DRAFT

NATIONAL ACTION PLAN FOR FOREST AND LANDSCAPE RESTORATION IN PAKISTAN

MINISTRY OF CLIMATE CHANGE
GOVERNMENT OF PAKISTAN
2023

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ACRONYMS

AJK	Azad Jammu and Kashmir
BTAP	Billion Trees Afforestation Project
BTTP	Billion Trees Tsunami Project
FAO	Food and Agriculture Organization
FD	Forest Department
FLR	Forest and Landscape Restoration
GB	Gilgit Baltistan
GCF	Green Climate Fund
GEF	Global Environment Facility
GIS	Geographic Information System
GoP	Government of Pakistan
ha	Hectare
ICT	Islamabad Capital Territory
INRM	Integrated Natural Resource Management
IUCN	International Union for Conservation of Nature
KP	Khyber Pakhtunkhwa
mm	Millimeter
m^3	Cubic meter
MoCC	Ministry of Climate Change
NCS	National Conservation Strategy
NDCs	Nationally Determined Contributions
NGO	Non-Governmental Organization
NTFPs	Non-timber Forest Products
PFI	Pakistan Forest Institute
PKR	Pakistani Rupees
REDD+	Reducing Emissions for Deforestation and Forest Degradation, Conservation of Carbon Stock, Enhancement of Carbon Stock and Sustainable Forest Management
SDG	Sustainable Development Goal
SFM	Sustainable Forest Management
SLMP	Sustainable Land Management Project
UN	United Nations
UNCBD	United Nations Convention on Biodiversity
UNCCD	United Nations Convention TO Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WFP	World Food Programme
WWF	World Wide Fund
WRI	World Resources Institute

PREFACE

The forest and landscape restoration (FLR) approach has gained momentum at global, national and subnational scales in recent years. The concept is based on the recognition that trees and forests comprise critical components of rural landscapes and that diversification at landscape levels can enhance ecological and socio-economic resilience while accommodating different site conditions and land management goals. FLR is crucial not only for ensuring the sustainability of vital ecosystem services from the landscapes but also for nature based solutions for climate change mitigation and adaptation.

Asia and Pacific region has a vast scope for FLR and several initiatives are already underway in the region to reverse degradation and restore forests and other landscapes. Various international and national commitments and the emerging of a wide range of financing prospects for FLR now provide new opportunities to scale up efforts to effectively restore vast areas of degraded forests and landscapes of the Asia-Pacific region. In order to streamline and upscale these efforts, FAO prepared a Regional Strategy and Action Plan for Forest and Landscape Restoration in the Asia-Pacific region. This regional Strategy and Action Plan is now being downscaled to national level to identify FLR approaches and actions which are more suited to national and local circumstances.

Pakistan is one of those countries which face severe form of forest and land degradation due to numerous anthropogenic and climatic factors. Population pressure, poverty, deforestation, unsustainable practices, overgrazing, soil erosion, soil salinity and water logging, water scarcity, frequent droughts, and the lack of integrated land use plans are the key causes of forest and land degradation. In order to reverse the process of degradation and restore degraded landscapes, several initiatives have been undertaken by the Government including the mega afforestation and reforestation billion trees programme, the initiation of REDD+ programme, increasing the percentage of protected areas in the country and implementation of GEF funded SFM project and restoration of Chilghoze pine forests in the country.

The current National Action Plan for Forest and Landscape Restoration was developed by Pakistan Forest Institute in collaboration with a wide range of stakeholders including government departments, NGOs, academia, research organizations and local communities through technical and financial support of FAO. This document outlines key strategic areas and actions and identifies potential landscapes for FLR in all provinces and territories of the country. It will contribute in mainstreaming FLR in national and subnational planning framework and sustainability of full spectrum of ecosystem services and livelihood improvement of the local communities. This will become a vehicle for bilateral and multilateral funding from national and international sources in the future.

EXECUTIVE SUMMARY

Forest and landscape restoration (FLR) is a planned process "that brings people together to identify, negotiate and implement practices that restore an agreed optimal balance of the ecological, social and economic benefits of forests and trees within a broader pattern of land uses". FLR has gained momentum in recent years across the globe due to international commitments by countries to restore large tracts of degraded forests and other ecosystems. In order to streamline and upscale these efforts, FAO prepared a Regional Strategy and Action Plan for Forest and Landscape Restoration in the Asia-Pacific region. One of the key action under this regional strategy is to support the development and implementation of national FLR plans and targets.

The current National Action Plan for Forest and Landscape Restoration was developed by Pakistan Forest Institute in collaboration with a wide range of stakeholders including government departments, NGOs, academia, research organizations and local communities through technical and financial support of FAO. The main objectives of the action plan include the following:

- Help identify strategic priorities and take actions for FLR at different levels in Pakistan through collaboration and consultation of stakeholders.
- Guide government agencies, non-governmental organizations, private actors and local communities to undertake FLR in Pakistan.
- Mainstream FLR in other relevant national/sub-national initiatives, in the forest conservation and development programmes in the country.
- Support restore degraded forests and other landscapes for ensuring the sustainability of full spectrum of ecosystem services and livelihood improvement of the local communities.
- Identify national and international partners and donors for financing FLR implementation

Landscape degradation is widespread in Pakistan ranging from agricultural land to rangelands and community forests and woodlots to natural forests. All these landscapes can be restored through different FLR options. Depending upon the local conditions, wide scale or mosaic restoration can be adopted in different landscapes. For landscapes where forest is the dominant land use and the area is suitable for wide-scale restoration, natural regeneration and establishment of woodlots or plantations are the recommended options for landscape restoration. For lands which are managed to produce food and which are suitable for mosaic restoration, agroforestry and improved fallows systems are recommended. Finally, for lands that are vulnerable to or critical to safeguarding against soil erosion and catastrophic events, land stabilization and watershed protection or mangroves plantations are the recommended option for landscape restoration.

Keeping in view the current state of degradation and potential for restoration, the following seven priority areas have been identified to restore degraded landscapes in different parts of Pakistan. A list of selected landscapes having potential for FLR is given at Annex-II.

1. Restoration of landscapes where natural forests are the dominant landuse
2. Restoration of landscapes where Community forests, woodlots and plantations are the dominant landuse
3. Restoration of Degraded Watersheds and other vulnerable lands
4. Restoration of landscapes where Rangelands are the dominant landuse
5. Restoration of Marginal Agricultural Lands
6. Creation of enabling environment for FLR in Pakistan
7. Human, Technical and Institutional Capacity

Sixteen strategic priorities and 111 actions have been identified for short term (1-5 years), medium term (5-10 years) and long term (10-20 years). Different actors have also been identified for implementation of these interventions. Resource mobilization options have also been provided in the document. The action plan has also identified and mapped potential landscapes and targets for FLR in all provinces and territories of the country.

1. INTRODUCTION

1.1. Background

Forest and landscape restoration (FLR) is a planned process "that brings people together to identify, negotiate and implement practices that restore an agreed optimal balance of the ecological, social and economic benefits of forests and trees within a broader pattern of land uses".[1] . It integrates restoration work in the forest with other activities across the landscape for achieving optimum productivity, both in economic and ecological terms. It involves increasing the number and/or health of trees in an area, including watersheds, valleys, districts, or even regions in which many land uses interact. It aims at bringing back the biological productivity and ecological functions of an area. It requires a multi-year vision of the ecological functions and benefits to human well-being that restoration will produce (IUCN, and WRI, 2014).

FLR is more than just planting trees - it is restoring a whole landscape containing multiple land uses and offering multiple benefits over time such as climate change mitigation, biodiversity conservation, watershed protection, timber production and livelihood enhancement. FLR is undertaken through the full participation of the people who will have a crucial role in the management of the restored lands (FAO & APFNet, 2018).

A landscape can contain a mosaic of land uses from natural forests, secondary forests and timber plantations to agricultural and degraded lands. Depending on the stakeholders, restoration efforts vary. Individual farmers may seek economic gains, whereas government agencies may pursue ecological and environmental benefits. Restoration has to, therefore, meet the needs of various stakeholders in terms of land use, species suitability and people's needs (IUCN, and WRI, 2014). FLR attempts to bring a balance between conservation and production issues by first paying attention to the causes of forest loss and degradation, engaging stakeholders in removing conflict over landuse planning and sharing of benefits, and negotiating trade-offs that are acceptable to all, including biodiversity conservation and a range of other benefits.

FLR has gained momentum in recent years across the globe due to international commitments by countries to restore large tracts of degraded forests and other ecosystems. The REDD+[2] mechanism of the United Nations Framework Convention on Climate Change (UNFCCC); the Convention on Biological Diversity (CBD) Aichi Target 15 to restore at least 15 percent of degraded ecosystems by 2020; the post-2020 global biodiversity framework; UNCCD Land Degradation Neutrality Targets, the Global Forest Goals; Sustainable Development Goal (SDG) 15.2 to restore degraded forest and substantially increase afforestation and reforestation

[1] The Global Partnership on Forest and Landscape Restoration

[2] REDD+ stands for countries' efforts to reduce emissions from deforestation and forest degradation, conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon stocks.

and SDG 15.3 on land degradation neutrality; and the Bonn Challenge to restore 150 million hectares of deforested and degraded land by 2020 and 350 million hectares by 2030 are some of the key instruments that have brought FLR to the international discourse.

FLR has been extensively practiced in different countries of the Asia-pacific region in the past. Several countries in the region have implemented large-scale nationwide reforestation, afforestation and/or forest rehabilitation projects over the last few decades. Efforts are also underway to restore degraded forest and other landscapes as part of the countries' commitments under NDCs and other international commitments. However, some reforestation efforts have focused on extensive monoculture plantations of exotic species, and the establishment of native and mixed species forests focusing on ecological and local benefits has largely been ignored.

For scaling up FLR, a Regional Strategy and Action Plan for Forest and Landscape Restoration in Asia-Pacific (APFLR)[3] has been prepared, primarily covering the member countries of the Asia-Pacific Forestry Commission (APFC). The Regional Strategy and Action Plan is aimed at supporting efforts to advance implementation of FLR, including through mobilization of financing; strengthening stakeholders' engagement, scientific basis, and ecological, social and economic sustainability of FLR efforts; and enhancing learning, collaboration and coordination on FLR across the region. The following six strategic priority areas alongwith 30 actions have been identified by APFLR:

- Support the development and implementation of national FLR plans and targets
- Promote regional dialogue, learning, collaboration and coordinated action on FLR
- Build recognition for and support the use of various technical, social and institutional approaches as appropriate for different landscapes and restoration objectives
- Facilitate and support the mobilization of financing for FLR
- Encourage private sector participation and investment in FLR
- Support community-level action on FLR

The current National Action Plan for FLR in Pakistan was developed by Pakistan Forest Institute (PFI) with technical and financial support of FAO and participation of a wide range of stakeholders at national and provincial levels. The National Action Plan covers all the provinces and territories of Pakistan including Gilgit Baltistan and Azad Jammu & Kashmir.

1.2. Objectives

The main objectives of the National Action Plan are as follows:

- Help identify strategic priorities and take actions for FLR at different levels in Pakistan through collaboration and consultation of stakeholders.
- Guide government agencies, non-governmental organizations, private actors and local communities to undertake FLR in Pakistan.

[3] https://www.fao.org/3/i8382en/I8382EN.pdf

- Mainstream FLR in other relevant national/sub-national initiatives, in the forest conservation and development programmes in the country.
- Support restore degraded forests and other landscapes for ensuring the sustainability of full spectrum of ecosystem services and livelihood improvement of the local communities.
- Identify national and international partners and donors for financing FLR implementation

1.3. Guiding Principles

The guiding principles for FLR in Pakistan are based on the strategic priorities outlined in the Regional Strategy and Action Plan and the Principles of UN Decade of Ecosystem Restoration[4] which are listed below:

i. Ecosystem restoration contributes to the UN Sustainable Development Goals and the goals of the Rio conventions.
ii. Ecosystem restoration promotes inclusive and participatory governance, social fairness and equity from the start and throughout the process and outcomes.
iii. Ecosystem restoration includes a continuum of restorative activities.
iv. Ecosystem restoration aims to achieve the highest level of recovery for biodiversity, ecosystem health and integrity, and human well-being.
v. Ecosystem restoration addresses the direct and indirect causes of ecosystem degradation.
vi. Ecosystem restoration incorporates all types of knowledge and promotes their exchange and integration throughout the process.
vii. Ecosystem restoration is based on well-defined short-, medium- and long-term ecological, cultural and socio-economic objectives and goals.
viii. Ecosystem restoration is tailored to the local ecological, cultural and socioeconomic contexts, while considering the larger landscape or seascape.
ix. Ecosystem restoration includes monitoring, evaluation and adaptive management throughout and beyond the lifetime of the project or programme.
x. Ecosystem restoration is enabled by policies and measures that promote its long-term progress, fostering replication and scaling-up.

2. PROCESS OF DEVELOPING THE NATIONAL ACTION PLAN

2.1 Review and Analysis of Existing Policies, Strategies and Action Plans

A number of policies, strategies and action plans provide strategic and operational guidance for FLR. An extensive review was, therefore, conducted to analyze and identify the relevant strategies, provisions, measures and actions contained in these documents for FLR and build on these frameworks while developing a NAP for FLR in the country. The following documents are worth mentioning in particular:

[4] Principles for Ecosystem Restoration to Guide the United Nations Decade 2021–2030

- National Forest Policy (2015)
- National Conservation Strategy (1992)
- Forestry Sector Master Plan (1992)
- Climate Change Policy (2021)
- National Agriculture and Food Security Policy (2018)
- National Rangeland Policy (Draft) (2010)
- National REDD+ Strategy (2018)
- National Biodiversity Strategy and Action Plan (2017-2030)
- National Action Programme to Combat Desertification in Pakistan (2022)
- Updated Nationally Determined Contributions (2021)
- Provincial Forest Policies
- Provincial REDD+ Strategies
- Provincial Climate Change Policies and Action Plans
- Provincial Biodiversity Conservation Strategies and Action Plans

2.2 Consultation with Stakeholders

An extensive consultation process was conducted with the relevant stakeholders. This includes the Ministry of Climate Change, Pakistan Agricultural Research Council, Provincial Forest Departments, Wildlife Departments, Agricultural Departments, Livestock Departments, Soil Conservation Departments, International Organizations, Non-Governmental Organizations, Academia, Private Sector, Women and local communities. These stakeholders shared their experiences, insights, success stories, demands, priorities, opportunities and challenges for development of National Action Plan for FLR. A detail account of the consultative process is given at Annex-III.

2.3 Implementation of NAP

Once finalized, the Action Plan will be shared with provinces and other stakeholders for their endorsement. The Action Plan will then be shared with the Ministry of Climate Change for sharing with all concerned ministries, provinces and other national and international organizations for implementation.

A national level workshop was organized on November 22-23, 2022 at Pakistan Forest Institute, Peshawar under the auspices of the Ministry of Climate Change, FAO and the World Bank which was attended by 75 representatives of national and provincial government departments, NGOs, Civil Society Organizations, Academia, Research, media and local communities who deliberated upon the role of landscape and ecosystem restoration in socio-economic development of Pakistan. The workshop participants unanimously adopted a “Resolution for integration of landscape and ecosystem restoration in national resilience framework and development planning”. The Resolution is given at Annex 1.

3. SITUATION ANALYSIS

3.1 Location, Land Area and Population

Pakistan is a subtropical country located in South Asia at latitude 24 °N to 36 °N and longitude 61.5 °E to 76.5 °E. It has got a uniquely diverse topography with world famous mountain ranges, the Himalayas, the Karakoram and the Hindu Kush lying in the north and northwest and vast deserts of Thal, Cholistan, Thar and shores of Arabian Sea in the south. Geographically three significant regions are lowlands along Indus in the south and east, the arid plateau of Balochistan in southwest and lofty mountains in the north (Sarfarz, 2014). These variations in altitude and topography results in diversity of climate, landscapes and ecosystems.

The official country territory, as reported and published by the Survey of Pakistan, is 796,096 km^2 including Islamabad Capital Territory (ICT), Punjab, Sindh, Khyber Pakhtunkhwa and Balochistan. Gilgit-Baltistan and Azad Jammu and Kashmir are referred to as "Disputed Territory" without demarcating the international border by Survey of Pakistan. Therefore, the land areas of these two provinces are not officially published, however, they have the status of federating units or regions. Pakistan is mainly a dry land country with 80 percent of its land falling in arid and semi-arid areas. Grassland and cropland are the major landuses with 50% and 29% area respectively. Forests cover only 5% of the total land. Rest of the land (16%) comprises settlements, wetlands and other lands (PFI, 2012).

