.08	0.04	0.01
10	34.3790	73.6340	1	Kail	<i>Pinus wallichiana</i>	0.9	13	0.49	0.00	0.00	0.00
10	34.3790	73.6340	2	Kail	<i>Pinus wallichiana</i>	1.2	13.5	0.77	0.01	0.00	0.00
10	34.3790	73.6340	3	Kail	<i>Pinus wallichiana</i>	1.7	26	2.58	0.03	0.01	0.00
10	34.3790	73.6340	4	Kail	<i>Pinus wallichiana</i>	0.8	13	0.41	0.00	0.00	0.00
10	34.3790	73.6340	5	Kail	<i>Pinus wallichiana</i>	2.0	24	3.31	0.03	0.02	0.00
10	34.3790	73.6340	6	Kail	<i>Pinus wallichiana</i>	2.5	29	5.80	0.06	0.03	0.01
10	34.3790	73.6340	7	Kail	<i>Pinus wallichiana</i>	2.2	27	4.23	0.04	0.02	0.00
10	34.3790	73.6340	8	Kail	<i>Pinus wallichiana</i>	1.5	25	2.07	0.02	0.01	0.00
10	34.3790	73.6340	9	Kail	<i>Pinus wallichiana</i>	2.0	23.5	3.25	0.03	0.02	0.00

Annexure-2: Participatory Identification of the Stakeholders, DFA Lachrat

Stakeholder	INTEREST in Forest Management		INFLUENCE in Forest Mgt.t		INTEREST in Carbon Pool		INFLUENCE in Carbon Pool	
	Type of Interest	Level of Interest*	Type of Influence	Level of Influence*	Type of Interest	Level of Interest*	Type of Influence	Level of Influence*
Beneficiary Communities/ Concessionaire	Communities tend to protect forests hence cooperate with FD generally	Medium	Supportive, while, retaining concessionary rights	Medium	Wood/ timber, forage and grazing domestic animals besides other economic products	High	Communities tend to sustain forestry resources to meet their current and the future needs	High
The Political Government	Political Governments are inclined toward community interests	Medium	Being decision maker have high influence	High	Short term vision whereas REDD+ is long term	Low	Supportive of forest concessions in favour of communities	Low
Dolomite and Coal mining contractors	Construction material and coal miners have no interest in forest management rather want to continue business at the cost of forest	Negative	The lobby against FD to continue their business in the forestland irrespective of conservation requirements	Negative	None, they tend to expend mining areas	None	They lobby against forests extension on mining area	None
Forests Department	Forest management and planning, policing forests, administering concessions and facing accountability	High	Specialized GLD vested with authority of the State Forests management under the Rules of Business of GoAJK.	High	All five carbon pools	High	Draw legal framework and implement, control management, take admin and technical decisions and own Carbon credits in State Forests	High
Wildlife & Fisheries Department (W&FD)	Wildlife, particularly the game animals and biodiversity of flora/ fauna conservation and the management of protection area network	High	Sate own the wildlife resources, there are no concessions and W&FD is vested with the management of PAS	High	All 5 carbon pools with respect to PA network	High	Draw legal framework and implement, control management, take admin and technical decisions and own Carbon credits in PA Network	High

Stakeholder	INTEREST in Forest Management		INFLUENCE in Forest Mgt.t		INTEREST in Carbon Pool		INFLUENCE in Carbon Pool	
	Type of Interest	Level of Interest*	Type of Influence	Level of Influence*	Type of Interest	Level of Interest*	Type of Influence	Level of Influence*
Tourism Department	Natural resource conservation, forestry extension and water resource development for ecotourism research, education, site seeing and solitude	Low	Being GLD can lobby for the forest protection, extension & conservation with object of promoting eco-tourism	Medium	Pristine forest areas, wilderness areas and relict tree grooves, besides many historic and religious site in the State Forests area commanding respect from people and conserve lot of carbon stock	Medium	Tremendous potential of eco-tourism development in the State, which can help conserve and enhance forests carbon stock	Medium
AJK Environment Protection Agency	GHG emissions reduction, carbon sequestration/ enhancement with the object of pristine environment protection and enrichment	Low	Being a GLD can lobby for the forest's protection, extension & conservation to sequester atmospheric carbon, besides legal action against environment offenders	Medium	All 5 carbon pools	Medium	Lobbying and to some extent legal actions against offenders	Medium
Land Use Planning Cell (LUPC) P&DD	Afforestation	Low	LUPC may promote and pursue implementation of land use recommendations through the approval of the State Land Use Policy	Medium	All 5 carbon pools	Medium	Implementation of Sub-watershed-based Land Use Plans/ informal land-use policy	Medium