Pakistan is 5^{th} most populous country in the world. According to the World Population Review (WPR,2022), the estimated population of Pakistan is 236 million in 2022 of which 40% reside in urban areas, whereas 60% live in rural areas and the population density is 282 per Km^2. The total population of Pakistan was 207.8 million in 2017 which grew to 236 million in 2022 showing an annual growth rate of 2%. At an average economic growth rate of 4.9 percent from 1952 to 2015 (GoP, 2016), with increase to 5.4 percent on average from 2016 to 2018 (GoP, 2018), Pakistan is classified primarily as a lower middle-income and agrarian country. The population directly and indirectly associated with the agriculture sector is estimated to be 42.3 percent (GoP, 2017a) with a contribution of 18.9 percent to the overall GDP of the country.

Pakistan's natural resources including forests and land are under tremendous pressure due to high population growth rate and the resultant demands for timber, fuelwood, food, settlements and infrastructure. Deforestation and land degradation are serious environmental issues in Pakistan. According to FAO (2020) Pakistan has lost its 25% forest cover in the last three decades. Several socio-economic factors including population pressure, poverty, complex land tenure, ineffective policies and weak implementation of laws are some of the major drivers of deforestation and degradation in the country. Besides, climate change is a new challenge which is also adversely affecting the natural resource base. Extreme climate events such as floods, droughts and heat waves are becoming more frequent in the country which are posing serious threats to agro-based economy and ecosystems of Pakistan. FLR is perceived as one means to mitigate some of these extreme climate events.

Source: Survey of Pakistan

3.2 Landuses

By and large, Pakistan is a dryland country with 85% area falling in arid and semi-arid climatic zones. Spanning more than 1,500 km – from the peaks of over 8,600 m of K2 in the Karakorum range to the shores of the Arabian Sea – this huge altitudinal spread also accounts for a progressive decrease in total precipitation from the northern to the southernmost parts of the country. About 60 per cent of the total country area receives less than 250 mm rainfall and about 25 per cent between 250-500 mm per year (Rasul *et al*., 2012). Topographic and climatic diversity give rise to different land uses in Pakistan. Rangeland or grassland is the dominant land use with 44.36 million ha area (54%), followed by cropland or agricultural land with 25.78 million ha (32%). Irrigated farming is mostly practiced in the Indus Basin of Punjab and Sindh which produces bulk of the food and fiber including wheat, rice, fruits, vegetables and cotton.

Rainfed agriculture is practiced in other parts of the country which produce wheat, barely, millet, pulses, oil seeds and fodder. Some valuable fruits like apple, oranges, peach, apricot, plum, almond and olive are also grown in these areas. Livestock rearing is also an important part of agriculture in dry areas.

Table 1: Province-wise Land uses in Pakistan (million ha)

Category	Punjab	Sindh	KP	Balochistan	GB	AJK	ICT	Total
Rangeland	4.458	2.422	3.509	29.730	3.915	0.317	0.013	44.363
Cropland	13.323	6.693	2.541	2.826	0.115	0.247	0.040	25.785
Forestland	0.554	0.661	2.043	0.499	0.337	0.435	0.020	4.550
Wetland	0.377	0.458	0.225	0.546	0.041	0.030	0.001	1.677
Settlement	0.537	0.191	0.127	0.091	0.001	0.011	0.014	0.973
Other land	0.821	3.666	1.808	1.027	2.630	0.291	0.002	10.245
Total	**20.070**	**14.091**	**10.253**	**34.718**	**7.040**	**1.331**	**0.090**	**87.980**

Source: PFI, 2012

3.3 Forest Cover Status

Pakistan is a forest deficient country with only 5% forest cover. The total forest area of Pakistan is 4.11 million ha which constitute 4.7 % of the total geographic area of the country (MoCC, 2022). The forests are mostly concentrated in the northern mountainous part of the country i.e. Khyber Pakhtunkhwa, Gilgit Baltistan and Azad Jammu & Kashmir which together contain 63% of the total forest cover of the country. These are mostly coniferous forests which have valuable timber species. These forests are crucial for protecting the upland watersheds which regulate water supply in the Indus River System for hydropower generation and irrigation in the downstream areas making them of vital importance for ensuring energy security and food security in the country. These forests also supply valuable timber, fuelwood and numerous NTFPs; and are crucial for biodiversity conservation, carbon sequestration, nature-based tourism and rural livelihoods of the local communities.

Indus plain and deserts have dry tropical thorn forests which are generally open, low, scrub and in highly degraded form. However, these forests are still important for providing habitat to wildlife, protecting land against degradation and desertification and producing fuelwood and fodder. These forests have experienced a particular dramatic degradation in recent history resulting in loss of forest cover of about 90%, mainly stemming from conversion to agriculture and indiscriminate felling for fuelwood and fodder, invasion of exotic invasive species, mining and urbanization (Gratzfeld and Khan, 2015).

The western hilly parts of Balochistan contain dry temperate forests of Chilghoza pine and Juniper which are very important for NTFPs and biodiversity conservation. The coastal areas contain mangrove forests which are very important for shoreline stabilization, preventing sea intrusion, fish and shrimp breeding, NTFPs and climate change mitigation. These forests are also facing severe anthropogenic pressure and climate change impacts.

3.4 Forest Population Ratio

Pakistan is the 5th most populous country of the world with very low forest cover. The total population of Pakistan is 236 million in 2022 (WPR, 2022) and the forest cover is only 4.56 million ha (GoP, 2021). Thus, per capita forest is 0.02 ha which is the lowest in South Asia. More than 60 percent of the population resides in rural areas and has to depend heavily on forests for basic needs particularly biomass energy. Forests also fulfill timber requirements of the growing population and provide many non-woody forest products and ecosystem services which play important role in the socio-economic development of the country.

3.5 Major Forest Types

Pakistan has diverse forest ecosystems mainly stemming from variations in altitude from the lofty mountains in the north to the deserts and sea shore in the south. There are eight distinct types of natural forests located in four climatic zones of the country. Besides, there are man-made plantations mainly in Indus Plain of Punjab and Sindh. Areas under different forest types in provinces and territories are given in the Table 2.

Table 2: Forest Types of Pakistan (Area in ha)

Forest Type	Punjab	ICT	Sindh	Balochistan	KP	AJK	GB	Total
Subalpine	-	-	-	-	19,562	4,355	82,592	106,509
Dry Temperate	-	-	-	-	841,999	19,323	243,813	1,329,365
Moist Temperate	1,199	-	-	224,237	303,634	251,692	-	556,525
Sub-tropical Pine	134,267	-	-	-	314,575	190,644	-	639,486
Subtropical broad leaved (Scrub)	403,334	25,882	1,488	280,040	162,692	151,694	-	1,025,130
Dry Tropical Thorn	35,248	-	42,167	36,308	1,843	451	-	116,017
Riverine	30,016	-	82,862	-	-	-	-	112,878
Irrigated Plantations	47,936	-	18,838	-	-	-	-	66,774
Mangrove	-	-	151,045	6,312	-	-	-	157,357
Total	**652,000**	**25,882**	**296,400**	**546,897**	**1,644,298**	**618,159**	**326,405**	**4,110,041**

Source: MoCC (2022)

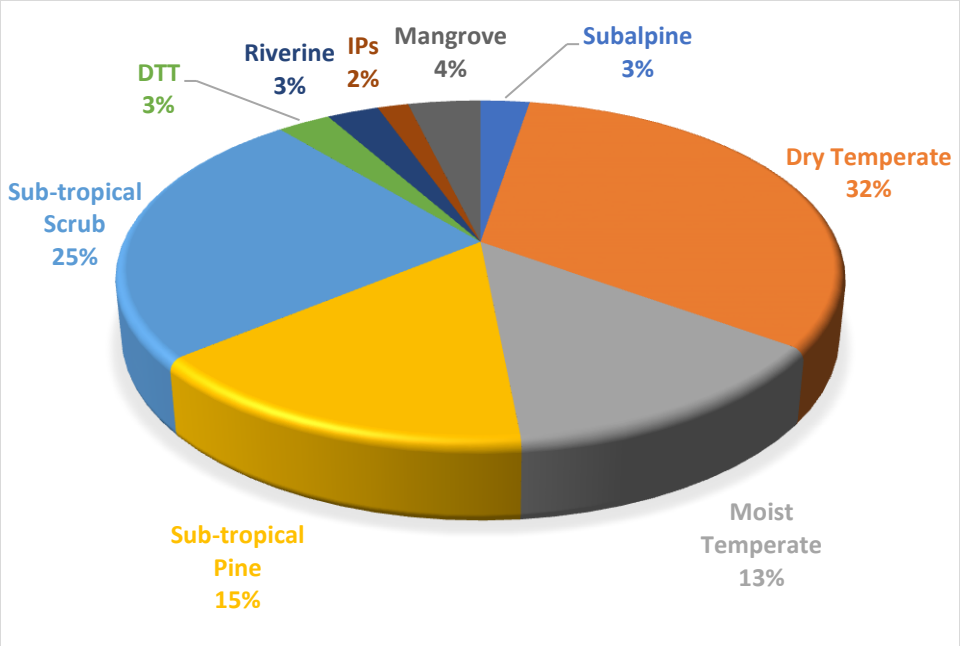

Figure 2: Forest Types Coverage in Pakistan

3.6 Forestland Ownership

In terms of ownership, forests can be divided into two main categories: government owned forests and privately owned forests. Government owned forests include reserved forests, state forests, demarcated forests, un-demarcated forests, protected forests, resumed lands, village forests and un-classed forests. Privately-owned forests include Guzara forests, community forests, protected wastelands, Section 38 forests and Chos Act areas.

Reserved forests, state forests and demarcated forests are exclusively owned by the Government and free of rights and privileges. These are the strictest categories of forests in terms of governance and access. All acts and activities are prohibited until and unless permitted by the Government. The total area under these categories of forests is 1.528 million ha which is 34% of the total forest area. Protected forests and un-demarcated forests are those forests where local communities have established rights and concessions. All acts and activities are permitted unless prohibited by the Government through proper notifications or through the promulgation of rules in respect of such matters. Resumed lands are those private lands which have been taken over by the Government under various Land Reforms and are under the control of Forest Department. Similarly, village forests are those forests which have been assigned by the relevant Provincial Government for the use of a village community through a proper notification or rules. In KP such forests are managed by the Joint Forest Management Committees. The total area under protected forests, un-demarcated forests, resumed lands and village forests is 1.980 million ha which is 44% of the total forest area.

Private forests including Guzara Forests, Community Forests and Protected wastelands are jointly owned by communities or families and managed by the Provincial Forest Departments. Owners of these forests can only exercise their rights with permission of the Forest

Departments. All acts and activities which harm the trees or forest resources are prohibited by the Forest Department. Right holders are granted timber, fuelwood and other products for their genuine domestic requirements after permission and proper assessment by the Forest Departments. Section 38 are those private lands or wastelands whose owners may hand over the management of these lands to the government to be managed by the Forest Department as a forest on such terms and conditions which may be mutually agreed upon. The total area under private forests is about one million ha which is 22% of the total area (Fig. 3).

The prevailing land tenure will significantly affect the restoration efforts in the country. In case of the state land, the government agencies primarily the Forest Department will decide about the selection of different restoration techniques, choice of species and objectives of the FLR interventions. However, in case of the private land or where local communities have rights and concessions, the FLR interventions need to be designed very carefully so that the demands of local communities are given due priority and their active participation is ensured.

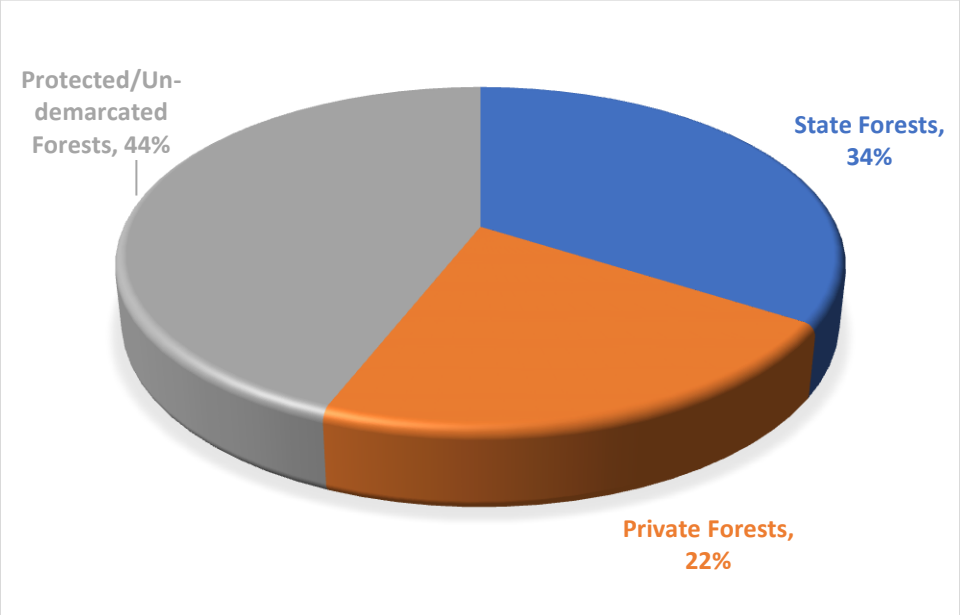

Figure 3: Forest Ownership

3.7 Rangeland Ownership

Rangelands cover about 60% of the total geographic area of Pakistan. Rangelands or wastelands are either owned by the state or local communities and used as common property resource. Most the rangelands are owned by local communities, tribes or villages. However, in some parts of Balochistan and Khyber Pakhtunkhwa landlords and local elites have also individual ownership (FAO, 2016). In case of individual ownership, the local landlords collect grazing fee from nomads and other graziers whereas in case of communal ownership the rangelands are mostly used as an open access resource. The rangelands are generally entrusted with Forest Department for management. However, Forest Department has control merely over 12% of the total rangelands of the country (FSMP, 1992). Due to complex land tenure and other challenges

the rangelands could not be brought under sustainable management in so far. Restoration of rangelands is the most challenging job as it requires lots of human and financial resources, multiple technologies and consensus among a wide range of stakeholders including different government agencies, land owners, local communities and nomadic graziers.

3.8 Agricultural land Ownership

Agricultural land is privately owned by individuals or families. Majority of the farms have small sizes and are owned by individual farmers. However, there are also some big land lords in Sindh and Punjab who own hundreds of hectares of agricultural land. State ownership of agricultural land is nominal. A large number of farms are cultivated by the tenants who do not have ownership rights over the land. Due to small landholdings, complex tenure, unawareness of farmers and lack of opportunities for modern farming, the restoration of degraded agricultural lands is a challenging job.

3.9 Extent of Deforestation and Forest Degradation

Pakistan is a country of low forest cover and high deforestation rate. Deforestation is the conversion of forest into non-forest land. Different agencies have reported different estimates of deforestation. FAO (2020) has reported that Pakistan lost forest cover of 1.261 million ha during 1990-2020 which is equivalent to 25% of the total forest area. This is equal to annual deforestation rate of 42,030 ha. However, Government agencies normally report substantially less amount of deforestation. The National Forest Policy of Pakistan (2015) has mentioned a deforestation rate of 27,000 ha per year. The Forest Reference Emission Level (FREL) of Pakistan has reported annual deforestation of 11,000 ha during 2004-2021. Recently, MoCC reported total deforestation of 44,179 ha during 2016-2020 which is equal to 11,045 ha per year. The difference between FAO and Government agencies reporting is mainly arising due to the use of different methodologies for mapping and classification of landcover and different definitions of forest. Second reason is unavailability of high resolution quality geo-spatial data at comparable time scale. Riverine forests have the highest deforestation rate 34%, subtropical broad-leaved forests 20%, dry temperate 19%, subtropical pine 13% and dry tropical thorn forests 9%.

Forest degradation is different from deforestation in the sense that land use change does not occur in the former but forest health and quality is declined in terms density, stocking, canopy cover, growing stock, biomass and other variables. While deforestation is quite clearly visible, the extent of forest degradation generally remains unquantified. It is an established fact that forest degradation is more serious than deforestation in Pakistan. Recently an effort was made to quantify the magnitude of forest degradation in the country. For this purpose, national definition of forest degradation was adopted and notified by the Government in 2021. According to this definition, forest degradation was defined as “Human induced long-term losses within forest persisting of at least four years or more due to changes in canopy cover i.e., open (11-30%), sparse (31-50%), medium (51-70%), dense (>70%) resulting in reduction in forest carbon stock and not qualifying as deforestation”. On the basis of freely available

satellite data (Landsat), annual forest degradation in the country was estimated 161,843 ha during 2016-2020 (MoCC, 2022).

3.10 Drivers of Deforestation and Forest Degradation

Drivers of deforestation and degradation can be categorized as proximate or direct causes and underlying or indirect causes. Proximate drivers are those which are carried out by human beings that directly affect forest cover. In Pakistan, they include conversion of forest into agricultural land, grazing land, infrastructure and urban expansion, and mining. Underlying causes are the result of complex interactions of demographic, economic, technological, institutional and sociocultural factors. Population growth is the main indirect driver in Pakistan, which places additional demand for agricultural land for food production, urbanization and infrastructure beside demand for timber and fuelwood, leading to deforestation and forest degradation. In addition, poor governance, corruption, poverty, tenure uncertainties, ineffective policies, low institutional capacity for planning and enforcement of laws are also important underlying causes of deforestation and forest degradation in Pakistan. It is worth noting that these drivers initially cause forest degradation which ultimately results in deforestation over time if not tackled at initial stages.

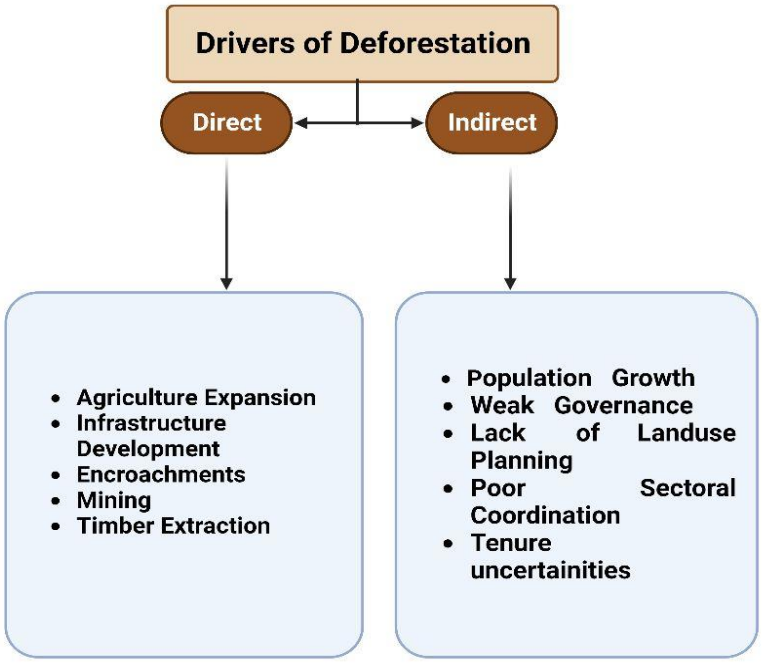

Figure 4: Drivers of Deforestation

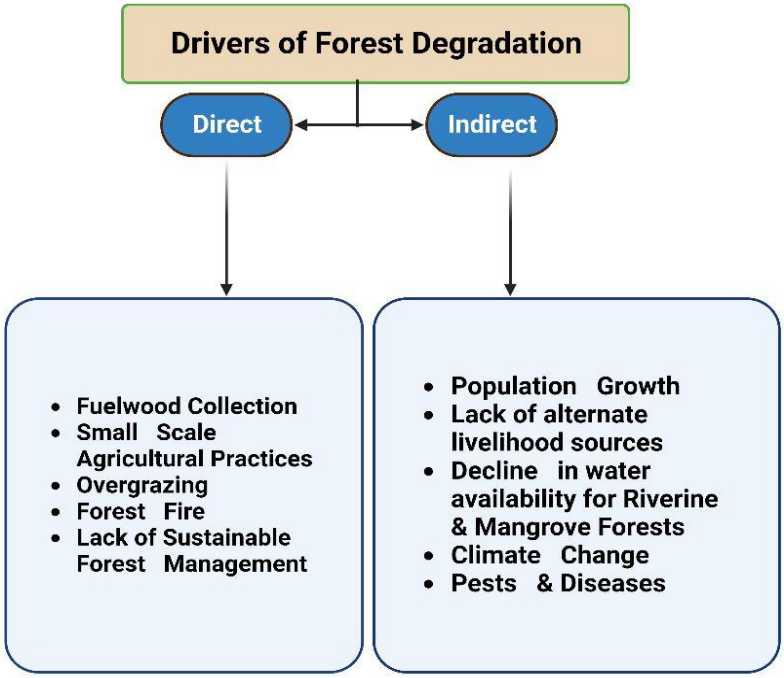

Figure 5: Drivers of Forest Degradation

3.11 Rangeland Land Degradation

Rangelands are the major landuse in Pakistan which cover more than 60% of the total area of the country. It has a vast spread starting from the northern mountains to temperate and Mediterranean ranges in the western mountains, and deserts in the Indus plain. The rangelands are generally in a degraded condition and there is an obvious downward trend in the overall productivity of the rangelands as well as their ecological functions and services. The current productivity of the majority rangelands varies from 25-50% of their potential. Besides, the species composition of these lands has changed in the favor of non-palatable weed species to the extent of more than 40%. Invasive species have widely spread and the foliar cover has decreased upto 27% of its potential, thus resulting in low productivity as well as contributing to high soil erosion rates. Due to overgrazing, climate change and other biotic factors, desertification of the range resources is taking place at an alarming rate especially in the arid and semiarid zones of the country, which constitute about 80% of the total rangelands.

Almost all the range lands are communal and common property which are often over exploited by all without taking any responsibility for their management. Forest Department is the custodian of the range lands but it gives least importance to this huge resource. The problems of the rangelands are social as well technical. Sustainable management of rangelands require a multi-disciplinary team including foresters, agriculturists, animal husbandry professionals and

sociologists. Rangelands are fundamental to food security and improved livelihoods. Sustainable range management will increase the resilience of landless pastoralists and transhumant graziers and will contribute in food security, woodfuel energy, fodder and fiber production. Besides, biodiversity conservation, soil and water conservation, climate change mitigation and adaptation will be ensured.

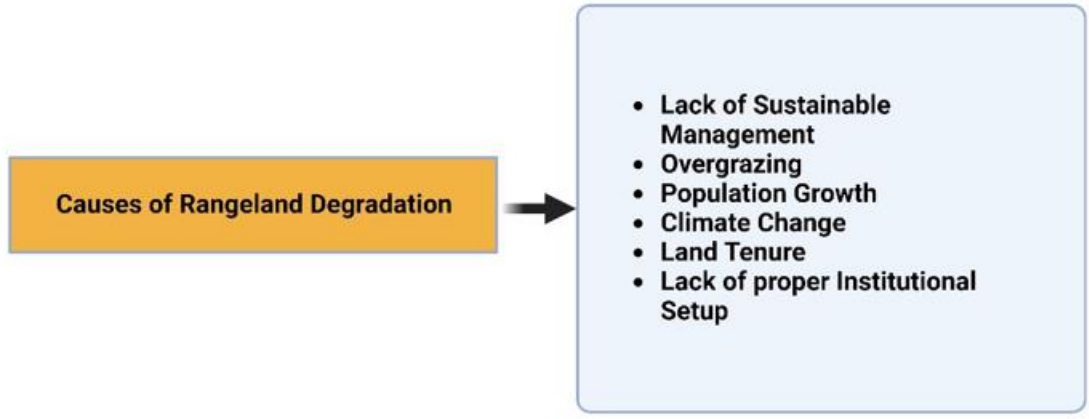

Figure 6: Causes of Rangeland Degradation

3.12 Agricultural Land Degradation

Agriculture is the backbone of Pakistan's economy. It accounts for about 20% of the country's GDP and 60% of the total export. About 22 million ha land is cultivated, of which 75% is under irrigation, and the remainder is dryland or rainfed agriculture. A significant majority of the farmers hold less than two hectares of land, which constitutes 22% of total cultivated area. Salinity, water logging, soil erosion and unsustainable agricultural practices are the major causes of agricultural land degradation. It is estimated that water logging affects 11 million hectares across the country, while another five million hectares are affected by salinity and sodicity (GoP, 2017b).

3.13 Current Plans and Targets for FLR

The government of Pakistan is giving high priority to forest and landscape restoration. For this purpose, several large scale initiatives have been launched.

Ten Billion Tree Tsunami Programme[5]: This national level mass-scale afforestation program is the upscaling of the Green Pakistan Programme aimed to to revive Forest and Wildlife resources, improve the overall conservation of the existing Protected Areas; encourage eco-tourism, community engagement and job creation through the conservation. During phase one (2019-2023), 3.29 billion plants will be planted or grown through natural regeneration over an area of 1.2 million ha. During phase two, 750 to 850 million plants will continue to be planted over the next six years up to 2030. This initiative builds upon the success story of the Billion Trees Afforestation Project (BTAP) that was implemented in the Khyber Pakhtunkhwa (KP)

[5] https://mocc.gov.pk/ProjectDetail/M2QzOWJmMjUtZTU3MC00NmFkLWE4YmMtZDFhMmRlOGU2NGRh

province during 2015-2020, whereby 1.2 billion trees were raised during 2014–2018. This programme is the flagship initiative of Pakistan for forest and landscape restoration.

Reversing Deforestation and Degradation in High Conservation Value Chilgoza Pine Forests in Pakistan: It is a joint venture of the Ministry of Climate Change, FAO and GEF. It is a four-year project (2018-2021) which will be completed by December, 2023. The project is aimed to contribute to the restoration, protection and sustainable management of Chilgoza pine forests to provide global environmental benefits as well as enhance resilience and livelihoods of local stakeholders in Pakistan. The project is being implemented in Sherani district of Balcohistan, South-Waziristan and Chitral districts of Khyber Pakhtunkhwa and Diamer district of Gilgit-Baltistan. The project will bring around 30,000 hectares area of chilgoza forests under sustainable forest management through active participation of the local communities. This will also include 3600 hectares under Assisted Natural Regeneration and 800 hectares under agroforestry and farm forestry. This project is also currently developing FLR plans at the local level where more appropriate actions are being identified for restoration of this valuable ecosystem.

Ecosystem Restoration Initiative (2019-2030): This initiative is aimed at mainstreaming adaptation and mitigation through ecologically targeted initiatives for afforestation, biodiversity conservation/ecosystem rehabilitation, and policy development by restoring 30% of degraded forest, 5% of degraded cropland, 6% of degraded rangeland and 10% of degraded wetlands by 2030. Setting up a transparent Ecosystem Restoration Fund (ESRF) to finance the initiatives under the Ecosystem Restoration Initiative (ESRI) is also part of the initiative.

Protected Areas Initiative (2020-23)[6]: Expanding the coverage of protected areas from 12 to 15% of the total land area by 2023, by notifying 15 new national parks covering a land area of over 7,300 square kilometers. The government will implement ecological management plans and governance through community-led conservation funds.

Reduced Emissions from Deforestation and forest Degradation (REDD+)[7]: The Ministry of Climate Change with the support of the World Bank is implementing REDD+ Project to achieve REDD+ readiness in the country. After completing the readiness phase, REDD+ implementation will be started across the country. Restoration of degraded forests and development of new forest resources are the integral components of the REDD+ programme.

Recharge Pakistan[8]: Building resilience to climate change through Ecosystem-based Adaptation for Integrated Flood Risk Management by identifying flood vulnerable areas where adaptation strategies could be most effective. The project aims to utilize floodwater for restoring wetland ecosystem and recharging its aquifer. The project would possibly impact around 10 million vulnerable people through reduced flood risks, increased water security, improved agricultural

[6] https://tbttp.gov.pk/protected-areas-initiative.php#
[7] https://www.redd-pakistan.org/
[8] https://www.wwfpak.org/our_work_/recharge_pakistan_/

productivity and food security, community-based disaster risk management (CBDRM), and climate-resilient livelihood options.

Transforming the Indus Basin with Climate Resilient Agriculture and Water Management (2019-2026)[9]: This US$47.7 million project will disseminate information and utilize state of the art technology to build the country's capacity to adapt to climate challenges in agriculture and water sectors. The project envisages enhancing farmer's resilience to climate through skill and capacity development.

Sustainable Land Management Project (SLMP Phase II, 2015-21): Rehabilitated approximately 10,000 acres of land, 5000 acres of plantations, and 15,000 acres of land receding. For FY 2020-21, 800 acres of plantation, 4500 rangeland rehabilitation, 30 gated structures, and 5000 acres rangeland receding have been planned.

Sustainable Forest Management (SFM, 2016-21): Regeneration and management of seven forest landscapes spreading over 145,300 hectares; temperate coniferous forests in Khyber Pakhtunkhwa, dry scrub forests in Punjab, and riverine forests in Punjab and Sindh.

REDD+ Indus delta (2019-2030 Delta Blue Carbon Phase I): Restoring 350,000 ha in the Districts of Thatta and Sajawal in Sindh province through plantation in 60 years via a multi-phase public private partnership. Phase 1 aims at restoration of 224,997 ha of degraded land through large scale reforestation of which 75,000 ha was restored by 2020 with mangrove plantations.

Restoring mangrove forests (1990-ongoing): Under voluntary plantation drives, Pakistan has annually increased at an annual growth rate of 3.74%, making Pakistan the only country in the region with an expanding mangrove cover. Over four million mangroves were planted under various partnerships, involving public and private sectors as well as Civil Society Organizations (CSOs). Under TBTTP, Sindh province has planned a plantation of 1.5 billion trees, mainly in mangrove areas. Preservation of mangrove forests will be used for carbon capture and to develop resilience against seawater intrusion and tropical storms. In Balochistan,1200 ha have been added over the years.

Glacial Lake Outburst Flood II (2017-2022): Scaled up GLOF I from two districts to 10, and initiated the revision of two policies to include GLOF risk reduction, provide early warning signs to target communities for appropriate actions, scaling up monitoring systems, and deploying 250 small-scale engineering structures to reduce effect of GLOF on local livelihoods. This will help strengthen resilience of communities that are likely to be affected by GLOF.

Pakistan Snow Leopard and Ecosystem Protection Program (PSLEP, 2018-2023):

At least 1,500,000 hectares of critical snow leopard habitat effectively managed under integrated participatory management landscape approaches, and 4,000 households benefitted from sustainable resource management approaches.

[9] https://www.fao.org/asiapacific/news/detail-events/en/c/1200831/

4 PRIORITY AREAS AND RESTORATION INTERVENTIONS

FLR does not prescribe a single recipe for all types of landscapes, rather it works through different measures and options depending on the nature of landscape degradation. FLR is developed and tailored to fit individual landscapes on the basis of assessment of local needs and conditions. There are two main types of restoration approaches: wide scale restoration and mosaic restoration. Wide scale restoration is practiced in large contiguous tracts of degraded landscapes whereas mosaic restoration is carried out in a patchwork or mosaic of different landuses e.g. agriculture, agroforestry, improved fallow systems and discrete areas of forests and woodlots within a landscape.

Landscape degradation is widespread in Pakistan ranging from agricultural land to rangelands and community forests and woodlots to natural forests. All these landscapes can be restored through different FLR options. Depending upon the local conditions, wide scale or mosaic restoration can be adopted in different landscapes. For landscapes where forest is the dominant land use and the area is suitable for wide-scale restoration, natural regeneration and establishment of woodlots or plantations are the recommended options for landscape restoration. For lands which are managed to produce food and which are suitable for mosaic restoration, agroforestry and improved fallows systems are recommended. Finally, for lands that are vulnerable to or critical to safeguarding against soil erosion and catastrophic events, land stabilization and watershed protection or mangroves plantations are the recommended option for landscape restoration.

Keeping in view the current state of degradation and potential for restoration, the following seven priority areas have been identified to restore degraded landscapes in different parts of Pakistan. A list of selected landscapes having potential for FLR is given at Annex-II.