Stakeholder	INTEREST in Forest Management		INFLUENCE in Forest Mgt.t		INTEREST in Carbon Pool		INFLUENCE in Carbon Pool	
	Type of Interest	Level of Interest*	Type of Influence	Level of Influence*	Type of Interest	Level of Interest*	Type of Influence	Level of Influence*
Transhumant Grazers (Bakarwals)	Reforestation	High	Grazing in the pasture is one of their basic human rights	Low	Grasses, forage, fuel wood and economic herbs	Low	Animal grazing in pasture lands is their usufruct right	Low
Livestock/ Animal Husbandry Department	Forest degradation in terms of land use changes impacting forests carbon stock, hence is the main focus of rural land use planning in AJK which is mandated to LUPC	Low	Animal grazing	Medium	Grasses, forage	Medium	Animal grazing in pasture lands	Medium
Irrigation & Small Dams Department	Grasses, forage, fuel wood and economic herbs	Low	Watershed protection	Medium	Protective vegetative cover	Medium	Hill slope protection	Medium
NGOs/ INGOs and Dev. Agencies pursuing SDGs, NRM, environment protection (e.g., IUCN, WWF, Wildlife Foundation) and RSPs.	Sustainable natural resource management, climate change adverse impacts mitigation and adaptation through forest conservation, extension and sustainable management	High	Promote SDG	Medium	All 5 carbon pools	High	Realizing vast potential of Forests Carbon Stock enhancement, which exist in AJK	Medium
Revenue Department	Owner of forestland record	Low	Environment Protection & Enrichment	Medium	None	0	None	0
Police Department	Crime control	Low	Crime control	Low	None	0	None	0

Stakeholder	INTEREST in Forest Management		INFLUENCE in Forest Mgt.t		INTEREST in Carbon Pool		INFLUENCE in Carbon Pool	
	Type of Interest	Level of Interest*	Type of Influence	Level of Influence*	Type of Interest	Level of Interest*	Type of Influence	Level of Influence*
Mineral Department	Despite being GLD, issues mining permits of coal and dolomite mining in forestland irrespective of environmental consideration	None	Entrusted with mining regulation authority tend to support mining without environment protection measures	High	None	0	Influence on clearing area of vegetation and fertile soils in favour of mining	0
<b>CONTROLLERS:</b>		<b>HIGH INFLUENCE, LOW INTEREST:</b>		The State Government, the Ministries of Forests & Wildlife				
<b>MAJOR PLAYERS:</b>		<b>HIGH INFLUENCE, HIGH INTEREST:</b>		Forests Department, Wildlife Department and Dependent Communities				
<b>NEGELECTED PLAYERS:</b>		<b>LOW INFLUENCE, HIGH INTEREST:</b>		Transhumant Grazers, Landless People, Destitute, Services Cast Groups				
<b>MARGINAL PLAYERS:</b>		<b>LOW INFLUENCE, LOW INTEREST:</b>		All other GLDs linked with the Climate Change Mitigation and Stakeholders				

Annexure-3: Participatory analysis of the Stakeholders' Interests and Influences in Management of DFA Lachrat and Carbon Pool

Stakeholder	INTEREST in Forest Management		INFLUENCE in Forest Management		INTEREST in Carbon Pool		INFLUENCE in Carbon Pool	
	Type of Interest	Level of Interest*	Type of Influence	Level of Influence*	Type of Interest	Level of Interest*	Type of Influence	Level of Influence*
Beneficiary Communities/ Concessionaire	Communities tend to protect forests hence cooperate with FD generally	1	Supportive, while, retaining concessionary rights	2	Wood/ timber, forage and grazing domestic animals besides other economic products	3	Communities tend to sustain forestry resources to meet their current and the future needs	3
The Political Government	Political Governments are inclined toward community interests	1	Being decision maker have high influence	3	Short term vision whereas REDD+ is long term	1	Supportive of forest concessions in favor of communities	1
Dolomite and Coal mining contractors	Construction material and coal miners have no interest in forest management rather want to continue business at the cost of forest	Negative	The lobby against FD to continue their business in the forestland irrespective of conservation requirements	None	None, they tend to expend mining areas	None	They lobby against forests extension on mining area	None
Forests Department	Forest management and planning, policing forests, administering concessions and facing accountability	3	Specialized GLD vested with authority of the State Forests management under the Rules of Business of GoAJK.	3	All five carbon pools	3	Draw legal framework and implement, control management, take admin and technical decisions and own Carbon credits in State Forests	3
Wildlife & Fisheries Department (W&FD)	Wildlife, particularly the game animals and biodiversity of flora/ fauna conservation and the management of protection area network	3	Sate own the wildlife resources, there are no concessions and W&FD is vested with the management of PAs	3	All 5 carbon pools with respect to PA network	3	Draw legal framework and implement, control management, take admin and technical decisions and own Carbon credits in PA Network	3