8. Restoration of landscapes where natural forests are the dominant landuse
9. Restoration of landscapes where Community forests, woodlots and plantations are the dominant landuse
10. Restoration of Degraded Watersheds and other vulnerable lands
11. Restoration of landscapes where Rangelands are the dominant landuse
12. Restoration of Marginal Agricultural Lands
13. Creation of enabling environment for FLR in Pakistan
14. Human, Technical and Institutional Capacity

Different strategic priorities and actions have been identified for short term (1-5 years), medium term (5-10 years) and long term (10-20 years). Different actors have also been identified for implementation of these interventions. These are elaborated in the following lines.

4.1 Restoration of degraded landscapes where natural forest is the dominant landuse

Context

Forest and landscape restoration is aimed at the sustainability of multiple ecosystem services. Thus, it is not only concerned with restoration of the degraded landscapes but also with conservation of existing forests. Sustainable forest management is the key to prevent degradation of the forest landscapes and achieve optimum balance in the production of goods and services by the forests. In Pakistan there are nine different forest types which have their peculiar silvicultural and ecological requirements. Three of these forest types i.e. sub-alpine, dry temperate, moist temperate and subtropical pine forests are mainly located in high hills in the northern part of the country i.e. Gilgit Baltistan, AJK and northern zone of Khyber Pakhtunkhwa. Dry temperate forests of Chilghoza pine and Juniper are found in the western mountains of Khyber Pakhtunkhwa, Balochistan and Gilgit Baltistan. Similarly, subtropical broad-leaved scrub forests are found in the foot hills. On the other hand, southern part of the country i.e. Punjab, Sindh and Balochistan mostly contain dry forests which include dry tropical thorn forests, riverine forests and mangroves forests. These forests have also enormous importance for ecosystem services and local livelihoods. However, most of these forests are currently degraded and need restoration for continuity of the crucial ecosystem services they provide.

Issues and Trends

Natural forests of Pakistan are facing severe threats of deforestation and degradation due to numerous direct and indirect causes mentioned in section 3.10. There is a need to take proper measures to address these drivers of deforestation and degradation and prevent further degradation of forest landscapes. According to FAO, Pakistan has lost 25% of its forest cover during the last three decades. The remaining forests are also in a highly degraded state. More than 50% of the forests have canopy cover less than 50% showing a considerable level of degradation and requiring restoring efforts. There is a growing realization in the country that natural forests should be managed for sustenance of crucial ecosystem services like watershed protection, biodiversity conservation, climate change mitigation, non-timber forest products and nature-based tourism etc. It is, therefore, essential that native species be preferred while restoring these landscapes. The government has started several mega afforestation projects in the country including the world acclaimed Billion Trees Afforestation Project of Khyber Pakhtunkhwa, Mangroves restoration in Sindh and the on-going Ten Billion Trees Tsunami Programme across the country. FAO is also implementing a GEF- funded project for restoration of Chilghoza Forests in Khyber Pakhtunkhwa, Balochistan and Gilgit Baltistan. These initiatives will significantly contribute to achievements of FLR targets[10] and implementation of National REDD+ Strategy[11].

FLR Options

[10] https://www.fao.org/3/i8382en/I8382EN.pdf

[11] https://redd.unfccc.int/files/pakistan_redd__strategy_final-oct_2_2021.pdf

For landscapes where natural forest is the dominant landuse and the forests are deforested or degraded, the priority will be to address the drivers of deforestation and forest degradation to check the degradation process. In such landscapes wide-scale restoration will be the recommended approach. In case the landscape is without trees, then plantation of multiple species will be the recommended option for restoration; and if mother trees are available in sufficient number then assisting natural regeneration will be more viable and feasible option for restoration. In degraded forest landscapes, where trees stock is substantial but below the normal level, silvicultural operations including thinning, removal of dead, diseased and wind fallen trees, enrichment plantations and control on fire and grazing will be the key strategies for restoration.

Strategies and Actions

Strategic Priority 1: Improve conservation and management in natural forests through addressing the drivers of deforestation and degradation on 2.10 million ha.				
Action	Short Term (1-5 year)	Medium Term (5-10 year)	Long Term (10-20 year)	Responsible Actors
1.1. Establish/Strengthen innovative (e.g. Satellite Based Land) Monitoring System supported by Terrestrial Forest Inventories at Provincial and Regional Level for ensuring effective forest monitoring	√			Provincial Forest Departments, Local Communities
1.2. Develop innovative approaches for improving agricultural productivity around the forested landscapes to provide alternate livelihoods	√	√	√	Provincial Agriculture Departments, NGOs, Research Organizations, Academia, Local Communities
1.3. Improve agricultural productivity and establish hill fruit orchards around the forested landscapes to provide alternate livelihoods	√	√	√	Provincial Agriculture Departments, NGOs, Research Organizations, Academia, Local Communities
1.4. Promote alternate livelihood options e.g. off-season vegetables, fruit orchards, NTFPs, apiculture, poultry, aquaculture, ecotourism etc.	√	√	√	Provincial Agriculture Departments, Forest Departments, Fishery Departments, Tourism Departments, Wildlife Departments, NGOs,

				Research Organizations, Academia, Local Communities
1.5. Promote alternate fuel technologies e.g. solar, biogas, hydel, wind etc.	√	√	√	Energy Department, Local Government, WAPDA, NGOs, Forest Department
1.6. Promote fuel-efficient stoves and energy efficient houses for reducing household energy consumption	√	√	√	Energy Department, Local Government, WAPDA, NGOs, Forest Department
1.7. Control illegal timber harvesting and transportation	√	√	√	Forest Department, Local Government, NGOs, Local Communities
1.8. Encourage timber alternatives in furniture and building construction	√	√	√	Forest Department, Local Government, NGOs, Local Communities
1.9. Liberalize timber import through appropriate taxation measures	√	√	√	Finance Department, Commerce Department
1.10. Develop, update and implement participatory forest management plans/Joint Forest Management Plans	√	√	√	Forest Departments, NGOs, Local Communities
1.11. Identify crucial forests and other landscapes for establishment of High Conservation Value Areas (HCVA) and ecological corridors through scientific surveys and consultation with stakeholders	√	√		Forest Departments, Wildlife Departments, Academia, Research Organizations
1.12. Establish forest fire prevention and control systems in the vulnerable forest areas	√	√	√	Forest Departments, Rescue Department, NDMA, PDMA, NGOs, Local Communities
1.13. Control grazing in forests through social fencing	√	√	√	Forest Departments, Local Communities
1.14. Technological improvement; proper coordination among different provinces during planning,	√	√	√	MoCC, Forest Department, Agriculture Department, NGOs, Academia, Research

implementation and monitoring				Organizations
Strategic Priority 2: Undertake forest restoration measures in degraded forests on 2.10 million ha.				
2.1. Identify degraded landscapes in different forest ecosystems and classify different strata of degraded forests as highly degraded, moderately degraded and slightly degraded forests	√			Forest Department, Local Communities, Academia, Research Organizations
2.2. Establish closures in medium and low degraded forests where sufficient number of mother trees are available to ensure ANR employing negahbans (guards) for closures through community consultation	√	√	√	Forest Department, Local Communities
2.3. Undertake plantation/direct seeding/artificial regeneration in areas which are denuded or highly degraded using multiple native species of the ecosystem	√	√	√	Forest Department, NGOs, Local Communities
2.4. Develop proper system for Payment for Ecosystem Services (PES) for different restored forest landscapes	√	√	√	Forest Departments, Revenue Department, NGOs, Local Communities
2.5. Develop equitable benefit distribution mechanism for the benefits from timber, fuelwood, carbon trading, tourism, NTFPs and other ecosystem services from areas restored.	√			Forest Departments, Revenue Department, NGOs, Local Communities
2.6. Integrate recent scientific knowledge along with preservation of the indigenous and local knowledge	√	√		Forest Department, NGOs, Local Communities, Academia, Research Organizations

4.2 Restoration of Landscapes where Community Forests, Woodlots and Plantations are the dominant Landuse

Context

Most of the country's forests are privately owned by local communities either jointly or individually. Privately-owned forests include Guzara forests, community forests, village forests, protected wastelands, Section-38 forests and Chos Act areas. Besides, local communities have also established rights and concessions in protected forests and un-demarcated forests. Thus about 65% of the forests are burdened with rights and concessions of the local communities. Irrigated plantations are found in Punjab and Sindh province which were raised in the past to produce timber and fuelwood for railway and other industrial purposes. Community forests, woodlots and irrigated plantations should be primarily managed for production of fuelwood and industrial timber to reduce pressure on natural forests. The main focus should be on raising of fast growing tree species which have the capacity to produce maxim wood of high quality.

Issues and Trends

Community forests and woodlots are open access resource and are often over-exploited by the local communities due to lack of effective management and tenure conflicts. Consequently, these forests and woodlots are facing severe degradation and need serious efforts for restoration. Due to shortage of irrigation water and lack of sustainable management, irrigated plantations are facing severe problem of degradation. There is a wide scope for restoration of community forests, woodlots and irrigated plantations in the country. The government mass afforestation initiatives e.g. the on-going Ten Billion Trees Tsunami Programme are not only focusing on the rehabilitation of communal forests, woodlots and irrigated plantations but also expanding the area under communal woodlots and plantations. However, the sustainability of these interventions are questionable as the fate of these woodlots and plantations will be determined by the local communities and land owners who are much more interested in short term monetary benefits.

FLR Options

For landscapes with degraded community forests and woodlots, the priority will be to address the drivers of deforestation and forest degradation particularly control on soil erosion, fire, grazing and illicit cutting. In such landscapes both wide-scale and mosaic restorations will be applied. In case the landscape is without trees, then plantation or direct seeding will be the recommended option for restoration; and if mother trees are available in sufficient number then natural regeneration will be more viable and feasible option for restoration. Enhancement of area under community forests and woodlots by promoting fast growing native and exotic tree species for production of industrial wood, NTFPs and fuelwood will be the key restoration option.

Strategies and Actions

Strategic Priority 3: Undertake restoration in community forests, woodlots, irrigated plantations and linear plantations on 0.7 million ha.				
Action	Short Term (1-5 year)	Medium Term (5-10 year)	Long Term (10-20 year)	Responsible Actors
3.1. Increase the area under community forests and woodlots	√	√	√	Forest Departments, Local Communities
3.2. Restore degraded irrigated plantations and linear plantations through appropriate measures	√	√	√	Forest Departments
3.3. Promote plantation of fast growing tree species which have industrial uses, NTFPs and quick returns in degraded community forests and woodlots	√	√	√	Forest Departments, Wood-based Industries, Local Communities
3.4. Establish closures in medium and low degraded community forests and woodlots where sufficient number of mother trees are available to ensure ANR employing negahbans (guards) for closures through community consultation	√	√		Forest Departments, Local Communities
Strategic Priority 4: Ensure the participation of local communities, NGOs, CBOs, private sector and other stakeholders in restoration of degraded community forests and woodlots				
4.1. Encourage and incentivize local communities and private sector to invest in conservation and restoration of communal forests and plantations through provision of tax rebates, credit facilities and subsidized inputs	√	√	√	Forest Department, Finance Department, Banks, Investment Companies, Private Investors, Local Communities
4.2. Sensitize national organizations like WAPDA, NHA, Pakistan Railway, Armed Forces, Educational	√	√		Forest Department, NGOs, Academia, Industries

Institutions and industries to prepare, sponsor and implement a long-term mass afforestation programme on lands in their jurisdiction				
4.3. Organize local communities and develop their capacity to undertake sustainable management of their forests	√	√	√	Forest Department, NGOs, Local Communities
4.4. Develop equitable benefit distribution mechanism for the benefits from timber, fuelwood, carbon trading, tourism, NTFPs and other ecosystem services from areas restored.	√	√		Forest Department, Revenue Department, NGOs, Local Communities
4.5. Identify, assess and address tenure issues to overcome the barrier of tenure insecurity				
4.5. Establish effective and speedy conflict resolution mechanism to resolve tenure related issues in community forests.	√	√		Forest Department, Revenue Department, Local Government, NGOs, Local Communities

4.3 Restoration of Degraded Watersheds and other Vulnerable Lands

Context

Pakistan has been ranked as the sixth most vulnerable country of the world due to climate change. The sustainability of water resources of the country is under tremendous pressure due to accelerated melting of the glaciers under the global warming and climate change. Besides, the intensity and frequency of floods, storms and cloud bursts have also increased many folds in northern part of the country where crucial watersheds of the Indus River System are located. About 11 million ha area is affected by water erosion. Water erosion is not only a particular problem in the northern hilly areas, but it also affects the agricultural landscapes in Potwar plateau of Punjab and the Sulaiman rodkohi system of Balochistan. The catchment areas in southern part of the country are crucial for recharging ground water table and provision of water for drinking by humans and their livestock as well as irrigation of crops. The sandy deserts of Thal, Cholistan, Thar and Chagai-Kharan suffer from wind erosion and the linked

problem of shifting sand dunes. These areas are generally degraded and have high scope for restoration.

Issues and Trends

The natural resources of the northern upland watersheds particularly land, water, forests and other vegetation are facing high level of degradation resulting in high rates of soil erosion, landsliding and sedimentation in the water reservoirs. These watershed areas feed major reservoirs of the country including Tarbella and Mangla which produce more than 8000 MW electricity together. Besides several large, medium and small reservoirs are under construction in these areas which further underscore the need for effective watershed management in these uplands. Recent floods, catastrophic rains and glacial melting have caused havoc in these areas endangering the socio-ecological systems of these areas. On the other hand, southern part of the country especially desert areas of Sindh and Balochistan are facing prolong drought and water scarcity. Aquifer recharge is very low resulting in decline of ground water table in many parts of Balochistan. Excessive pumping of ground water through tube-wells have also exacerbated the ground water table in Balochistan. Rising temperature, scarcity of water, open grazing, excessive removal of ground vegetation for fuel and fodder purposes, faulty agricultural practices and climate change have resulted in severe wind erosion and desertification. Low lying areas in Balochistan, Sind and southern Punjab have been severely damaged by the recent floods which must be given priority in the restoration initiatives.

FLR Options

Mosaic restoration approach will be used for restoration of watershed areas and other vulnerable lands. The focus will be to restore maximum vegetation cover, promote soil and water conservation measures and bio-engineering techniques, improve the cropping practices and discourage cultivation of annual crops on steep slopes in upland watershed areas through integrated participatory watershed management programme. In case of lowland watersheds and desert areas, the focus will be on soil stabilization through increasing the vegetative cover, fixation of sand dunes, ground water recharge and dry afforestation techniques.

Strategies and Actions

Strategic Priority 5: Increase vegetation cover in the degraded watersheds over 1.20 million ha.				
5.1.Restore degraded watershed areas through plantation or sowing of suitable species	√	√	√	Forest Department, Watershed Mgt Authorities, CBOs
5.2. Promote fast growing multipurpose tree species which are tested and proven in the local climate	√	√	√	-do-
5.3. Establish closures in medium	√	√	√	-do-

and low degraded community forests and woodlots where sufficient number of mother trees are available to ensure ANR employing negahbans (guards) for closures through community consultation				
5.4. Encourage and incentivize local communities and private sector (mineral water companies and other industries) to invest in watershed management measures.	√	√	√	-do-
5.5. Sensitize national organizations like WAPDA, NHA, Wildlife Conservation Organizations and Provincial Energy Departments to invest in watershed management	√	√	√	-do-
Strategic Priority 6: Undertake soil and water conservation in the degraded watersheds over 1.20 million ha.				
6.1. Treat severely degraded land with check dams and other soil conservation measures	√	√	√	Forest Department, Watershed Mgt Authorities, CBOs
6.2. Support terracing and conservation agriculture on sloping agricultural land	√	√	√	Forest Department, Watershed Mgt Authorities, Agriculture Department, CBOs
6.3. Construct small water harvesting ponds/dams	√	√	√	-do-
6.4. Support farmers in soil and water conservation activities	√	√	√	-do-
6.5. Treat critical landslides with different bio-engineering techniques	√	√	√	-do-
6.6. Restore traditional rodkohi system in Suleman Range	√	√	√	-do-

4.4 Restoration of Landscapes where Rangeland is the dominant landuse

Context

Rangelands are the largest landuse in Pakistan, covering about 60% of the total area of the country. Rangelands have a vast spread starting from the northern part of the country and

extending to temperate and Mediterranean ranges in the western mountains and also covering a considerable part of the Indus plain. The extent of rangelands in different parts of the country varies with Balochistan having the highest i.e. about 97% of its area under rangeland. Other provinces and territories have also large areas under rangelands. AJK, GB, KP, Punjab, and Sindh have 64 %, 61%,35%, 24%, and 21% land areas under rangeland respectively. These rangelands are primarily under the management responsibility of provincial departments. Most of the rangelands in Pakistan are not in healthy condition and their ability to produce forage is much lower than their potential. The current productivity of the majority of rangeland varies from 25-50% of their potential. Rangelands support grazing of about 88 million livestock heads in the country which are 40% of the country's livestock population.