Tourism Department	Natural resource conservation, forestry extension and water resource development for ecotourism research, education, site seeing and solitude	1	Being GLD can lobby for the forest protection, extension & conservation with object of promoting eco-tourism	2	Pristine forest areas, wilderness areas and relict tree grooves, besides many historic and religious site in the State Forests area commanding respect from people and conserve lot of carbon stock	2	Tremendous potential of eco-tourism development in the State, which can help conserve and enhance forests carbon stock	2
AJK Environment Protection Agency	GHG emissions reduction, carbon sequestration/enhancement with the object of pristine environment protection and enrichment	1	Being a GLD can lobby for the forest protection, extension & conservation to sequester atmospheric carbon, besides legal action against environment offenders	2	All 5 carbon pools	2	Lobbying and to some extent legal actions against offenders	2
Land Use Planning Cell (LUPC) P&DD	Afforestation	1	LUPC may promote and pursue implementation of land use recommendations through the approval of the State Land Use Policy	2	All 5 carbon pools	2	Implementation of Sub-watershed-based Land Use Plans/ informal land-use policy	2
Transhumant Grazers (Bakarwals)	Reforestation	3	Grazing in the pasture is one of their basic human rights	1	Grasses, forage, fuel wood and economic herbs	1	Animal grazing in pasture lands is their usufruct right	1
Livestock/ Animal Husbandry Department	Forest degradation in terms of land use changes impacting forests carbon stock, hence is the main focus of rural land use planning in AJK which is mandated to LUPC	1	Animal grazing	2	Grasses, forage	2	Animal grazing in pasture lands	2



Irrigation & Small Dams Department	Grasses, forage, fuel wood and economic herbs	1	Watershed protection	2	Protective vegetative cover	2	Hill slope protection	2
NGOs/ INGOs and Development Agencies pursuing SDGs, NRM, Environment Protection (e.g. IUCN, WWF, Wildlife Foundation ) and RSPs	Sustainable natural resource management, climate change adverse impacts mitigation and adaptation through forest conservation, extension and sustainable management	3	Promote SDG	2	All 5 carbon pools	3	Realizing vast potential of Forests Carbon Stock enhancement, which exist in AJK	2
Revenue Department	Owner of forestland record	1	Environment Protection & Enrichment	2	None	0	None	0
Mineral Department	Despite being GLD, issues mining permits of coal and dolomite mining in forestland irrespective of environmental consideration	None	Entrusted with mining regulation authority tend to support mining without environment protection measures	3	None	0	Influence on clearing area of vegetation and fertile soils in favor of mining	0

*Scale	Level of interest	level of influence
0	None	Negligible or ignored
1	Little	Little
2	Significant	Significant
3	High/vital for existence	Controller

## Annexure-4: Socio-economic Data Matrix, DFA Lachrat

**Socio-economic Data Matrix, DFA Lachrat**

<b>I</b>		<b>Stakeholder group (name)</b>	Board of Lachrat Conservation VCOs ( <i>Ad hoc</i> )
<b>II</b>		<b>General information</b>	
	1	Social Organizations	
		Location of stakeholder groups (e.g., different villages/hamlets in and outside forest area): names and indicate on map, if possible	Govt. of AJK has covered whole AJK under a VCOs network by implementing series of the rural development project, with donors' and local ADP's funding. Heads of these VCOs from Lachrat DFA were invited to participate in FFMP DFA Lachrat planning consultation. They were advised to organize into VCOs' apex body on <i>ad hoc</i> basis for REDD+ Programme planning and inception, would be formalized into Lachrat Conservation VCO Board on inception of RDD+ Programme. They agreed and participated in the planning of PFMP DFA Lachrat.
<b>III</b>		<b>Social organization in the forest area</b>	
	2	<i>Traditional organizations (e.g., Jirga</i>	
	2.1	Organization (name; purpose; membership)	The traditional Jirga in each village is formed by a loose assembly of respectable elderly men who have a proven track record of problem solving and consensus building ability amongst the communities. Jirga members are not necessarily the ones that were chosen to represent sections of the community with outsiders. Qualities such as concern for the community, fairness, honesty, honour and integrity are considered more important than outside exposure and social contacts. On the knowledge of local forestry staff Jirga Members were invited in the consultation who willingly participated and contributed.
	3	<i>Formal organizations (e.g., social welfare organizations; village development committees)</i>	There is no DFA Lachrat specific social welfare organization, however a number NGO with wider coverage also operate in the DFA Lachrat.
<b>IV</b>		<b>Use of forest and forest area</b>	
	4	For what are you using the forest area?	Forests are generally used by the local communities for receiving forest concessions. The concessions are granted in the State forests and village forests for domestic and agricultural uses to the landowners and tenant farmers residing within a 4.8 KM radius of the forest boundary. The concession rights include; grazing, grass cutting and the collection of forage and timber (excluding Deodar wood) for domestic/ personal use. The forests are also used by transhumant grazers for summer grazing and for eco-tourism by outside visitors. There is some mining activity also by contractors.
	5	What would it mean if you had no access to these forest products? (Any alternatives? Threat to livelihood?)	Only affluent people can by alternatives. Forests concessions are their centuries old traditional right for their survival. These concessions can be exchange with alternative means of livelihood.
<b>V</b>		<b>Rights and concessions in forest area</b>	
	6	Do you have formal, legal, or traditional, customary rights on forest products (use)? Which ones? If documented rights, where?	Forest concessions are granted to Zamindars (those who cultivate the land as landowners, Assamis or tenants) as well as the traditional artisan groups that

			<p>reside and are employed permanently in villages that lie within five km of the demarcated forest boundary. The concessions are for agricultural and domestic purposes and not for sale, barter or transfer in any way. They are also subject to the availability of trees, keeping forest conservation in due regard. The concessions include (Source; Forests Law Manual):</p> <ul style="list-style-type: none"> <li>• The right to graze livestock and to cut grass;</li> <li>• To pass livestock freely through the forests;</li> <li>• Timber for house building and repairing at 12.5 percent of standard rates; zamindars living 5-8 km from the forest boundary are allowed timber at 50 percent of the standard rates;</li> <li>• Fallen and dead trees are free; and free grants of timber if the house is destroyed by fire or natural disasters;</li> <li>• Free firewood for domestic use; timber for public use such as building bridges;</li> <li>• Lopping of branches no thicker than a man's wrist;</li> <li>• Free access to brush wood.</li> </ul>
<b>VI</b>		<b>Control of forest area</b>	
	7	Who is controlling access to the forest area?	Forests Department controls demarcated forests. Communities help Forests Department in cognizance of forest offences.
	8	What are forest control mechanisms? E.g., watch and ward; herdsmen; fencing; providing permits.	Forest policing by forestry staff. There is no fencing, no permit system. Reforestation plantations are protected by watchers.
	9	Explain control mechanisms	Forest territorial staff with cooperation of concessionary communities protect state demarcated forests. Some villages have constituted informal forest protection committees, who don't allow outsiders to harvest forest products or graze animals.
<b>VI</b>		<b>Changes over time in forest area</b>	
	10	What changes took place regarding the availability of forest products (timber; firewood; grasses; NTFP) during the last 30 years?	Forests productivity has gone down. Forest cover has contracted to far flung area. Soil erosion and landslides are common phenomena. Forestry concessions are getting more and more difficult to benefit from. Exciting wildlife species are scarce. Livelihoods are diminishing.
	11	What are according to you the reasons for change?	Pressure of increasing population demands i.e. firewood and timber. Overgrazing, bushfires, road construction, joblessness and poverty are the main causes of forests degradation.
	12	Were there any efforts in the past for forest restoration and by whom?	Yes, Forests Department in implementing development projects, also communities have become vigilant to conserve natural resources. Reforestation and watershed projects did good development works.
<b>VIII</b>	13	<b>Main problems</b>	
		What are the main problems in forest management with respect to; rights,	The demographic pressure and finance resource deficiency, which include;