Issues and Trends

Most of the rangelands of Pakistan are facing severe threat of degradation. Low and erratic rainfall, prolong droughts, increase in human and livestock population, over grazing, spread of non-palatable and invasive plant species, excessive exploitation of natural resources, soil erosion, complex tenure, lack of effective policies, plans and institutional setup for management are the main causes of rangelands degradation. Climate change is exacerbating the natural resource productivity and the associated livelihoods in these areas and making these areas into hotspots in terms of climate change vulnerability. Currently, there is no much focus of the government or donor agencies on the restoration of rangelands in the country. Though rangelands are the largest landuse in the country, there is no specialized agency for the management of these lands. Mostly, the management lies with forest department which give more preference to forest conservation and plantation and have low interest and priorities for restoration of rangelands. These areas are inhabited by the people who are the poorest and extremely marginalized section of society and highly vulnerable to the impacts of climate change. Rangelands restoration needs to be given the highest priority in southern and western parts of the country, particularly Balochistan and Sindh where dominant landuse is the rangelands and local population are primarily depended on these lands for their livelihoods.

FLR Options

Mosaic restoration is the recommended approach for landscape restoration in rangelands of Pakistan. There are several landuses within these landscapes which include subsistence agricultural lands, grazing lands, patches of trees and shrubs and degraded barren lands. Site specific mosaic restoration strategies will be adopted for restoration of these landscapes with focus on improving the vegetation cover, increasing the forage and biomass productivity, soil and water conservation, sustainable agricultural practices, improved livestock breeds, drought management and capacity building of the local communities.

Strategies and Actions

Strategic Priority 7: Conduct baseline surveys and assessment of rangelands.				
Action	Short	Medium	Long	Responsible Actors

	Term (1-5 year)	Term (5-10 year)	Term (10-20 year)	
7.1. Conduct surveys for collection of baseline data on the extent of the resource, forage productivity, the prevailing trend and conditions	√			Forest Department, Range Mgt Authorities
7.2. Develop effective mechanism for monitoring and implementation of management plans involving all stakeholders	√	√		-do-
7.3. Introduce suitable grazing systems in different rangelands according to the prevailing conditions	√	√		-do-
7.4. Organize and train local communities for undertaking range management activities	√	√		-do-
Strategic Priority 8: Increase forage productivity in the degraded rangelands over 1.57 million ha.				
8.1. Restore degraded rangelands through reseeding and natural regeneration measures	√	√	√	Forest Department, Range Mgt Authorities, CBOs
8.2. Promote plantation of fodder tree and shrub species	√	√	√	-do-
8.3. Eliminate non-palatable invasive plant species	√	√	√	-do-
8.4. Undertake soil and water conservation measures to increase rangeland productivity	√	√	√	Forest Department, Range Mgt Authorities, Soil Conservation Dept.
8.5. Increase agricultural productivity in the landscape/rangelands by introducing high yielding varieties of grain and fodder crops	√	√	√	Agri Department, Range Mgt Authorities, NGOs
8.6. Promote biodiversity conservation in rangelands through community participation	√	√	√	Wildlife Department, Range Mgt Authorities, NGOs
Strategic Priority 9: Improve the livelihoods of rangeland communities				
9.1. Introduce improved breeds of livestock in rangeland areas with	√	√	√	Livestock Department, Range

improved livestock management				Mgt Authorities
9.2. Organize collectors and develop linkages with Herbal industries and market players,	√	√		Livestock Department, Range Mgt Authorities, NGOs
9.3. Conduct resource assessment of medicinal and aromatic plants (MAPs) in the rangelands.	√	√		Livestock Department, Range Mgt Authorities, Academia
9.4. Promote in- situ conservation and sustainable utilization of MAPs,& NTFPs collection, cultivation, processing, storage, branding and marketing	√	√	√	Forest Department, Range Mgt Authorities, NGOs, Research Organizations
9.5. Support rangeland enterprises	√	√	√	-do-
9.6. Promote rangeland ecotourism	√	√	√	Forest Department, Tourism, Range Mgt Authorities
9.7. Promote alternate energy technologies e.g. solar, hydel, biogas, wind	√	√	√	Forest Department, Energy, Range Mgt Authorities
9.8. Promote linkages of the rangeland communities with different government agencies and non-governmental organizations	√	√	√	Forest Department, Range Mgt Authorities, NGOs

4.5 Restoration of Marginal Agricultural Lands

Context

Agriculture is the backbone of rural livelihood and economy in Pakistan. Marginal agricultural lands are very vulnerable to degradation and loss of soil particularly in the hilly landscapes and dry landscapes in plain areas. In high hill landscapes, subsistence agriculture is practiced for food production which hardly meet few months' requirements. These marginal agricultural lands are best suited to fruit hill orchards which will not only reverse the process of environmental degradation in the uplands but will also diversify the livelihoods options of small farmers, will generate economic activities and reduce pressure on natural forests for firewood. Farmers in these areas are very poor, have extremely small land holdings and unaware of modern farming technologies. Population is rapidly growing in these critical and vulnerable landscapes and the land and other natural resources are under continuous pressure. Climate change is further aggravating the situation. There is a need to introduce conservation agriculture, climate smart agriculture practices and other technologies which conserve the

natural resource base, increase productivity and improve the livelihoods of the rural communities.

Issues and Trends

Due to increase in population demands for food and housing increase. The poor farmers mostly dependent on small pieces of lands and few livestock try to clear more land for growing agricultural crops and building houses for their growing families. This results in degradation of forest and land and high rates of soil erosion. With passage of time the land becomes unproductive and the farmers try to bring new area under the shifting cultivation. GLOF, flash flooding and landsliding are other serious issues which lead to landscape degradation. Climate change has made these marginal farmers most vulnerable and they are totally unable to make their survival. The anthropogenic pressure and climate change are causing severe degradation of these marginal lands.

FLR Options

Mosaic restoration is the recommended approach for landscape restoration in marginal agricultural lands. If the land is under permanent management, then agroforestry is the best option for restoration. Suitable tree species are grown in combination with different agricultural crops to reduce soil erosion, increase soil fertility, improve crop productivity, provide fodder and fuelwood and diversity farm income. Sustainable agricultural practices will be promoted and the resilience of the farmers will be improved to cope with the challenges of climate change. If the land is under intermittent management, then improved fallow is the best option for restoration. Leguminous trees species which fix nitrogen and produce high quantity of biomass are raised on the fallow lands to improve soil fertility and bring a considerable income for the farmers. Ultimately these lands will be utilized for raising agricultural crops when soil fertility is improved.

Strategies and Actions

Strategic Priority 10: Improve farm productivity by promoting agroforestry and sustainable agricultural practices over 4.86 million ha				
Action	Short Term (1-5 year)	Medium Term (5-10 year)	Long Term (10-20 year)	Responsible Actors
10.1. Promote agroforestry using multipurpose tree species	√	√	√	Forest Department, Agriculture Dept., NGOs, CBOs
10.2. Promote novel cropping patterns to improve agricultural yield under water-stressed conditions	√	√	√	Agriculture Dept., NGOs, CBOs

10.3. Promote Sloping Agricultural Technologies (SALT) in hilly areas	√	√	√	Agriculture Dept., Soil Conservation Dept.
10.4. Protect low lying land against floods	√	√	√	Irrigation Dept., Soil Conservation Dept.
10.5. Reduce the application of chemical fertilizers and pesticides by integrated pest management in agricultural systems and promote organic farming	√	√	√	Agriculture Dept., NGOs, CBOs
10.6. Conserve genetic resources e.g. traditional varieties of crops and native breeds of livestock	√	√	√	Agriculture Dept., NGOs, CBOs
10.7. Promote high efficiency irrigation technologies e.g. drip irrigation	√	√	√	Irrigation Dept., Agri Dept.
10.8. Improve on-farm water management through lining of irrigation channels	√	√	√	Irrigation Dept., Water Mgt Dept.
10.9. Undertake rain water harvesting and construct conservation ponds for irrigation and livestock.	√	√	√	Irrigation Dept., Water Mgt Dept, Soil Conservation Dept.
10.10. Promote crop rotation and intercropping	√	√	√	Agri Dept., NGOs, CBOs
10.11. Promote improved fallow systems in lands under intermittent management (e.g. raising Hurries plantations of *Acacia nilotica* in Sindh)	√	√	√	Agri Dept., Forest Dept., NGOs, CBOs
10.12. Apply soil conservation measures in the degraded agricultural land	√	√	√	Agri Dept, Soil Conservation Dept.
10.13. Treat saline and water-logged areas through bio-reclamation measures	√	√	√	Agri Dept, Forest Dept., Soil Conservation Dept.
Strategic Priority 11: Enhance the climate resilience of farmers				
11.1. Promote awareness about climate change adaptation and climate smart agriculture in farmers	√	√	√	Agri Dept, Forest Dept., NGOs, Local Communities
11.2. Involve the farming community in the process of	√	√	√	Agri Dept, Forest Dept. NGOs, Local

identifying local risks and devising safeguards				Communities
11.3. Identify susceptible locations within rain-fed agriculture systems that are prone to increased crop failure due to heat and drought	√	√		Agri Dept., Local Communities
11.4. Diversify farming strategies	√	√	√	Agri Dept., NGOs, Local Communities
11.5. Identify and promote those varieties of crops and breeds of animals which are drought resistant and adapted to the changing climate	√	√	√	Livestock Dept., NGOs, Local Communities
11.6. Establish early warning systems for floods, storms, droughts	√	√		Met Dept. Agri Dept.
11.7. Promote integrated pest management	√	√	√	Agri Dept., Research Organizations, Local Communities
11.8. Promote organic farming	√	√	√	Agri Dept., Research Organizations, Local Communities
11.9. Promote agroforestry to reduce the impacts of high temperature on crops and provide additional source of income.	√	√	√	Agri Dept., Research Organizations, Local Communities
11.10. Improve existing financial services for farmers in order to accommodate the technical innovation required owing to anticipated climate change-related droughts	√	√	√	Agri Dept, Micro Finance Banks, Rural Support Programs, NGOs
Strategic Priority 12: Develop the capacity of farmers and promote diversification of farm income				
12.1. Train farmers in apiculture, floriculture, aquaculture, hydroponics, mushrooms and tunnel farming, food technologies, horticulture, nursery raising etc.	√	√	√	Agri Dept, Fishery Dept. NTFPs Directorate, NGOs
12.2. Improve access of farmers to different government agencies	√	√	√	Agri Dept, Forest Dept. NGOs
12.3. Build the capacity of farmers through Farmer Business School (	√	√	√	Agri Dept, Forest Dept. NGOs

FBS) and Improve access to market				
12.4. Provide credit facilities	√	√	√	Agri Dept, Micro Finance Banks, Rural Support Programs, NGOs
12.5. Promote alternate income sources e.g. poultry farming, fish farming, offseason vegetables, fruit orchard development	√	√	√	Agri Dept, Fishery Dept. Poultry Dept, NGOs
12.6. Promote farmers fruit and forest nurseries	√	√	√	Agri Dept, Forest Dept. NGOs

4.6 Creation of Enabling Environment for Forest and Landscape Restoration in Pakistan

Context

Forestry and landscape restoration is a provincial subject in Pakistan. Forests and land are either owned by provincial governments, local communities or individuals and primarily managed by provincial forest departments or communities. Since FLR seeks to enhance the role of trees and ecological functioning across different land uses at the landscape level, it is important to support and strengthen collaboration and coordination among the different sectors e.g. forestry, agriculture, irrigation, mining, tourism and infrastructure. The objectives of landscape restoration can only be achieved if the concept and principles of FLR are integrated with the current policies and plans.

Issues and Trends

Planning process is generally dominated by sectoral approach in Pakistan, there is no proper mechanism for inter-sectoral coordination. Even there is no coordination among the different departments working on management of different natural resources in the same landscape. This situation not only leads to loss of resources but also creates barriers in achieving optimum level of ecosystem services. The Administrative Departments normally work in tight compartments and lack appropriate inter and intradepartmental coordination mechanisms especially more so at operational level. As such, each sector is undertaking planning and management of its own sector without effective consultation with sister sectors and involvement of community. Thus department concerned may become at times oblivious to ground reality and may create negative competition and or perverse incentives. In this context more specific issue is lack of interdepartmental coordination.

There is a need to bring different sectors and actors together to look at the issue of land and natural resource degradation holistically and plan restoration at landscape level. Forest and landscape restoration can only bring positive results if it is integrated and synchronized with the existing policies, strategies and planning frameworks. A number of policies, strategies and action plans are currently operational in Pakistan which can be tailored towards FLR including Ten Billion Trees Tsunami Programme, National REDD+ Strategy, Provincial REDD+ Action Plans, National Biodiversity Strategy and Action Plan, National Action Programme to combat desertification, and Nationally Determined Contributions (NDCs) for climate change mitigation. In the face of recent catastrophic impacts of climate change in the country, the Government

has embarked upon the development of a National Resilience Framework. There is a need to integrate FLR into this framework to ensure the restoration of vulnerable and degraded landscapes in the country. The Regional Strategy and Action Plan for FLR in the Asia-Pacific also underscores the need for integration and synchronization of FLR into existing sectoral and cross-sectoral policies and goals, as well as development planning frameworks at local and national levels.

FLR Options

Integrated landuse planning, effective inter-sectoral coordination and cooperation among government agencies and integration of FLR into national and provincial planning framework are the key strategic options for ensuring the sustainability of restoration initiatives.

Strategies and Actions

Strategic Priority 13: Integrate FLR into national and provincial planning framework				
Action	Short Term (1-5 year)	Medium Term (5-10 year)	Long Term (10-20 year)	Responsible Actors
13.1.Analyze the policies, laws, regulations, strategies, plans and programmes across different sectors in terms of their adequacy for FLR.	√			MoCC, Provincial Forest Departments, Agriculture Departments
13.2. Integrate FLR into existing sectoral policies, strategies and plans, laws and regulations as well as National Resilience Framework and development planning frameworks at national and subnational levels.	√	√		Planning Commission, MoCC, Provincial Planning and Development Departments
13.3. Develop FLR Plans based on integrated land use planning at provincial, regional and district levels through participation of all stakeholders including local communities.	√	√		Provincial P&D Departments, Forest Departments, Agriculture Departments, Revenue Departments
Strategic Priority 14: Establish effective institutional setup for planning and implementation of FLR at national, provincial and district levels				
14.1. Establish a national working group in MoCC to	√			MoCC

coordinate FLR activities and support resource mobilization efforts in provinces				
14.2. Establish an intern-departmental coordination committee at provincial level under the chairmanship of Secretary, Planning & Development and comprising the secretaries of Forest, Agriculture, Irrigation, Mining, Tourism, Energy and Revenue.	√			Provincial P& D Departments, Forest Departments, Agriculture Departments, Irrigation Departments, Mining, Tourism, NGOs, INGOs
14.3. Establish an inter-departmental coordination committee at District Level under the chairmanship of Additional Deputy Commissioner (Planning & Finance) and comprising District Heads of Forest, Agriculture, Livestock, Soil Conservation, Irrigation, Mining, Tourism and Revenue Departments as well as representatives of District Government, NGOs and Civil Society to coordinate FLR interventions at landscape level and manage conflicts over landuse and tenure	√			Revenue Department, Forest Department, Agriculture Department, Wildlife, Livestock, Mining, Tourism, Local Government, NGOs

4.7 Human, Technical and Institutional Capacity for FLR

Context

Knowledge, skills, field experience and expertise related to Human, Technical and Institutional Development for FLR design, planning, implementation and M&E within various stakeholder groups at various levels within Pakistan is either non-existent, scattered and/or not properly documented. This has negative consequences for expeditious implementation of the much-needed FLR program in the country. Developing and making systematic use of a well-established and functional Institutional and Human Resource Development Program would go a

long-way and yield rapid results and dividends in successful implementation of the envisaged FLR program. Capacity building is needed for working with stakeholders and local communities to build trust; setting policies and regulations that are implementable on the ground; and ensuring planning, enforcement and implementation of laws and regulations for FLR.

Issues and Trends

Professional degrees of forestry, agriculture, livestock, water management etc. at graduate and post graduate levels have little rooms for allied disciplines and integrated natural resource management. Consequently, the professionals produced in Pakistan pursue sectoral approach in planning and implementation of interventions in their respective sectors which is a key challenge for FLR. There is also a lack of inter-sectoral, inter-departmental coordination and cooperation in Pakistan both at national, provincial and district level. The concerned government agencies also lack necessary human, technological and financial resources for implementation of FLR approaches. Lack of a proper Training and Capacity Building Program to support the implementation of FLR activities is taking its toll on implementation and progress of FLR in Pakistan. While programs for large-scale tree planning have been implemented from time to time in Pakistan and at various provincial levels, no accompanying human, technical and institutional capacity building programs have been carried out in the past. This situation needs immediate rectification. Therefore, to address this critical gap, a comprehensive Training and Capacity Building Program in support of FLR for various stakeholder groups will have to be designed and implemented on a priority basis.

Strategies and Actions

Strategic Priority 15: Build the capacity of professional and para-professional staff of the concerned agencies for planning, implementation and evaluation of FLR				
Action	Short Term (1-5 year)	Medium Term (5-10 year)	Long Term (10-20 year)	Responsible Actors
15.1. Conduct assessment of existing capacities of different stakeholder groups in FLR planning, implementation, monitoring and evaluation.	√	√	√	Agri Dept, Forest Dept., PFI, INGOs, FAO
15.2. Develop specialized training modules of appropriate duration for training of different stakeholders groups	√	√	√	Agri Dept, Forest Dept, INGOs, PFI
15.3. Develop a comprehensive program for implementation of the Training and Capacity Building Program.	√	√	√	Agri Dept, Forest Dept. PFI, NGOs

15.4. Add specialized subjects on FLR in undergraduate and post graduate study programmes in Forestry, Agriculture and other relevant degrees	√	√	√	PFI, Academia
Strategic Priority 16: Build the capacity of the concerned agencies for planning, implementation, monitoring and evaluation of FLR				
16.1. Conduct assessment of the concerned government departments and NGOs for planning, implementation and evaluation of FLR efforts.	√			Agri Dept, Forest Dept. PFI, NGOs
16.2. Identify gaps in knowledge that research institutions could address more effectively and emphasize research geared to innovative solutions for local stakeholders.	√			Agri Dept, Forest Dept. PFI, Academia
16.3 Equip concerned agencies with trained manpower, latest hardware, software and technologies for FLR planning, implementation, monitoring and evaluation	√	√		MoCC, P&D Dept, Finance Dept, Forest Dept, Agri Dept.
16.4. Develop networks/knowledge platforms at national and regional levels to disseminate good FLR practices	√	√	√	Agri Dept, Forest Dept. PFI, Research, Academia
16.5. Establish/strengthen the existing Institutional Development and Human Resource Development (ID/HRD) set-ups in Forest Departments for planning, implementation, and M& E of the Training and Capacity Building Program.	√	√		Agri Dept, Forest Dept. PFI

4.8 Cross Cutting Actions for FLR

Some elements of restoration encompass different thematic areas of FLR and hence need to be treated as cross cutting actions in the current NAP. These include the following.

Action	Short Term (1-5 year)	Medium Term (5-10 year)	Long Term (10-20	Responsible Actors

			year)	
Undertake GIS and Satellite based mapping of degraded forests, rangelands, watershed and agricultural lands which need restoration.	√	√	√	Forest Department, Agriculture Department, Range Mgt Authorities, Watershed Authorities, NGOs, Academia.
Organize local communities and develop their capacity to address drivers of deforestation and land degradation	√	√	√	Forest Department, Agriculture Department, Range Mgt Authorities, Watershed Authorities, NGOs, Academia.
Develop management plans for forests, rangelands, watersheds and agricultural lands	√	√	√	Forest Department, Agriculture Department, Range Mgt Authorities, Watershed Authorities, NGOs, Academia, Local communities
Capacity building of line departments and local organizations for implementation of FLR	√	√	√	Forest Department, Agriculture Department, Range Mgt Authorities, Watershed Authorities, NGOs, Academia, Local communities
Develop and implement conducive Policies and Action Plans at different levels for involvement of Private Sector in Forest and Landscape Restoration	√	√		MoCC, P&D Department, Finance Department, Forest Department, Agriculture Department, Range Mgt Authorities, Watershed Authorities
Identify opportunities for value chain promotion and business	√			MoCC, P&D Dept, Finance Dept, Forest

models of various ecosystem goods and services from restored forests and landscapes.				Dept, Agri Dept.
Develop mechanisms for the actualization of identified opportunities for the promotion of sustainable and inclusive value chain and business models in the sector.	√	√		MoCC, P&D Dept, Finance Dept, Forest Dept, Agri Dept.
Develop benefit-sharing mechanisms for the revenue accruing from these value chains and business opportunities in the sector.	√	√		MoCC, P&D Dept, Finance Dept, Forest Dept, Agri Dept.
Develop and adopt Model Public-Private Partnership Arrangements, Joint Ventures/Special Purpose Vehicles, Process and SoPs for the involvement of and promotion of investment by Private Sector in FLR.	√	√	√	MoCC, P&D Dept, Finance Dept, Forest Dept, Agri Dept.

5 RESOURCE MOBILIZATION OPTIONS

The availability of sufficient finances on regular basis is the biggest challenge for implementation of this action plan. Though the government is giving high priority to forest restoration, the available fiscal resources are limited and there is tough competition for these limited financial resources with the government. At the same time, implementing the actions proposed in this plan requires significant financing. The key actions for resource mobilization include the following:

i. Estimate the resources already available for FLR through existing national and provincial development programmes: Federal Government provides funding for forest and landscape restoration through Public Sector Development Programme (PSDP). Large scale afforestation and land rehabilitation projects have been funded by the PSDP in the past such as Green Pakistan Programme and the on-going Ten Billion Trees Tsunami Programme. PSDP also provides entire budget of forest development in Gilgit Baltistan and Azad Kashmir.

ii. Increasing provincial spending for FLR: Provincial Governments provide funding for forest development and restoration through their Annual Development Programme (ADP). Provinces have implemented large scale restoration projects in the past e.g. Billion Trees Afforestation Project in KP which was completed with a cost of PKR. 19 Billion during 2014-2018. Similarly, considerable budgets have been allocated for

forest restoration in Punjab, Sindh and Balochistan. During 2016-17, PKR 4.816 billion were spent by provinces on forest restoration under development budget. Besides ADP, regular there is also provision of budget for forest development under the normal budgets of the Provincial Forest Departments. The provincial governments need to convinced that more resources should be allocated for FLR which will bring numerous socio-economic and environmental benefits and will enhance climate change resilience at local scales.

iii. Develop and adopt an enabling policy and regulatory framework for the involvement of private sector in FLR.

iv. Integrate FLR into national, provincial and local government budgets and public investment funds.

v. Run a strong national level advocacy campaign to sensitize and persuade policy makers to allocate a substantial budget for FLR.

vi. Establish FLR Funds in provinces on the analogy of the Forest Development Fund established in KP which receives a fixed share from the sale of timber and provides funding for forest restoration.

vii. Allocate a substantial share in the revenue from mining, tourism, hydropower and other energy projects carried out in forest areas for FLR activities.

viii. Persuade national agencies such as Water and Power Development Authority (WAPDA) and National Highway Authority (NHA) to provide funding for FLR from their resources. WAPDA has provided funds for watershed management projects of Tarbella and Mangla in the past. A number of water reservoirs are currently being constructed by WAPDA in different parts of the country for power generation. It is expected that WAPDA will provide funding for restoration and management of watershed areas to reduce sedimentation of these reservoirs. Similarly, NHA may provide funding for stabilization of critical landslides and sand dunes along the highways.

ix. The national action plan may provide the basis for building trust with bilateral and multilateral donors in terms of national commitment to FLR. The bilateral funding sources like United States Agency for International Development (USAID), Australian Aid, Japan International Cooperation Agency (JICA), German Government support etc. offer reasonably good opportunities for the implementation of the National Action Plan. Similarly, multilateral support available through, for example, the World Bank (WB), the Green Climate Fund (GCF), the Global Environment Facility (GEF), the Food and Agricultural Programme of the United Nations (FAO), the United Nations Development Programme (UNDP), and the Asian Development Bank (ADB) may be tapped.

x. Though international funding opportunities are growing due to international commitments for climate change mitigation and adaptation, there is a need to develop the capacity of the government sector to explore and access these windows. MOCC will have to play a key role in this regard.

xi. Develop national and local financing mechanisms for FLR, in particular by promoting the development of financial instruments at the local level (e.g. local development funds, microfinance instruments, credit facilities in Agricultural Bank, and private banks), with positive incentives for local stakeholders to promote sustainable FLR investments.

xii. Develop Model Public-Private Partnership (PPP) Arrangements, Joint Ventures (JV)/Special Purpose Vehicles (SPVs), Processes and Standard Operating Procedures (SoPs) for the participation of and investment by Private Sector in FLR.

xiii. Develop and implement a mechanism for promotion of corporate social responsibility (CSR) and networking of Private Sector for greater involvement in Nature-based Solutions (NBS) and FLR.

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7 ANNEXURES

ANNEX 1: INTEGRATION OF LANDSCAPE AND ECOSYSTEM RESTORATION IN NATIONAL RESELIENCE FRAMEWORK AND DEVELOPMENT PLANNING

A national level workshop was organized on November 22-23, 2022 at Pakistan Forest Institute, Peshawar under the auspices of the Ministry of Climate Change, FAO and the World Bank which was

attended by 75 representatives of national and provincial government departments, NGOs, Civil Society Organizations, Academia, Research, media and local communities who deliberated upon the role of landscape and ecosystem restoration in socio-economic development of Pakistan.

Recognizing that the renewable natural capital in Pakistan accounts for 14% of the total wealth of the country and supporting up to 70% of the wealth of the rural population in the country; and further acknowledging that through restoring landscapes and ecosystems in the country can reduce climate change induced disasters in the country which during the recent floods have led to the damages, losses and needs of 46 billion US dollars.

Therefore, cognizant of the above role and importance of landscape and ecosystem restoration for the creation of green jobs, rural wealth enhancement and contribution to development of resilient communities and landscapes, the participants from Federal Government and all provinces and federating units of Pakistan including private sector, local communities, civil society and other stakeholder groups, resolved to urge upon the concerned political and decision making authorities at the federal and provincial levels to include landscape and ecosystem restoration as part of resilience building framework, environmental conservation and socio-economic development planning that the Governments at the federal and provincial levels are embarking upon.

In this connection, the forum has specifically asked for the following:

1. The National Landscape restoration draft plan developed by the forum which identifies the priority areas for landscapes restoration which needs to be taken forward from domestic resources at federal and provincial levels supported by multilateral and bilateral donor agencies resources. The plan should be further elaborated by Provinces and Federal Government.
2. The concerned agencies at the federal and provincial levels should advocate for the implementation of the landscape restoration plan through its integration in the resilience framework of the government and follow on Provincial development plans.
3. To ensure implementation of the above resolution the forum also demands that this agenda be pursued vigorously at various fora and levels to create awareness and secure needed support of all stakeholders.
4. A mechanism should be established by MoCC in collaboration with MoPDSI, the Provinces to drive forward development, financing and implementation of the Plan.