		protection, conflicting uses, managing drivers of deforestation and degradation etc.	<ol style="list-style-type: none"> <li>1) Lack of natural regeneration due to the indiscriminate overgrazing of forests, pastures and community grasslands;</li> <li>2) Encroachments on forestland;</li> <li>3) Rural road construction;</li> <li>4) Forests fires;</li> <li>5) The ever-increasing burden of forest concessions on the nearby forests, beyond their sustainable rejuvenation capacity, and;</li> <li>6) Illicit cutting of trees from public forests for personal gains.</li> <li>7) Biomass productivity of rangelands has gone down to almost 35%;</li> <li>8) There is no rest period for flowering and seeding for good fodder and forage species;</li> <li>9) No range rehabilitation or development programme is under implementation, and;</li> <li>10) No credible database on range carrying capacity and current status.</li> </ol>
<b>IX</b>		<b>Conflicts / disputes</b>	
	14	<p><i>On different land uses:</i> Describe nature of conflict, between which groups and put location on map if possible and impacts of the conflicts.</p>	<ol style="list-style-type: none"> <li>1) Award of forestland for public infrastructure i.e. governance infrastructure;</li> <li>1) Rural road construction through the forests mostly and consequently land encroachment along roadsides by business enterprises;</li> <li>2) Extensive mining in forests areas;</li> <li>3) Intentional bushfires to convert forests into grassland and for encroachment;</li> </ol> <p>All above conflicts impact forests management adversely.</p>
	15	<p><i>On social issues:</i> Describe nature of conflict, between which groups and put location on map if possible</p>	None.
	16	<p><i>Existing Conflict resolution mechanisms:</i></p> <ul style="list-style-type: none"> <li>- traditional (e.g. Jirga)</li> <li>- formal (court)</li> </ul>	Forests Department compound offence cases, forest courts and higher judiciary settle forest cases in case of appeal, Revenue Department settle land ownership issues. There is no traditional Jirga for settlement of forest disputes.
<b>X</b>		<b>Other Forest Management Projects</b>	
	17	There is any other Forest Management Projects in the area? If so, which projects? What are their activities?	<p>Yes, the most promising ones are;</p> <ol style="list-style-type: none"> <li>1) Ten Billion Tree Tsunami Project, and;</li> <li>2) Demarcation of Forests Boundaries.</li> </ol>
<b>XI</b>		<b>Recommendations</b>	
	18	What are your recommendations for forest management activities?	<p>Possible strategies to combine are:</p> <ol style="list-style-type: none"> <li>1) Planting additional trees on forests and private lands;</li> <li>2) Increasing productivity of public forests by planting blank forest areas and employing joint forests management by the State and beneficiary communities;</li> <li>3) Reducing inefficient wood utilization;</li> <li>4) Wasting less wood in dispensing forests concessions;</li> <li>5) Replacing wood with viable alternatives;</li> </ol>

			<ul style="list-style-type: none"> <li>6) Ensuring communities' responsibility for sustainable natural resource management;</li> <li>7) Exclusion of grazing animals and utilization of range resource by cut and carry;</li> <li>8) Arranging fodder or increasing range production on marginal agriculture land;</li> <li>9) Reducing number of animals to range carrying capacity of rangelands;</li> <li>10) Providing animal health and related services;</li> <li>11) Re seeding of palatable species and eradication of weeds in pastures;</li> <li>12) A comprehensive range resources study;</li> <li>13) Ensuring participation of pastoralist communities in the range management programme on the lines of social forestry programme, and;</li> <li>14) Integrating women into livestock management extension services.</li> </ul>
	19	Specific Recommendation to embark upon REDD+ Programme on pilot and full scale	<p>In order to proceed toward REDD+ implementation on pilot basis and full scale it would be ideal to;</p> <ul style="list-style-type: none"> <li>1. Review and work on human and institution capacity building i.e. Forests Department, VCOs and the concerned line departments;</li> <li>2. Review and implement climate change mitigation options;</li> <li>3. Review and implement climate change adaptation options;</li> <li>4. Seek different source and modalities of financing options, and;</li> <li>5. Integrate REDD+ with forests management and implementation should involve deep engagement with extended stakeholders including beneficiary communities, civil society organization and the finance sector.</li> </ul>