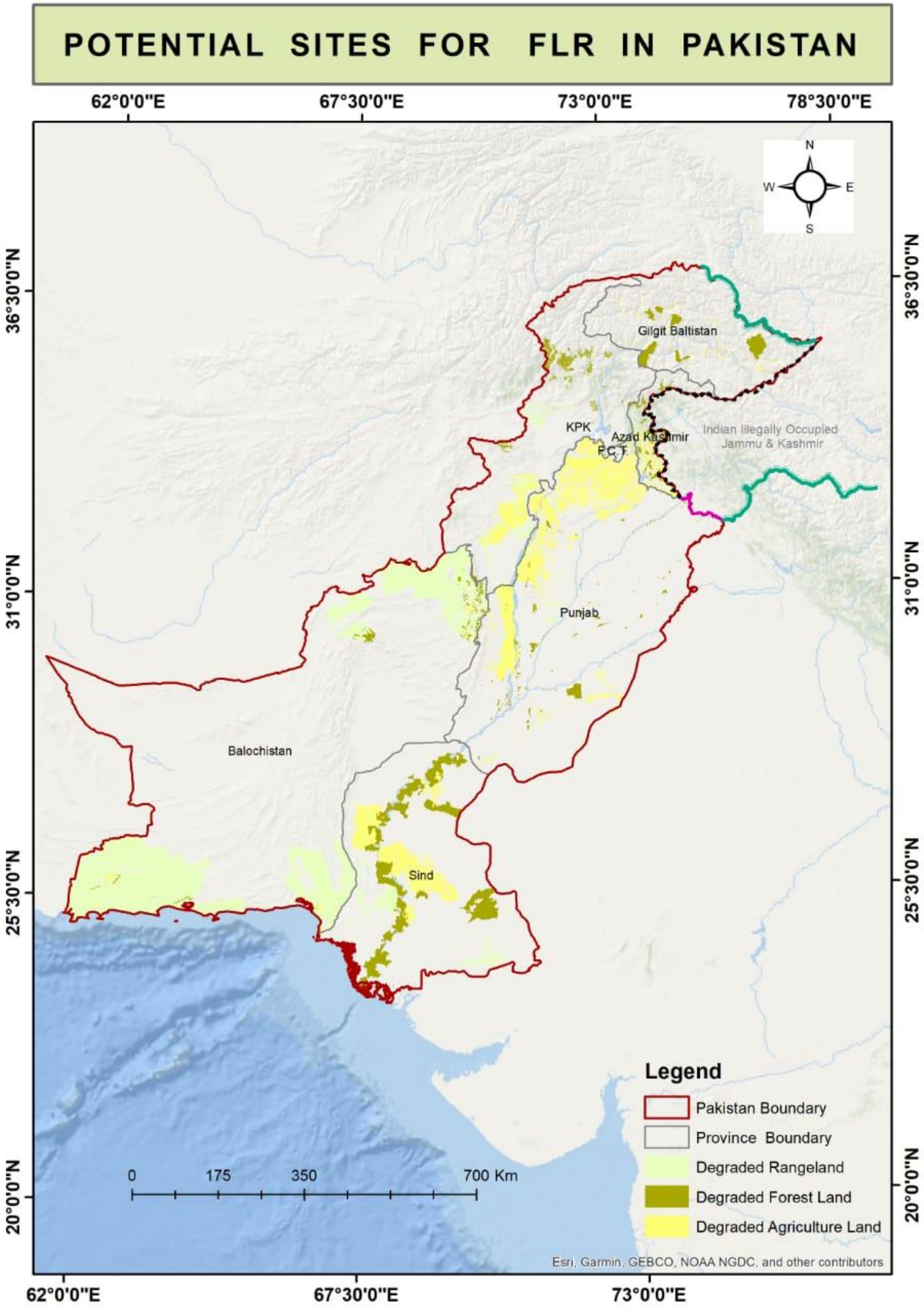
PESHAWAR: NOVEMBER 23, 2023

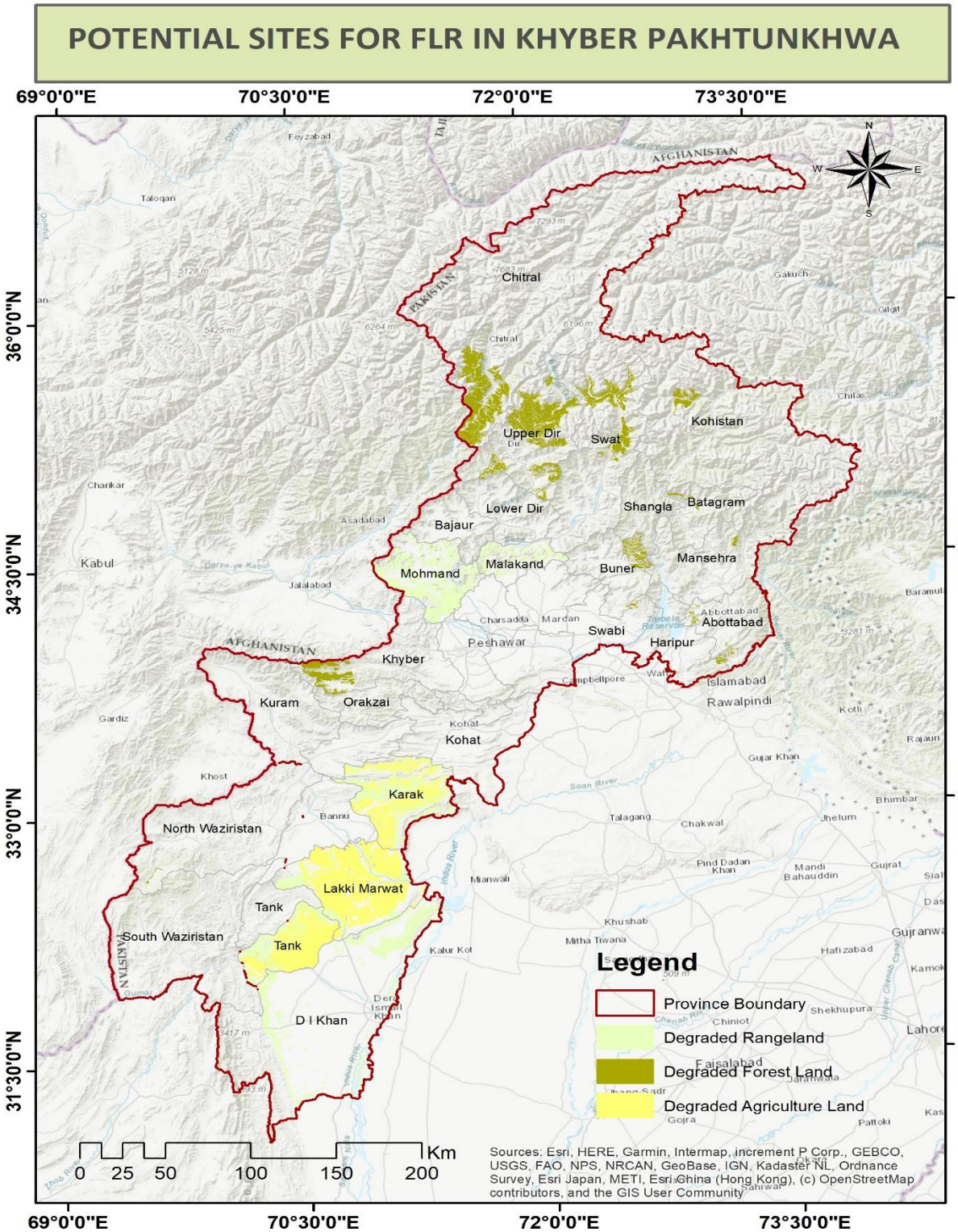
ANNEX 2: POTENTIAL LANDSCAPES FOR FLR IN PAKISTAN

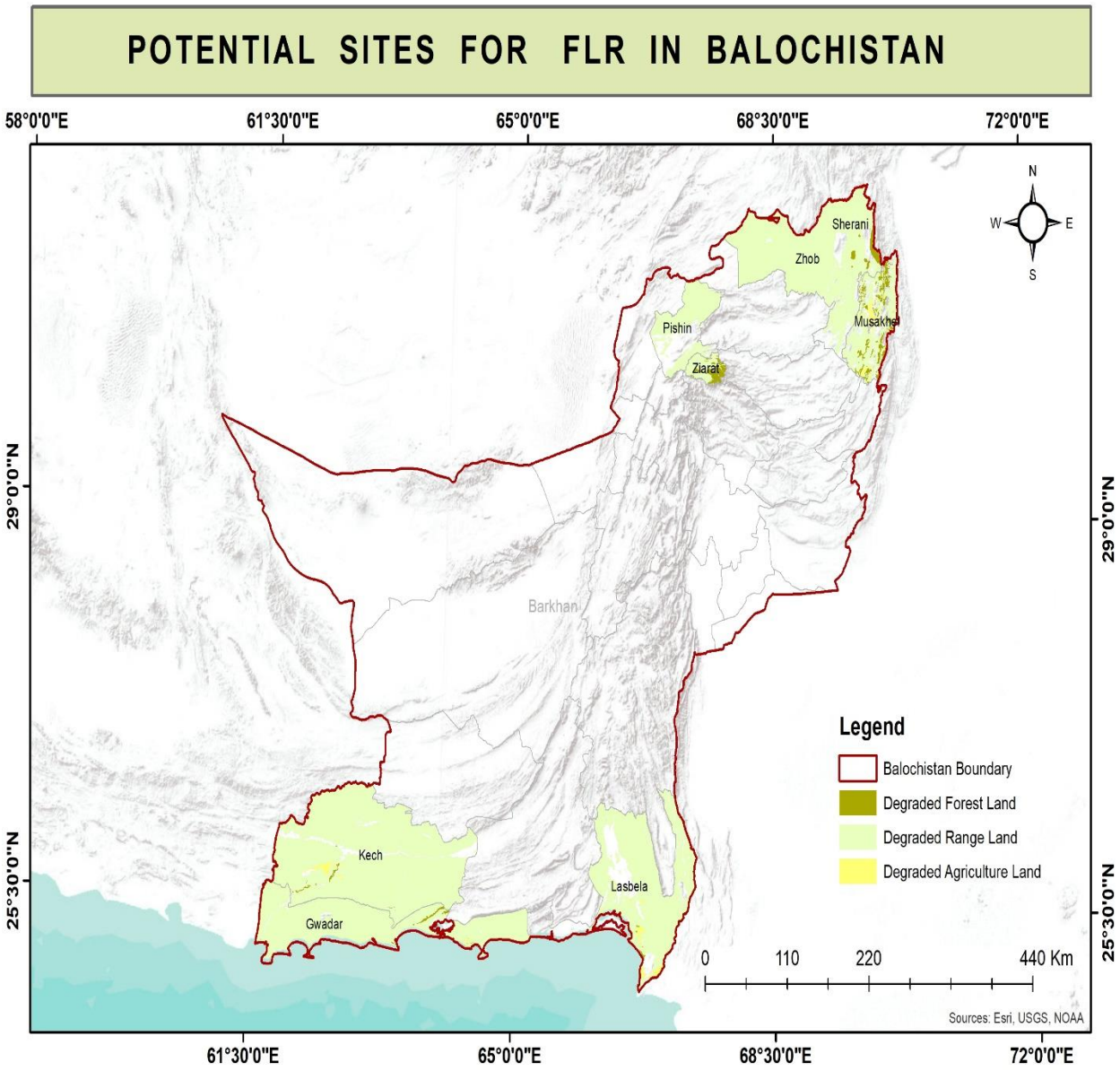
Province/Region	Potential Landscapes	Area (ha)	Estimated Cost (million US$)
Khyber Pakhtunkhwa	Dry Temperate: i) Drosh , Chitral ii) Arandu, Chitral iii) Kandia Valley Upper Indus Kohistan		230.27

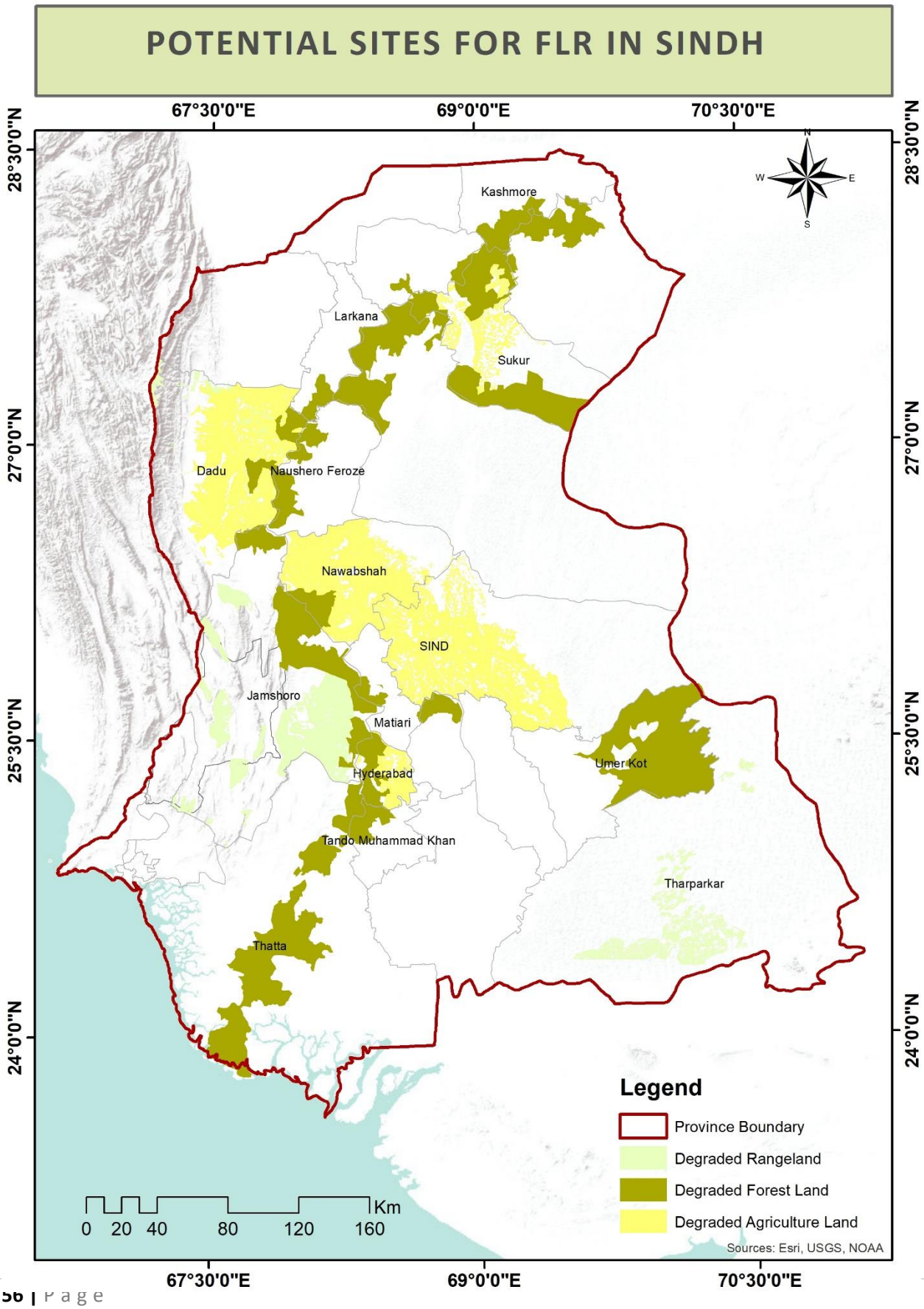
	iv) Seo Valley, Kohistan v) Barawal Valley (Upper Dir) vi) Dogdara, Dir Kohistan vii) Usho, Kalam viii) Utror, Kalam ix) Shawal Valley (North Waziristan) x) Para chamkani (Kurram Agency) Moist Temperate: i) Jabori Valley (Mansehra) ii) Karo Darra (Upper Dir) iii) Osherai Dara,Wari (Upper Dir) iv) Nehag Dara (Upper Dir) v) Jabori , Siran vi) Chail , Madyan Swat Sub-tropical Pine: i) Chagharzai Valley Buner ii) Jabri-satora (Sherwan, Mansehra) iii) Teerah Valley (Khyber) iv) Ghiljo Orakzai v) Shergarh , Mansehra vi) PaashtoValley,Allai,Batagram Sub-tropical Scrub: i) Gadoon Bir gali (Swabi) ii) Tank Kulachi (D.I. Khan) iii) Lawaghar Khwar (Karak)	1,076,102	
Balochistan	Mangrove i) Kalmat, Pasni, Gawadar ii) Miani Hore, Lasbela iii) Gorchela, Pasni iv) Makola , Pasni v) Shadi kor, Turbat Musa Khel i) Kingri, Barkhan ii) Drug iii) Wah Hassan Khel iv) Teri Sot v) Kingri vi) Musakhek Sad Chilghoza i) Kapip, Sherani ii) Manikhwa, Sherani, iii) Danesar, Serani Juniper i) Zandra, Ziarat ii) Kach, Ziarat	857,879	178.58

	iii) Kawas, Ziarat iv) Sadar Samalan, Sinjavi Ziarat v) Poi, Sinjavi Ziarat vi) Regorah, Sinjavi Ziarat		
Sindh	Riverine Forest It can be divided into three sub-landscapes Downstream Guddu to Upstream Sukkur Downstream Guddu to Upstream Kotri Downstream Kotri to Indus Delta Range ecosystem Karounjhar Kohistan Region Khirthar	3,246,232	818.63
Punjab	Desert: Cholistan Thal Riverine Forest/ Belas: Irrigated Plantations Potohar Plateau	3,168,063	618.07
Azad &Jammu Kashmir	i) Gureze Valley ii) Jagran Valley iii) Lachrat valley iv) Leepa valley v) Surgan valley vi) Kohala vii) Dhirkot viii) Banjosa ix) Tararkhel x) Goi kotli Dudyal	385,806	90.49
Gilgit Baltistan	i) Samahni valley ii) Chaprot valley iii) Hudar valley iv) Hoshay valley v) Shagar Valley vi) Bagrot vii) Fairy meadows viii) Rama ix) Sher Qila x) Thor	504,225	140.79

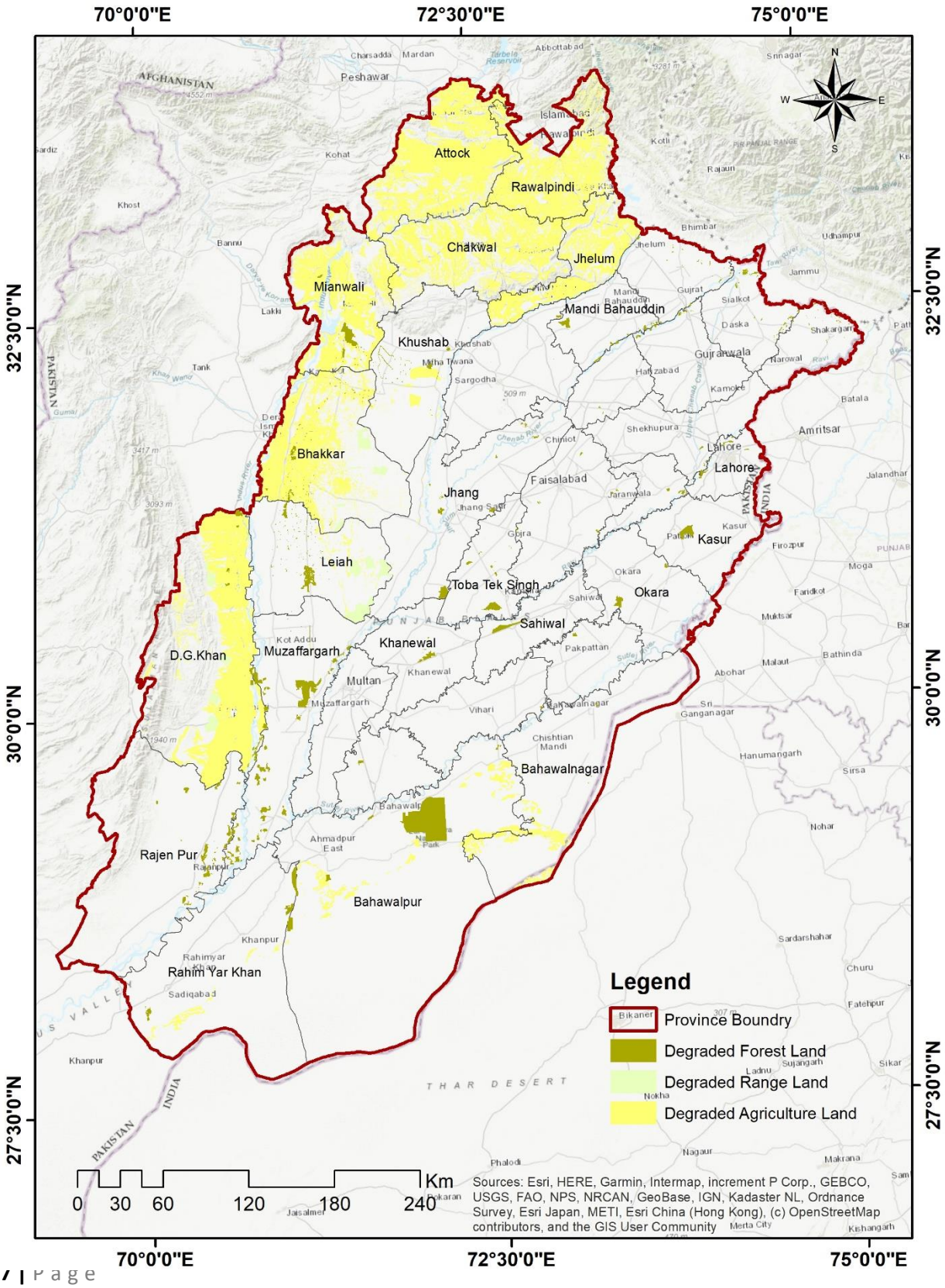

POTENTIAL SITES FOR FLR IN PAKISTAN
62°0'0"E
67°30'0"E
73°0'0"E
78°30'0"E
36°30'0"N
31°0'0"N
25°30'0"N
20°0'0"N
N
W
E
S
Gilgit Baltistan
KPK
Azad Kashmir
F.C.T
Indian illegally Occupied Jammu & Kashmir
Punjab
Balochistan
Sind
0
175
350
700 Km
Legend
Pakistan Boundary
Province Boundary
Degraded Rangeland
Degraded Forest Land
Degraded Agriculture Land
Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

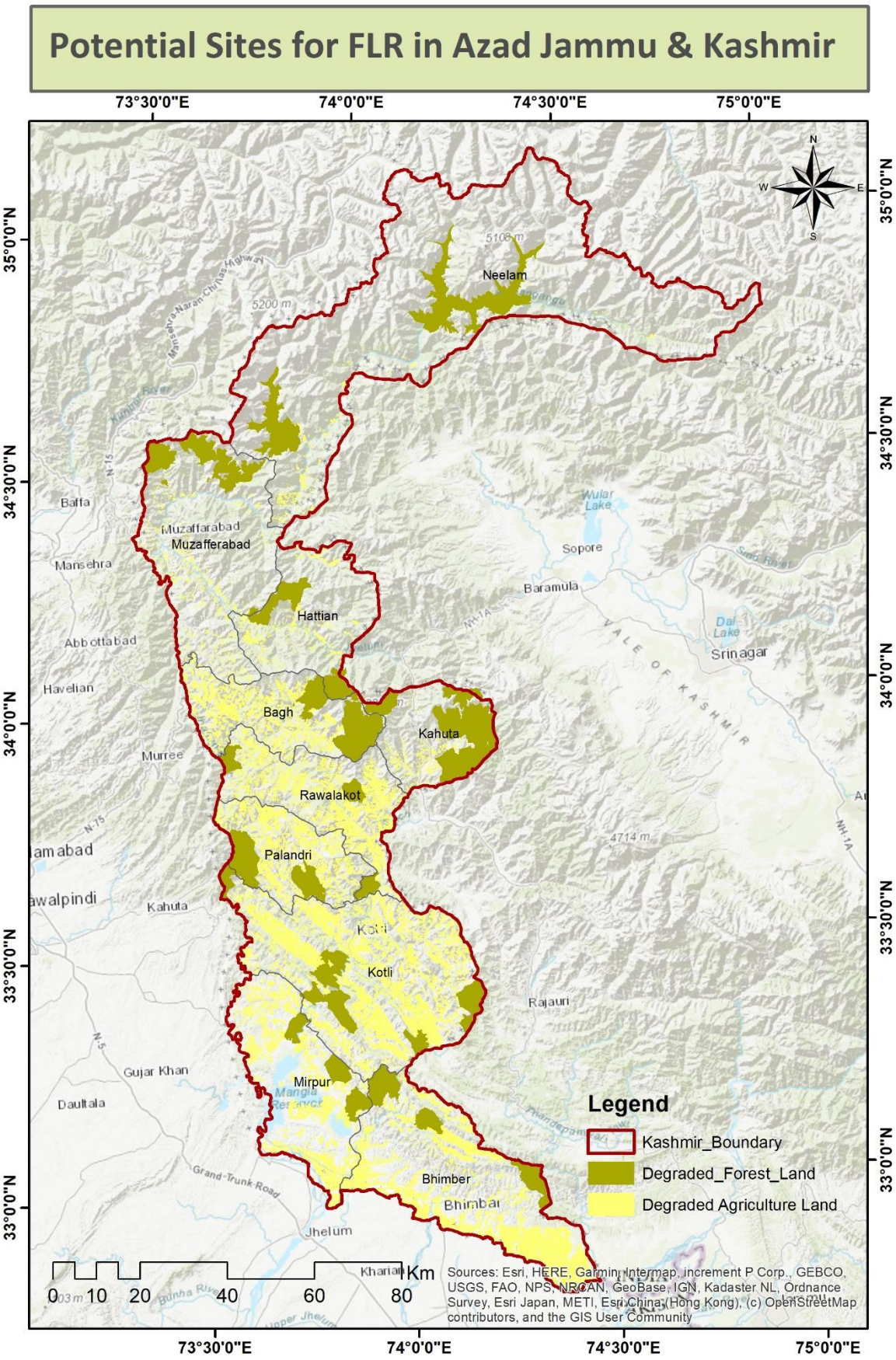

POTENTIAL SITES FOR FLR IN KHYBER PAKHTUNKHWA
69°0'0"E
70°30'0"E
72°0'0"E
73°30'0"E
36°0'0"N
34°30'0"N
33°0'0"N
31°30'0"N
AFGHANISTAN
PAKISTAN
Chitral
Upper Dir
Lower Dir
Swat
Kohistan
Shangla
Batagram
Bajaur
Malakand
Buner
Mansehra
Mohmand
Swabi
Haripur
Abbottabad
Peshawar
Khyber
Kuram
Orakzai
Kohat
Karak
North Waziristan
Lakki Marwat
Tank
South Waziristan
D I Khan
Kabul
Islamabad
Rawalpindi
Legend
Province Boundary
Degraded Rangeland
Degraded Forest Land
Degraded Agriculture Land
0 25 50 100 150 200 Km
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

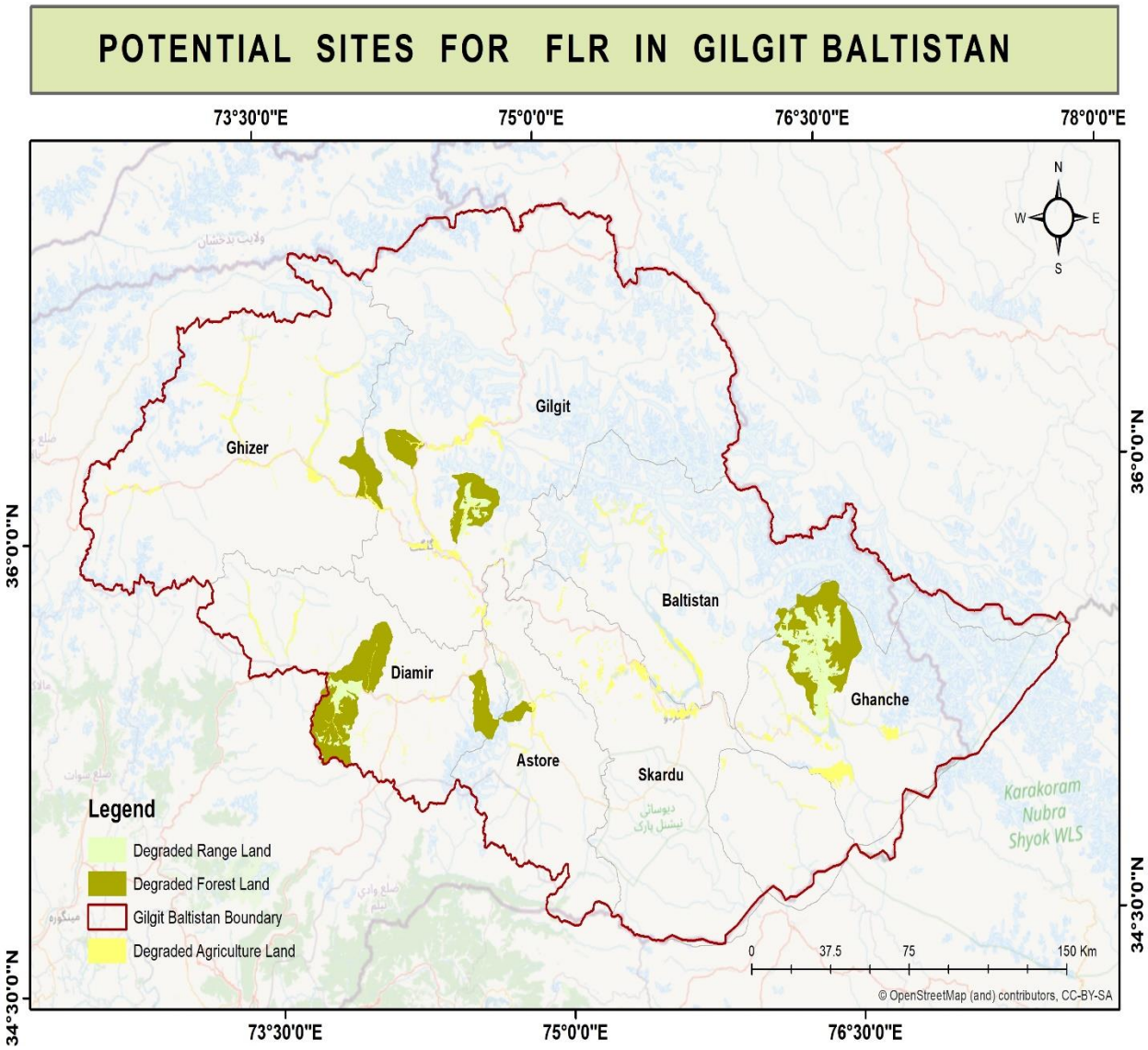

POTENTIAL SITES FOR FLR IN BALOCHISTAN
58°0'0"E
61°30'0"E
65°0'0"E
68°30'0"E
72°0'0"E
29°0'0"N
25°30'0"N
N
W
E
S
Sherani
Zhob
Pishin
Musakhel
Ziarat
Barkhan
Kech
Gwadar
Lasbela
Legend
Balochistan Boundary
Degraded Forest Land
Degraded Range Land
Degraded Agriculture Land
0
110
220
440 Km
Sources: Esri, USGS, NOAA


POTENTIAL SITES FOR FLR IN SINDH
67°30'0"E
69°0'0"E
70°30'0"E
28°30'0"N
27°0'0"N
25°30'0"N
24°0'0"N
N
W
E
S
Kashmore
Larkana
Sukur
Dadu
Naushero Feroze
Nawabshah
SIND
Jamshoro
Matiari
Hyderabad
Umer Kot
Tando Muhammad Khan
Tharparkar
Thatta
Legend
Province Boundary
Degraded Rangeland
Degraded Forest Land
Degraded Agriculture Land
0 20 40 80 120 160
Km
Sources: Esri, USGS, NOAA

POTENTIAL SITES FOR FLR IN PUNJAB




Potential Sites for FLR in Azad Jammu & Kashmir
73°30'0"E
74°0'0"E
74°30'0"E
75°0'0"E
35°0'0"N
34°30'0"N
34°0'0"N
33°30'0"N
33°0'0"N
N
S
E
W
Neelam
Muzaffarabad
Hattian
Bagh
Kahuta
Rawalakot
Palandri
Kotli
Mirpur
Bhimber
Baffa
Mansehra
Abbottabad
Havelian
Murree
Kahuta
Gujar Khan
Daultala
Jhelum
Sopore
Baramula
Srinagar
Rajauri
Legend
Kashmir_Boundary
Degraded_Forest_Land
Degraded Agriculture Land
0 10 20 40 60 80
Km
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community


POTENTIAL SITES FOR FLR IN GILGIT BALTISTAN
73°30'0"E
75°0'0"E
76°30'0"E
78°0'0"E
36°0'0"N
34°30'0"N
N
W
E
S
Gilgit
Ghizer
Baltistan
Diamir
Ghanche
Astore
Skardu
Karakoram
Nubra
Shyok WLS
Legend
Degraded Range Land
Degraded Forest Land
Gilgit Baltistan Boundary
Degraded Agriculture Land
0
37.5
75
150 Km
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ANNEX 3: DETAIL OF STAKEHOLDERS' CONSULTATION PROCESS

Provincial Forest Departments

Forestry and land management are provincial subjects in Pakistan. Forest conservation, restoration and development are the exclusive mandate of the provincial forest departments. Besides, the management of rangelands and wastelands also fall in the domain of provincial forest departments. Agroforestry, watershed management and wildlife management are also directly or indirectly performed by these departments. This gives Provincial Forest Departments a central position in forest and landscape planning and restoration. All massive reforestation, afforestation, watershed management, rangeland rehabilitation and desertification control projects have been implemented by forest departments. It was, therefore, decided to undertake in-depth consultation with forest departments in provinces. For this purpose, FLR Working Groups were established in all provinces and territories, comprising three senior forest officers of the concerned provincial forest departments.

In addition to consultation with FLR Working Groups, consultative meetings were also held in the headquarters of provincial forest departments which were attended by Chief Conservators, Conservators and DFOs involved in forest restoration, planning and development. Through these meetings, the forest officers were briefed about the background, objectives, roadmap and draft framework of the National Action Plan. They shared their experiences, success stories, demands, priorities, opportunities and challenges for FLR in provinces.

Consultation with other Government Departments

Other government departments dealing with land or natural resources were also consulted for development of National Action Plan. These included the following departments:

- Agriculture Extension
- Agricultural Research
- Wildlife Department
- Soil Conservation Department
- Mining Department
- Irrigation Department

Consultation with Private Sector Organizations

The following organizations were also consulted for development of National Action Plan:

- Agha Khan Rural Support Programme (AKRSP)
- IUCN-Pakistan
- WWF-Pakistan
- Swiss Inter Cooperation Helvetas
- Civil Society Organizations (Khwedokor, Lasoona, Seswa)

- Indus Delta Blue Carbon
- Tobacco Industries (PMI, PTC)
- Wood based industries (ZRK)

Consultation with Local Communities

Extensive consultations were held with local communities in the 30 different landscapes across the country. A list of these areas/landscapes is given in the table given below. These landscapes were identified by the stakeholders in the first consultative workshop. PFI Teams visited these landscapes and held Focus Group Discussion with local communities on the following aspects of FLR:

- Causes of degradation
- Issues and barriers to restoration
- Potential for restoration
- Priorities and demands of local communities
- Potential FLR approaches

Table: List of community consultation for development of National Action Plan

Province/Territory	Area/District	Community members
Khyber Pakhtunkhwa	Darosh, Chitral	42
	Booni, Chitral	22
	Rambur, Chitral	30
	Bara, Khyber	17
	Chagharzi, Buner	31
Punjab	Ahmad Muhana, Muzaffargarh	8
	Bait Qasim Ali Shah, Muzaffargarh	24
	Kotla Sadat, Muzaffargarh	09
	Rakh Sohni, Muzaffargarh	12
	Gorha Maar, Attock	09
	Bagh Neelab, Attock	12
Balochistan	Ahmadi Dargah, Sherani	07
	Soorlakay, Sherani	06
	Gushtai, Zhob	17
	Bahlol, Zhob	05
Sindh	Rahooja, Qadirpur, Sukkur	13
	Bhedi Dhareja, Sukkur	17
	Shamani, Khairpur	17
	Gumbat, Kairpur	18
Gilgit Baltistan	Bagrot, Gilgit	16
	Chaprot, Nagar	08
	Sher Qila, Ghizer	22
Azad Jammu &	Banjosa, Poonch	25

Kashmir	Dheerkot, Bagh	21
	Jhagran, Neelam	44
	Leepa, Jhelum	19
	Lubgaran, Jhelum	19
	Mooji, Jhelum	23
	Nokot, Jhelum	26

Consultative Workshops

Two consultative workshops were held at PFI Peshawar to get inputs from different stakeholders for preparation of the National Action Plan. The first consultative workshop was held on 3rd October 2022 which was attended by 28 participants from Forest department, Wildlife Department, Agriculture Department, Academia, Research, NGOs, Women Group and private sector. The second consultative workshop was held on 22-23 November 2022 which was attended by 75 participants from different sectors.